# CATALAN PHYSICIANS' CONTRIBUTIONS TO MEDICINE: A HISTORICAL VIEW THROUGH EPONYMS

Elena Guardiola
and Josep-E Baños

DR. ANTONI ESTEVE
FOUNDATION

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DR. ANTONI ESTEVE FOUNDATION

The Dr. Antoni Esteve Foundation was established to honor the pharmacist, researcher, and entrepreneur for whom it is named, with the idea of focusing on one of the key elements of his personality: love and respect for science. Established by his family in 1982, the Foundation is a non-profit organization, and its activity centers on science, with special emphasis on the field of pharmacology.

Dr. Antoni Esteve i Subirana was born in Manresa, Spain in 1902. He earned a degree in pharmacy, becoming the fifth in a lineage of pharmacists to settle in his hometown, Manresa. However, his professional aspirations would take him far beyond his humble beginnings. Starting out elaborating medicinal preparations in the backroom of his pharmacy, in 1929 he went on to found what would one day become an important pharmaceutical company, thanks to his

scientific know-how and entrepreneurial spirit and the enthusiastic support of his wife.

The Foundation fosters communication among professionals by organizing international symposiums, roundtables, and discussion groups. It also helps disseminate quality scientific research by awarding the Esteve Foundation Research Award every two years for the best scientific article published by Spanish authors.

The Foundation also promotes scientific communication in the broadest sense by publishing the Dr. Antoni Esteve Foundation Monographs summarizing the contents of the roundtables, books covering the contributions to the symposia, Dr. Antoni Esteve Foundation Notebooks focusing on the world of science, and articles in scientific journals. Another special contribution that the Foundation makes to the sharing of scientific knowledge is the book collection "Pharmacotherapy Revisited". Each of these books recompiles thirty-odd articles selected by prestigious scientists to show key developments in different branches of pharmacotherapy.

The Foundation organizes seminars in collaboration with universities, hospitals, and other scientific institutions, with the aim of strengthening competencies that are often inadequately covered in degree programs at institutions of higher learning. These seminars are mainly held in Spain, but have also been done in other countries in Europe and America. Another activity, the "Meet the expert", lies halfway between teaching and scientific communication, and consists of meetings in which a small group of Spanish researchers are invited to discuss key issues in their field with a renowned international expert.

Last but not least, the Foundation collaborates with a wide range of biomedical professionals and it is involved in many collaborative projects with universities, scientific societies, research institutions, or bodies that provide support to research.

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This book compiles a selection of articles published by Annals de Medicina under the title "Eponímia mèdica catalana" (Catalan medical eponymia).
This edition expresses the opinions of its authors, which are not necessarily the views of the Dr. Antoni Esteve Foundation.

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Passeig de la Zona Franca 109. 08038 Barcelona
Phone: (+34) 93 433 53 20
Email: fundacion@esteve.org
http://www.esteve.org

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# PREFACE

Twenty years ago, our special interest in terminology and language, as well as in the history of Catalan medicine, prompted us to compile and study medical eponyms of Catalan origin. To this end, we reviewed all sorts of collections, dictionaries, listings, and textbooks where we thought we might find one.

Being able to search bibliographic databases has enabled us to consult many digital catalogs in our country as well as in other countries and to find books that might be useful for our task. We thoroughly reviewed these books to find medical eponyms of Catalan origin, to obtain information about what the eponym represents, and to collect biographical information about the eponymous person. We also strived to obtain the publication that gave rise to the eponym. In each case, we have tried to reflect the context and historical background in which the eponym originated. Many people have added to our findings, enriching our archives and our knowledge by sending us references about eponyms.

When we undertook this endeavor, little did we imagine that it would span more than 20 years. Now we have compiled over 100 eponyms from virtually all branches of medicine. What started out as a whim, an

amusing pastime without consequence, has grown into a collection containing over 90 articles with contributions from many authors from various centers and cities.

Through the years, all these articles have been published in Catalan in *Annals de Medicina*, the official journal of the *Acadèmia de Ciències Mèdiques i de la Salut de Catalunya i de Balears*. The Dr Antoni Esteve Foundation published a compilation of these articles —duly revised and, in some cases, expanded— in three volumes, and is now giving us this opportunity to publish this selection in English, which includes eponyms from 25 individuals, some who have inspired more than one eponym. The current collection helps to paint a picture, albeit an incomplete one, of the history of medicine in Catalonia. We are grateful to the *Acadèmia* and to the Foundation for giving us the opportunity to publish these articles.

We are also grateful for the generous and unconditional support of the many people who have helped us to develop these articles throughout the years, especially by providing us with all sorts of information to enable us to write these stories.

Eponyms take us back in time, and by using them we are paying tribute to those who contributed to the development of medical science in their day. We hope this book helps us appreciate these great figures in the history of science, some of whom are well recognized and remembered and others who are less so.

Elena Guardiola and Josep Eladi Baños
Barcelona, May 2021

# CATALAN MEDICAL EPONYMS: AN INTRODUCTION

The basic elements required for scientific discourse include a set of precise, coherent, systematic terms. This rich lexicon is the most characteristic aspect of specialty jargons. Scientific texts are also characterized by concision (avoiding redundancy), precision (avoiding ambiguity), and depersonalization (avoiding emotion)[1]. Thus, scientific language must continually create thousands of terms with special meanings or neologisms[2]. In this context, scientists must be aware of the complexity of scientific language and of the creation of neologisms.

Within the realm of science, medical terminology deserves to be considered separately, as it has some characteristics that make it different from the language used in other fields.

## Medical terminology

Medical terminology has developed alongside scientific thinking and medical practice. Hippocrates, considered the father of modern Western medicine, started a process of recycling words from common language through analogism to form terms with specialized meanings for the health sciences[3]. Medicine and language have points of interconnection

and mutual needs: healthcare professionals use terminology to consolidate knowledge, to transmit it, and to communicate it. They also need terminology to classify information so they can recover it to study it, to analyze it, and advance medical knowledge. In the health sciences, the communicative framework becomes somewhat more complicated when non-specialized speakers (e.g., patients) are included in the discourse[3].

Like its fields of reference, medical language is continuously evolving, constantly incorporating new terms, modifying others, and abandoning some that were common in the past. The language of medicine is also very rich. Many medical words have their origins in Latin or Greek; others come from Arabic. Medical language also has many words that have been borrowed directly from other languages. However, above all, it is based on a reduced set of Greek and Latin building blocks: about a thousand morphemes combine to generate 80% of lexicon of the health sciences. Nowadays, words from other languages such as French, German or, especially, English also influence the health lexicon[3].

On the other hand, some words that are in use in common language adopt specific meaning or incorporate nuances when they are used in the health sciences. Moreover, the complexity of the health sciences and their interrelations with other fields result in the incorporation of jargon from other scientific disciplines from biology to mathematics, chemistry, or psychology, to name but a few[4].

In midst of all this linguistic baggage, we find eponyms (from the Greek *eponymos*, "given as a name or giving one's name to"). The Merriam-Webster Dictionary gives two definitions: (1) "*one for whom or which something is or is believed to be named*" and (2) "*a name (as of a drug or a disease) based on or derived from an eponym*", also giving specific medical definitions for the word, adding (*as a disease*) after *something* in the first definition and repeating the second definition verbatim. On the other hand, the term eponym is also applied to the names given to

certain diseases, syndromes, tests, etc. that derive from other proper nouns, such as institutions, cities, or countries.

The use of eponyms is not, however, a recent phenomenon. Eponyms started to become popular in science in the sixteenth and seventeenth centuries, but their origins extend much farther back in time. The Assyrians, 2,000 years before the Common Era, assigned the name of an important official to designate each year, and their kings gave their names to the first year of their reign (lists including these eponyms have helped historians to reconstruct Assyrian history and to know how long each king ruled). In ancient Greece, the years were named after the archons, and many places were named after mythological heroes[5]. Later, science would also incorporate some eponyms from these and other mythological characters (e.g., "atlas", for the first vertebra of the neck, or "Oedipus complex" in psychoanalytic theory).

## Eponyms in scientific language

The use of eponyms in science is not exclusive to medicine. Eponyms are found in all fields, and the language of our daily lives is also full of them. Indeed, in science, many theories, laws, principles, theorems, constants, and units of measurement are eponyms; thus, it is not unusual to speak of "Mendel's laws" or the "Pythagorean theorem" or to measure radiation in curies (now supplanted by becquerel, another eponym) or electrical power in watts. However, not only the names of persons have been incorporated into our language, many brand names have also been adopted to refer to the products they represent, and many of these proprietary eponyms have also been accepted into dictionaries.

Other eponyms derive from literature[6] or mythology. Some come from geographical names and others from the names of centres or institutions.

Some patients have also given their name to the conditions they suffered[7]. And a few students have made discoveries that are forever linked to their names[8]. On the other hand, the names of many scientists who have made valuable contributions that could be considered candidates for eponyms have, for whatever reasons, been relegated to anonymity, whereas, at the other extreme we find people who have proposed their own names as eponyms.

In any case, there is always a story behind every eponym: the story of a physician, a scientist, a patient, a department, or a hospital. Eponyms invite us to travel to the past to discover the individuals behind the names who would otherwise have gone unnoticed. Merton[9] argues that eponyms are the most enduring and prestigious form of institutionalized recognition in science, and Garfield[5] affirms that eponyms are one of the last vestiges of humanism is an increasingly technological and computerized society.

## Eponyms in medicine

Medicine is one of the fields of science where technical and scientific language have the greatest number of eponyms. Many anatomic structures, diseases, diagnostic procedures, and treatments owe their names to the person who discovered, described, or promoted them.

Although eponyms are very common in medicine, their use has met with a certain reticence from some groups. Linguists, especially specialists in terminology, have had little attraction to medical eponyms[4]: eponyms do not follow the logic of other linguistic signs, have no roots in Greek or Latin, and are not borrowings from other languages. They represent an added difficulty for translators because the same eponym can have very different meanings in different languages or in different countries, and different languages can have different eponyms[10].

Not all eponyms have the same components or structure. Various authors have studied the formation of eponyms, the terms derived from them, and compounds including proper nouns[11], and different classifications have been established[12]. Among eponyms (the examples we provide here are of Catalan origin[13-15]), some are expressions that incorporate the first of a Catalan person's (generally a scientist) two surnames* such as "Casal collar" or "Casal necklace" (after Gaspar Casal i Julián) or "Trueta method" (after Josep Trueta i Raspall), whereas others include both Catalan surnames such as "Duran-Reynals spreading factor" (after Francesc Duran i Reynals) or "Cervós-Navarro reticulo-histiocytic granulomatous encephalitis" (after Jordi Cervós i Navarro). Others include the surnames of more than one person, for instance, "Ravetllat-Pla serum" (after Joaquim Ravetllat i Estech and Ramon Pla i Armengol). Sometimes, the name of the person gives rise to the name of a genus or species (e.g., "*Psychrobacter fozii*", in honor of Amadeo Foz i Tena) or to the name of a device or tool (e.g., "casalimagnes" or "casalímetre", instruments used during the nineteenth century, after Bonaventura Casals i d'Echauz).

In other cases, a single eponym can be used for different concepts (polysemy). Thus, the eponym "Gil-Vernet operation" (after Josep Maria Gil-Vernet i Vila) is used for four distinct surgical procedures: extended

* In Catalonia, like in other areas of the Iberian Peninsula and Latin America, people are assigned two surnames at birth, and women do not change their surname when they marry. Traditionally, the father's first surname becomes his child's first surname and the mother's first surname becomes her child's second surname. In Catalan, the conjunction "i" ("and") was traditionally placed between the two surnames, although nowadays it is often omitted. Most people are most often referred to by a combination of their first name and their first surname alone, although occasionally when the first surname is very common, an individual is referred to by a combination of their first name and second surname. It is becoming increasingly common for scientists to connect their two surnames with a hyphen instead of the conjunction "i".

pyelotomy, trigonoplasty, vesical autoplasty with a posterosuperior flap, and kidney transplantation taking advantage of the recipient's excretory tracts. There are also eponyms that seem to have the same origin or to refer to the same concept, but come from different persons (homonymy); an example of this is "Barraquer method", which refers to both a technique for extracting cataracts (after Joaquim Barraquer i Moner) and to keratophakia and keratomileusis (after Josep Ignasi Barraquer i Moner).

It is also common for different medical eponyms to be used to define the same concept (synonymy). Thus, "Ribera method" (after Josep Ribera i Sans) is the same as "Momburg technique" (after the German surgeon who disseminated Ribera method in the rest of Europe, who is erroneously credited with devising it).

Sometimes a single person has given his or her name to various eponyms, which are shared with others; this occurs in "Vilanova-Piñol syndrome" and "Vilanova-Cañadell syndrome", in which the name of the same person (Xavier Vilanova i Montiu) forms part of the eponyms for two very different syndromes, one with Joaquim Piñol i Aguadé and another with Josep Maria Cañadell i Vidal. To further complicate matters, another Cañadell (José María Cañadell i Carafí) lends his name to "Cañadell technique".

For all these reasons, it should not be surprising that physicians consider that eponyms are often a source of confusion and that it is better to replace them with more descriptive synonyms. However, this is not always the case. When an eponym is well established (e.g., Alzheimer disease or Parkinson disease), it can be more confusing to use more descriptive alternative terms. Thus, Garfield[5] is convinced that eponyms are a natural language form for expressing complex ideas and that this is what makes them useful.

In this sense, one of the main advantages of eponyms is that they are easy to use. An eponym can be just as descriptive as the nosological species or

the biochemical, pathological, or complete clinical description of a disease or a syndrome. Furthermore, in many cases, if the eponym is widely used, it can favour communication among professionals from different countries or different specialties. In other cases, using eponyms can avoid the need to use denominations that patients might find offensive (e.g., it can be preferable to use Hansen disease instead of leprosy).

In general, in using eponyms, we pay homage to the physician who first described a disease, sign, or symptom, or who devised a technique or made a discovery. Eponyms are thus often a link with a tradition and a glorious past. However, this is not always the case, as some eponyms are linked with shameful episodes of history. Some groups[16-20] have recently called for the elimination of eponyms linked to individuals whose relationships with their patients were unethical or who carried out unethical experiments, especially in Nazi Germany (e.g., Reiter syndrome, after Hans Conrad Julius Reiter).

Most medical dictionaries include numerous eponyms. Moreover, dictionaries of eponyms, more common in English-speaking countries, shine additional light on this type of denominations. However, in Catalonia and in Spain, publications focusing mainly on eponyms are uncommon. Books and articles that compile information about the individuals from whose names the eponyms are derived have also been published. One of the most important of these is *Stedman's medical eponyms*[21], with nearly 18,000 entries (few, however, of Catalan origin). In the next section, we discuss medical eponyms of Catalan origin, with a brief digression into non-medical eponyms originating from Catalan physicians.

## Catalan medical eponyms

The vast majority of medical eponyms of Catalan origin come from the names of Catalan physicians or scientists credited with a discovery or

invention, to which, over time and for various reasons, they lent their names[22]. In recent years, we have collected and studied more than 100 eponyms[23] originating with about 80 scientists who have made different types of contributions to the internationalization of Catalan medicine, many of whom lived in especially difficult periods of our recent history. Table 1 provides a detailed list of all these eponyms.

It bears mentioning that there are Catalan eponyms in nearly every field of medicine, including internal medicine, pharmacology, dermatology, haematology, ophthalmology, rheumatology, urology, cardiology, endocrinology, neurology, and traumatology, as well as in many other specialties. Moreover, some of these eponyms have had important repercussions in medicine.

The real importance of Catalan eponyms in the history of medicine varies widely. Some are widely known and others are not. Here we mention just a few. "Gimbernat ligament" (after Antoni de Gimbernat i Arboç) is found in anatomy texts, "Trueta method" helped saved many lives, and the Barraquer techniques discussed above have helped many people recover their vision. The latest important example is "Brugada syndrome", a term which is already present in more than 5,000 references in the *PubMed* database. Among the lesser known eponyms is, for example, "Duran method", after Frederic Duran i Jordà, the physician who devised this method that made it possible to do "remote" transfusions during the Spanish Civil War, opening the possibility for blood banks, a very important contribution that had unfortunately hardly been recognized until a few years ago.

Some eponyms from important Catalan physicians are marginal nowadays. Nevertheless, the decisive contributions of great Catalan physicians to the advancement (and sometimes to the creation) of their specialties (e.g., Azoy with "Azoy test", Bellido with "Müller-Bellido-Bürger reaction", Corachán with "Corachán gastropexy", Farreras with "Farreras

pneumopathic endosteal osteosclerosis", and Nubiola with "Nubiola disease") helped achieve extraordinary prestige for Catalonia in healthcare and to place it at the forefront of biomedical research.

However, eponyms are not only derived from people; as mentioned above, they also come from the names of institutions, cities, or countries (Table 2). The name Catalonia itself has given rise to several medical eponyms, being found in the name of a variant of haemoglobin (*Hemoglobin F Catalonia*) and a balsam, no longer in use, "Catalan balsam". Barcelona lends its name to various antithrombins, fibrinogens, a variant of haemoglobin, and a prothrombin, as well as the well-known "Barcelona test" in neuropsychology and "Barcelona criteria" for improvement in primary liver cirrhosis. The *Hospital de Sabadell*'s critical care center devised the internationally recognized "Sabadell score". A system for staging liver cancer used around the world, "Barcelona clinic liver cancer staging system (BCLC)" was developed at the *Hospital Clínic de Barcelona* in 1999. The *Hospital del Mar* of Barcelona lends it name to a set of criteria for joint hypermobility. The "Dexeus scoring system" to measure the fetoplacental respiratory reserve is named after another Catalan hospital, and a procedure to correct pectus excavatum has been dubbed "taulinoplasty" after the *Hospital Parc Taulí*.

Some Catalan eponyms are derived from contemporary physicians, many of whom are still professionally active. However, some of these eponyms have their own characteristics that are different from traditional eponyms. They often do not refer to an individual's name; rather they are derived from the hospitals where these physicians work, as in the case of the *Hospital Clínic de Barcelona*, *Hospital del Mar*, and *Hospital Parc Taulí*, or to the cities or regions where they are located, as is the case in Barcelona, Sabadell, or Catalonia. Furthermore, in addition to surgical techniques, signs, or anatomic findings, these modern eponyms refer to concepts such as risk calculators for heart failure, criteria for therapeutic improvement, or devices for surgical interventions.

## Non-medical eponyms after Catalan physicians

Not only medical eponyms have been derived from Catalan physicians: several Catalan physicians have lent their names to eponyms in other disciplines (Table 3). In the Pyrenees, we find "Via Gabarró" and "Punta Gabarró", after Pere Gabarró i Garcia, who lent his name to these two geographical eponyms in addition to three medical eponyms: "Gabarró grafting", "Gabarró board", and "Gabarró dermatome". In the field of botany, Catalan physicians lend their names to the species designation of some plants (e.g., *Auricula ursi myconi, Clarisia volubilis*, *Lepidella codinae*) and to the genus designation for several (e.g., *Barnadesia*, *Campderia*, *Clarisia*, *Condalia*, *Gimbernatia, Masdevallia*, *Miconia*, *Palaua*, *Paltoria*, *Puiggaria*, *Queria*, *Soliva*, etc.)[24], as well as the species designation for some insects (such as *Conocephalus puiggarii*)[14,15].

## Final considerations

In medicine, although firmly established and widely used, eponyms are not without controversies[25-29]. Eponyms can pose a challenge to learners and can lead to errors in communication. Some entities are designated by more than one eponym, and some eponyms designate more than one entity. Furthermore, some eponyms are identical, but are derived from different people. Eponyms can vary among cultures and their meaning can also vary depending on the country where they are used. Finally, their use can vary widely even within a specialty[30].

Some consider eponyms an encumbrance from the past that we should abandon in favour of more descriptive terms, claiming that eponyms are imprecise and confusing and can hinder scientific debate in an ever-shrinking world. However, eponyms are ubiquitous. We find them in scientific journals, textbooks, the mass media, internet... The World

Health Organization's international classification of diseases includes numerous eponyms, recognizing their importance in medical terminology[31].

Eponyms have long been part of medical language; they represent a tradition that connects us to the past. However, it would be fair to ask: what is the relevance of eponyms for physicians today and tomorrow? Some would say that they are merely a reverberation that idolizes a romantic past. We are not fierce defenders of the use of eponyms, but it would be unfair to forget the contributions that Catalan physicians have made to medicine. Many of these contributions have been surpassed and supplanted over the years, but which of today's breakthroughs will still be considered key 50 years from now?

We believe that most of the Catalan physicians and scientists that have given their names to eponyms contributed, and often decisively so, to the advancement of medicine. Using these eponyms, or in some case, merely remembering them, is a way to pay homage to all.

## NOTE

This chapter is based on two earlier papers by the same authors, which have been revised and updated for this book: Guardiola E, Baños JE. De noms propis en el llenguatge: una visió històrica i actual de l'eponímia mèdica. Llengua, Societat i Comunicació. 2012;10:74-83. Accessible at: http://revistes.ub.edu/index.php/LSC/article/view/3638/pdf, and Guardiola E, Baños JE. Creació de termes científics. In: Fargas Valero FX, coord. Espais Terminològics 2016. Creació terminològica: de Ramon Llull a les xarxes socials. En Primer Terme. 11. Papers. Barcelona: TERMCAT, Centre de Terminologia; 2017. p. 53-72. Accessible at: https://arxiu.termcat.cat/enprimerterme/creacio-terminologica-de-llull-a-les-xarxes-socials-espais-terminologics-2016.pdf

Table 1. **Catalan physicians and scientists whose names have given rise to medical eponyms**

| CATALAN PHYSICIAN OR SCIENTIST | EPONYM |
|---|---|
| Hermenegild Arruga i Liró | Arruga operations[a]<br>Arruga forceps<br>Arruga eye speculum |
| Adolf Azoy i Castañé | Azoy test |
| Ignasi Barraquer i Barraquer | Barraquer operation |
| Lluís Barraquer i Bordas | Barraquer i Bordas signs |
| Joaquim Barraquer i Moner | Barraquer cataract extraction technique |
| Josep Ignasi Barraquer i Moner | Barraquer refractive keratoplasty techniques (keratophakia and keratomileusis) |
| Lluís Barraquer i Roviralta | Barraquer-Simons syndrome<br>Barraquer reflex |
| Antoni Bayés de Luna | Bayés syndrome |
| Jesús Maria Bellido i Golferichs | Müller-Bellido-Bürger reaction |
| José Boix-Ochoa | Boix-Ochoa procedure |
| Ricard Botey i Ducoing | Botey local anaesthesia<br>Gluck-Botey method<br>Killian-Botey submucosal resection |
| Pere, Josep, and Ramon Brugada i Terradellas | Brugada syndrome<br>Brugada phenocopy |
| Joaquim Cabot i Boix | Cabot popliteal sign |
| José María Cañadell i Carafí | Cañadell technique |
| Josep Maria Cañadell i Vidal | Vilanova-Cañadell syndrome |
| Francesc Canivell i de Vila | Canivell cystotome |
| Martí Carbonell i Juanico | Carbonell-Pérez reflex |
| Gaspar Casal i Julián | Casal necklace<br>Casal disease |
| Bonaventura Casals i d'Echauz | Casalimetre<br>Casalimagnes |
| Jordi Cervós i Navarro | Cervós-Navarro reticulo-histiocytic granulomatous encephalitis |

*continued*

| CATALAN PHYSICIAN OR SCIENTIST | EPONYM |
|---|---|
| Fernando Collado i Herrero | Collado early bone splinter removal |
| Manuel Corachán i García | Corachán gastropexy |
| Frederic Duran i Jordà | Duran method |
| Francesc Duran i Reynals | Duran-Reynals spreading factor |
| Pere Farreras i Valentí | Farreras pneumopathic endosteal osteosclerosis |
| Jaume Ferran i Clua | Ferran vaccine |
| Amadeo Foz i Tena | *Psychrobacter fozii* |
| Valentí Fuster i Carulla | Fuster-CNIC-Ferrer cardiovascular polypill |
| Pere Gabarró i Garcia | Gabarró chessboard grafts<br>Gabarró graft board<br>Gabarró dermatome |
| Salvador Gil i Vernet | Gil-Vernet extradural anaesthesia |
| Josep Maria Gil-Vernet i Vila | Gil-Vernet operations[b] |
| Antoni de Gimbernat i Arboç | Gimbernat ligament |
| Josep Antoni Grífols i Roig | Grífols transfusion device |
| Enric Juncadella i de Ferrer | Juncadella Ferrer point |
| Josep Llombart i Pagès | Trabmull balsam |
| Segimon Malats i Codina | Malats balsam |
| Fernando Martorell i Otzet | Martorell ulcer<br>Martorell syndrome<br>Martorell sign<br>Martorell phlebography test<br>Martorell stinger syndrome |
| Josep Masdevall i Terrades | Masdevall electuary |
| Emili Mira i López | Mira test<br>Mira axistereometer |
| Pere Nubiola i Espinós | Nubiola disease |
| Rafael Orozco i Delclós | Orozco plate |
| Agustí Pedro i Pons | Pedro Pons sign<br>Pedro Pons haemocytopenic gastrorrhagic splenomegaly |

*continued*

| CATALAN PHYSICIAN OR SCIENTIST | EPONYM |
|---|---|
| Jordi Perelló i Gilberga | Perelló theory<br>Perelló garage |
| Tomàs Àngel Pinós i Marsell | Pinós sign |
| Pere Piulachs i Oliva | Piulachs-Hederich syndrome<br>Piulachs flank pinch |
| Ramon Pla i Armengol | Ravetllat-Pla bacterium<br>Revetllat-Pla corpuscles |
| Joaquim Piñol i Aguadé | Vilanova-Piñol syndrome |
| Rossend Poch i Viñals | Poch-Viñals test |
| Ignasi Ponsetí i Vives | Ponseti method |
| Miquel Prats i Esteve | Prats technique |
| Miquel Puig i Massana | Puig Massana ring |
| Antoni Puigvert i Gorro | Puigvert operation<br>Puigvert disease |
| Joaquim Ravetllat i Estech | Ravetllat-Pla bacterium<br>Ravetllat-Pla corpuscles |
| Josep Ribera i Sans | Ribera method |
| Jordi Río i Izquierdo | Rio score |
| Jaume Rotés i Querol | Forestier-Rotés Querol disease<br>Forestier-Jacqueline-Rotés Querol sacroiliac point |
| Emili Roviralta i Astoul | Roviralta partial gastric ectopia<br>Roviralta syndrome<br>Duhamel-Roviralta-Casas technique |
| Lluís Sayé i Sempere | Burnand-Sayé syndrome |
| Máximo Soriano i Jiménez | Soriano periostitis deformans<br>Soriano sign<br>Soriano syndrome |
| Eduard Tolosa i Colomer | Tolosa-Hunt syndrome |
| Josep Trueta i Raspall | Trueta method |

*continued*

| CATALAN PHYSICIAN OR SCIENTIST | EPONYM |
|---|---|
| Enric Vidal i Colomer | Vidal Colomer symptom |
| Xavier Vilanova i Montiu | Vilanova-Cañadell syndrome<br>Vilanova-Piñol syndrome |

[a] Stedman's medical eponyms[21] includes eleven eponyms for medical instruments and interventions from H. Arruga's name.
[b] "Gil-Vernet operation" is used to refer to four different operations: extended pyelotomy, trigonoplasty, vesical autoplasty with a posterosuperior flap and renal transplantation utilizing the recipient's excretion channels.

Table 2. **Other Catalan medical eponyms**

| ORIGIN | EPONYM |
|---|---|
| Barcelona (the capital of Catalonia) | Antithrombin Barcelona-2[a]<br>Antithrombin III Barcelona[a]<br>Antithrombin III Barcelona-2[a]<br>Barcelona bio-heart failure risk calculator (BCN Bio-HF calculator)<br>Barcelona criteria<br>Barcelona nomenclature<br>Barcelona test<br>Fibrinogen Barcelona I[a]<br>Fibrinogen Barcelona II[a]<br>Hemoglobin Barcelona[a]<br>Prothrombin Barcelona[a] |
| Catalonia | Catalan balsam<br>Hemoglobin F Catalonia[a] |
| Catalan hospitals and clinics | Barcelona clinic liver cancer staging system (BCLC) (from *Hospital Clínic de Barcelona*)<br>Dexeus test (from *Institut Universitari Dexeus*)<br>Hospital del Mar criteria<br>Taulinoplasty (from *Hospital Parc Taulí*) |
| Sabadell (a city in Catalonia) | Sabadell score |

[a] National Library of Medicine MeSH (Medical Subject Headings) term, used to index articles in PubMed (http://www.ncbi.nlm.nih.gov/mesh)

Table 3. **Some non-medical eponyms from Catalan physicians**

| CATALAN PHYSICIAN | EPONYM |
|---|---|
| Joan Francesc Bahí i Fontseca | Genus *Bahia* |
| Miquel Bernades i Claris | Genus *Clarisia*<br>*Clarisia volubilis* |
| Miquel Bernades i Mainader | Genus *Barnadesia* |
| Francesc Campderà i Camín | *Genus Campderia* |
| Joaquim Codina i Vinyes | Genus *Codinaea*<br>*Lepidella codinae*<br>*Pteris codinae* |
| Antoni Condal | Genus *Condalia* |
| Antoni de Gimbernat i Arboç[a] | Genus *Gimbernatia* |
| Pere Gabarró i Garcia[a] | Via Gabarró (mountain-climbing route)<br>Punta Gabarró (mountain peak) |
| Josep Masdevall i Terrades[a] | Genus *Masdevallia* |
| Ramon Masferrer i Arquimbau | *Sempervivum masferreri* |
| Francesc Micó | *Auricula ursi myconi*<br>Genus *Miconia* |
| Antoni Palau i Verdera | Genus *Palaua* |
| Benet Paltor i Fité | Genus *Paltoria* |
| Joan Ignasi Puiggarí | Species names for ferns, mosses, liverworts, algae, diatoms, fungi... *puiggarii, puiggaria, puiggariella, puiggariopsis, puiggariana*<br>*Conocephalus puiggarii* |
| Josep Quer i Martínez | Genus *Queria* |
| Prudenci Seró i Navàs | *Berberis vulgaris* subsp. *seroi*<br>*Goniomitrium seroi*<br>*Chrysopa vulgaris* var. *seroi* |
| Salvador Soliva | Genus *Soliva* |
| Ricard Zariquiey i Cenarro | *Speophilus cenarroi*<br>*Bathysciola zariquieyi*<br>*Galathea cenarroi* |

[a] These physicians' names also gave rise to medical eponyms (see Table 1).

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# GASPAR CASAL I JULIÁN
# CASAL NECKLACE

## The eponyms

**Casal necklace or Casal collar**. An area of erythema and pigmentation that appears around the neck in patients suffering from pellagra[1,2]. A pellagrous eruption in the form of an arc around the neck[3]. Brownish or pale red annular erythema, generally with well-delimited borders, that forms around the neck, a typical sign of pellagra[4]. Dermatitis that partially or fully encircles the lower part of the neck, appearing in pellagra[5].

**Casal disease. Pellagra**[1,3], a disease due to vitamin B3 (niacin) deficiency. Clinically, it is characterised by gastrointestinal symptoms (diarrhoea, stomatitis), skin disorders (rosy erythema on the skin resembling a necklace glove, or sock), nervous disorders (hyperreflexia, spastic ataxia symptoms, and paresthesia), and psychological disorders. It is also known as Gaspar Casal disease or *Mal de la rosa*[1].

Gaspar Casal i Julián
(1680-1759)

## Gaspar Casal i Julián (1680-1759)

The information available about the life of Gaspar Casal i Julián is full of gaps and contradictions. Catalan by birth but Asturian by adoption, his birthplace was a source of controversy for many years. He was ascribed to many nationalities, including Aragonese, Castilian, Asturian, Italian, and Catalan, until his birth in Catalonia was definitively confirmed thanks to the efforts of the dermatologist Jaume Peyrí. Convinced by certain documents that he had been born in Girona, Peyrí asked Josep Vila i Sabater and Tomás Noguer i Musquera, the canon and archivist of Girona Cathedral, to help locate his birthplace in the parish registries pertaining to the diocese of Girona[6]. Finally, in January 1936, Gaspar Casal's birth certificate was found in the records of the parish of Santa Susanna de Mercadal, establishing that he had been born there on 31 December 1680. With the publication of a monograph[6] that contained a photograph of this document, the controversy was laid to rest. The finding was truly a stroke of luck, since five months later all the documents in this church were destroyed by fire at the outbreak of the Spanish Civil War. Without Peyrí's persistence, it is highly likely that Casal's birth would still remain a mystery. No doubt adding to this confusion is the fact that, four years before his death, Casal signed his will as a "native of Utrilla, diocese of Sigüenza" in Soria[7].

Casal was the son of a Lombard subaltern born in Pavia who, in some documents, such as Gaspar's birth certificate, appears as Federico Xacon i Casal and in others as Federico Casal Dajon. His mother was Magdalena Julián, a native of Utrilla (Soria). It seems that Gaspar soon left Catalonia to settle in his mother's country. It is not known what he did there until he reappeared working as a physician in several villages in the Alcarria region, such as Somolinos, Medinaceli, and Romanillos, and above all, in the city of Atienza (Guadalajara) from 1706 to 1712[6,8]. This period of his life is also controversial, since there is no evidence that Casal had earned a degree in medicine[9]. For many years, nobody questioned his

qualifications until Marañón did so: "Gaspar Casal was lucky enough not to be from the university. Had he been so, his innate capacity for observation would have been drowned in the stupidly theoretical atmosphere that pervaded classes"[10]. At that time, it was not uncommon to practice medicine without a degree, but it is hard to believe he was not awarded a degree at some point in time, considering the important posts that he went on to occupy. In any case, it seems no documentary evidence exists anywhere to confirm his qualification. While some authors have suggested he would have studied at the *Universidad de Alcalá*, the university's records do not include Casal among its graduates[8].

Casal graduated with a Bachelor in Arts from San Antonio de Porta Coeli College at Sigüenza University in 1713[9]. In this city lived the apothecary Juan Manuel Rodríguez de Luna, who had been trained in Rome, and who taught Casal physics and chemistry. The same year, Casal went to work in Madrid, but it seems that he did not adapt to the city's climate; in 1717 he left for Oviedo[6]. Some authors have surmised that he might have been fleeing from the Inquisition, which had issued an ignominious sentence against his wife, María Ruiz, that also affected him and their children[7]. This is another obscure aspect of his life, since no documentary evidence has been found to substantiate the Inquisition's accusation. Yet there are no doubts that the Asturian ecclesiastical authorities ordered that Casal's children were to be banished from the Principality of Asturias on reaching the age of twelve years. Certain authors have questioned why Casal abandoned his clients in Madrid and travelled to Asturias, a difficult place to make a living in the early 18th century, suggesting that his wife may have been exiled to Asturias by the Inquisition[11].

In Asturias, Casal would undertake his most interesting work, for which he is remembered both nationally and internationally. Initially he was protected by the Duke of Parque, but he did not earn enough to maintain his large family. So in March 1720, he applied for and was awarded the

post of municipal physician in Oviedo, a post he would leave on 5 March 1729 when he was chosen as physician of the *cabildo* (council) of the Cathedral[10]. The responsibilities of this position included care of the hospitals of Santiago, San Juan, and Santa María de los Remedios[8]. He maintained good relations with Father Benito Feijoo, one of the key intellectuals of the Enlightenment in Spain. Casal himself gradually became a respected physician thanks to his critical view of life and significant contributions to the fields of natural history, epidemiology, nutrition, and medical pathology.

Though he had declared that he wished to remain in Asturias, Casal returned to Madrid in 1751 to attend the Spanish queen, Barbara of Portugal. It is hard to understand why a 70-year-old man would choose to move to the capital and begin a new life, though it appears Father Feijoo had a notable influence in his decision. On 24 August he was appointed temporary (later permanent) physician of Fernando VI Royal Chamber; on 8 January 1752, he was appointed chief physician of the Kingdom of Castile[6,7]. He was later elected a permanent member of the *Real Academia de Medicina de Madrid* reaching the highest pinnacle of recognition for a physician of this period.

Casal died in Madrid on 10 August 1759, the same day as King Fernando VI. He was buried in secret, albeit with the vicar's permission, in the church of San Sebastián in Madrid[6,8]. No documents explaining the need for such secrecy have been found.

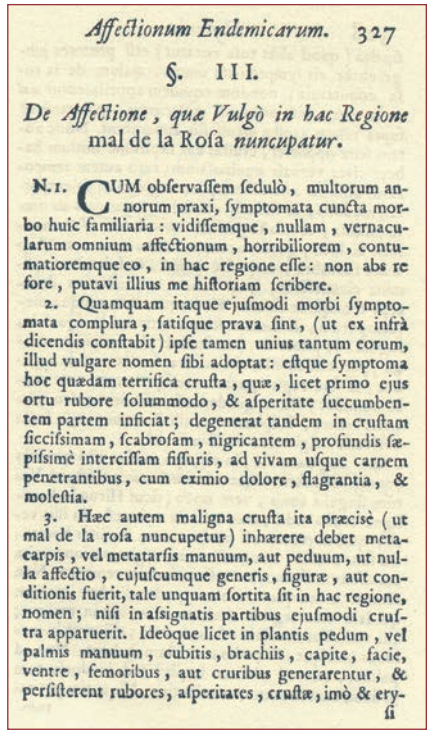
Gaspar Casal is the author of a single surviving work, which seems to have been written about 1735 and published posthumously in Madrid in 1762, entitled *Historia Natural y Médica del Principado de Asturias* (Natural and Medical History of the Principality of Asturias). This work is in fact a compilation of several books, whose only apparent connection is that they were penned by Casal. The most important are *Historia physico-medica del Principado de Asturias* (Physical and medical history of the

Principality of Asturias); *Historia de la constitución de los tiempos, y de las enfermedades epidémicas, y particulares, que en este Principado de Asturias observamos desde el año 1719 hasta el de 1721* (History of the constitution of the times, and of epidemic –and individual– diseases, that in this Principality of Asturias we have observed from 1719 until 1721); *Constitución de los tiempos* (Constitution of the times); and *Historia affectionum, quarumdam regionis hujus familiarum* (History of some diseases endemic to this region). The original work was not republished until 1900 and has since been reprinted several times. A facsimile edition was published by the government of Asturias in 1988.

## Casal necklace and Casal disease

The third chapter of *Historia affectionum, quarumdam regionis hujus familiarum* contains a description of what Asturian peasants called the "*mal de la rosa*". This point is noteworthy because some writers credit Casal with creating this expression. In his work, Casal described an endemic disease observed in this region among poor farmers whose diet was based almost exclusively on maize, with no ingestion of fresh meat. This clinical presentation was called "*mal de la rosa*", as the chapter heading describing it states: "*De affectione, que Vulgò in hac Regione mal de la Rosa nuncupatur*" (In this province, this affliction is known among the common people as "*mal de la rosa*"), since affected individuals displayed a typical reddening of the skin and an exanthema with vesicles on the back of hands and feet, as well as a similar outbreak on the neck. Casal had mentioned that the skin displayed "reddening, roughness, a scab, and erysipelas". Casal described the disease in the following way:

> "Having, over many years of practice, carefully observed all the peculiar symptoms of this disease, and having noted that, of all the common afflictions in this country, none is more horrific nor stubborn, I judged that it would not be inopportune to write its history."



*Affectionum Endemicarum.* 327

§. III.

*De Affectione, quæ Vulgò in hac Regione* mal de la Rosa *nuncupatur.*

N. 1. CUM obſervaſſem ſedulò, multorum annorum praxi, ſymptomata cuncta morbo huic familiaria: vidiſſemque, nullam, vernacularum omnium affectionum, horribiliorem, contumatioremque eo, in hac regione eſſe: non abs re fore, putavi illius me hiſtoriam ſcribere.

2. Quamquam itaque ejuſmodi morbi ſymptomata complura, fatiſque prava ſint, (ut ex infrà dicendis conſtabit) ipſe tamen unius tantum eorum, illud vulgare nomen ſibi adoptat: eſtque ſymptoma hoc quædam terrifica cruſta, quæ, licet primo ejus ortu rubore ſolummodo, & aſperitate ſuccumbentem partem inficiat; degenerat tandem in cruſtam ſicciſsimam, ſcabroſam, nigricantem, profundis ſæpiſsimè interciſſam fiſſuris, ad vivam uſque carnem penetrantibus, cum eximio dolore, flagrantia, & moleſtia.

3. Hæc autem maligna cruſta ita præcisè (ut mal de la roſa nuncupetur) inhærere debet metacarpis, vel metatarſis manuum, aut peduum, ut nulla affectio, cujuſcumque generis, figuræ, aut conditionis fuerit, tale unquam ſortita ſit in hac regione, nomen; niſi in aſsignatis partibus ejuſmodi cruſtra apparuerit. Ideòque licet in plantis pedum, vel palmis manuum, cubitis, brachiis, capite, facie, ventre, femoribus, aut cruribus generarentur, & perſiſterent rubores, aſperitates, cruſtæ, imò & ery-

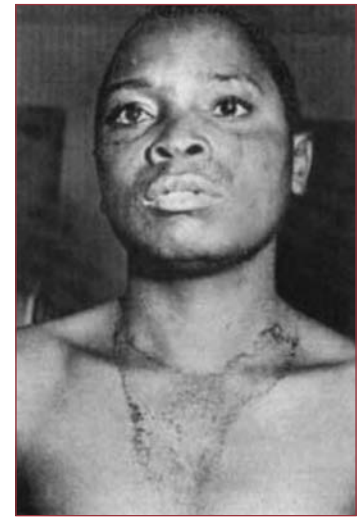
ſi

First page of the chapter describing the "mal de la rosa" in the original edition of Casal's *Historia physico-medica del Principado de Asturias* (Physical and medical history of the Principality of Asturias) published in Madrid in 1762

In the following lines, Casal accurately described the dermatological characteristics of the disease. The last paragraph of this description is devoted to the sign for which it is especially well known:

> "Another visible sign appears in this class of patient, though not in all, and that is a scabby roughness of a dark ashy colour in the lower frontal neck region, like a necklace, extending from one side of the nape to the other, over the collar bones and the upper edge of the sternum, having the width of one or two fingers, like a strip, and which, often leaving the upper part of the nape intact, just reaches, at its edges, the borders of both trapezius muscles without extending further. In its central section, an appendix of equal width descends

Casal necklace on a patient with pellagra[15]



from the sternum to the mid-point of the thorax. No such sign can be found in any person, sick or healthy, except in patients suffering from the "*mal de la rosa*", from which I infer that it occurs solely in them, though not in all".

Casal also suspected that there might be a relation between diet and the disease, though he had doubts, as the lines below show:

"1) The cause of this disease should be sought in climatic or atmospheric conditions, or in the patients' constitution or diet. Yet, since I have analysed the climatic conditions extensively enough, in the *Physical and Medical History* of this region, which I myself wrote and keep in my house, and therefore not to repeat what has been said, I currently propose treating solely diet. 2) Maize or Indian corn is the main food of almost all those who suffer from this affliction; in fact, the flour of this cereal is used to create their bread, and from it are made the gruels which some mix with milk or with milk butter, for their ordinary fare [...]. Only rarely do they eat fresh meat;

> furthermore, only occasionally do they eat cured meat, since almost all those having this disease are poor farmers, so it is not possible to eat bacon or the cured meat of another animal daily, not even once in three days [...]. 3) Such a diet might unexpectedly seem to some enough to produce not just this disease but also other, worse ones. Yet he who, having thought about this calmly, had carefully observed all the concurrent circumstances, would truly not fail to find great difficulties that have nothing to do with those who maintain such an opinion: 1) because throughout almost the entire province all the peasant farmers eat such foods and, notwithstanding, not all are afflicted by this disease... 2) because this "*mal de la rosa*" is not found equally throughout the region, but especially in one section or territory of it... 3) because a theory as abstruse as diet is, as is said, *a priori* and obscure, so that I do not think any clear reason can be deduced from it."

The original description of the *mal de la rosa* became famous thanks to its dissemination by François Thiéry, the former physician of Louis XIV of France, who remitted the definition of the disease to the dean of the Faculty of Medicine in Paris, A. F. Chomel, in 1755[11,12]. This enabled it to be included in Saunders' Medical Nosology under the name *Lepra asturianensis*[7], but did not stop the *mal de la rosa* being better known in the future as pellagra, an adaptation of the term popularised by Frapolli when in 1771 he used "pellagra" to refer to *mal de la rosa* (from *pelle agra*, or "rough skin")[12]. It would also be known —and this denomination remains valid today— as Casal disease, or Gaspar Casal disease[1].

In ensuing centuries, the *mal de la rosa* was recognised in the poorest classes of Lombardy, Venice, and the south of France. The disease remained endemic among poor farmers with diets almost exclusively of maize, until it was also described in the US in the early 20th century, where it took on epidemic proportions in the southern states[13]. Once more, poverty and consumption of maize were recognised as the main

risk factors, causing physicians at the time to pinpoint this cereal as being responsible for the disease. In 1914, it began to be suggested that a nutritional deficiency could be behind it, but it would take 18 years before Goldberger and Tanner would suggest that the disease was associated with the lack of an amino acid. It was Goldberger himself who confirmed that it was in fact a dietary deficiency, finally identifying the preventive factor of pellagra as nicotinamide[13]. It is now known that primary pellagra is a consequence of a niacin (nicotinic acid) deficiency, resulting from inadequate intake of niacin and/or its precursor, the essential amino acid tryptophan. Secondary pellagra appears when there is sufficient intake but pathological interferences hindering adequate availability, such as prolonged diarrhoea, anorexia nervosa, chronic alcoholism, chronic colitis, severe ulcerous colitis, Crohn disease, or


Engraving of Casal's work, displaying the characteristics of the "mal de la rosa" (Casal disease), clearly showing Casal necklace

hepatic cirrhosis, among others[13]. It can also appear in association with isoniazid treatment when pyridoxine is not administered concomitantly, as the latter is necessary for the synthesis of nicotinamide.

The clinical manifestations of pellagra are the classic triad of dermatitis, diarrhoea, and dementia, although they do not always appear in this order. Atypical forms exist that are oligosymptomatic. The dermatological manifestations are very constant; when absent, it may be difficult to reach the diagnosis. These consist of a symmetrical, bilateral eruption in the areas exposed to sunlight, which can be painful to the touch in the acute phase. It begins as an initially acute or intermittent erythema, progressing to an exudative eruption on the back of the hands, face, neck, and thorax with a stinging, burning sensation. The affected areas are initially red and clearly defined, but progressively change to cinnamon and brown tones.

They also appear in areas subject to pressure, friction, or heat. Initially, they can be confused with sunburn, but are differentiated by later darkening[13]. The distribution of affected areas depends on exposure to the sun. Initially flaky and erythematous areas are observed on the face, back of the hands, and forearms, accompanied by itching. In a more advanced phase, the dermatosis worsens and the skin becomes rough. Lichenification and pigmentation processes appear, and end up cracking. It is common for the neck, nape, and sternal region all to be affected, creating the typical Casal necklace.

The back of the hands is the most frequently affected area (77%-97%), though in fact, many other areas can be affected: feet, legs, shoulders, elbows, forearms, and knees. On the face, an erythema appears that may follow the innervation of the trigeminal nerve and a butterfly-wing eruption similar to erythematous lupus may appear. Equally frequent is the appearance of a well-defined eruption on the front of the thorax, extending in a wide band or necklace completely around the neck to the

regions of dermatomes $C_3$ and $C_4$. The upper limit reaches to the hairline in the back and the larynx in the front, while the lower limit starts in the hollows of the spinous processes, reaching the sternal manubrium. The following may appear in its evolution: vesicles or phlyctenae, ulcers, intense dryness, hyperpigmentation, and flakiness in areas not exposed to light. It is believed that a low concentration of urocanic acid in the skin could explain the photosensitivity to sunlight, given the capacity of this compound to absorb ultraviolet light[14].

Casal's work is striking for its clarity and scepticism, features that make him one of the most notable scientists of the Spanish Enlightenment. In this sense, García-Valdecasas'[12] words are apt:

> "His clarity of understanding surprises me, as does his objectivity and lack of prejudice, observing the facts, without allowing himself to be influenced by a number of philosophical principles and systematic deductions on which the ingenuities of his age became shipwrecked. His independence of criteria compared to the prejudices of the period are not found in any author from those times, not even a hundred years later. While his discovery of the mal de la rosa is

*El médico* (The doctor, 1779) by Francisco de Goya y Lucientes. It is argued that represents Gaspar Casal with two young students

notable, even more worthy, in my view, was his clarity of thought and his scientific criteria, independent of the prejudices of his time, which place him among the great men of his period".

Casal was a man of his time: as well as a physician, he was one of the most important Spanish scientists in the first half of the 18th century. He precisely described for the first time a disease that was the result of a dietary deficiency. His is one of the Catalan medical eponyms that is most used internationally. Even today, numerous publications and images refer to Casal necklace, as illustrated in with its inclusion in a FAO publication[15].

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# ANTONI DE GIMBERNAT I ARBOÇ
# GIMBERNAT LIGAMENT

## The eponym

**Gimbernat ligament**. A band of fibrous tissue that fills the angle formed by the internal portion of the inguinal ligament with the pectineal line. It is merely the reflected portion of the aponeurosis of the external oblique muscle, which converts from vertical to horizontal or slightly rising. It is triangular and its outer edge is free, sharp, and crescent-shaped, forming the medial boundary of the femoral ring. Thus, it abuts Cloquet node and the femoral vessels[1]. It is also known as the lacunar ligament[2].

Antoni de Gimbernat i Arboç (1734-1816)

## Antoni de Gimbernat i Arboç (1734-1816)

Antoni de Gimbernat i Arboç was born in Cambrils on 15 February 1734 and studied philosophy at *Universitat de Cervera*[3]. After completing his studies culminating in a Bachelor of Arts degree, he travelled to Cádiz in 1756 to continue training in the *Real Colegio de Cirugía de Cádiz* (college of surgeons) created by another Catalan, Pere Virgili[4], though it seems he did not enter the College until 1758[3]. In Cádiz, Gimbernat proved to be especially talented in anatomy and dissection. He summarised this preference in one of his best-known declarations: "My favourite author is the corpse".

Just three years after Gimbernat arrived in Cádiz, Virgili created a new surgeons' college in Barcelona at the *Hospital de la Santa Creu*. After holding several positions and graduating in 1762, Gimbernat was proposed for a professorship in Barcelona by Virgili. However, in Madrid, they opposed the appointment based on his youth. Nevertheless, the next year Virgili managed to have him appointed honorary professor and shortly afterward, supernumerary[4]. Two years later, Gimbernat obtained the position of professor of anatomy and was also appointed senior surgeon. During his time in Barcelona, he provided the first description of the anatomical element that would thenceforth be known as Gimbernat ligament (1768). Then in 1772, he described his technique for operating on a crural hernia, though publication of both contributions was delayed until 1793[5].

In 1774, he was paid by the government of Carlos III of Spain to visit several European cities to gather knowledge on modern surgical practice, with the idea of creating a third college of surgeons, in Madrid. Gimbernat and Mariano Ribas, a professor from Cádiz, visited Paris (1774-1777), where they attended *Hôtel-Dieu* and *La Charité*, London (1777), Edinburgh, and Amsterdam (1778). In London, Gimbernat showed John Hunter his technique for operating on a femoral hernia:


Bust of Antoni de Gimbernat in the *Reial Acadèmia de Medicina de Catalunya*

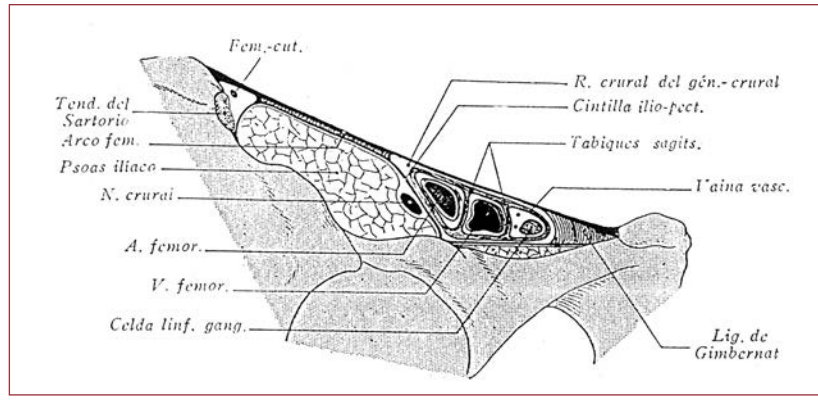
"I am also encouraged to publish this new method by the approval of the wise and expert Dr Hunter, because when I was his listener in London at the time I mentioned, I explained it to him, after the lesson dealing with this hernia, demonstrating it in detail and with the possible clarity in his presence, before some of his disciples, on the same dry, well-prepared piece of a crural hernia, on which he had just been giving an exact demonstration with knowledgeable practical reflections. My satisfaction was enormous to see that, once I had concluded my demonstration, Hunter himself answered: 'You are right sir'. And he added: 'I will make this public in my lessons, and I will undertake it thus when I have the occasion to operate on a live patient'[5]."

It seems that Hunter proposed that the this technique should be known as Gimbernat operation (another eponym). Faithful to his word, Hunter publicised the Catalan surgeon's technique in his writings and conferences, and this was probably one of the keys to Gimbernat's immortality[7].

## Gimbernat ligament

Several French physicians recommended that the fibrous fold of the femoral canal should be known as Gimbernat ligament[6]. The author himself described it thus:

> "From this it results that the crural arch has two sides, one external and rather rounded like a rope, thicker toward the pubis, and similar to a ligament. Therefore, they call it the Fallopian ligament; to it adheres the expansion of the fascia lata as has been said, and in very thin patients the direction and tension of this cord can be seen through the teguments. The other side, which I have called internal, is the end of the fold of the aponeurosis: it is very thin; and from the start it joins the aponeurosis that covers the iliac muscle. This close



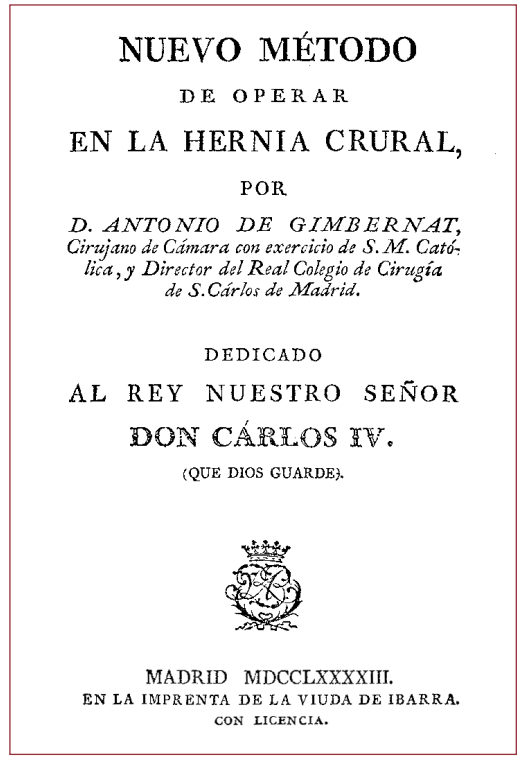

Transversal slice of the femoral arch showing the constitution of the femoral ring, especially Gimbernat ligament[6]

> junction and that of the fascia lata with the external edge are more notable from the anterior superior iliac spine to near the crural vessels, resulting in the crural arch being flatter and depressed against the iliac muscle throughout this course, acting as a girdle to support the muscle and hold it in place during its contractions. Consequently, it is impossible that a crural hernia could ever form in this space, as some have thought[5]."

These were not Gimbernat's only discoveries, since he also described the node that would later be known as Cloquet or Rosenmüller node[4], although it is still known as Gimbernat node[7]. For some authors[6], Gimbernat should also be credited with the discovery of the septum crurale, which is also usually attributed to Cloquet, or with the discovery of the ligaments known as Cooper ligaments.

## Other activities

Gimbernat's efforts in favour of creating the *Colegio de Cirugía de San Carlos* in Madrid were recognised by his appointment as its director[3]. Only two years later, however, he was appointed royal surgeon and had to withdraw from his teaching duties. In 1799, he managed to unify the colleges of medicine and surgery, but in practice, the protests of the medical professionals hindered this merger[3]. In 1801, Gimbernat was appointed First Royal Surgeon, thus becoming the president of all the surgeons' colleges in Spain. Despite most of his time then being occupied with management tasks, he still published *Disertación sobre las úlceras oculares que afectan a la córnea transparente* (Dissertation on the eye ulcers affecting the transparent cornea) (1802). Gimbernat's dedication to these organisations continued in the following years, when the faculties of medicine and pharmacy as well as the surgeons' colleges, were forced to merge under Napoleonic administration in 1811 into a single organism, the *Consejo Superior de Salud Pública*, which Gimbernat



NUEVO MÉTODO

DE OPERAR

EN LA HERNIA CRURAL,

POR

*D. ANTONIO DE GIMBERNAT,*
*Cirujano de Cámara con exercicio de S. M. Católica, y Director del Real Colegio de Cirugía de S. Cárlos de Madrid.*

DEDICADO

AL REY NUESTRO SEÑOR

DON CÁRLOS IV.

(QUE DIOS GUARDE).

MADRID MDCCLXXXXIII.
EN LA IMPRENTA DE LA VIUDA DE IBARRA.
CON LICENCIA.

Cover of Antoni de Gimbernat's most important work[5], *Nuevo método de operar en la hernia crural* (A new method of operating the crural hernia), published in 1793

presided over, though he felt now old and sick. His progressive loss of sight had made a surgical operation advisable, and he was operated on by Josep Ribes in 1810[8]. This was complicated when Gimbernat, who now suffered bouts of mental instability, removed the bandages on the night of the operation to check whether he could see, and finally lost his sight in the eye that had been operated upon[9].

The ensuing years were increasingly worse, since he was relegated to a lesser role by Fernando VII's new government, probably due to his collaboration with the Napoleonic government. When he was 80 years

old, Gimbernat abandoned all public life[3]. His physical condition continued to deteriorate. He became increasingly blind and his moments of lucidity became less frequent[9]. He finally passed away in Madrid in the early hours of 17 November 1816.

Gimbernat contributed notably to the development of surgery by introducing new techniques and instruments, as well as through his anatomical discoveries and proposals for the organisation of surgery studies. Gimbernat ligament is probably one of the best-known Catalan medical eponyms.

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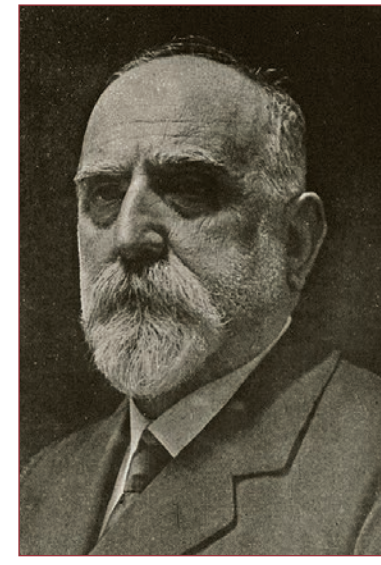
# JAUME FERRAN I CLUA
# FERRAN VACCINE

## The eponym

**Ferran vaccine**. The first of the cholera vaccines, consisting of a suspension of live *Vibrio cholerae* isolated from the faeces of cholera patients, in collaboration with Innocent Paulí, when one of the last great epidemics of this disease was raging[1]. It is also known as Ferran cholera vaccine.



Jaume Ferran
i Clua (1851-1929)

## Jaume Ferran i Clua (1851-1929)

Jaume Ferran i Clua was born on 1 February 1851[2] in Corbera d'Ebre, where his father, Joan Ferran i Llombart, practiced as a physician. This led him to study medicine in Barcelona, where he graduated on 9 December 1873. Having finished his studies, he specialised in ophthalmology (with Josep Caralt i Matheu) and became interested in hydrotherapy and electrotechnics. He began to practice in a small village, El Pla del Penedès, and later in the city of Tortosa, where he was the official physician from 1874 to 1887, the year he moved to Barcelona[3].

He also studied painting, and was a co-disciple of Francesc Gimeno, with whom he often went landscape painting while he was in Tortosa[4]. He was also a keen photographer. In collaboration with Innocent Paulí, a chemical engineer and close personal friend with whom he would work for many years, he invented a photographic emulsion technique using silver bromide with gelatin, which they presented in 1879 in a monograph entitled *La instantaneidad de la fotografía* (Instantaneousness of photography). With Paulí he also worked in telephony[3,5], and they established the longest communication connection achieved at that time, 84 kilometres, between Tortosa and Tarragona. They published works on microtelephony and on the transmission of images by telephone.

Thanks to his relationship with the Valencian astronomer and geologist Josep Joaquim Lànderer, Ferran started using a microscope, and he discovered Louis Pasteur's work. In 1880, he set up a small laboratory at home, where he isolated and cultured various microorganisms. He followed Pasteur's technique, preparing vaccines against swine erysipelas and anthrax.

He published his first microbiological studies in 1883. He defended the theory of animated contagion as the origin of infectious diseases, and

Jaume Ferran i Clua, c. 1873

wrote *Memoria sobre el parasitismo bacteriano* (Memory on bacterial parasitism), which received an award from the *Real Academia de Medicina y Cirugía de Madrid* in 1884[3].

That year saw cholera outbreaks in Marseille and Toulouse (France), so Barcelona City Council sent Ferran, as member of a commission, to study it. There, he and Paulí visited cholera patients, conducted autopsies, and learned to identify and culture *Vibrio cholerae* following the steps Koch had described a few months earlier. On their return, they brought *Vibrio cholerae* cultures hidden in a matchbox. Despite having to spend eight days in Portbou's quarantine station and the fumigations they were

subjected to, the cultures survived, thus demonstrating the uselessness of contemporary measures against cholera[3].

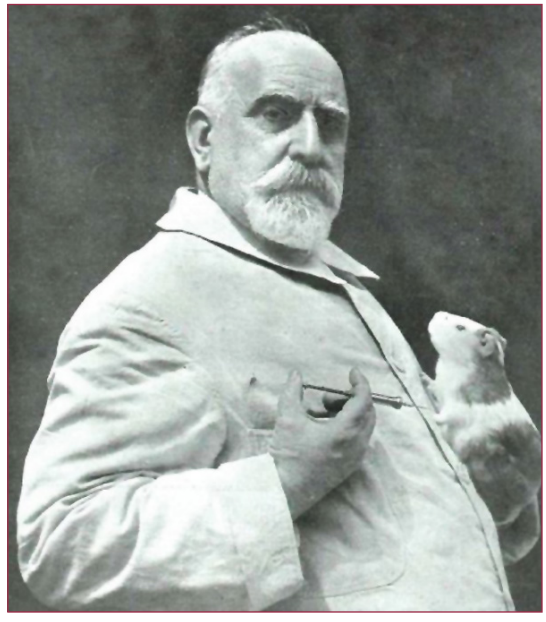
## Ferran vaccine

On returning to his laboratory, Ferran devoted himself to studying *Vibrio cholerae*. He discovered that subcutaneous inoculation of a broth containing pure cultures of this bacteria cultured at 37 °C produced immunity in guinea pigs. The vaccinated animals resisted inoculation with virulent *Vibrio*, while the non-immunised animals died. Ferran found that the route of inoculation was the key: subcutaneous cellular tissue was unsuitable for the development of the bacteria (unlike the digestive tract, through which the disease was produced). Subcutaneous inoculation enabled the organism to become used to the presence of the germ, so that when it was later ingested, the disease did not develop.

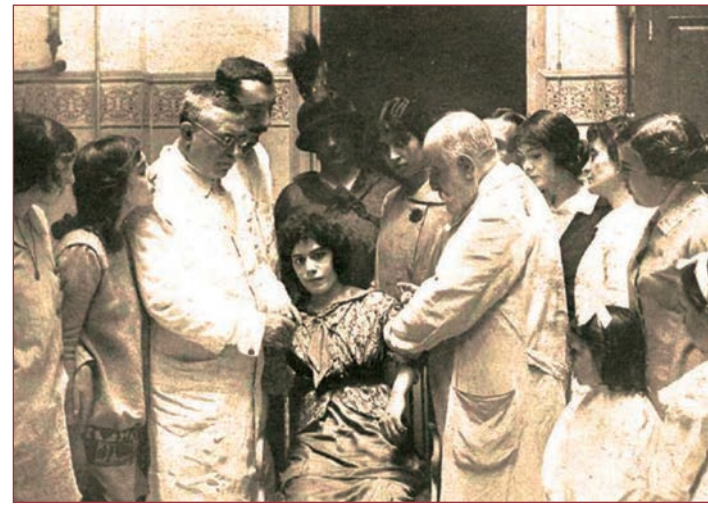
Ferran tested this vaccine, the first bacterial vaccine used on humans, on himself: in late 1884, he inoculated a cubic centimetre of live culture under the skin of his abdomen, and he also vaccinated Paulí. He announced his discovery by writing to Coll i Pujol, the mayor of Barcelona, as well as to Robert Koch. After testing the vaccine on friends and family and obtaining good results, he telegraphed the Minister of the Interior, Francisco Romero Robledo (from whom he received no reply) and Josep de Letamendi. He wrote a report summarizing his studies entitled *Estudios sobre el cólera* (Studies on cholera), which was structured into three sections (on the morphology of the microbe responsible for cholera, its pathogenic action, and the prophylactic action of the vaccine), and presented it to Barcelona City Council. The Council, on receiving it, requested a report from *Reial Acadèmia de Medicina de Barcelona*. On 11 March 1885, the report was issued. The commission that had written it defended the vaccine's harmlessness after inoculating and even re-inoculating volunteers, mainly physicians and

medical students[5]. They recommended the Council provide Ferran with the necessary funds to set up a microbiological laboratory to study cholera and other infectious diseases, as well as to travel abroad. A month later, a Ferran's note explaining his research results was read at the *Académie des Sciences* in Paris[3].

A huge cholera epidemic broke out a few days later in Valencia. Amalio Gimeno, then at Valencia's Faculty of Medicine, who had made several trips to Tortosa and was aware of the importance of the vaccine, invited Ferran to visit Valencia, where they began to apply the vaccine[4]. On 1 May, they began inoculations in Alzira. They continued in around 30 other towns, including the city of Valencia. However, they met with fierce opposition from a segment of the medical establishment, which influenced Minister Romero Robledo to the point where he prohibited the vaccination campaign. The controversy, dubbed the "Ferran



Portrait of Jaume Ferran in the laboratory



Jaume Ferran and his colleage Masip, vaccinating a girl for rabies

question"[6], reached the lower house of the Spanish parliament, where Emilio Castelar and Práxedes Sagasta defended vaccination. Yet despite the favourable report stating that the procedure was harmless, the statistics were considered insufficient and a period of observation was recommended. Nobody but Ferran was allowed to inoculate people. Ferran refused to continue and returned to Tortosa: of the nearly 50,000 people he had inoculated, only 54 had died[3]. Several Spanish and foreign commissions took part in the controversy. Some made special mention of the "secret" nature of Ferran vaccine: he had communicated the "scientific procedure" he employed to prepare it, but not the "industrial procedure". Especially important were the testimonies of a French commission and Santiago Ramón y Cajal's arguments against the vaccine[7]. The so-called "Ferran question" had significant political repercussions. Finally, however, after many vicissitudes, the use of the vaccine was recognised internationally and the Paris *Académie des Sciences* awarded Ferran the Bréant Prize for being the first to achieve active immunisation of humans using a bacterial vaccine[3,4]. It was 1907,

and in awarding the prize, it was said that Ferran should be recognised for "the initiative of preventive immunisation against cholera" and that his discovery "constituted the point of departure for numerous studies that have enriched science with facts of the highest importance". Ramón y Cajal himself later recognised the value of the vaccine in his *Anatomía patológica general* (General pathological anatomy)[8].

The vaccine was later employed on a large scale in India and among soldiers fighting in the First World War.

## Other vaccines and the *Laboratori Microbiològic Municipal de Barcelona*

Ferran proposed Barcelona City Council to create a vaccination institute (at first an anti-rabies centre). The Council accepted and on 16 November 1886 appointed him director of Barcelona's future *Laboratori Microbiològic Municipal*[5]. In May 1887, the laboratory began inoculations against rabies: the first vaccination against rabies in Spain took place on 17 May 1887.

It was in this laboratory where Ferran created a vaccine against typhoid fever that same year and where he developed a rabies vaccine that followed the so-called "supra-intensive vaccination method", consisting of inoculating a large amount of active virus to provoke an intense defensive reaction in the organism (so he did not follow Pasteur's vaccine guidelines)[4,8]. He also changed the route of inoculation for this vaccine to intraocular, reducing treatment to five days and 20 injections. The first person was vaccinated using this new method in the second week of July 1887[5]. From 10 January 1888[3], Ferran's new method replaced Pasteur's method in the laboratory. The next year he published *Estudios sobre la rabia y su profilaxis desde 1887 a 1889* (Studies on rabies and its

prophylaxis from 1887 to 1889). By that time, he had vaccinated more than 500 people.

He also studied a vaccine against diphtheria that used an attenuated diphtheria bacillus. Deaths in people that had been inoculated with the diphtheria vaccine and a few cases of paralytic rabies occurring after vaccination using Ferran's supra-intensive method generated great controversy, and a commission was formed to examine the facts. Nevertheless, he published an article in 1891 outlining the results obtained from applying the diphtheria vaccine. The following year G. Klemperer recognised in *Berliner Klinische Wocheschrift*[3]: "If Ferran had the idea of using the blood of cholera patients to vaccinate healthy subjects, then Ferran may claim paternity of the discovery (*of anti-diphtheria serotherapy*) of Behring and Kitasato". In 1894, he managed to prepare an anti-diphtheria serum, and the *Hospital de Caridad* in Cartagena was the first centre to administer it[5]. Barcelona City Council authorised the establishment of a department of serotherapy in October 1894.

Ferran's activity was always extraordinary. In Mallorca, in 1892, he successfully carried out a vaccination campaign against swine erysipelas. In 1898, he demonstrated that the tetanus bacillus was facultative and could live in anaerobe conditions and the possibility of cultivating anaerobic bacteria in an acetylene atmosphere. In 1899, he went to Oporto (Portugal) to investigate an outbreak of bubonic plague. There, he studied the application of the plague serum and prepared a vaccine made with heat-attenuated bacilli. At that time, there was a similar vaccine, created by Haffkine. A commission studied the relevant information and agreed to grant Ferran priority in the discovery of the chemical vaccine, proposing to call the plague vaccine "Ferran-Haffkine vaccine" (another eponym).

Jaume Ferran i Clua (centre), with an assistant (left) and his grandson Joan Vila i Ferran (right), examining a culture tube during one of his last days at the laboratory

In 1900, he created the *Institut de Patologia Experimental i d'Higiene*, known as the *Institut Ferran*, where he began to use polyvalent vaccines. The impact of fatal cases occurring with the diphtheria vaccine and the cases of paralytic rabies, together with accusations questioning administrative management of the *Laboratori Microbiològic Municipal* and interests that have yet to be entirely cleared up even today[5,9], led to Ferran's dismissal from his position as the director of this institution in 1905[3,4,9].

International recognition of some of his merits (especially prophylaxis against cholera among troops fighting in the First World War) encouraged him to keep researching. In 1919, he created an anti-alpha vaccine against tuberculosis[4]. The first vaccination campaign using this new vaccine took place in the Valencian towns of Alzira and Alberic, and two years later, another took place in Mallorca. There, with his son Joan's

help, he also organised an anti-rabies service in the *Casa de Socors*, in Palma de Mallorca.

In 1925, during a trip for Spanish and Latin American physicians, he received several honors in Germany. A few years before, Ferran had been elected a member of *Reial Acadèmia de Medicina de Barcelona*, but he refused to occupy his seat due to the controversy that, once more, had flared up over his vaccination campaign in Mallorca.

Buenos Aires was the first city outside Spain where vaccination using the anti-alpha vaccine was successful. In 1927, the Argentinean government invited him to participate in the First Pan-American Congress on Tuberculosis. He attended it with his grandson, who had become his collaborator.

He died in Barcelona on 22 November 1929. In May, King Alfonso XIII had wished to meet him on a journey to Barcelona. On that occasion, Ferran would not allow the king to bestow any decoration or noble title upon him as he had done with other eminent scientists of the period. Ten years before[5], in 1919, the League of Nations had offered its unconditional congratulations on Ferran's work.

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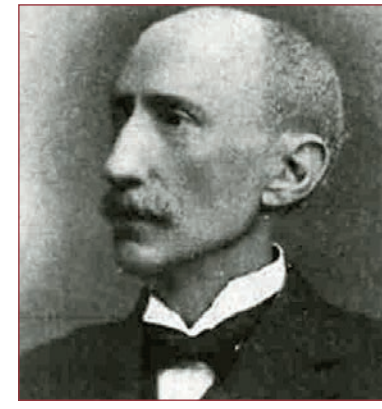
# LLUÍS BARRAQUER I ROVIRALTA
# BARRAQUER-SIMONS SYNDROME

## The eponym

**Barraquer-Simons syndrome**. A condition initially described by Lluís Barraquer i Roviralta (1907) as atrophy of adipose tissue and later by Simons (1911) as progressive lipodystrophy. It is characterised by extraordinary weight loss in the upper half of the body, especially in the face (mummy face), that begins in childhood or around puberty. The lower half of the body maintains the adipose stores –they even increase. The syndrome is more common in women than in men; it may be accompanied by lipoatrophic diabetes, mental retardation, otosclerosis, bone cysts, and nephritis[1].
It is also called Barraquer-Simons disease, Barraquer syndrome, Barraquer disease, and Barraquer progressive cephalothoracic lipodystrophy.



Lluís Barraquer i Roviralta (1855-1928)

## Lluís Barraquer i Roviralta (1855-1928)

Lluís Barraquer i Roviralta is considered the founder of Catalan neurology. Furthermore, prestigious physicians, such as Pedro i Pons[2] and Barcia Goyanes[3], consider him the founder of Spanish neurology, although his personality was an impediment to his teaching fully reaching beyond Catalonia's borders. Barraquer was fully dedicated to the medical profession; in his grandson's words, he "lived with a Benedictine devotion to his work"[4]. This dedication resulted in the development of a new medical specialty in Catalonia, following the example of other European countries such as France, Germany, and Austria.

Lluís Barraquer i Roviralta was born in Barcelona in 1855 and graduated from the *Universitat de Barcelona* in 1878. During his time at the Faculty of Medicine he was notably influenced by two teachers[5]. The first was his brother Josep Antoni, an ophthalmologist with an intimate knowledge of the nervous system. The other, Bartomeu Robert, had a passionate interest in clinical neurology and would go on to become very well known for his political activity as the mayor of Barcelona. Barraquer's early interest in diseases of the central nervous system was rewarded when in 1882, just four years after graduating, he was appointed director of the Dispensary of Electrotherapy and Diseases of the Nervous System, later known as the Department of Neurology and Electrotherapy and eventually as the Department of Neurology. At this time, no such department yet existed anywhere in Spain[6].

It was, perhaps, portentous that 1882 was a significant year for European neurology: Charcot took on the first Chair of Neurology in Paris, and Obersteiner opened his Institute of Neurology in Vienna[7]. When the *Hospital de la Santa Creu* moved to its new headquarters in Sant Antoni Maria Claret Street to be renamed *Hospital de la Santa Creu i Sant Pau*, Barraquer transferred there too. He would not leave his position in this hospital until his death.

Three generations of neurologists: Lluís Barraquer i Roviralta (right), his son Lluís Barraquer i Ferré (left), and his grandson Lluís Barraquer i Bordas (centre). Summer of 1923, Sant Climent de Llobregat

All biographic references to the figure of Barraquer i Roviralta highlight his single-minded dedication to his profession, only interrupted by periods of relaxation at his home in Sant Climent de Llobregat, near Barcelona. Such an intense professional life enabled him to develop a new medical specialty, with no teachers or foreign references, since Barraquer i Roviralta, contrary to custom, did not train under any of the great figures of the period. He had only his own effort, his intelligence, his patients, and his books. He was, in fact, a self-taught neurologist. This important undertaking deserves to be even more highly valued considering that Barraquer i Roviralta had a weak constitution, and his character was infused with a certain sadness and irritability. He had his

reasons, since he was widowed for a second time when he was 35 years old, and a few years later he lost the son from his first marriage, Enric Barraquer i Solà. Furthermore, his financial situation was not very good, since he had given up the practice of psychiatry in favour of neurology, an exceptional situation for the time[4].

Barraquer i Roviralta's work was not limited to the *Hospital de la Santa Creu*; he also founded the Department of Neurology at the *Hospital de Nostra Senyora del Sagrat Cor*. Moreover, he took the first steps toward establishing neurosurgery in Barcelona. From 1910 onward, under his instruction, Salvador Cardenal and Enric Ribas operated on patients affected by focal epilepsies, often of a traumatic origin[6]. He also indicated the excision of expansive brain lesions such as cerebral cysticercosis, an operation undertaken by Cardenal, and a cerebellar tumour, operated on by Antoni Raventós[8].

In 1922, he became a member of the *Reial Acadèmia de Medicina de Barcelona*, giving a speech on the semiologic value of idiomuscular contraction. Corominas, who was president years later, recalled an anecdote that occurred at the Academy with Barraquer i Roviralta at its heart[9]:

> "At that time it was common for the Academy to pronounce on court cases concerning accidents at work; when the matter was not very clear, the worker was summoned to plenary session and was asked to enter the hall, where all the academics could examine him and give their opinion after the worker had left. At one of these sessions, in which the case of a worker affected by sciatica was being contended, some of the academics claimed he could be malingering, but Barraquer, who had seen him and knew that he was not, without saying a word, took a bunch of keys from his pocket, flung them at the standing worker's feet and asked him to pick them up. The good man remained perplexed for a moment, but finally decided to crouch down. However, he did so through a series of contortions so as to keep

> his sciatica relaxed to avoid the pain it would cause him to bend his spine as a healthy person would. Once the worker had left, alone with the academics, Barraquer explained the reason for the movements the worker had executed to pick up the keys. He went into so much anatomical detail about the situation and the path of the sciatic nerve that all present were convinced, and nobody dared to suggest that the worker was faking it."

Barraquer i Roviralta passed away on 12 October 1928 at the age of 73, at home in his beloved Sant Climent de Llobregat. Only thus was this indefatigable worker halted. Two years after his death, his study on brain compression, the last he had undertaken, was published. All his efforts were not in vain: his school would continue the work he undertook under the direction of his son, Lluís Barraquer i Ferré.

## Barraquer-Simons syndrome

Among his many contributions to clinical neurology, perhaps the best known was his description of a case of progressive lipodystrophy. Rodríguez Arias gave a thorough account of the story of this description more than 70 years ago[10]. In 1906, Barraquer described a case of a little-known entity, lipoatrophy, which was published the following year in *Neurologisches Zentralblat*. In fact, only a single similar case, but exclusively affecting the upper part of the body, had been presented before, by Weir Mitchell in 1885. Barraquer i Roviralta provided the first full description; the German physician Simons characterised it as a separate disease entity, systematised it, and coined the name "progressive lipodystrophy" in 1911.

Barraquer-Simons syndrome is not the only eponym associated with Lluís Barraquer i Roviralta. The eponym Barraquer reflex is also widely used to refer the grasp reflex of the foot[11], the athetosis associated with

Patient with progressive lipodystrophy described by Barraquer i Roviralta included in the original publication[9]

childhood encephalopathies, Barraquer anaesthetic mask, and Barraquer generalised hemilateral atrophy. With time, as would be expected, his work was recognised in Spain and abroad. Martí-Vilalta[5] recounted an anecdote that reflects the professional esteem in which other prestigious doctors held him:

> "Two brothers, affected by the atrophy described by the renowned French neurologist, whose name is associated with Pierre-Marie, visited Charcot, at the Hôpital de la Salpêtrière in Paris. 'Well then', said the great French master, upon realizing they came from Barcelona and their doctor was Dr Barraquer, [...] 'You needn't have come to me. In your country you have a man who knows your disease as well as I do'."

The syndrome is also known as acquired partial lipodystrophy, cephalothoracic lipodystrophy, and progressive lypodystrophy. The first seems now the preferred name for describing it.

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# MANUEL CORACHÁN I GARCÍA
# CORACHÁN GASTROPEXY

## The eponym

**Corachán gastropexy**. Gastropexy is the surgical correction of gastroptosis by attaching the stomach to the abdominal wall, diaphragm, or liver[1]. Corachán gastropexy is a modification of Lambret technique in which, instead of using the aponeurotic band to suspend the stomach, two thick silk threads are entwined into a cord and fastened to the left costal arch and to the suspensory ligament of the liver[2].

Manuel Corachán i García (1881-1942)

## Manuel Corachán i García (1881-1942)

Manuel Corachán i García was born in the Valencian town of Xiva de Bunyol on 2 November 1881. His father worked as a surgeon and barber –more the latter than the former according to Marí i Balcells[3,4]. His mother, María García Hernán, died prematurely when Corachán was only six[5]. Shortly after her death, Corachán went to live with his uncle and aunt in Barcelona, where he began secondary school in 1893 and medical school six years later[5]. Corachán always considered himself "Valencian by birth, Barcelonian by heart and by adoption, yet irrevocably Valencian"[6]. Given his family's modest financial means, he had to work as a barber, in his father's trade, from a young age, especially after his father's early death; this work helped pay for his studies. He had the top score on the examination to choose an intern in Professor Àlvar Esquerdo's department. Later, Enric Ribas i Ribas, an associate in the same department, allowed

The *Institut Clínica Corachán*
1936

him to work as a trainee in his clinic. This work improved his finances, though he would continue working as a barber on Saturday afternoons[5].

He graduated in 1906 and two years later earned a position as a physician in the *Dispensaris Municipals*. Later he continued collaborating with Ribas i Ribas when the latter was designated head of the Department of Surgery at the *Hospital de la Santa Creu*. Corachán was chosen for the same post on the death of Àlvar Esquerdo in 1921. While devoting himself to these tasks, in 1915 Corachán had opened a small clinic; six years later, under the name *Casa de Salut Clínica Corachán*, he expanded his practice with a new centre. The establishment still exists on the same premises as the *Institut Clínica Corachán*.

In 1925, Corachán earned a PhD with a thesis on gastric surgery in Madrid, the only Spanish university that granted such a qualification at that time. On 19 April that year, he was elected a member of the *Reial Acadèmia de Medicina de Barcelona* replacing Ramon Torres. Corachán's speech, *El cirujano. Su aspecto científico y profesional a través de los tiempos* (The surgeon: his scientific and professional countenance over time), was honoured with a reply by Salvador Cardenal, the preeminent surgeon who had introduced the practice of aseptic surgery into Spain. In 1933, Corachán was appointed professor of surgical pathology at the *Universitat de Barcelona* in recognition of his scientific and teaching abilities, which had become patent in previous years. In the ensuing years, he gave courses in general surgery[6]. Alongside Ribas i Ribas and the Trias i Pujol brothers, he founded the *Revista de Cirugía de Barcelona* (Barcelona Journal of Surgery) in 1931[7].

He was also attracted to the field of politics; in 1933 he was elected president of *Sindicat de Metges de Catalunya* (the Physicians' Union of Catalonia), a powerful medical association at this time. In 1935, during a tribute in Xiva, he received the Cross of the Order of the Republic[8]. His work was also recognised with his appointment as Minister of Health

and Social Care of the *Generalitat de Catalunya* (Government of Catalonia) in May 1936. Although Corachán's politics differed from those of the government of the time, he accepted the post with a moral justification:

> "I came to Catalonia in my youth, almost a child, leaving behind my native town of Xiva in Valencia to come and live in my uncle's house in the neighbourhood of Sants in Barcelona, at the barbershop they had. There, while shaving customers, I studied for my profession and became a man. Everything else I have achieved up to reaching the position I now hold, I owe to Catalonia. Catalonia made me and has given me all it had to give. I think that at this time, as I enter the final phase of my maturity, it is fitting that I make the sacrifice, even a substantial one, for the good of the country that has taken me in like a son"[9].

Corachán, however, had little chance to prove his worth at the head of the department. He soon resigned and shortly afterwards was forced to go into exile.

Similar to the circumstances surrounding the flight of Lluís Sayé, an internationally recognised specialist in tuberculosis[10], the Corachán family's flight from Catalonia had more to do with threats from uncontrolled groups during the early days of the Spanish Civil War than with any stand contrary to the Republican government. Trueta, one of Corachán's main disciples, explained in detail how this flight took place and the tragic events that accompanied it[9]. The Civil War having broken out, he saw that he had no chance to do anything and President Companys accepted his resignation on August 1. Soon afterwards, he was "pursued by a group calling themselves anarchists, whose leader claimed that Corachán had operated on him and left him incapacitated due to a supposed technical error"[9]; this man demanded substantial financial compensation. However, Corachán's friend, Jaume Aiguader, advised him to leave the country, which he did, aided by an authorisation from President Companys himself.

However, this decision did not resolve the question, as shortly afterwards the same individuals made the same demands on Corachán's son, Manuel Corachán i Llort. According to Trueta[9], they demanded 30,000 pesetas, which Manuel deposited at the Palace of Justice to avoid problems. The strategy failed; they continued to pressure him, claiming they had only received 20,000. Given the situation and the threat to his life it represented, Manuel decided to flee to France and managed to arrive there after many ordeals. Against the advice he was given, he decided to cross over to the territory controlled by Franco's army, possibly influenced by his wife, who had family there. Although Manuel was a first-class neurosurgeon and Franco's army had few if any first-class neurosurgeons, he was unable to gain acceptance as a physician due to the opposition of a military colleague, perhaps because his father had occupied a prominent position in the government of Catalonia[8]. Finally, he volunteered as a nurse, and was wounded on the Basque front, apparently by a shell from the German air force. His wounds were not serious, but were not treated correctly, and he developed gas gangrene and died at the age of 27.

After his son's death, Corachán decided to go into exile in Venezuela in May 1937. In Latin America, he directed the Institute of Experimental Surgery in Caracas and was appointed head of the departments of anatomic technique and surgical technique at the *Universidad de Caracas*. He was invited to deliver conferences and undertake operations in Cuba, Mexico, and the United States, where he was made a corresponding member of the American College of Surgeons in October 1940[5]. Finally, he returned to Catalonia in June 1941. The *Tribunal de Responsabilidades Políticas* (Court of Political Responsibilities) in Barcelona had condemned him on 30 July 1940 "to pay 75,000 pesetas for having been the Minister of Health in the government of Catalonia for a short time", though it recognised that he "offered his resignation and left the country [...] Considered a person of order"[8,11]. It is clear that these statements should be read in the context of the period, but they enabled him to be reinstated in his position as head of surgery at the *Hospital de la Santa Creu i Sant Pau*

in Barcelona without undue difficulty. On 8 January 1960, the *Comisión Liquidadora de Responsabilidades Políticas* (Commission for the Settlement Political Responsibilities) waived the above-mentioned fine[8], but it was too late; Corachán died prematurely on 1 February 1942, a victim of the typhus epidemic that was sweeping Barcelona[3].

Corachán left a large body of written works. As well as nearly 200 scientific articles, especially notable are three books: *Cirugía gástrica* (Gastric surgery), *Clínica y terapéutica quirúrgica de urgencia* (Emergency clinical conditions and surgical therapeutics), and *Diccionari de medicina* (Catalan Dictionary of Medicine). *Cirugía gástrica* (Gastric surgery) was published in two volumes: the first, 794 pages long, appeared in 1934, while the other, 666 pages long, was published shortly after his death.

Corachán also maintained a long and intense relationship with the *Acadèmia de Ciències Mèdiques*, which he served as secretary (1921-1923), vice-president (1925-1927), and president (1932-1934). He was also the founder and second president of the *Societat Catalana de Cirurgia* (1930-1931). Furthermore, he published numerous articles in *Annals de Medicina* between 1908 and 1936. In 1931, he proposed the Academy move its premises from Portaferrissa Street to the *Casal del Metge*, on Via Laietana, where it remained until 1970. Corachán was also elected President of the X *Congrés de Metges de Llengua Catalana* (Congress of Catalan Language Physicians), which was to be held in Valencia in 1938. However, due to the Spanish Civil War and later circumstances, the X Congress did not take place until 38 years later, when it was held in Perpignan, France; Valencia would not be the seat of the organization until 2004.

## The Corachán family and the birth of Catalan neurosurgery

The first surgical operations on the nervous systems were collaborative interventions in which a neurologist made the topographic diagnosis and a general surgeon performed the operation[12]. Then, early in the twentieth century, the first specialists who were trained in both neurology and surgery made concurrent diagnosis and intervention possible. In Catalonia, the new specialisation developed at the *Hospital de la Santa Creu* with the collaboration of surgeons such as Cardenal, Reventós, and Corachán himself. Corachán and Ribas i Ribas participated in resections of cortical areas affected by scarring injuries in epilepsy patients under the supervision of Barraquer i Roviralta[13]. However, the new era belonged to younger men, such as Corachán's son, Manuel Corachán i Llort.

Receiving his MD in 1931, Corachán i Llort had completed internships abroad during his time as a student. He worked at the *Laboratoire de Physiologie de Toulouse* of Languedoc in France and at the Cantonal Hospital of Geneva in Switzerland, together with Antoni Llauradó and Vicens Artigas. Later, he undertook doctoral studies in Madrid, where he worked in Pío del Río Hortega's laboratory. He would also travel to the *Städtisches Krankenhaus* in Frankfurt and the *Hôpital de la Pitié* in Paris. He returned to Barcelona in 1934 and joined his father's Department of General Surgery, though he spent a large amount of time in the Neurology Dispensary. In this period he operated on no fewer than 35 patients admitted to hospital through the Department of Neurology. After being operated on, they were monitored in Corachán i Llort's own Department of Surgery before being reassigned to the Neurology Department. As Molet et al.[12] emphasised, the clinical histories of these patients show that history taking and neurological examination had improved greatly, indicating a change and specialisation in the sphere of neurosurgery as well as the incorporation of specific diagnostic tests (e.g., pneumoencephalography and myelography using lipiodol).

Unfortunately, Corachán i Llort's premature death put an end to the promising career in neurosurgery that his early years had seemed to presage.

## Corachán gastropexy

Manuel Corachán i García was one of the last "great general surgeons" in Catalonia. In the words of Casassas[6]: "He was a perfect surgeon, who took care of every detail in an operation, both surgical and postoperative". He published papers about orthopaedic-traumatological surgery and later shifted his attention to gastric and digestive surgery. He also practised plastic, vascular, thoracic, and endocrine surgery –even neurosurgery, as noted in the above section. Not only did he practice surgery, but he also carried out numerous research studies, both in Barcelona and Venezuela. These included studies on skin grafts, chloruremia in intestinal occlusions, carcinogenesis, and the appearance of collateral vessels after ligating arterial trunks[2]. He contributed to the invention of certain procedures that were innovations in their time, such as skin grafts, elbow arthroplasty, gastrostomy, colostomy, denervation of the adrenals to treat diabetes, or a new approach to access the humerus. Net[14] concludes that urological surgery developed from Corachán's department through the work of his disciple Vicens Compañ. Corachán also established relations with the German surgeon Sauerbruch, who did the first operations in prosthesis surgery in Munich, especially on the stumps of upper-limb amputees, and Corachán introduced these procedures in Catalonia[14]. However, we will focus on describing his contribution to gastropexy, known as Corachán gastropexy.

In his book *Cirugía gástrica* (Gastric surgery)[2], Corachán devotes a chapter to describing the techniques of gastropexy and gastroapplication. Gastropexy is a procedure to suspend the stomach

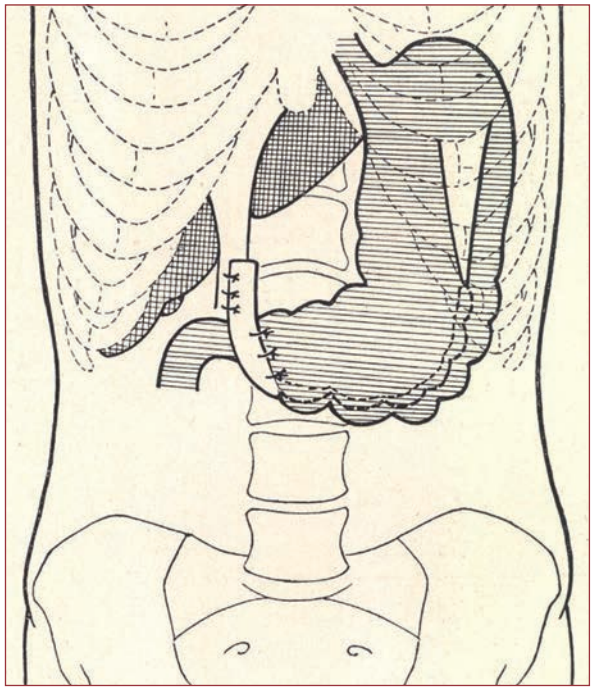
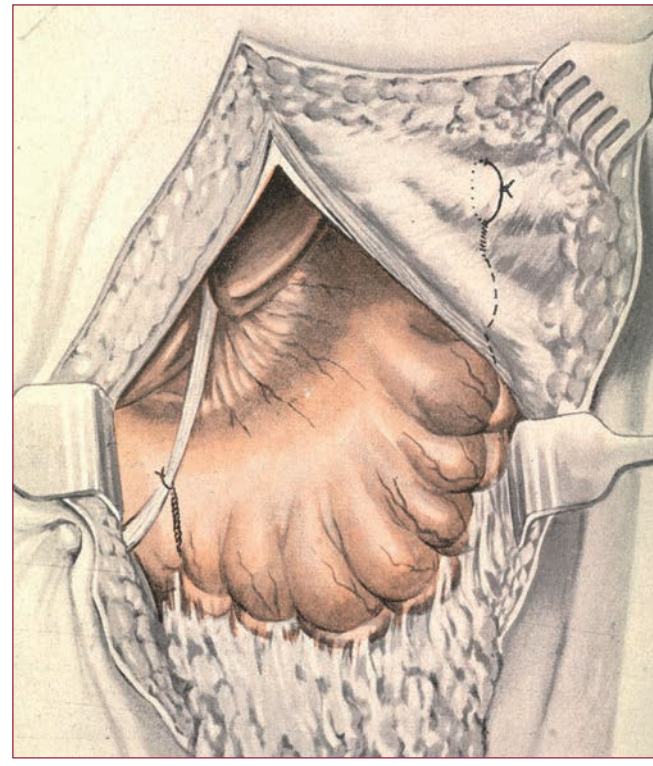


Diagram illustrating Lambret gastropexy in Corachán's book *Cirugía gástrica*[2] (Gastric surgery)

that is used to treat gastroptosis and certain forms of "idiopathic or atonic dilatation of the stomach". Corachán described five approaches to the procedure in use at that time: suspension of the stomach by fixing the greater omentum to the anterior abdominal wall (Coffey operation), shortening the greater omentum (Beyea operation), direct fixation of the stomach to the abdominal wall (Duret operation, Rovsing gastropexy), suspension of the lesser curvature (Perthes gastropexy) and suspension of the greater curvature (Lambret gastropexy). Corachán chose to modify Lambert's procedure to make it quicker and easier to perform. In 1933, he had published an article entitled *Modification de la technique de Lambret dans la gastropexie* (Modification of Lambret gastropexy technique) in the *Bulletin de la Société Nationale de Chirurgie*. In Corachán's words[2]:

## Corachán gastropexy[2]



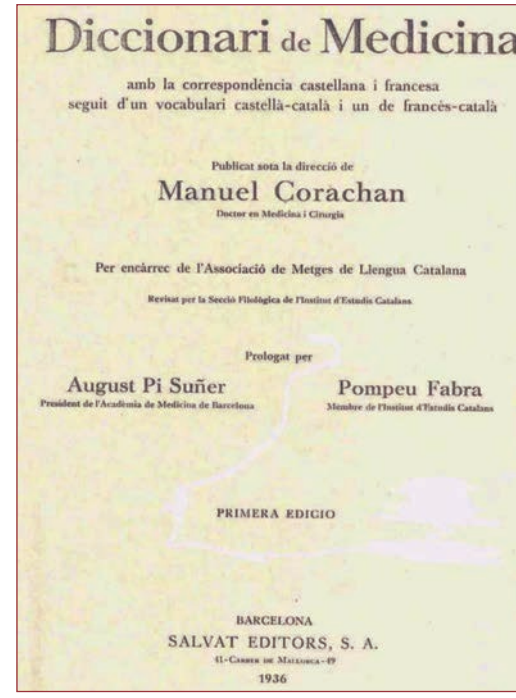
"The advantages of gastropexy with the round ligament of the liver, which Perthes conceived in 1920, have been surpassed by the procedure that Lambret presented in 1931, since in this latest technique the stomach is suspended from the greater curvature, which is in a relaxed state, and furthermore, because it achieves a reduction of the gastric cavity thanks to the stomach creasing along the aponeurotic band. We have employed the Lambret method with excellent results, but find his technique complicated and cumbersome due to the time lost in dissecting and preparing the aponeurotic band. So as to simplify the method, while respecting his fundamental bases, we have conceived a modification that consists of

> replacing the aponeurotic strip with two thick silken threads, twisted around each other like a cord, and which we fix, on one side, to the left chondral arch, without piercing the skin, and on the other, to the suspensory ligament of the liver. The suture of invagination and coulissage along the greater curvature is done in the same way as the Lambret method; for this suture we use fine silk. The degree of fixation of the silk cord to the chondral arch depends on the arrangement of the patient's thorax and varies from case to case. The advantages of our method consist mainly in simplifying the operation, which can be undertaken in ten or fifteen minutes, with fewer incisions and sutures, achieving remarkable solidity of the suspension and stability of the support points."

We do not know how useful the operation was or whether it was performed by other surgeons after Corachán's death. Nevertheless, it shows his interest and ability in improving surgical procedures and reducing their aggressiveness; Corachán was always concerned with postoperative care, beyond mere technical success.

## Corachán and the Catalan Dictionary of Medicine

Most Catalan physicians nowadays remember Corachán for his participation in creating the first Dictionary of Medicine available in Catalonia in the Catalan language. Corachán edited and partly financed this work written by 85 collaborators, including the great medical figures of the period. For example, among the surgeons who contributed were the Trias i Pujol brothers, Puig-Sureda, Pi i Figueras, and Trueta[15]. Published in 1936, it was in fact commissioned during the course of the *VIè Congrés de Metges i Biòlegs de Llengua Catalana* (VI Congress of Catalan Language Physicians and Biologists) held in 1930. Corachán said of the recently published book: "We have called it *Diccionari de Medicina* (Catalan Diccionary of Medicine)... because we believe the time has come


Diccionari de Medicina

amb la correspondència castellana i francesa
seguit d'un vocabulari castellà-català i un de francès-català

Publicat sota la direcció de
Manuel Corachan
Doctor en Medicina i Cirurgia

Per encàrrec de l'Associació de Metges de Llengua Catalana

Revisat per la Secció Filològica de l'Institut d'Estudis Catalans

Prologat per
August Pi Suñer
President de l'Academia de Medicina de Barcelona
Pompeu Fabra
Membre de l'Institut d'Estudis Catalans

PRIMERA EDICIO

BARCELONA
SALVAT EDITORS, S. A.
1936

Cover of the *Diccionari de Medicina* (Catalan Dictionary of Medicine), edited by Manuel Corachán, 1936

when Catalan books need not declare that they are written in Catalan." The dictionary contained a foreword by August Pi i Sunyer and another by Pompeu Fabra, who wrote that "this dictionary must contribute to improving the *Diccionari General de la Llengua* (General Language Dictionary)"[6].

Fernández i Sabaté[15] explained the dictionary's ultimate fate. It was published in instalments, complemented with Spanish-Catalan and a French-Catalan glossaries, totalling 830 pages for binding. It was to be distributed in the autumn of 1936, but the outbreak of the Spanish Civil War made it advisable to hold off. The entire edition was stored in the basement of the *Casal del Metge* in sealed boxes awaiting more peaceful

times. This was a tightly guarded secret because knowledge of its existence could lead to its destruction, given the persecution of the Catalan language in the post-war period. From the 1960s onward, the work was discreetly distributed among doctors who requested it until no more copies remained[15].

The *Diccionari* became legendary among those who defended the use of Catalan in medicine. It was the only reference work available to Catalan physicians until the appearance of the first *Vocabulari Mèdic* (Medical glossary) in 1974, published on the initiative of the *Acadèmia de Ciències Mèdiques de Catalunya i de Balears* and its president, Josep Laporte. It would not be substituted, however, until 1990, when the *Diccionari Enciclopèdic de Medicina* (Encyclopaedic dictionary of medicine), edited by Oriol Casassas, was published. Publication of the second edition ten years later, now coordinated by Màrius Foz, Eduard Llauradó, and Joaquim Ramis, would also normalise the situation in this sphere. Nevertheless, it should be remembered that 54 years were to elapse between the publication of Corachán's and Casassas' dictionaries.

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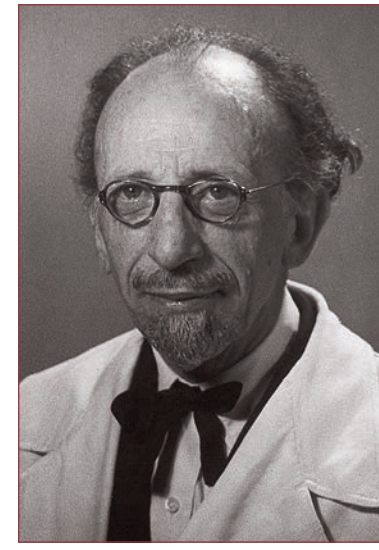
# IGNASI BARRAQUER I BARRAQUER
# BARRAQUER OPERATION

## The eponym

**Barraquer operation**. Extraction of a cataract by suction using an erysiphake, an instrument for extracting the lens invented by Ignasi Barraquer circa 1917; the procedure uses the vacuum produced by a small suction cup to draw out the lens[1]. It is also known as Barraquer procedure, Barraquer method, Barraquer intervention, phacoerisis, phacoerysis, phakoeresis, phakoerisis and phakoerysis.



Ignasi Barraquer
i Barraquer
(1884-1965)

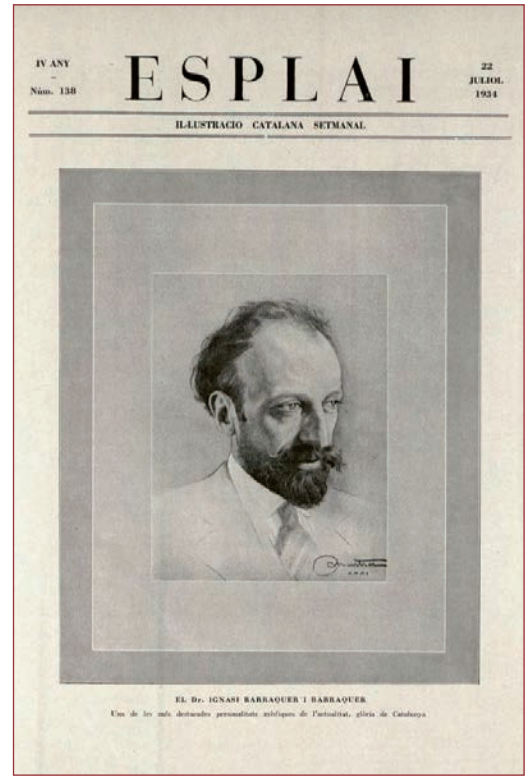
## Ignasi Barraquer i Barraquer (1884-1965)

Ignasi Barraquer i Barraquer was born in Barcelona on 25 March 1884 to Josep Antoni Barraquer i Roviralta (1852-1924) and Concepció Barraquer. After finishing secondary school in 1900, he studied medicine in Barcelona, graduating with highest honors in 1907. The following year, he was awarded a PhD for his thesis *Dacriocistitis* (Dacryocystitis). Long before studying medicine, he was an excellent carpenter and metalsmith and, at the age of fourteen, he had operated on cataracts in animals[2]. In 1904, he published his first scientific paper, *La tuberculosis del oído* (Tuberculosis of the ear), in the scientific journal *Gaceta Médica*[3].

On graduation, he immediately began to work alongside his father, a great teacher and the founder of a line of ophthalmologists, as an assistant physician at the Santa Creu Dispensary and the Faculty of Medicine. From 1909 to 1918, he was associate professor and in 1919 he was appointed honorary professor of the *Instituto Rubio de Terapéutica Operatoria* in Madrid. From 1919 to 1923, he was the interim chairman in Barcelona, replacing his father, who had retired[4,5]. According to Pedro i Pons[6], although Ignasi Barraquer was the ideal person to occupy the position permanently, he refused to sit the official examinations that university regulations required and had to give up this position. In the words of Pedro i Pons: "In the case of Ignacio Barraquer, this did not merely mean the loss of a teacher, but also of the school he gave rise to" [...] "He practised his mastery in a private clinic, just as he would have done in the Faculty of Medicine"[6]. Years later, in 1933, he would return to the university, but only briefly.

In 1910, he married Josefa Moner, with whom he had seven children. Two of them, Joaquim and Josep Ignasi, would follow in his footsteps in ophthalmology, also giving rise to eponyms (Joaquim Barraquer's eponym is detailed in a later chapter).

Ignasi Barraquer i Barraquer, front cover of *Esplai* (1934)




Barraquer studied many fields and areas complementary to ophthalmology. He studied mechanics, mold making, and plastic arts at the *Escola d'Arts i Oficis* in Barcelona. At the *Institut General i Tècnic* he studied physics and chemistry. He extended his studies at the *Universidad de Madrid* and the *Universitat de Barcelona* in the areas of comparative and human anatomy, emergency surgery, microbiology, general chemistry, and chemical and microscopic analysis. Furthermore, he studied botany at the *Laboratori Químic Farmacèutic* in Barcelona. He also undertook studies in histology, embryology, and parasitology at the *Université de Paris* and the *Université de Montpellier*[2,5,7].


Ignasi Barraquer (to the right of centre of the photograph) during a surgical intervention at the *Hospital de la Santa Creu i Sant Pau*, Barcelona 1920s

Just nine years after completing university, in 1917, he made a definitive contribution to improving the technique of cataract operations. He sent the *Reial Acadèmia de Medicina de Barcelona* a description of his own technique for using of an apparatus of his own invention that he named *erisífac* (erysiphake, a glass suction cup activated by a pump that creates a vibratory vacuum). Furthermore, he described a good number of original operating procedures for other ocular afflictions (especially significant were his contributions to dacryocystectomy, sclerotomy in a single operation, and full keratoplasty) and around thirty original pedagogical apparatuses and instruments for ocular surgery[4].

In 1928, as a permanent physician at the *Hospital de la Santa Creu i Sant Pau*, he organised an ophthalmology department which, thanks in part to his own valuable contributions, became a model institution in those times.

In 1929 and 1930, he was the president of the *Societat Catalana d'Oftalmologia*. In 1933, the *Universitat de Barcelona* named him an associate professor of the Faculty of Medicine; Barraquer carried out his teaching duties at the *Hospital de la Santa Creu i Sant Pau*, where he held a permanent position from 1928 onward. When the Spanish Civil War ended, he organised and directed the Ophthalmological Dispensary of the Red Cross of Barcelona until 1942.

## The erysiphake and the phacoerysis

Barraquer, who had a great sense of observation (according to Pedro i Pons, "in addition to his skillful technique, this man's personality comprises two qualities: insight and observational skills"[6]), had a new idea for extracting cataracts on observing how a leech gripped a stone in an aquarium:

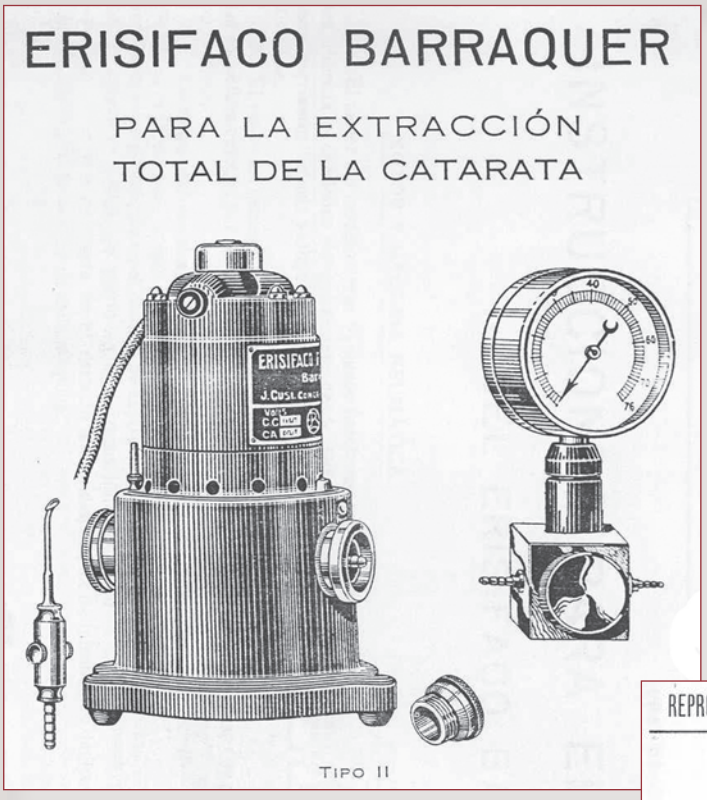
> "If one could grasp the lens of the human eye in a way like the leech grasps a stone and transfers it within the aquarium without displacing the water, the pneumatic suction produced by the suction cup would sever the fibres of the zonule –the ligament securing the lens– and thus gently extract the cataract with minimal trauma"[5,6].

This simple observation, which he later put into practice, was the basis of his new surgical technique. So he built the necessary instruments, basically consisting of a glass suction cup and a mechanical device producing a vacuum that could be regulated to facilitate extraction of the lens. He called the procedure *phacoerysis* (*facoèrisi* in his native Catalan, or *facoérisis* in Spanish), from the Greek *phakós* = lens or lentil and

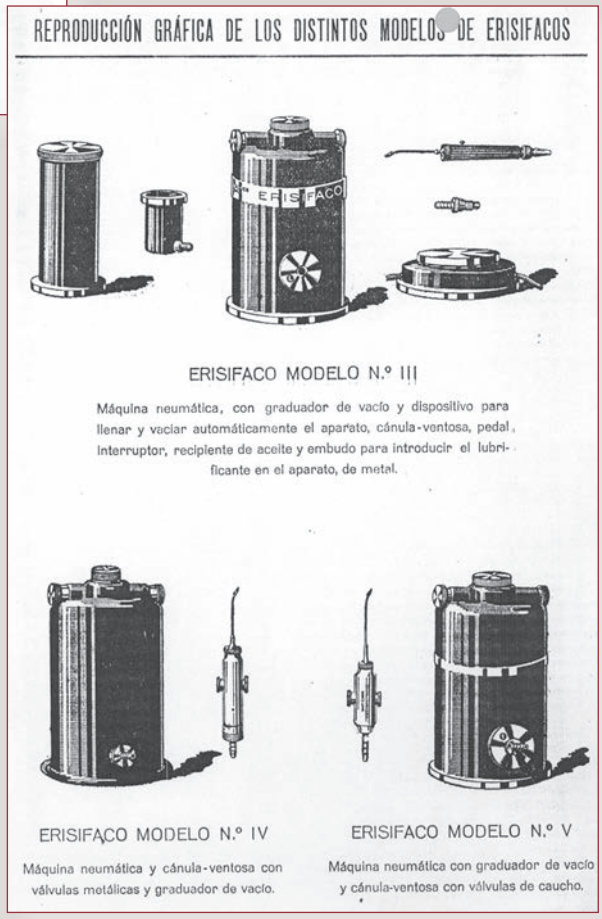
*haíresis*, *hairéseos* = the action of taking or receiving[8], and he called the device an *erysiphake* (Catalan: *erisífac*, Spanish: *erisífaco*)[5].

On 15 March 1917, Ignasi Barraquer sent the Royal Academies of Medicine and Surgery of Madrid and Barcelona a manuscript entitled *Extracción ideal de la catarata* (Ideal extraction of the cataract), which was published in the May issue of the journal *España Oftalmológica*. In the article, he explained his new method in these words[9]:

> "Avoiding all pressure on the organ and the use of cutting instruments within the ocular chambers is the only way to see the loss of the vitreous humor with full certainty. This idea constituted my objective when putting into practice my procedure for in toto extraction, regarding which I have the honour of informing this wise Corporation. It consists of adapting a small glass suction cup to the surface of the cataract, which captures it and allows its movement, its separation from the ligament, in a complete and gentle fashion. Thereby the action of withdrawing the instrument, without any traction or force whatsoever, sees the lens and its capsule fully withdrawn, with astounding ease, without the least violence to the eye. No compression is needed, nor entry into the eye of any other instrument.
>
> What is especially striking is the gentleness of the procedure compared to the extreme ocular deformations produced by the energetic compressions demanded by other procedures. It is of extraordinary simplicity, completely avoiding accidents, and enables delayed care since there is no need whatsoever for mydriatic eye drops, as no iritis occurs, nor can the border of the pupil adhere to the capsule or any vestige because there is none.
>
> The instrument, which adheres to the lens like a suction cup, is mounted on the end of a special metal arm that enables one to establish, graduate, and interrupt the vacuum in the suction cup,




Barraquer erysiphake for extracting cataracts type II




Barraquer erysiphakes for extracting cataracts, types III, IV and V

> provided along its length with a conduit through which a special device constantly blows air, activated by an electric motor.
>
> As well as avoiding the eight defects and dangers noted above, the advantages of the new procedure are such that all types of lenticular and capsulolenticular cataracts may be extirpated, whether or not their development is mature, and even, highly advantageously, the transparent lenses of myopics. There is no need to lift the bandage until it is definitively removed, it does not leave the high degree of astigmia seen in procedures that deform the eye, and the patient operated upon enjoys full sharpness of sight as soon as the dressing is removed and they use suitable lenses".

Shortly afterward (1920), he presented extensive results at the *Primer Congreso Nacional de Medicina* (First National Congress of Medicine) with a paper and conference called: *Crítica de los métodos modernos de extracción de la catarata* (Criticism of modern cataract extraction methods) and *Sobre mil facoérisis* (On 1,000 phacoeryses)[10]. In 1922, he presented a paper at the International Congress of Ophthalmology in Washington[11], and in 1923, summarising seven years' experience, he published: *La enseñanza de siete años de facoérisis* (Lessons from seven years of phacoerysis) in the journal *La Medicina Íbera*[12].

This procedure[13] revolutionised ophthalmic surgery and it spread around the world, supplanting the previously most-used procedure, which employed forceps instead of a suction cup and had various drawbacks during and after surgery. At one international ophthalmology congress where both techniques were being discussed, Barraquer, amidst great expectation, stood up to defend his technique, saying: "Gentlemen, one might compare the lens expressor forceps with a cat's claw and my glass suction cup with the lips of a beautiful woman. Which would you prefer to feel on your cheek?". With these words, which elicited a murmur of approval among the public, the discussion was considered closed[5,6].

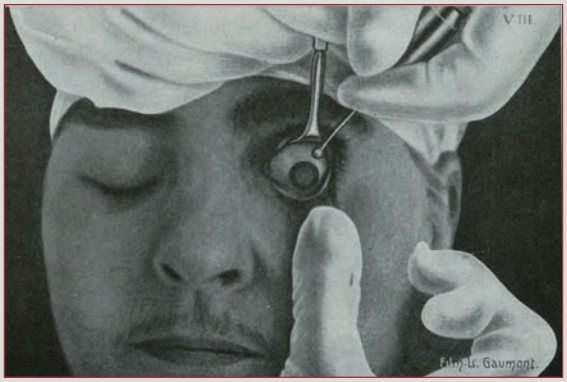
In the course of his professional life, he conducted over 30,000 operations and his patients included people from all walks of life, from the Empress Eugénie de Montijo, the wife of Napoleon III, to many patients of modest means or on charity.

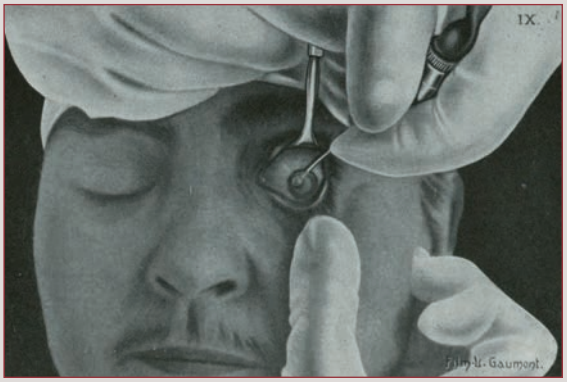
## The Clinic, the Foundation and others

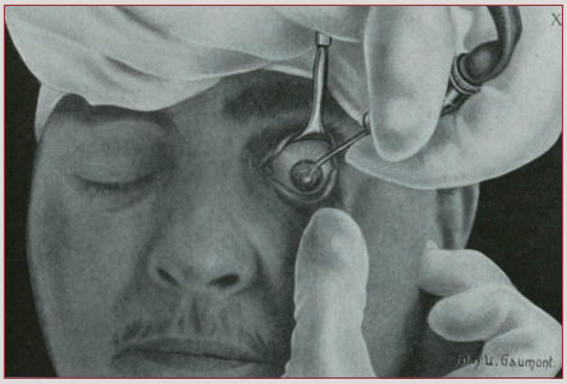
His best-known work is, without doubt, the new *Clínica Barraquer* which was inaugurated in September 1940. It was there that, in addition to his medical duties, he undertook extensive teaching activity. *Clínica Barraquer* was possibly the first serious attempt to create a centre where both rich and poor could enjoy identical quality of service. Right from the start, the clinic had some charity beds in addition to beds for private patients. After resigning as the head of the department at the *Hospital de la Santa Creu i Sant Pau* –Ignasi Barraquer had initially wanted to situate his project within the grounds of this hospital, but before the Spanish Civil War he clashed with the hospital's *Muy Ilustre Administración* (Highly Illustrious Administration)– he devoted himself body and soul to his new centre, in which he invested a large portion of his family's money[14].

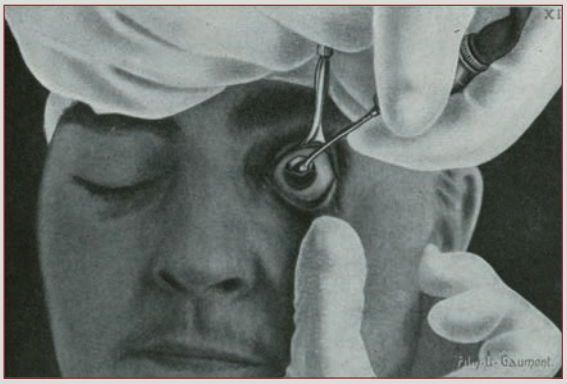
Ignasi Barraquer and his wife founded the *Institut Barraquer* on 15 April 1947, in memory of his father, Josep A. Barraquer i Roviralta. The *Institut Barraquer* was an independent, self-financed, scientific association, dedicated to ophthalmology research and teaching, exchange of ideas and scientific discoveries, improvement and dissemination of medical and surgical therapies, and general advancement of ophthalmology. In 1973, the Clinic and the Institute merged under the same name: *Centre d'Oftalmologia Barraquer*.

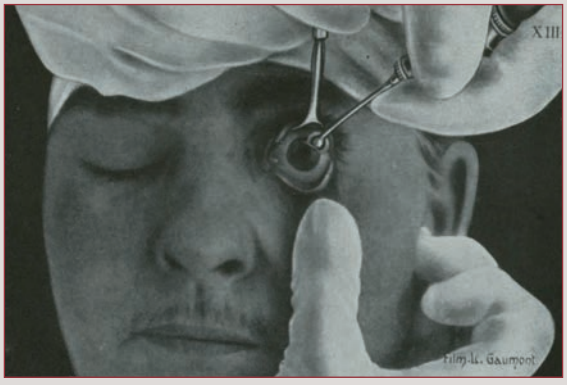
Barraquer's hobbies included cars (he was both a skilled mechanic and an adept driver), architecture, and decoration (though he claimed to have no artistic tendencies[6], the distribution, proportions, and functional

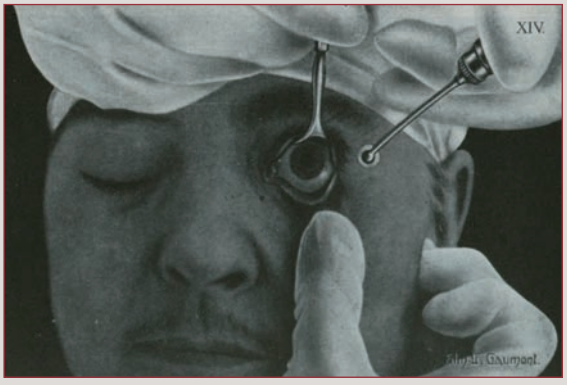


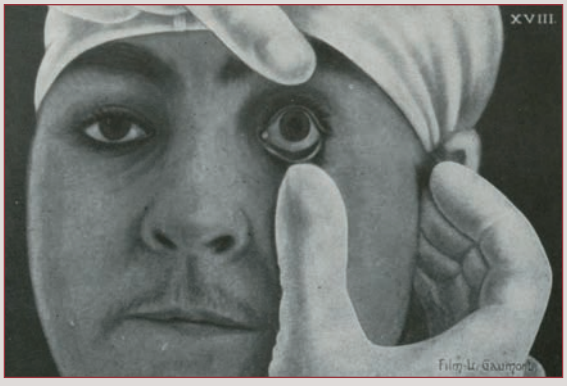




Barraquer operation: phacoerysis

order of *Clínica Barraquer* –which he himself designed– demonstrate otherwise), and zoology. His love for and curiosity about animals led him to create a small zoo in the gardens of his home in Barcelona (first at Torre Vilana, in the neighbourhood of Bonanova, and later at his home in Pearson Avenue). It seems that his favourite animals were chimpanzees, and he can be seen with them in many photos. This hobby probably also explains why he was a great fan of circuses, which he regularly attended (especially *Circ Olímpia* in Barcelona)[6].

He received numerous awards and decorations, both in Catalonia and abroad. In 1964, he fell seriously ill with a hepatic infection[2]. He died in Barcelona on 13 May 1965. He had decided to donate his eyes; the extraction was carried out by his son Joaquim[6], and his corneas were transplanted into two blind patients[2].

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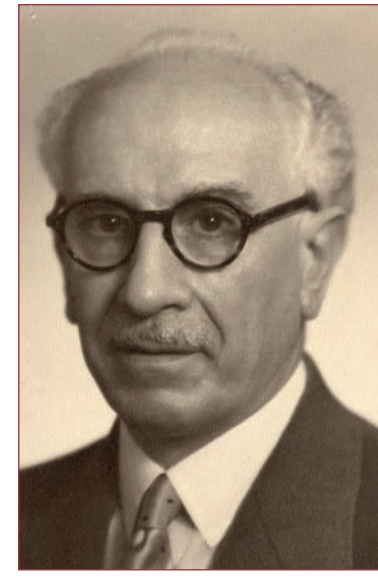
# HERMENEGILD ARRUGA I LIRÓ
# ARRUGA EPONYMS

## The eponyms

**Arruga operation**. A dacryocystectomy technique with a perforation of the bone using hollow cylindrical drills activated by a motor[1-3].
**Arruga operation**. Enucleation leaving a ring of sclera from the limbus to the equator[2,3].
**Arruga operation**. Reduction of the ocular cavity in retinal detachment via a suture that passes through the equatorial region[3,4].
**Arruga forceps**. Forceps for intraocular extraction of the cataract[1,4].



Hermenegild Arruga i Liró (1886-1972)

## Hermenegild Arruga i Liró (1886-1972)

Hermenegild Arruga i Liró was born in Barcelona on 15 March 1886. His father, Eduard Arruga, an ophthalmologist, worked with Manuel Menacho, who he had met while in the army in the Philippines[5]. Hermenegild went to high school in Barcelona and began to study medicine in 1902; he graduated in 1908. While he was in his second year, he began to frequent Manuel Menacho's consultation and thus began his apprenticeship in ophthalmology.

After graduating, he travelled around Europe for two years with a grant from Barcelona City Council. He visited Paris (where he completed internships at the Ophthalmology Clinic at the *Hôtel-Dieu* and the *Institut Pasteur*) and Berlin (where among other places, he visited the clinics of the professors van Graefe and Hirschberg)[6,7]. Some years later he did an internship in Lausanne, where he met Gonin; Arruga became his favourite disciple and they established a firm friendship (Gonin called him "the general of the southern troops")[6]. Arruga became one of the foremost followers, and later modifiers, of Gonin technique for treating retinal detachment: "Before Gonin work was known, it was rare to achieve a cure for retinal detachment. Some authors estimated one in a hundred cures; others believed they had cured a higher percentage; still others claimed they had never seen a cure. The fact is that if anyone was ever cured, we do not know how or why", Arruga said[8].

Upon returning to Barcelona, he introduced techniques as yet unknown in Spain, including the Wassermann reaction (an antibody test for syphilis) and the use of the ocular tonometer, which was at first highly controversial. He worked alongside his father, first in the ophthalmology consultation on Portaferrissa Street and later, from 1913 onward, on Aragó Street where there were some rooms for patients awaiting surgery[5]. He soon became renowned for his operating skills: "Arruga had

Hermenegild Arruga (centre) in the operating theater

the innate gift of a simple and precise operating technique. Watching him while he operated, it seemed as if nothing could be easier than an eye operation. He handled the finest instruments with elegance and dexterity, with extraordinary ability"[6].

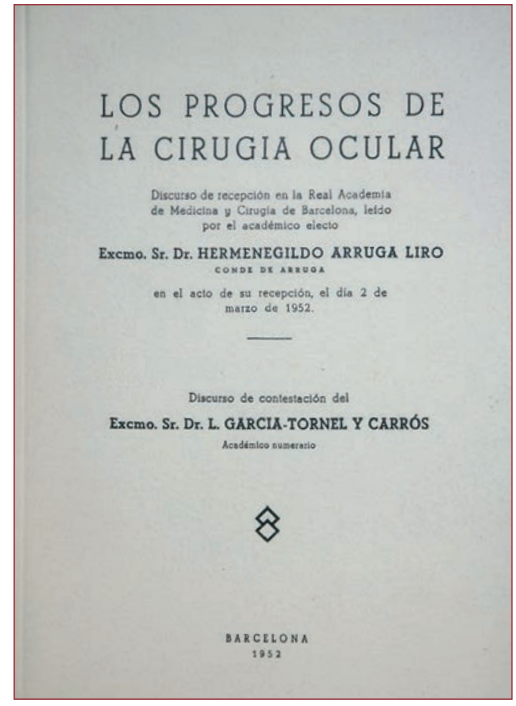
In 1914, he married Teresa Forgas, the daughter of an industrialist from Begur, with whom he had three daughters and a son, Alfred, who also became an ophthalmologist. His wife died in 1940 in an automobile accident (Hermenegild was also in the vehicle). His link to Begur and the Costa Brava was therefore strong and his relationship with Josep Pla started there. During the 1926-1927 academic year, H. Arruga defended his doctoral thesis entitled *Una modificación sencilla y eficaz de la dacriocistorrinostomía* (A simple and effective modification of dacryocystorhinostomy) in Madrid. In 1929, at the XIII International

Ophthalmological Congress in Amsterdam, he presented his first results in the surgical treatment of 100 cases of retinal detachment (he had used Gonin techniques, which he had learned the year before in Lausanne)[9]. He achieved overwhelming success. From this time onwards, he often participated in international meetings. His contributions to the treatment of retinal detachment and cataract surgery were especially noteworthy[5].

## Contributions to ophthalmological surgery

In 1934, he first conducted what would later be known as the "Arruga operation", dacryocystectomy in the absence of a lacrimal sac[5,10]. That year, construction started on *Clínica Oftalmològica del Dr Arruga* in Barcelona[5], his own clinic, which was equipped with cutting-edge technology for that time. The building consisted of a basement, ground floor, and three upper floors. The basement contained the equipment necessary to provide the building with modern heating, hot water, air conditioning, and softened water. The ground floor was devoted to consulting rooms. It also included two splendidly equipped refraction rooms, a darkroom (containing a Gullstrand ophthalmoscope, an ophthalmodynamometer, a refractometer, an astigmometer, and a slit lamp), three treatment rooms, an operating theatre (with a Zeiss "panphotos" lamp, a cinematography system for filming operations, and a system for sterilising surgical material using dry heat). The first floor was devoted to hospitalisation; the second contained the clinic's staff rooms, while the fourth was the Arruga family residence[11].

During the Spanish Civil War, Arruga moved to Lausanne, where he undertook important scientific activity and participated in ophthalmological conferences. On his return to Spain in 1939, he published his first works on corneal transplantation. During the Second World War, he organised a food bank to help ophthalmologists from different countries around the world, distributing aid as food packages[9].


LOS PROGRESOS DE
LA CIRUGIA OCULAR

Discurso de recepción en la Real Academia de Medicina y Cirugía de Barcelona, leído por el académico electo

Excmo. Sr. Dr. HERMENEGILDO ARRUGA LIRO
CONDE DE ARRUGA

en el acto de su recepción, el día 2 de marzo de 1952.

Discurso de contestación del

Excmo. Sr. Dr. L. GARCIA-TORNEL Y CARRÓS
Académico numerario

BARCELONA
1952

Cover front of *Los progresos de la cirugía ocular* (Advances in ocular surgery), Arruga's talk when he entered the *Reial Acadèmia de Medicina de Barcelona*

In 1946, he published the first edition of his book, *Cirugía Ocular* (Ocular Surgery), which became a worldwide reference.

Arruga was renowned in ophthalmology. In 1950 he was awarded the Gonin Medal; this prestigious medal, considered "the Nobel prize in ophthalmology" is awarded every four years. In 1952, Arruga entered the *Reial Acadèmia de Medicina de Barcelona*, he gave a talk entitled *Los progresos de la cirugía ocular* (Advances in ocular surgery). He took part in numerous scientific events such as the Annual Meeting of the American Academy of Ophthalmology and Otorhinolaryngology in 1951, the International Congress of Ophthalmology –held in New York in 1954–, the congresses of the French and Irish societies in 1955, the Pan-American

Congress of Ophthalmology –held in Chile in 1956–, the International Congress of Ophthalmology –held in Brussels in 1958–, the Pan-American Congresses of Ophthalmology in 1960 and 1965, and so on[5]. He also received very many honours and distinctions: he was the president or honorary member in several academies and in over 30 ophthalmological societies worldwide; and he was named *Doctor honoris causa* in various universities. In 1950, the title of Count of Arruga was bestowed upon him[5-7,12,13]. Hermenegild Arruga i Liró died in Barcelona on 17 May 1972; he had atherosclerosis[14]. He was buried in Begur, next to his wife. His death was felt keenly around the world. Evidence of this is the beginning of the obituary that the *British Journal of Ophthalmology* published in June 1972, a few days after his demise. It is worth reproducing the original text here[13]:

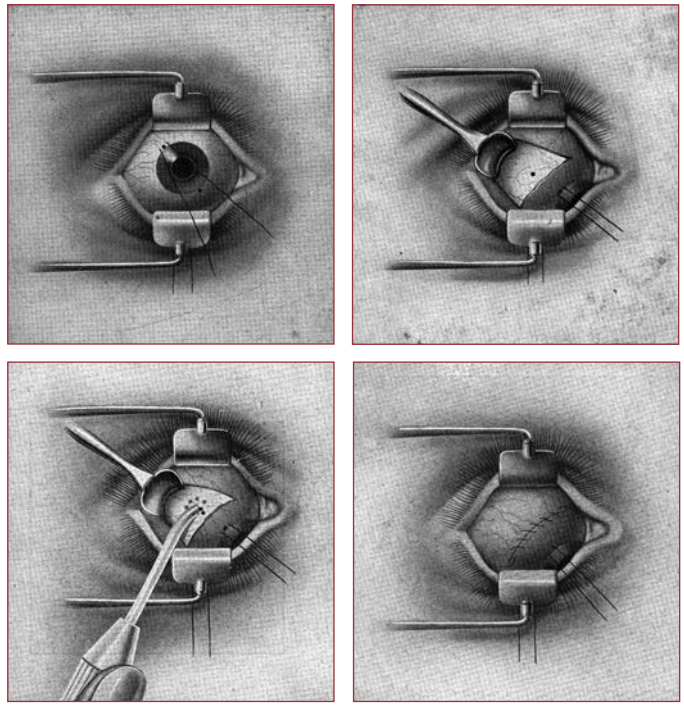
> "A shadow has fallen over the whole ophthalmological world at the death of Hermenegildo Arruga on May 17th in his 87th year, one of the very greatest ophthalmologists of the previous generation. His skill in surgery was legendary, his ingenuity in devising new techniques unique, his writings were profuse and excellent, his capacity for living a full life in every sense and his appreciation of its joys were only exceeded by his ability to create lasting friendships and inspire the warmest reciprocal affection".

He had published around 150 works[10]. The first publications, from 1909 to 1911, were related to laboratory techniques. From 1926 to 1951, he published 14 works on lachrymal pathology, the first of which was the result of his doctoral thesis. He published 31 articles on cataracts and their surgical treatment between 1928 and 1960. In cataract surgery, he was inclined to favour the intracapsular technique. Furthermore, he created or modified surgical instruments as required to carry it out, such as a hook for intracapsular extraction and a capsular forceps model that bears his name, "Arruga forceps". He also published works on corneal transplant and keratoplasty. However, it is in the area of retinal

detachment where he was most prolific: 63 publications from 1929 to 1970. And it is in this area where his contributions were most significant[14,15]. Arruga was the first to undertake and to improve Gonin technique outside Switzerland. He explained it himself in 1940[8]:

> "I used the technique conceived by Gonin and perfected by other surgeons, based on the search for and localisation of the retinal tears existing in almost all cases of retinal detachment, and removing them via an operation consisting of production of an adhesive choroiditis in the area of the choroid around the retinal tear or tears, and in draining the subretinal liquid situated between the choroid and the retina, with one or several punctures perforating the sclera and choroid. The adhesive choroiditis is preferably obtained by applying diathermy to the sclera using a blunt electrode. The evacuative punctures to drain the subretinal liquid are also preferably made using a diathermic needle. [...] Favourable results have increased greatly with improvement of the technique, since this is a chapter of ocular surgery that is merely 12 years old. So we were overjoyed if we obtained cure rates of 20% to 26%, a figure that has been rising until today we have reached 75% [...] When dealing with simple cases —in other words, where there is little retinal detachment, or a small tear a few days old— the prognosis is so encouraging we achieve a cure in 95% of cases. [...] In large or multiple tears, the results are only favourable in 50% of cases".

He also studied the general conditions linked to retinal detachment, the pathological conditions (general and ocular) that facilitate its appearance, and the clinical features related to the pathogeny of the detachment. He studied the features of the subretinal liquid and experimental production of retinal detachment (especially in rabbits) as well as modifications that the presence of a retinal detachment with tearing produces in the circulation of aqueous humour, etc. In 1957, during the XXXV Annual Assembly of the *Sociedad Española de*



Figures illustrating the surgical technique for treating retinal detachment employed by Arruga in 1940[8]

*Oftalmología* he delivered his paper: *Modalidades técnicas recientes de las operaciones del desprendimiento de retina* (Recent technical modalities of operations for retinal detachment), where he presented his cerclage technique[5] (giving rise to another eponym, since it is also known as "Arruga operation"). His last work, *Experiencia de mil operaciones de cerclaje en el desprendimiento retiniano (*Experience of 1,000 cerclage operations for retinal detachment), was published in 1969 in the journal *Archivos de la Sociedad Española de Oftalmología*. His last conference, when he was designated *Doctor honoris causa* by the *Universitat de Barcelona* in 1970, also dealt with retinal detachment[10].

Arruga was especially interested in advances in ocular surgery and he wrote several historical treatises on this subject, analysing both the progress of ophthalmological surgery itself, especially the treatment of retinal detachment, and advances in surgical ophthalmological material. He published several books, though none as important as the one cited above: *Ocular surgery*, which was very well received[13]:

> "In 1946, this admirable treatise on ocular surgery appeared: it was accurate, simple, clear, illustrated with fabulous figures, often drawn by the author himself, revealing his artistic facet and concern for accuracy. [...] This treatise enables the trained oculist to venture into a new operation, even a difficult one, with a feeling of confidence and security for the patient"[6].

The book went through four editions in Spanish, three in French, and two in English. In the fourth edition (1962), he invited his son Alfred to participate as the author of the chapter on strabismus.

## Arruga and his contributions to ophthalmological surgical material

If Arruga's contributions to surgical technique were momentous, so were his contributions to modifying or creating new apparatuses and instruments for use in ophthalmological operations. Streiff[6] says:

> "Arruga had the gift of knowing how to simplify the techniques and how to identify and produce the appropriate instruments. This craftsman, who created his own tools like the brilliant masters of the Middle Ages had done, studied his tools and their application down to the last detail until he achieved perfection. So many instruments and so many surgical techniques have been christened with Arruga's illustrious name: the needle holder, separator, forceps,

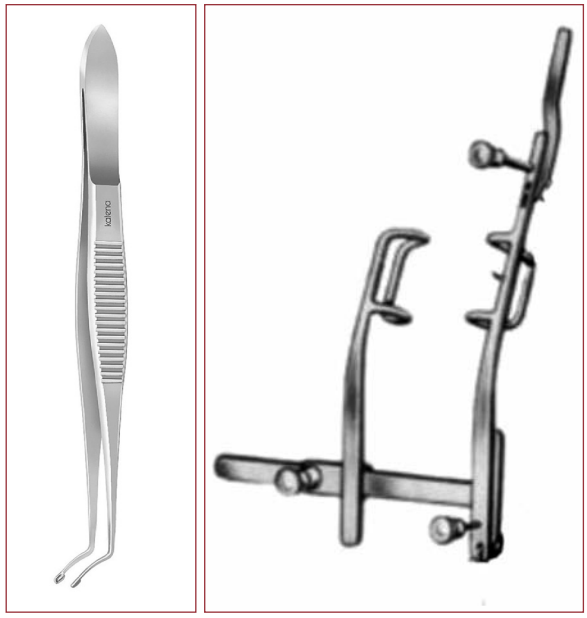
> dacryocystorhinostomy, cataract extraction, pterygium, cerclage in detachment, and others I cannot list here".

The 1998 edition of *Stedman's medical eponyms*[4] included 11 Arruga eponyms referring to instruments and techniques: Arruga capsular forceps, Arruga eye expressor, Arruga eye implant, Arruga eye retractor, Arruga eye speculum, Arruga eye trephine, Arruga forceps (for intracapsular cataract extraction), Arruga globe retractor, Arruga keratoplasty, Arruga lacrimal trephine, Arruga needle holder, Arruga protector, and Arruga retinal detachment operation.

M. Pelayo, in his introduction to the *Encuesta acerca del tratamiento actual del desprendimiento de retina* (Survey on current treatment of retinal detachment) says[8]:

> "He (*Arruga*) has contributed to bringing modern ophthalmological surgical techniques to the degree of perfection we have today. He has invented instruments, such as the forceps for intracapsular cataract extraction, the hook for expulsion of the opaque lens, a model of crowns for trephining the bone in a dacryocystorhinostomy, a blepharostat that exerts no pressure on the eye. And many others".

Arruga's contribution was so notable that he explained the process he followed to obtain some of his instruments at a conference presented in the *Secció Oftalmològica de l'Acadèmia de Ciències Mèdiques de Barcelona* in March 1942[16]. First he talked about his retinal detachment separator: "This separator is the result of two years of trials —Arruga explained—, even though it is an apparently simple instrument. I introduced variations in size, curvature, depth and shape of the edges [...] The model I offer to our colleagues can be used in the vast majority of cases." He also presented trephines for dacryocystectomy, as well as new contributions to intracapsular cataract extraction, which he had been researching since 1932:



Arruga forceps (left) and
Arruga speculum (right)

> "Recently I built a model for oculists who operate without using mydriatics to dilate the pupil, only the mydriasis produced by anaesthetic eye drops and retrobulbar block. This new model has a bevelled point so it can be easily positioned under the iris, and the upper edges, which are in contact with the rear face of the iris, are rounded so they do not pinch the iris when applying pressure to the capsule. [...] For cases of cataract –Arruga continued– I have conducted trials using many cupping glasses mounted on syringes and have managed to synthesise these experiences into the model I have built, consisting of many small pieces having no screws or rivets...".

Other innovations were also present: "Additionally, I have had a device made to measure the traction power of cupping glasses and forceps. It is a string that carries a sort of rosary of wooden balls [...] At one end of the

string, there is a piece of metal with a 5 mm hole in which to place a lens that has just been extracted...".

Probably, however, the best-known instrument bearing his name is the forceps, which constitutes a significant contribution to intracapsular cataract extraction: by 1957 over 30,000 sets of Arruga forceps had been manufactured.

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# LLUÍS SAYÉ I SEMPERE BURNAND-SAYÉ SYNDROME

## The eponym

**Burnand-Sayé syndrome**. Miliary tuberculosis[1,2], also known as chronic miliary tuberculosis[3] or Sayé-Burnand syndrome.

Lluís Sayé i Sempere
(1888-1975)

## Lluís Sayé i Sempere (1888-1975)

Lluís Sayé i Sempere was born in Barcelona on 19 February 1888. His life was dedicated almost exclusively to tuberculosis. Perhaps this was because two of his brothers died from the disease and a third also contracted it, but recovered after a stay at the sanatorium in Davos, Switzerland[4] –the sanatorium that inspired Thomas Mann's novel *The Magic Mountain*.

Sayé i Sempere studied medicine in Barcelona, graduating with highest honours in 1911. While still a student, he showed his interest in tuberculosis by presenting a paper, *Las opsoninas en la tuberculosis pulmonar* (Opsonis in pulmonary tuberculosis), at the International Tuberculosis Congress in Barcelona in 1910 together with Joan Baptista Darder. The following year, together with Jacint Reventós, Sayé performed the first pneumothorax to treat tuberculosis in Spain at *Hospital Clínic de Barcelona*. It bears reminding that this procedure invented by Forlanini was quickly consecrated as an important therapeutic option that would only be abandoned 40 years later with the generalised use of antituberculous drugs.

After graduating, Sayé began practicing as an intern physician in the Department of General Pathology chaired by Professor Eusebio Oliver Aznar. With Joan Baptista Darder, who was well versed in the tuberculin test, and Jacint Reventós, they convinced Oliver to authorise the setting up of a dispensary, and they began to attend tuberculosis patients there[5]. Shortly afterwards, the *Hospital Clínic's* renown from therapeutic pneumothoraces enabled an entire ward to be devoted to patients with tuberculosis, thanks to a donation from Joaquim Sans, and Sayé became its director[6]. The experience he gained there allowed him to complete his doctorate in Madrid in 1912, with the thesis *Tratamiento de la tuberculosis pulmonar por el neumotórax artificial* (Treatment of pulmonary tuberculosis by artificial pneumothorax)[7]. In 1913, he earned the title of Associate Professor of Pathology and General Pathology at the

*Universidad de Valladolid*. However, he would soon leave this position to continue his work in Barcelona, where he remained associate professor of physiology under Pi i Sunyer's chair. In 1914, he received a grant from Spanish government to improve his knowledge about tuberculosis in Professor Brauer's department at Eppendorf Hospital in Hamburg. However, his internship was interrupted by the outbreak of World War I. As early as 1919, Sayé founded *Archivos Españoles de Tisiología*, the first journal in Spain specialising in tuberculosis[8].

Although he was very young, Sayé was well known and his work in the field of tuberculosis was arousing great interest. His capacity for hard work and organisation were evident when the *Institut d'Estudis Catalans* created the *Centre d'Estudis Sanitaris* in 1918 to compile data that could be employed to solve health problems in Catalonia[5]. At this time, a working group on tuberculosis was created, headed by Sayé, in which Tomàs Seix played an important role. The data that Seix obtained enabled them to issue the report *Mortalitat tuberculosa a Catalunya i especialment a Barcelona* (Tuberculosis mortality in Catalonia and especially in Barcelona), which recommended founding the *Servei d'Assistència Social dels Tuberculosos de Catalunya*. This initiative would flourish with the creation of a dispensary under Sayé's direction and Seix's organisation that began operating in Poble Sec, a working-class neighbourhood in Barcelona on 23 April 1921[4]. Despite the shabby appearance of its exterior (they even called it the "*barraca*" or shanty), it became a highly important centre for clinical care and scientific dissemination. In fact, the first vaccinations with Calmette-Guérin (BCG) vaccine in Barcelona began there in 1924. This dispensary worked at a slower pace during Primo de Rivera's dictatorship, but the restoration of the *Generalitat de Catalunya* (Government of Catalonia) during the Second Republic enabled a new center to be built on Goya and Torres Amat streets. Known as the *Dispensari Antituberculós*, it was the work of the architects Josep L. Sert, Joan B. Subirana, and Josep Torres. It opened in January 1937 while Sayé was already outside Catalonia, in exile[6].

The period from his graduation until his exile was an extraordinarily prolific one for Sayé professionally. When the *Universitat Autònoma de Barcelona* was planned, he was appointed associate professor of tuberculosis studies at the Faculty of Medicine[7]. Shortly afterwards, Sayé asked the university board to create the Anti-Tuberculosis University Program. His request was granted on 18 October 1933. At first, all entry-level students and those in the first three years of medical school were examined clinically and radiologically; the following year, these examinations were extended to cover all medical students as well as those in the first three courses of the other schools[8].

Sayé attained one of the highest pinnacles of Catalan medicine in this period. In addition to his roles as director of the Department of Tuberculosis at the *Hospital Clínic de Barcelona*, the *Servei d'Assistència Social dels Tuberculosos de Catalunya*, the Department of Tuberculosis at the *Quinta de Salut l'Aliança*, the Anti-Tuberculosis University Program, and his university duties, he took on significant work in private practice. Furthermore, he travelled frequently, going to Madrid and Paris monthly to attend scientific sessions, and to Portugal to supervise sanatoriums[3]. Such frenetic activity meant Sayé became one of the best-known and most prestigious Catalan physicians abroad. Evidence of this is that he was one of the first to publish a scientific paper outside of Spain. He attended meetings of the *Institut Pasteur* in Paris and was renowned in many countries, especially in Latin America. In 1927, the government of Argentina invited him to give a series of conferences at the *Universidad de Córdoba*. After this, he went to New York, funded by the Rockefeller Foundation, to study American anti-tuberculosis work. This scientific reputation was recognised with multiple distinctions: France named him *Officier d'Académie* (1928) and *Chevalier de la Légion d'Honneur* (1930), and Denmark name him a Knight of the Order of Dannebrog (1926)[5].

He was also very active in the academic sphere. Together with Conrad Xalabarder and Jacint Reventós, he promoted the *Associació de*

*Tisiologia*, founded in 1930, and became its first president; in 1959, this society would become the *Associació de Patologia Respiratòria* under the presidency of Jacint Reventós[8]. In 1930, Sayé was appointed a member of the *Reial Acadèmia de Medicina de Barcelona*, with an acceptance speech titled *Les fases inicials de la tuberculosi pulmonar a l'adolescent i a l'adult* (The initial phases of pulmonary tuberculosis in adolescents and adults). Sayé's brilliant professional life in Barcelona was cut short by the outbreak of the Spanish Civil War.

In September 1936, Sayé fled Barcelona after being threatened by a patient's husband in the context of the revolutionary atmosphere in the city[9]. Sayé went into exile in Paris, where he lived for a year, working at the *Institut Pasteur*. Accepting an invitation from its director, he wrote the book *La tuberculose pulmonaire chez les sujets apparemment sains* (Pulmonary tuberculosis in apparently healthy subjects). However,


Attendees of the course of vaccination against tuberculosis, focused on the Calmette-Guerin (BCG) vaccine held in Barcelona (1927). In the front row, Guerin (wearing glasses and a dark suit), Calmette (also wearing a dark suit) and Sayé (wearing glasses and a white coat)

Abelardo Sanz, from Uruguay, and Lorenzo Armani, from Argentina, persuaded him to travel to South America[8]. There, Sayé accomplished great things. He organised the fight against tuberculosis in Uruguay; created an examination service for collectives; practiced in the central Montevideo dispensary; gave conferences and courses; acted as consultant to the governments of Cuba, Peru, Brazil, and Chile; and was a consultant at the *Hospital Central* in Buenos Aires[8]. His work was recognised with many honours, such as receiving the medal of the O'Higgins Order in Chile (1951), being appointed knight commander of the National Order of Merit of Carlos Juan Finlay in Cuba (1951), and being named *Doctor honoris causa* from the *Universidad Nacional de San Marcos* in Lima, Peru (1938)[5]. He was also named an honorary member of nearly all the tuberculosis societies in Central and South America as well as of the American College of Chest Physicians in the United States (1950). In Argentina, he would be acclaimed for many years, with the *Liga Argentina contra la Tuberculosis* paying homage to him as late as 1993. Neither was he forgotten in Europe. The *Institut Pasteur* in Paris awarded him its silver medal for his work on anti-tuberculosis vaccination (1951).

In 1951 Sayé returned to Barcelona, but nothing was as he had left it fifteen years before. Compared with his earlier privileged situation, he received a cool welcome. He had lost his influence in the new society. All his posts had disappeared or had been occupied by others for years. It is likely that his personality also contributed to his isolation. As Cornudella noted[5], Sayé acted as if everything he said was right because he was the authority. His cutting asseverations stemmed from his great erudition, which discouraged the young from speaking up in meetings. Oriol Anguera[3] wrote:

> "Sayé was marked, more than by his paltry war experience, by those 16 years of exile. Because on his return, he found things different than he had left them, and he did not find the right communicative approach to understand what was happening. Sayé never took

> 'others' into account. He published without acknowledging his collaborators. He asked you to do things without explaining why he wanted you to do them, and he never told you whether he had used them or why he had not used them... The master Sayé had returned, but now had no power to command, no disciples, no students, no collaborators; he had nothing but hellish emptiness."

Cornudella agreed[8]: "Lluís Sayé was erudite, dogmatic, with an extensive scientific trajectory in Europe and Latin America... His cutting ironic tone was a reproach to young people, losing him friends. The hangover from that mindset greatly influenced the cold reception he received on his return from exile."

On his return, the only public activity he was permitted was BCG vaccination of newborns in the *Casa de la Maternitat* and dedication to the Anti-Tuberculosis University Program, which he undertook for free[8]. But in 1954, the arrival of a new professor of general pathology, Arturo Fernández Cruz, changed the situation. He ordered that his department take charge of examining students for tuberculosis, although he allowed Sayé to keep "camping out" (in Cornudella's words)[5], vaccinating the nurses in the Anti-Tuberculosis Program[7].

Even so, he was still respected in many Catalan scientific circles. So, seven years after his return, he published *Tratamiento y profilaxis de la tuberculosis pulmonar* (Treatment and prophylaxis of pulmonary tuberculosis, 1958). Then in 1963, the *Societat Catalana de Biologia* asked him to give the inaugural speech of the academic year, which he titled *L'obra antituberculosa international* (International anti-tuberculosis work). The same year, Pedro i Pons, who held him in great esteem, commissioned five tuberculosis lectures from him for his department, which were published in the journal *Medicina Clínica* the following year. That year he was also elected vice-president of the *Reial Acadèmia de*

*Medicina de Barcelona* and shortly afterward, the *Acadèmia de Ciències Mèdique*s awarded him an honorary diploma.

The final years of his life were unhappy. Used to working unceasingly, he took his retirement with bad grace. Moreover, he was told in the worst possible way: a porter delivered the official notice the day before he turned 70. Shortly afterward, he was asked to vacate the premises of the Anti-Tuberculosis Program where he still worked. Domingo[9] describes how this occurred:

> "When nothing was left to him other than the University Anti-Tuberculosis Service, which he had founded on the first floor of the Faculty of Medicine, one day he had to hear from his nurse –*his* because he paid her wage– the following words: 'On behalf of the dean of the Faculty of Medicine, I have been instructed to ask you to gather everything that belongs to you and hand me the key, because they intend to install other services here'."

When he reached home, Sayé said to his wife: "My life is over." Oriol i Anguera considered that Sayé's demise began at that moment[3], though he would live for 17 more years. As a consequence of cerebral arteriosclerosis diagnosed by Belarmino Rodríguez Arias in 1964, Sayé entered a state of disorientation complicated by dementia that would lead to a purely vegetative life. He was admitted to Francesc Vilardell's department at the *Hospital de la Santa Creu i Sant Pau* where he died on 27 June 1975. His wife Mirka cared for him until the end, but she also fell seriously ill and died six weeks later[4].

Immersed in a state of total disconnection from reality, Sayé once again received institutional recognition. On 6 November 1972, the *Comisión Permanente del Patronato Nacional de Enfermedades del Tórax* in Madrid, at the proposal of its general secretary, Carlos Zurita, unanimously agreed to name *Dispensari Central Antituberculós de Barcelona* after

him[9]. Today, the building, inaugurated in 1937, houses the *Centre de Prevenció i Control de la Tuberculosi Dr Lluís Sayé*, the *Dispensari Central de Malalties del Tòrax*, and the *Centre d'Assistència Primària Lluís Sayé*.

## Sayé's contribution to the fight against tuberculosis

Sayé's wide-ranging written work comprised hundreds of studies and fifteen books, including *Profilaxis de la tuberculosis* (Tuberculosis prophylaxis, 1924), *Quimioterapia de la tuberculosis* (Tuberculosis chemotherapy, 1927), *Pneumolyse intrapleurale* (Intrapleural pneumolysis, 1932), *Crisoterapia de la tuberculosis* (Tuberculosis chrysotherapy, 1933), *Les noves orientacions de la lluita antituberculosa i la seva aplicació a Catalunya* (New perspectives in the fight against tuberculosis and their application in Catalonia) as *Monografies Mèdiques* 68-69 (1933), *La tuberculose pulmonaire chez les sujets aparemment sains et la vaccination antituberculeuse* (Pulmonary tuberculosis in apparently healthy subjects, 1938), *Doctrina y práctica de la profilaxis de la tuberculosis* (Doctrine and practice of tuberculosis prophylaxis, 1940), and a two-volume treatise entitled *La tuberculosis tráqueo-bronco-pulmonar* (Tracheobronchial-pulmonary tuberculosis, 1950), in collaboration with Diego Hernández Luna and Álvaro Benze, which is considered his most important contribution. After his return to Catalonia, he published *Tratamiento y profilaxis de la tuberculosis pulmonar* (Treatment and prophylaxis of pulmonary tuberculosis, 1958).

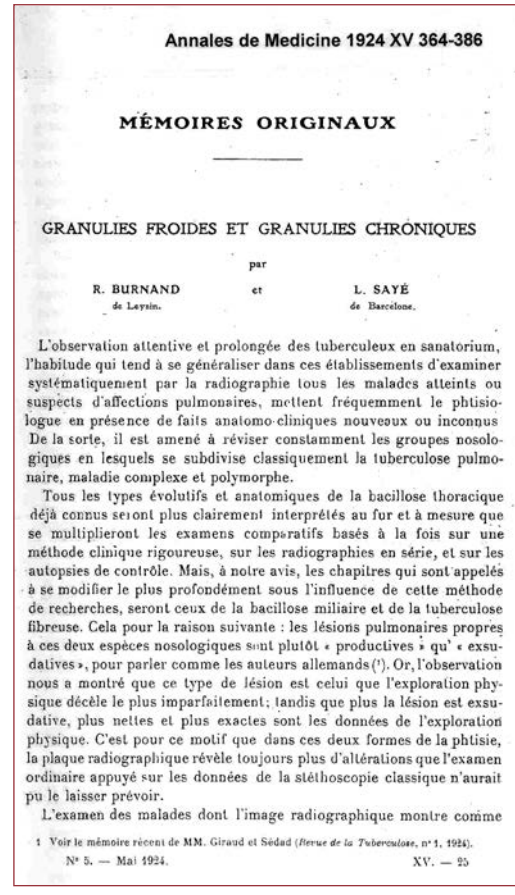
Among Sayé's many contributions, without a doubt the most important was the fight against tuberculosis, for which he is unanimously recognised as initiating in Spain[10]. As mentioned above, Sayé introduced BCG vaccination in November 1924, shortly after it was started in France, with the collaboration of Pere Domingo (who prepared the vaccines in the *Laboratori Municipal*), Tomás Seix, and Manuel Miralbell[11]. Increasingly positive results with the BCG vaccine

led to the Republican government recommending its use in 1931. By 1933, all babies were being vaccinated[10]. Sayé's work was interrupted by the Spanish Civil War. One consequence of this was the lack of a vaccination plan in Spain until the International BCG Congress in 1948. When Sayé returned, the treatment of tuberculosis had changed considerably. The appearance of chemotherapy meant the disease could be cured; it had become a disease in regression and was no longer an epidemic to target. Sayé was one of the men who helped conquer this scourge that had been causing death and suffering for centuries. He would not live to see the disease become a threat yet again in the late twentieth century.

## Burnand-Sayé syndrome

In the work we consider the best biographical study on Sayé[4], Josep Cornudella describes the path to discovery of the syndrome that would come to be called "Burnand-Sayé syndrome", reflected in the article published in *Annales de Médicine* in 1924:

> "An example of these concerns was the episode-problem of haematogenous tuberculosis, which was embroiled with hysteria in the 1930s. Sayé threw himself into it with his characteristic impetuosity. He even discovered a clinical form, 'chronic miliary tuberculosis', linked to that pathogeny, that *Anales de la Tisiología* would dub Sayé-Bournand. A slowly evolving form of pulmonary bacillosis with little symptomatology that, because it originated in the bloodstream, could not be treated by collapsotherapy but was treatable by aurotherapy, which was in fashion at that time. The subject gave rise to heated discussions among the *crème de la crème* of European phthisiologists: Brauening, Pagel, Raedeker, Simón and, naturally, Sayé. He even gave courses dedicated exclusively to haematogenous tuberculosis"[4].



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MÉMOIRES ORIGINAUX

GRANULIES FROIDES ET GRANULIES CHRONIQUES

par

R. BURNAND de Leysin. et L. SAYÉ de Barcelone.

L'observation attentive et prolongée des tuberculeux en sanatorium, l'habitude qui tend à se généraliser dans ces établissements d'examiner systématiquement par la radiographie tous les malades atteints ou suspects d'affections pulmonaires, mettent fréquemment le phtisiologue en présence de faits anatomo-cliniques nouveaux ou inconnus. De la sorte, il est amené à réviser constamment les groupes nosologiques en lesquels se subdivise classiquement la tuberculose pulmonaire, maladie complexe et polymorphe.

Tous les types évolutifs et anatomiques de la bacillose thoracique déjà connus seront plus clairement interprétés au fur et à mesure que se multiplieront les examens comparatifs basés à la fois sur une méthode clinique rigoureuse, sur les radiographies en série, et sur les autopsies de contrôle. Mais, à notre avis, les chapitres qui sont appelés à se modifier le plus profondément sous l'influence de cette méthode de recherches, seront ceux de la bacillose miliaire et de la tuberculose fibreuse. Cela pour la raison suivante : les lésions pulmonaires propres à ces deux espèces nosologiques sont plutôt « productives » qu' « exsudatives », pour parler comme les auteurs allemands (1). Or, l'observation nous a montré que ce type de lésion est celui que l'exploration physique décèle le plus imparfaitement; tandis que plus la lésion est exsudative, plus nettes et plus exactes sont les données de l'exploration physique. C'est pour ce motif que dans ces deux formes de la phtisie, la plaque radiographique révèle toujours plus d'altérations que l'examen ordinaire appuyé sur les données de la stéthoscopie classique n'aurait pu le laisser prévoir.

L'examen des malades dont l'image radiographique montre comme

1 Voir le mémoire récent de MM. Giraud et Sédad (*Revue de la Tuberculose*, n° 1, 1924).

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First page of the article *Granulies froides et granulies chroniques*, published in 1924 by R. Burnand and L. Sayé which gave rise to the eponym "Burnand-Sayé syndrome"

René Burnand, a French physician (Versailles, 1882 - Lausanne, 1960), and Lluís Sayé published a study in 1924, in which they reported 26 observations of "chronic miliary tuberculosis"[12]. These forms of chronic miliary tuberculosis, nearly always afebrile, lasted for months and years. At times, they ended in tubercular meningitis; at others, in rapid lung involvement. It was not infrequent for them to heal spontaneously and completely. For Burnand and Sayé, the slow propagation of these forms

occurred through an exclusively lymphangitic channel, through the pulmonary interstitial-lymphatic system.

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# EMILI MIRA I LÓPEZ
# MIRA TEST

## The eponym

**Mira test**. A graphic expression test that aims to detect what may be called the examined individual's attitudinal formula, in other words, his or her core reactive tendencies, constituting his or her peculiarities of temperament and character[1]. It is also known as myokinetic psychodiagnosis, PMK, MKP, Mira y López myokinetic test and Emili Mira y López expressive graphic test.

Emili Mira i López
(1896-1964)

## Emili Mira i López (1896-1964)

Emili Mira i López was born on 24 October 1896 in Santiago de Cuba, where his father, Rafael Mira Merino, from Granada, Spain, was stationed as a senior military doctor. In July 1898, when Spain lost the Cuban War of Independence, the family moved to Spain, first to A Coruña, and then, in 1902, to Catalonia, where they definitively settled in Barcelona[1]. Emili Mira grew up, studied, and trained in Barcelona and always considered himself a Catalan.

In 1917, at just 20 years old, he graduated in medicine at the *Universitat de Barcelona* with highest honours. He undertook his PhD studies in Madrid in 1922 and in 1923 he was awarded highest honours for his thesis *Las correlaciones somáticas del trabajo* mental (Bodily correlates of human mental activity), published in Barcelona in 1923, the first work in experimental psychology undertaken in Spain[1,2].

During his undergraduate years (1914-1917), he frequented the laboratory of *Escola de Fisiologia de Barcelona* headed by August Pi-Sunyer, where he was influenced by positivist thought. He employed positivist methods, and this gave him a genetic and evolutionary perspective on organisms and a unitary and functional conception of organisms (the individual's psychophysical unity).

From the start of his professional career, he chose to focus on psychiatry and psychology. He played a significant role in introducing vocational guidance to Catalonia. In 1918, he passed his governmental examinations to obtain an internship at the *Hospital Clínic de Barcelona*. Then in 1919, also by governmental examination, he gained the post of director of the psychology laboratory (this was the year he married Pilar Campins i Garriga, whom he would divorce in 1945 to marry Alice Galland Berthout). Throughout 1920, on a grant from *Ajuntament de Barcelona*

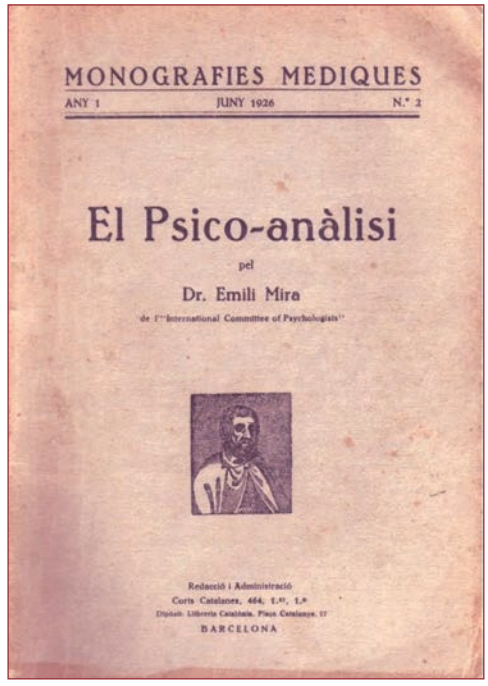
Emili Mira before the beginning of the Spanish Civil War, c. 1936

Emili Mira's signature

and *Diputació Provincial de Barcelona*, he visited diverse experimental psychology and physiology laboratories in France, Great Britain, Belgium, Germany, and Italy[1,2].

In 1923, he was one of the founders of the *Unió Socialista de Catalunya*, giving free courses to workers at Barcelona's *Ateneu Enciclopèdic Popular* (a working people's learning center or atheneum) until 1927.

In 1926, he began to direct the *Institut d'Orientació Professional de Barcelona* which depended on the *Escola del Treball de la Diputació*. In 1928, it came under control of the Spanish government, passing to the Catalan government in 1931, under the name *Institut Psicotècnic de la Generalitat*[1,2]. This institute, then broadening its functions, created an educational psychology section, with the aim, among others, of connecting with the movements for pedagogical renewal (*Escola Nova*) that were arising in Catalonia. Mira, along with the philosopher J. Xirau,




Front cover of the medical monograph *El Psico-anàlisi* (Phsychoanalysis) by Emili Mira i López (1926)

edited the *Revista de Psicologia i Pedagogia* (Journal of Psychology and Pedagogy), where for the first time he employed the neologism *psicopedagogia* (psychopedagogy) in this country. This institute was very active in research and was very influential throughout Europe; however, its research activity was cut short in January 1939.

Mira was one of the pioneers in introducing German psychiatric trends and psychoanalytical theories into Spain. Along these lines, he published *El psico-anàlisi* (Psychoanalysis) in 1926; this medical monograph was republished in 1935[1-3].

Together with A. Pi-Sunyer, B. Rodríguez Arias, and J. Vilardell, he was the co-director and owner of the Bonavista medical asylum in Sant Just

Desvern (1927)[1,2], near Barcelona. During that period, he was often invited to give courses and conferences in the United States (1929, 1933)[4].

He was an outstanding teacher, prompting the teaching body at the *Universitat Autònoma de Barcelona* to unanimously elect him to the first chair of psychiatry in 1933, the first psychiatry chair in the history of Spanish universities[1]. Later, he would sit on the tribunal called to constitute the first chair of psychiatry in Madrid. Also in 1933, he was designated professor of the *Facultat de Filosofia i Lletres i Pedagogia* (Faculty of Philosophy, Arts and Pedagogy), where he taught three subjects: child psychology, child psychopathology, and educational psychotechnics.

The same year, together with Alfred Strauss and Jeroni de Moragas, he founded the first clinic for the observation and treatment of childhood behavioural disorders in Spain, *La Sageta*, fitted with the most modern means. The clinic operated until 1936 when it was completely destroyed at the start of the Spanish Civil War.

In 1935, he was appointed director of the women's section at the psychiatric sanatorium in Sant Boi de Llobregat, near Barcelona. During the Spanish Civil War, he was director of the *Institut d'Adaptació Professional de la Dona*, within the *Generalitat de Catalunya* (Government of Catalonia), and in 1938, he was appointed head of psychiatric services for the army of the Spanish Republic by the *Ministerio de Defensa Nacional*[1]. During the war he formed a group of 32 psychiatrists who were distributed over the five existing war fronts. The psychiatric hospital was situated in the rearguard (about 200 km back), while pre-front psychiatric centres, where patients were admitted for a maximum of ten days, were located about 30 km from the front[5].

With the Republican defeat in 1939, Mira went into exile for some months in France (his family went first while he remained in Catalonia directing

the evacuation of the patients in his care). Then he moved with his entire family to London, where he received a grant from Maudsley Hospital, enabling him to continue his research and to devise the test that would bear his name. He gave a number of conferences at different universities in the Americas (in the USA and Cuba) before moving to Argentina in 1940, where he worked as a psychiatrist and taught numerous courses and lectures at different faculties in Buenos Aires and at *Universidad de Rosario*[1]. In 1942, he was the Salmon Lecturer invited by the New York Academy of Medicine and was chosen Scientist of the Year in recognition of his contributions to the development of psychiatry.

In South America, he undertook intensive consulting, teaching, and scientific activity[4]. He was director of *Servicios Psiquiátricos y de Higiene Mental* for the province of Santa Fe, Argentina (1943), founder and director of a vocational guidance institute in Montevideo, Uruguay (1944), and was contracted by the state government of Sao Paulo, Brazil (1945) to deliver training courses for vocational guidance specialists, which led to his being hired as the founding director of the Institute of Vocational Guidance in Rio de Janeiro (1946)[1]. He would occupy this position until his death, combining it with prodigious scientific and teaching activity, since he taught courses at many South American universities and attended numerous congresses on psychology and psychiatry[1,4].

He was secretary of the *Associacão Brasileira de Psicotécnica* (1950) and vice president for the Atlantic region of the *Sociedad Interamericana de Psicología* (1955). He reorganized the Department of Psychology at the *Universidad de Venezuela* (1958). As a UNESCO expert, he taught courses at *Universidad Nacional de La Plata* in Argentina (1960), etc. He died on 16 February 1964 from a heart attack (it was not his first). He had returned to Petrópolis, Brazil, after delivering an intensive course on medical psychology at the Faculty of Medicine at *Universidad Nacional de Cuyo* in Mendoza, Argentina.

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**Section of Psychiatry**

President—F. L. Golla, O.B.E., M.D.

[October 10, 1939]

**Myokinetic Psychodiagnosis: A New Technique of Exploring the Conative Trends of Personality**

By Emilio Mira, M.D. (Madrid)

*(Research Fellow of the Society for the Protection of Science and Learning at the Maudsley Hospital. Formerly Professor of Psychiatry at Barcelona University)*

All the usual devices for exploring temperament and character are either concerned merely with the physiological correlates of these psychological qualities, or are strictly related to situations in which there is a large number of possibilities of self-defence against them, i.e. to situations artificial and ingenious enough to allow an intelligent person a means of cheating the tester.

Recently, though considerable effort has been made to provide reliable methods of testing these aspects of the human mind, there is, as far as I know, no definite and simple technique that can be used in clinical psychiatry for this purpose.

To indicate the way in which further investigations could assure such a technique is the principal aim of this paper.

Fundamentals of the New Technique

When I started my research I wanted to provide "an objective measure of the dominant (conative) trends of personality as expressed in the individual's basic attitudes of reaction". In other words, following the ideas of Kurt Lewin, I wanted to detect the "vectorial expression of the conative trends".

I was impressed by the results already obtained by Downey with her battery of tests and I thought that Allport and Vernon were right when they wrote: "A considerable simplification of some of the complex factors in graphology may be secured through an investigation of the drawing of figures and lines. Oddly enough this rather obvious procedure has hitherto been neglected" ("Studies in Expressive Movement", New York: MacMillan, 1933, pp. 81–82).

Owing to the unity of the living subject every mental attitude of reaction must be accompanied by a corresponding muscular attitude, in which the movements leading to the realization of the purpose contained in the mental attitude are to be facilitated and those opposite to it are to be rendered difficult. As far back as 1828 Cheuvreuil showed with his "pendulum" that merely the "image" of a movement is enough to start it, unconsciously. Hence it is to be presumed that, according to this, each subject must have in any given moment a particular set of movements which is more capable of being elicited than all the others. Consequently if we ask him to accomplish a given movement in all possible directions of space it may be expected that this movement will be better executed in the directions corresponding to that predominant set, and will be more or less hindered in the opposite directions. As a matter of fact we can even assume that the differences so detected can be used as significant of the habitual attitude of reaction of the individual, provided that we find them sufficiently constant.

W. Stern pointed out that there are considerable individual differences in the

Fes.—Psych. 1

First page of *Myokinetic psychodiagnosis: A new technique of exploring the conative trends of personality*

During the years of Franco's dictatorship, Emili Mira was ignored in Spain and defamed on many occasions because of his Republican past[4,6]. However, in 1972, thanks to the efforts of Joan Obiols, professor of psychiatry at the *Universitat de Barcelona*, the first of many future events to pay homage to him was organized. In 1993, a square in Barcelona was named after him, and the *Universitat de Barcelona* published a book on his life and work. In 1996, the centenary of his birth was celebrated in Madrid and Barcelona, with psychologists' colleges and psychology and medical faculties from both cities participating in several events. A letter of homage was also published in the daily press; it was signed by two hundred public figures, from the world of culture as well as from psychiatric and medical spheres[7]. In 1999, the First Catalan Congress on Mental Health was named

the Emili Mira i López Memorial Congress, and a commemorative plaque was placed at no. 35 Rambla de Catalunya stating that Emilia Mira lived there before going into exile[1]. More recently, the name "Dr Emili Mira i López" has been appended to the *Centres Assistencials del Recinte Torribera* in Santa Coloma de Gramenet, near Barcelona.

He published many articles and books, first in Catalonia, and, after the Spanish Civil War, especially in Brazil and Argentina. A 1992 count[4] recorded a total of 313 works (254 articles or monographs and 59 books; of which, 153 were published between 1916 and 1938 and 160 between 1939 and 1965).

His books include *El Psico-anàlisi* (Psychoanalysis, 1926), *Manual de psicología jurídica* (Manual of legal psychology, 1932), *Manual de psiquiatría* (Manual of psychiatry, 1935), *Problemas psicológicos actuales* (Current psychological problems, 1940), *Psicología evolutiva del niño y del adolescente* (Developmental psychology in children and adolescents, 1941), *Manual de psicoterapia* (Manual of psychotherapy, 1942), *Los fundamentos del psicoanálisis* (The foundations of psychoanalysis, 1943), *Instantáneas psicológicas* (Psychological snapshots, 1943), *Psychiatry in war* (1943, translated into Spanish, *La psiquiatría en la guerra*, the following year), *Higiene mental del mundo de postguerra* (Mental hygiene in the post-war world, 1945), *Manual de orientación profesional* (Professional guidance manual, 1947), *El niño que no aprende* (The child who fails to learn, 1947), *Cuatro gigantes del alma* (Four giants of the soul, 1947), *Psiquiatría básica* (Basic psychiatry, 1948), *Cómo estudiar y cómo aprender* (How to study and how to learn, 1948), *Psicologia militar* (Military psychology, 1950), *Le psychodiagnostic miocinétique* (Myokinetic psychodiagnosis, 1951; several editions until 1964), *Psicología experimental* (Experimental psychology, 1955), *Guía de la salud mental* (Mental health guide, 1956), *Compendio de psiquiatría* (Psychiatry compendium, 1958), *Factores psicológicos de la productividad* (Psychological factors in productivity, 1961), *Hacia una vejez joven*

(Towards a young old age, 1961), *As vocaçoes e como descobrí-las* (Vocations and how I discovered them, 1963), *Doctrinas psicoanalíticas* (Psychoanalytic doctrines, 1963), and *Psicología de la vida moderna* (The psychology of modern life, 1963). Three more of his books were published posthumously: *Futebol e psicologia* (Football and psychology, 1964), *El pensamiento* (Thought, 1966), and *Manual de psicología general* (General psychology manual, 1969). Together with B. Rodríguez Arias, he founded (1924) and edited the journal *Revista Médica de Barcelona*.

He spoke several languages apart from Catalan and Spanish, including French, English, German, and Portuguese. From a young age he translated numerous works by other authors. For example, in 1924, he translated O. Lipmann's *Psychology for teachers* from the German.

He held many positions in societies and academies in Catalonia, including, amongst others, secretary of the *Acadèmia de Ciències Mèdiques* (1925) and general secretary of the *Acadèmia i Laboratori de Ciències Mèdiques de Catalunya* (1928).

## Mira test

Mira test is a graphic mental reaction test, which aims to detect what may be called the individual's attitudinal formula (what might be labelled his or her "psychic skeleton"), in other words, his or her core reactive tendencies, constituting her or his peculiarities of temperament and character. Through this instrument, Mira aimed to create a test that could not be faked or simulated by the individual being examined. In his own words[1]:

> "...placing the subjects in an experimental situation in which they not only cannot perceive the purpose of the test, but one where neither are they capable of controlling their performance or responses, since

> this is obtained under natural technical conditions linked to one of the psyche's deepest zones: the myopsyche. [...] Its theoretical foundation is that known as the motor theory of consciousness, according to which any intention or proposed reaction is accompanied by a modification of the postural tone that tends to favour movements aimed at achieving the objective and inhibiting contrary movements".

The test uses a booklet of six numbered pages with outlines for the subject to trace: lineograms, zigzag lines, staircase and circle, chains, egocifugal parallel lines with vertical shapes, and egocipetal parallel lines with sagittal U shapes. Even though it is a personality test, the subject does not know this. The test, conducted in two sessions, includes problems where the subject must transfer the lines of the printed drawings onto the sheets (which they sometimes cannot see because a screen is placed before their eyes), both with the right hand and with the left or both together, on horizontal and vertical planes. Each of the figures making up the test is related to some aspect of personality. Measurement of the deviations (in millimetres) are compared with coefficient tables, enabling many personality traits, both normal and pathological, to be diagnosed[1].

Mira presented his test, also known as myokinetic psychodiagnosis or MKP ("*psychological diagnosis through muscular movements*"), before the Royal Academy of Medicine in London in October 19391 under the title *M.P.D.: A new technique of detecting the conative trends of personality*. In 1940 he published it in a book, *Psicodiagnóstico miokinético* (Myokinetic psychodiagnosis). In the 1940s, this test was disseminated and was widely used in South America (Argentina, Uruguay, and Brazil). During the ensuing decade, it was published in other languages and became common in many countries.

Mira test has often been used in the fields of vocational selection, clinical psychology, psychiatry, and education. Among the qualities of its

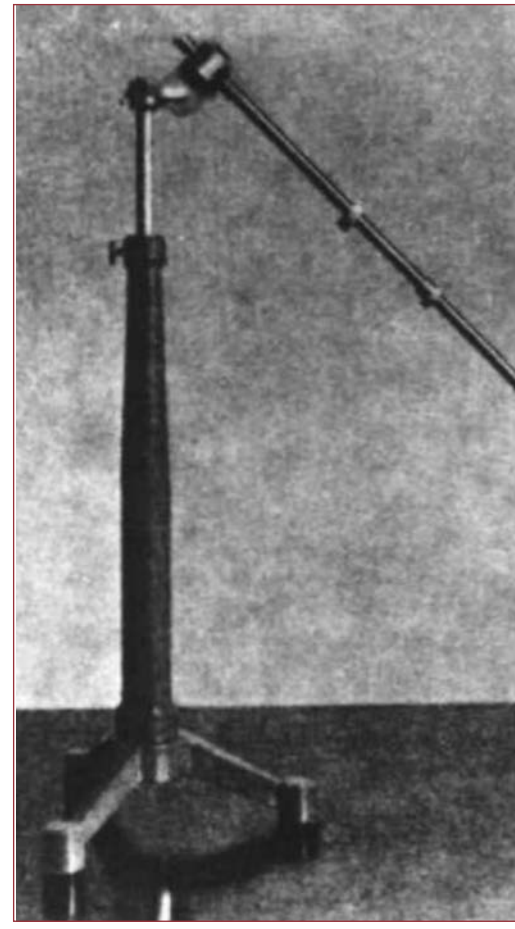
application is its reliability for discovering the examined individual's aggressiveness (of special interest in the legal sphere)[1]. In recent years, new technologies have enabled the test results to be digitized, greatly facilitating interpretation of the results.

## Other contributions

Emili Mira played an important role in introducing the following fields in Spain: experimental psychology, legal psychology, and the ideas of the German school of psychiatry, and especially psychoanalytic theory[3,8]. Along these lines, during the 1930s, he helped European psychoanalysts fleeing from Nazism settle in Barcelona as political refugees, and he introduced psychoanalytic methods in the psychiatric centres he directed[1]. Mira studied psychoanalysis extensively (reading Freud directly in German) and distinguished three dimensions within it: a method of exploration, a doctrine, and a therapy.

Emili Mira was also, as noted above, responsible for introducing professional guidance into Spain. He conceived of tests, trials, and measuring devices, such as the percepto-tachymeter for selecting vehicle drivers and the axistereometer —a precursor of the myokinetic psychodiagnostic test (Mira test)— used to select aviators for the Spanish Republic[5]. His most significant work in this area is his *Manual de orientación profesional* (Vocational guidance manual), published in Buenos Aires in 1947.

He was also a pioneer in psychology and in psychological guidance in sports: already, in 1937, he had published *Influència de la cultura física en la formació ètica de la joventut* (Influence of physical culture on the ethical formation of youth). He considered that psychological guidance was as necessary for choosing a sport as it was for choosing a profession, and argued in favour of the need for a sports counsellor (physician,



Mira axistereometer[5]

psychologist, or physical education technician) so that everyone, according to their biological type and psychological make-up, should practice the sport best suited to his or her traits, though with an eye to achieving integrated, balanced training. Of especial interest were his works on psychology and soccer, in which he proposed the psychotechnical examination of soccer teams, emphasising the missions of the captain and trainer, analysing each type of footballer's specific

Left: Emili Mira i López (1949)

Right: Emili Mira i López last lecture in Mendoza (Argentina) in 1963

aptitudes of, and even delving into the psychology of the crowds of spectators in the stadiums[2].

The Spanish Civil War undoubtedly influenced psychiatry's development in Catalonia. Mira was one of the strongest exponents of psychiatry during the war. Shortly after the war, he recorded his ideas and experience in *Psychiatry in war*[5]. For Mira, psychiatrists, like other physicians, in wartime situations are above all citizens with certain obligations: to relieve suffering, aid the recovery of combatants, keep combatants strength from failing, and offer the command every possible assistance to win the war. In that period, he described a series of nearly 100 cases of a type of malignant anxiety with sometimes fatal outcome (psychorrexis), publishing the results in the *British Medical Journal*[9]. Other aspects that concerned him were the simulation of cases of neurosis among soldiers and the prevention and eradication of alcoholism among combatants (he even made a film on the effects of alcohol on the liver to

show to soldiers at the front to discourage them from drinking). He also studied fear in situations of armed conflict (first published in *Revista de Sanidad de Guerra* in 1938 and then published in English in *The Lancet* the following year)[5].

Mira defended psychosomatic unity, advocating the biopsychosocial conception of a person, emphasising the importance of the family setting in the development of neuroses. In this sense, he was a pioneer in the use of family therapy in Spain, extolling the need for the entire family unit to undergo the same treatment plan. Later, when he lived in Latin America, he emphasised the importance of the social setting. In his own words (to cite textually from the biography written by his daughter, Montserrat Mira)[1]: "There can be no healthy individual in a sick society". Mira defined a sick person as "any individual who suffers or causes suffering". He thought that the goal of medicine should be to suppress suffering, so somatotherapy (therapy of the body) was very important and must be used together with psychotherapy (therapy of the mind) to restore health. In this way, he merged medicine with psychology, considering psychiatry a branch of both disciplines, more concerned with "morbid disruptions of (implicit or explicit) mental activity with the aim of correcting them"[1]. What is more, he advocated what he called holistic or *eubiatric* medicine, medicine to teach humans to live well: health stems from harmony in the functioning of all organs. Thus, the field of medicine encompasses all sciences that might be related to human well-being, and professionals from diverse backgrounds such as doctors, lawyers, teachers, economists, sociologists, and politicians, should have their roles to play.

In his work as the head of psychiatric institutions, he achieved many improvements in psychiatric services at all levels and considered offering open psychiatric services, as well as closed ones. In psychiatry, his most significant written work is his *Tratado de psiquiatría* (Treatise on psychiatry), first published in Barcelona in 1935. It was republished in Buenos Aires in 1942 in two volumes and again in 1955 in four volumes

(also available in Portuguese by then). This treatise was a key reference work for many psychiatrists for decades.

He also insisted on the need for judges to have knowledge of psychology, arguing that it was more important to prevent crime than punish it. Mira believed it was essential to instil a moral conscience in children and that education is fundamental in achieving a better society. He was also a pioneer in this area, publishing a *Manual de psicología jurídica* (Manual of legal psychology) aimed at legal professionals in 1932, where he stressed that legal psychology must aim first to prevent crime and help criminals readapt to society by offering corrective help, not merely punitive sanctions. Prohibited under Franco, the book was republished in Buenos Aires in 1945. Further editions were published until 1975, and it was translated into French, Portuguese, and Italian[1].

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# JOSEP TRUETA I RASPALL
# TRUETA METHOD

## The eponym

**Trueta method**. Care of open fractures by the following steps: meticulous cleansing with soap and water; if necessary, shaving the surrounding area; thorough debridement; extirpation of all the damaged tissue (especially bone fragments), reduction of the fracture, and extensive immobilisation in a plaster cast[1]. It is also known as Trueta method, Trueta treatment, Trueta technique[2], Spanish method, Orr-Bastos-Trueta technique[3], Orr-Trueta treatment, and Orr treatment[2].

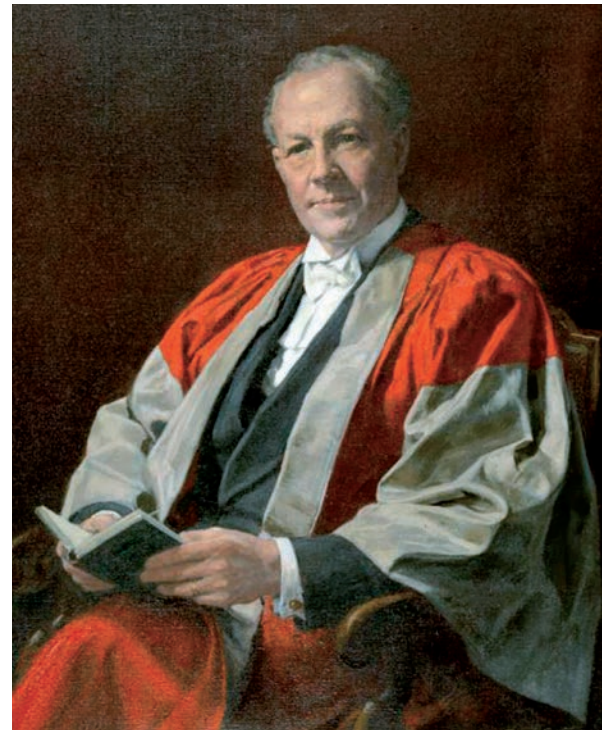
Josep Trueta i Raspall
(1897-1977)

## Josep Trueta i Raspall (1897-1977)

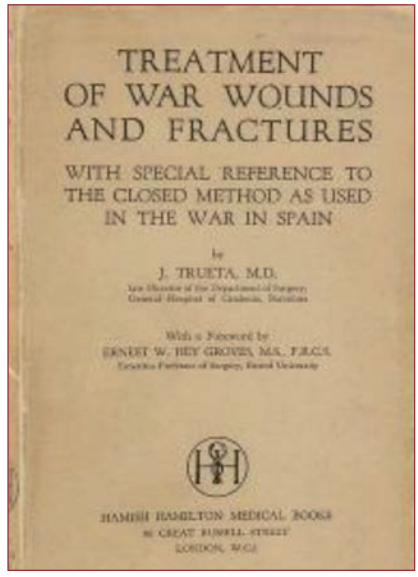
Josep Trueta i Raspall was born in Barcelona on 27 October 1897. He was the second son of Rafael Trueta, a physician, and Mercè Raspall. His paternal grandfather, Josep, imbued in him passions for long walks, politics, and sport –interests his father would also encourage in him. Josep Trueta was a keen swimmer, footballer, boxer, tennis player, and athlete. He also practiced fencing, mastering the epee, sabre, and foil; fencing enabled him to become ambidextrous (he was originally left-handed), so he was able to operate using both hands later in life.

From a young age, he wished to be a painter, and he began to study painting. However, his father was keen for him to continue the five- or six-generation family tradition of dedication to science and medicine and managed to convince him that a good artist needed to know anatomy thoroughly: "Study medicine and learn anatomy, and if you still insist on painting, then don't take up your career". He combined his medical studies with painting and had two exhibitions of his work during his university years. However, later he himself would say: "Once I was able to undertake dissection with my own hands, I immediately realised what my mission in medicine should be: to create art in the human body"[5]. He graduated in September 1921, having been an intern in Professor Ferrer Solervicens' Department of Internal Medicine from 1919 to 1921, and completed his doctorate in Madrid in 1922 (until well into the twentieth century, Madrid was the only city in Spain where doctoral studies could be done)[6]. In the same year, he returned to Barcelona to work alongside his respected teacher, Professor Corachán, in the Department of Surgery at the *Hospital de la Santa Creu*. In late December 1923, he married Amèlia Llacuna, with whom he would have four children. However, he earned his first salary as a physician on call at the *Caixa de Previsió i Socors Anònima d'Accidents* (a mutualised hospital). He also earned money administering Salvarsan injections against syphilis[5].

Portrait of Josep Trueta



Soon, he would opt to specialise in traumatology and began intensive research and consulting activity in this specialty. Later, Corachán entrusted him with the direction of the *Caixa de Previsió* (1929-1939), and he carried out surgical interventions at the *Clínica del Remei*. In the early 1930s, with Corachán, he undertook a study trip to central Europe[6]. On returning from this trip, he definitively chose to focus on surgical pathology of the locomotor system, as is reflected in his publications from that period[7]. In 1933, he was assistant to the chair of surgical pathology at the *Universitat de Barcelona*. In 1935, he was appointed head of surgery at the *Hospital de la Santa Creu i Sant Pau*[7]. When professor Ribas i Ribas passed away, Trueta succeeded him as professor of surgical pathology at the *Universitat Autònoma de Barcelona*[6].




Cover of Trueta's *Treatment of war wounds and fractures, with special reference to the closed method as used in the war in Spain* (1939)

## Trueta method: one of many contributions to orthopaedic surgery and traumatology

In 1924, the American surgeon Hiram Winnett Orr published an article describing a method for treating chronic osteomyelitis based on thoroughly draining the tissues around the infected bone and closing the opening with a large plaster dressing[5]. Trueta, at Manuel Corachán's request, tested this procedure with patients in his department and obtained surprising results. This led him to test this treatment on fresh wounds. Gradually he perfected the technique, adding new aspects: foreign bodies and the remains of deteriorated tissue had to removed, perfect excisions and drainage had to be done, and then the lesion had to be immobilised with plaster bandages. The results of his research were consolidated into the five points that became known worldwide as the "Trueta method"[7]: immediate surgical treatment, cleansing, excision

of the wound, drainage, and immobilisation using plaster dressings. In order for the wound to heal, these five points must be strictly followed. As Trueta himself explained[5]: "All the points are of vital importance, but the success of its application revolves around the third point: excision of the wound. Without a correct excision, even though the other points are faithfully adhered to, the technique does not work and may even be dangerous...".

In 1934, he presented this new technique to the *Societat Catalana de Cirurgia*. Although received with certain scepticism, with only some surgeons —including Gubern Salisachs— deciding to use it, the good outcomes achieved led to the new method gradually coming into more widespread use. In 1936, he presented the method for curing open wounds for the second time before the same society[8].

That same year, the Spanish Civil War started. Trueta treated war wounds with the method he had employed on other wounds. The arrival in Barcelona of Colonel J. d'Harcourt, a famous army surgeon, did much to advance the use of Trueta method when the army adopted it. The surgeon himself applied it very successfully during the Republican offensive on Teruel (December 1937 - January 1938) and established a diagram for coordinating treatment of injuries in their different stages from the field hospital to the rearguard[5].

The climate of war in Barcelona and the great number of wounded people that Trueta treated caused the wonders of that "miraculous" treatment to spread around the city and to the front. The results he obtained led him to write a paper, *Tractament actual de les fractures de guerra* (Current treatment of war fractures), published in 1937 in *La Medicina Catalana* where he described the technique; in 1938, a book entitled *Tractament de les ferides de guerra* (Treatment of war wounds) was published by the *Generalitat de Catalunya* (Government of Catalonia), and translated into Spanish, French, and English (the English

version, published in 1939, was entitled: Treatment of war wounds and fractures, with special reference to the closed method as used in the war in Spain). Trueta method enabled victory over the heretofore enemy of wounded combatants: gangrene.

In 1939, Trueta left Catalonia, going to Perpignan, where he awaited a visa to travel to Venezuela. There, at the request of the British government's Foreign Office, which had sent observing surgeons to interview Trueta in 1937 and 1938[6], two female physicians from England invited him to London to give conferences on the treatment of the wounded at *Hospital General de Catalunya* (now, *Hospital de la Santa Creu i Sant Pau*). In London, he also recounted his experiences in evacuating the wounded and the passive defence service during the more than 300 air raids Barcelona had weathered. The Minister of Health appointed him "Advisor on War Wounds"[4] and the Trueta family moved to Great Britain. In 1940, he was employed by Oxford University. The same year he joined the *Consell Nacional de Catalunya* set up in London. In 1941, he wrote *The spirit of Catalonia*, informing the Anglo-Saxon world of Catalonia's contribution to the birth and development of Western civilization.

In 1943, he was appointed director of the accident and emergency department at Radcliffe Infirmary[6], and on 6 May 1943, Oxford University bestowed the degree of *Doctor honoris causa* upon him[7]. He had published *Atlas of traumatic surgery*.

The usefulness of the basic principles of his method lost neither currency nor validity with the appearance of antibiotics[4]. Trueta method would be applied successfully during the Second World War, and later, in the Korean and Vietnam wars, saving thousands of human lives. In the latter war, all medical officers were instructed in the principles and techniques of debridement and delayed closure of wounds. Nevertheless, Trueta lamented that he would be remembered for this aspect since "the

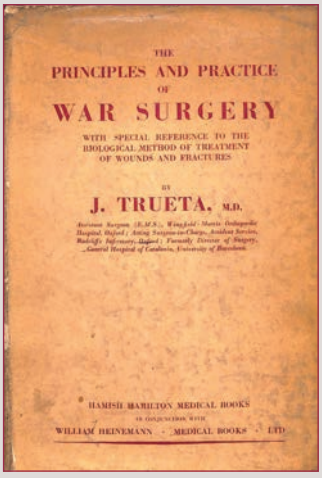
Josep Trueta immobilizing a fracture (c. 1930s)

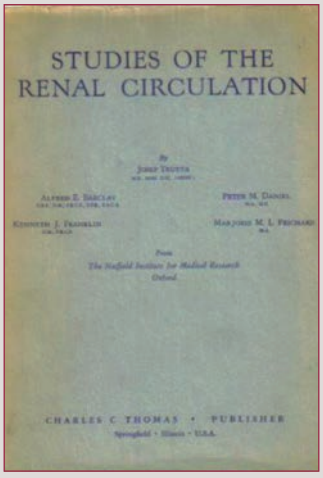
technique... has been conducted on our equals, victims of war..." considering that "surgeons, according to the oath of our profession, should be making war on war"[4].

## Other important contributions of Josep Trueta to science: dual renal circulation and the study of bones

Though his method for treating wounds is Trueta's best-known contribution to medicine, his scientific activity was broad-ranging, and his contributions in several areas were extremely important.

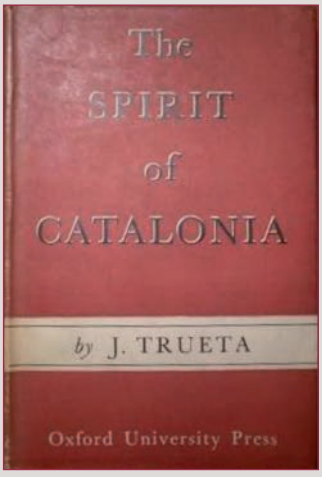
The discovery of dual renal circulation is one of his most important findings. The process of discovery began in 1936, during the Spanish Civil War, when he observed that renal failure often occurred after trauma from accidents or injuries caused by bombings. In Oxford, in 1942, along with Barnes, he carried out a number of research projects on animals, experiments using angiography to determine the calibre of renal

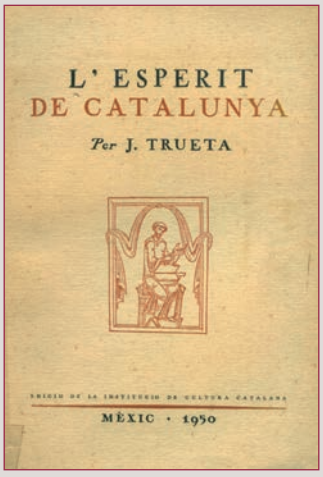



Left: Cover of *The principles and practice of war surgery: with reference to the biological method of the treatment of war wounds and fractures,* by Josep Trueta, published in London in 1943

Right: Cover of *Studies of the renal circulation*, by Josep Trueta. Published in Springfield (Ill., USA) in 1947




Cover of *The spirit of Catalonia* (left) by Josep Trueta, published in Oxford in 1941, and the translation to Catalan, *L'esperit de Catalunya* (right), published in Mexico in 1950

vessels and the effects of decreased blood volume on their calibre, and studies on the stimulation of different types of nerves. These and other later studies led Trueta and his collaborators to form a new concept regarding renal circulation: they discovered the kidney's second circulation[9]: "Blood entering the kidney potentially has two paths to traverse this organ. According to circumstances it may travel almost exclusively through one or the other of these channels, or else in variable proportion through each". In 1947, he published the book *Studies of the renal circulation*, which would be translated into Spanish two years later[7]. Trueta summarised this discovery thus[5]:

> "In reality, the kidney offers two potential circulations: one greater and the other lesser. Sometimes the blood can travel almost exclusively via one or the other. In cases of experimental or clinical shock, a deviation of cortical circulation occurs, which is reduced and may even be annulled toward the juxtamedullary glomeruli, a channel through which transit is faster, even to the point of not allowing the blood time to release its oxygen to the renal cells, as proved by the existence of the same proportion of oxygen in the blood of the renal vein as in the artery".

Furthermore, and especially noteworthy in this book on eponyms, this area of research gives rise to another eponym bearing Trueta's name, "Trueta experiment", described as[1]: "Diverse pathological circumstances (ischaemia, toxic reactions, excitation of the sciatic nerve) reduce circulation through the kidney's cortical and lead the blood toward the juxtamedullary glomeruli (short circuit or shortcut); the formation of urine is thereby severely reduced or annulled".

In 1949, Josep Trueta was appointed professor of orthopaedics at Oxford University and, as he would later say, "so, with a certain sadness, I closed my chapter on renal research". In 1955, Lord Nuffield made a

significant donation, enabling construction of a large research centre at Wingfield-Morris Hospital and the Nuffield Orthopaedic Centre was established. Completed in 1958, it contained laboratories, a library, a conference hall, etc.[4]. The chair and laboratory encouraged Trueta's investigative labours even further, and he continued his research on the bones. This was an area in which his other great contributions to medicine were centred[4,10]: bone growth and its stimulation, osteomyelitis, circulation of the femoral head, degenerative arthritis of the hip, circulation of the femoral head in infants, and osteogeny and calcification. The problems of bone circulation, of bone formation and, above all, osteoblasts and their origin, occupied the latter years of his research activity. Until he retired from the chair in late 1965[7], he directed numerous research projects in the department.

Research on these subjects was an important part of his workload when, in 1976, the disease that would end his life the next year first manifested. He had published over 200 works and 20 monographs. He had received recognition and awards from around the world, and twice had been nominated for the Nobel Prize. In Spain, due to political circumstances, any honours would arrive late. It was not until 1969 when he received the Virgili Prize from the *Societat de Cirurgia de Barcelona*. A year later, he was designated Honorary Academic of the *Reial Acadèmia de Medicina de Barcelona*. In 1972, he was appointed a numerary member of the *Institut d'Estudis Catalans* and in 1976 he was awarded a *Doctor honoris causa* from the *Universitat Autònoma de Barcelona*. He was also awarded the Gold Medal of Barcelona and the Grand Cross from the Order of Carlos III. In autumn 1976, already very ill, he delivered what would be his last public speech at *Hospital de la Santa Creu i Sant Pau* in Barcelona. These are words that have been reproduced many times in many publications and which partially sum up his thoughts[5]: "Having left Catalonia when democracy died there, it is a source of great satisfaction to me that this award is bestowed on me just as democracy is being reborn... Freedom is consubstantial with my

life. Today's act signifies a true return to my land, which I left because I did not want to see my people's freedom die".

He had returned to Catalonia after retiring in Oxford, and he died on 19 January 1977. Posthumously he was awarded the *Medalla d'Or de Sant Jordi* (Gold Medal of the Generalitat of Catalonia, the highest award for excellence in various spheres of civil life) and the *Premi Jaume I* (James I Prize for achievement in science). Shortly after his death, the *Acadèmia de Ciències Mèdiques de Catalunya i de Balears* paid him homage, and its journal, *Annals de Medicina*, published the speeches from the ceremony[11].

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# AGUSTÍ PEDRO I PONS
# PEDRO PONS EPONYMS

## The eponyms

**Pedro Pons sign**. In Brucella spondylitis, a destructive focus in the upper inner corner of one or more vertebrae (mainly lumbar)[1]; epiphysitis of the upper angle of a vertebra that can be seen in cases of chronic Brucella spondylitis[2]. A radiographic sign characteristic of Brucella spondylitis, also known as Pedro Pons-Soriano sign[3] or sign of Pedro-Pons.

**Pedro Pons haemocytopenic gastrorrhagic splenomegaly**. The most frequent Banti syndrome nowadays[1].

Agustí Pedro i Pons
(1898-1971)

## Agustí Pedro i Pons (1898-1971)

Agustí Pedro i Pons was born in Barcelona on 9 May 1898. He was the fifth and youngest child in a middle-class family of shopkeepers that showed great artistic sensibility. He was a precocious naturalist who found maths difficult; he finished high school in 1914 and started university, determined to study medicine as a "free student", which meant that Pedro Pons' time at university was undertaken mainly outside the official framework[4]. Though the medical school was in Casanova Street, next to *Hospital Clínic de Barcelona*, he carried out many activities in the old *Hospital de la Santa Creu*. He graduated in 1919; among the professors who had most influenced him were Francesc Esquerdo and Francesc Ferrer i Solervicens[5]. His doctoral thesis, which he defended shortly afterward, bore the title *La enfermedad de Banti y los síndromes esplenomegálicos* (Banti disease and splenomegaly syndromes). After graduation, he remained intensely active until gaining his professorship, pursuing both theoretical training and practice at the *Hospital de la Santa Creu*[6].

He sat governmental exams (four in a year and a half: one in Madrid, one in Cádiz, and two in Barcelona) for different professorships in medical pathology, the fourth of which, a post in Barcelona, he won. He was 28. He then left the *Hospital de la Santa Creu* and took up his post at the *Hospital Clínic de Barcelona*. At the same time as Pedro i Pons entered the Faculty of Medicine, certain changes began to be felt, albeit gradually. These brought clear benefits, a favourable historical balance, and were brought about by what Cid[4] called the "generation of the professors of 32" (as well as Pedro i Pons, this generation included Trias i Pujol, Bellido, Nubiola, and Gil i Vernet).

In his early career, Pedro i Pons shared the teaching of pathology and clinical medicine with Ferrer i Solervicens. In 1932, he began to publish the *Anales de la Clínica Médica A*. A few years later (1943), with Ramon Sarró, he would found the journal *Medicina Clínica*. That same year,

Ferrer i Solervicens died, and Pedro i Pons became the indisputable leader of internal medicine in Catalonia[5]. From 1954 to 1957 he was dean of the Faculty of Medicine. He was president of the *Acadèmia de Ciències Mèdiques* from 1939 to 1958 and president of the *Reial Acadèmia de Medicina de Barcelona* from 1957 until his death in 1971. In 1969, he entered the *Real Academia Nacional de Medicina*; he was the first Catalan non-resident in Madrid to be elected, occupying the position left vacant by Carlos Jiménez Díaz[7]. As well as *Medicina Clínica*, he was the founder and editor of another Barcelona journal, *Revista Española de Reumatismo y Enfermedades Osteoarticulares* (Spanish Journal of Rheumatism and Osteoarticular Diseases) and co-editor of two journals in Madrid: *Progresos de Terapéutica Clínica* (Advances in Clinical Therapeutics) and *Progresos de Patología Clínica*[5] (Advances in Clinical Pathology). He chaired or participated in numerous congresses and scientific meetings.

On 9 May 1968 he retired as professor, though he continued in the post until September (on the last day of September, after finishing his consulting rounds, he said goodbye as he usually did: "Good day, gentlemen, see you tomorrow")[7]. But in fact, he never truly retired. The next day, on 1 October, he joined another hospital in Barcelona,

Agustí Pedro i Pons, chair of the I Congress of Geriatrics held in Barcelona in 1950

*Residencia Sanitaria Francisco Franco* (name that *Hospital Universitari Vall d'Hebron* had at that time), as head of a new department, full of fresh hopes and challenges.

In 1969, enthused by the idea of creating the first Catalan Summer University, he accepted the honorary presidency[8], giving the closing conference entitled "*Homes i fets de la medicina catalana*" (Men and events in Catalan medicine).

He died in Barcelona on 27 March 1971. That morning, as usual, he had done his rounds of the patients hospitalised in the internal medicine department at *Hospital Vall d'Hebron*. In the afternoon, he had attended patients in his consulting rooms on Mallorca Street, and that evening he had chaired an ordinary session of the *Reial Acadèmia de Medicina de Barcelona*. He died during the night of a heart attack, the way he would have wanted: having completed his habitual working day, quickly and quietly[7].

He left a large amount of his assets to the *Universitat de Barcelona* through the constitution of a university foundation that bears his name.

## Agustí Pedro i Pons: his work in Catalan medicine

Agustí Pedro i Pons was a professor of pathology and clinical medicine at the *Universitat de Barcelona* for over 40 years: from 1927 to 1968. During this period, he became the most prominent professor in the field[5]. In his early years, prior to the Spanish Civil War, he had a less important role despite the great changes that education was undergoing. However, after the war, especially after 1943, with the death of Ferrer i Solervicens, Pedro i Pons became the most visible and representative head of Catalan medicine.

Agustí Pedro i Pons (centre) surrounded by teachers and students from a course at the *Hospital Clínic de Barcelona* in 1928

He was a peerless clinical doctor. The practice of medicine was his true passion. Although he was well versed in therapeutics, he was particularly attracted to diagnostics, especially of difficult cases. His exceptional diagnostic skill derived from different aspects: he considered a good medical history indispensable (taking it himself, speaking to the patient for as long as needed). He was an adept at semiotics, having acquired this skill during his years of training with great constancy and dedication. He also had an exquisite capacity for distinguishing important information and signs from irrelevant ones. He pondered deeply over the prognosis, and admitted that he could make mistakes[6], proving that he was a great doctor. He was skilled in neurological examinations (it was striking to see how he simulated different gaits for his students)[9] and always auscultated without a stethoscope, often obtaining surprising information. He had a great capacity for distinguishing the fundamental from the superfluous and so prioritised common sense that he allowed himself to reject even precise laboratory data if they did not fit with solid and consistent reasoning. His disciples report that everybody felt good around him. So it is logical that such an atmosphere generated a strong desire to collaborate and a great power of attraction, facilitating teamwork[9].

From left to right, Carlos Jiménez Díaz, Agustí Pedro i Pons and Gregorio Marañón at the II Meeting of the *Sociedad Española de Medicina Interna* in 1954

Corbella[5] recognises several aspects of Pedro i Pons career that made him especially important in Catalan medicine: a) He was a magnificent teacher of medical pathology (a brilliant orator –his classes were truly masterful–, he was also a gifted teacher of clinical practice at the bedside); b) He developed a significant consulting practice, both in the consulting rooms at *Clínica Mèdica A* (practical teaching sources) and in dispensaries (a source of growth of specialisations) or in the laboratories of the *Hospital Clínic de Barcelona*. After he retired in 1968 and started heading the internal medicine department at the *Hospital Vall d'Hebron* his work in his private consultancy was no less important; c) The publications he promoted were of the highest calibre: as well as the journals mentioned above, his *Tratado de Patología y Clínica Médicas* (Treatise on pathology and clinical medicine) –a collective work by Catalan authors in six volumes published from 1950 onward– was an important manual for consultation, study, and reference for over 30 years, and a series of monographs was also important; d) His influence and impetus were decisive in creating the School of Haematology at the *Hospital Clínic de Barcelona* in 1967 (once

created, he delegated the directorship to Pere Farreras)[10]; e) He trained many disciples (more than a dozen became full professors); and f) He served the profession through various bodies and organisations (university or academic posts, societies, etc.).

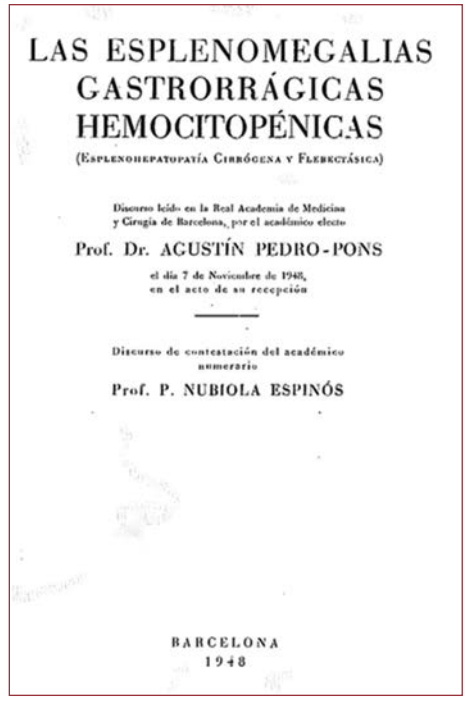
Pedro i Pons, a physician with exceptional clinical sense, was a great expert in infectious diseases and had a predilection for studying pneumological, neurological, and rheumatic patients[10]. As a researcher, his most important contributions are those related to brucellosis, slow endocarditis, hepatic cirrhosis, portal hypertension, Hodgkin disease, and collagenosis. Furthermore, he knew how to foster scientific productivity in his school[6].

## Agustí Pedro i Pons eponyms

### Pedro Pons haemocytopenic gastrorrhagic splenomegaly

In 1948, Pedro i Pons, who had compiled clinical observations accumulated over years and also had substantial micrographic material, published the monograph *Esplenomegalias gastrorrágicas hemocitopénicas* (Haemocytopenic gastrorrhagic splenomegalies), which would result in an eponym. This monograph, published as his acceptance speech for his appointment to the *Reial Acadèmia de Medicina de Barcelona*[4] went well beyond a simple compilation[11]. In it, he demonstrated that this type of splenomegaly constituted a syndrome: a set of lesions comprising a morbid species. Pedro i Pons affirmed that haemocytopenic gastrorrhagic splenomegalies were not solely a splenic disease, since, sooner or later, it could affect other organs, among them, the liver.

In 1894, Banti had described splenomegaly with cirrhosis that soon became known as “Banti syndrome or disease” (congestive



LAS ESPLENOMEGALIAS
GASTRORRÁGICAS
HEMOCITOPÉNICAS

(Esplenohepatopatía Cirrógena y Flebectásica)

Discurso leído en la Real Academia de Medicina y Cirugía de Barcelona, por el académico electo

Prof. Dr. AGUSTÍN PEDRO-PONS

el día 7 de Noviembre de 1948, en el acto de su recepción

Discurso de contestación del académico numerario

Prof. P. NUBIOLA ESPINÓS

BARCELONA
1948

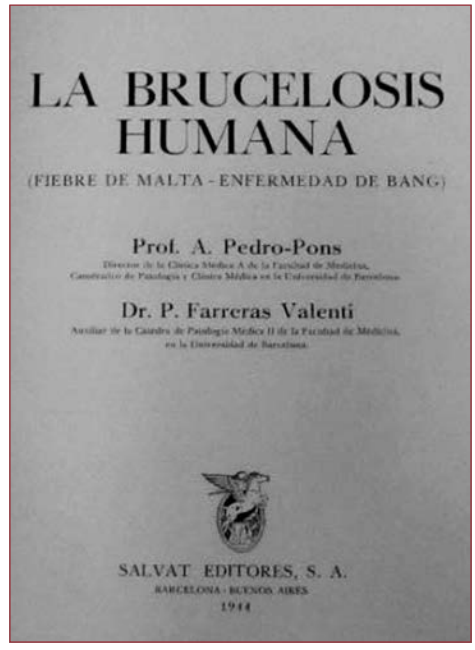
Pedro i Pons' acceptance speech for his appointment to the *Reial Acadèmia de Medicina de Barcelona* in 1948

splenomegaly secondary to portal hypertension, with ascites, anaemia, thrombocytopenia, leukopenia, and digestive haemorrhages)[3]. Pedro i Pons scientifically questioned the existence of Banti disease. He studied the symptoms and diseases related to this syndrome. As early as 1925 (long before publication of the monograph –it should be recalled that his thesis dealt with Banti disease and splenomegalies–, he clarified the reciprocal influence that exists between spleen and liver in this pathological process, describing the existence of gastrorrhagic splenomegalies. These, he claimed, were based on two main events: the presence of splenic tumours and gastric haemorrhages in which, furthermore, congestion and pulpal hyperplasia predominate, rather than the fibrosis that occurs in Banti disease[4]. The schematising of the

aetiologic factors, of the anatomopathological alterations localised in he vessels and hepatic parenchyma, and of the clinical manifestations made this monograph one of the most important texts in this area of research[11]. Thus, Pedro i Pons showed the existence of complementary morbid alterations that were a far cry from the schematic, systematised descriptions in most medical pathology treatises of the period.

## Pedro Pons sign

The study of brucellosis was one of the fields on which Pedro i Pons focused his attention. His great interest in this disease derived from his desire to find organic unity in clinical manifestations through etiopathological content[4]. Furthermore, he also examined the


LA BRUCELOSIS HUMANA

(FIEBRE DE MALTA - ENFERMEDAD DE BANG)

Prof. A. Pedro-Pons

Dr. P. Farreras Valentí

SALVAT EDITORES, S. A.

1944

*La brucelosis humana* (Human brucellosis) by A. Pedro i Pons and P. Farreras i Valentí (1944)

epidemiology of the disease (a little-studied aspect in Spain at that time), confirming that it was relatively common in the Mediterranean area. In addition to describing his observations on the particularities of different types of brucellosis (he clarified the differences between the types that came from goats and those that came from cattle, and observed the possible participation of pigs through epizootic abortion), his studies of its complications and sequelae were especially fruitful.

In an article titled *Espondilitis melitocócica* (Melitococcic spondylitis), he gave the first warning ever in this part of the world about the frequency of spondylitis during the decline of febrile cycles or in phases of complete apyrexia ("Pedro Pons sign" refers to a destructive focus –i. e., epiphysitis– in the anterosuperior angle of one or more vertebrae, mainly lumbar, which can be observed in cases of chronic Brucella spondylitis). Furthermore, he found evidence that, even though pain and vertebral stiffness are the most constant manifestations, it is not unheard of for parotitis or orchitis to be present. Pedro i Pons established the different clinical manifestations of *Brucella melitensis*, a remarkable achievement in the early twentieth century.

## Agustí Pedro i Pons, bibliophile, theatre and culture lover

While his vocation for medicine was absolute, he was also greatly interested in varied humanist pursuits. Pedro i Pons was an avid reader and voracious bibliophile. On his death, he donated his library of around eleven thousand volumes to *Acadèmia de Ciències Mèdiques de Catalunya i de Balears* (the medical books) and to the *Biblioteca de Catalunya* (as a collection). He considered books his principal form of wealth and frequently visited the Sant Antoni Market to hunt out the finest copies, such as first editions or quality bindings. The traders there paid homage to him in 1969. As well as medical books, he was a keen collector of documentation on Catalan and Barcelona folklore, especially

on his city's neighbourhoods. He was likewise an avid collector of press, participating in the publication of *Història de la premsa catalana* (History of the Catalan press)[8].

He was also a great lover of the theatre. He inherited a taste for the theatre from his parents. At *Clínica Mèdica A*, in *Hospital Clínic de Barcelona*, he encouraged members to put on theatrical performances. He actively participated in and supported numerous events: Catalan theatre performances at *Teatre Romea*, creation of the group Friends of Guimerà (Àngel Guimerà [1845-1924] was a Catalan playwright), creation of an *Institut d'Estudis Guimeranians* and a commission to promote a monument to Guimerà, etc.[8]. His patronage was very important in halting the close of *Teatre Romea*[6] when Catalan theatre was going through hard times.

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# FRANCESC DURAN I REYNALS
# DURAN-REYNALS SPREADING FACTOR

## The eponym

**Duran-Reynals spreading factor**. Hyaluronidase, an enzyme in the family of hydrolases that acts on hyaluronic acid. It plays a physiologically significant role in fertilisation: sperm contains a notable amount of this enzyme, which promotes the spermatozoa's progression through the cervical canal and penetration into the ovum. Certain pathogenic gram-positive bacteria produce extracellular hyaluronidase that seems to contribute to infection through its histolytic action on host tissue[1]. It is also known as Duran-Reynals permeability factor[1-3], Duran Reynals diffusion factor, Duran Reynals factor, Reynals factor, T factor[4], and invasin[1].

Francesc Duran i Reynals (1899-1958)

## Francesc Duran i Reynals (1899-1958)

Francesc Duran i Reynals was born in Barcelona on 5 December 1899. The youngest son of Manuel Duran i Duran, a writer and illustrator, and Agnès Reynals i Maillol, he was orphaned in 1906 and, along with his four brothers, was raised by three of his mother's sisters and one of their daughters. All his brothers flourished within the early 20th century cultural movement *Noucentisme*: Eudald (1891-1917) was a renowned novelist who died at early age; Raimon (1895-1966), a notable architect; Estanislau (1894-1950), a lawyer involved with *Acció Catalana* (a Catalan nationalist party), who was prohibited from practicing law under Franco's dictatorship; and Manuel (1896-1946), who devoted his life to private industry. Francesc, however, chose a completely different career: scientific research.

Francesc Duran i Reynals studied medicine in Barcelona (1916-1925). From his first year at university, he frequented the *Laboratori Microbiològic Municipal* headed by Ramon Turró. In 1919 he presented

Four of the five Duran i Reynals brothers, from left to right: Manuel, Raimon, Francesc, and Estanislau[9]. c. 1920s

his first research results at a session of the *Societat de Biologia de Barcelona*[4,5], a branch of the *Institut d'Estudis Catalans*, from a study on anaphylaxis and pregnancy in which he aimed to show that, once a mother induced anaphylactic sensitivity in her baby, desensitisation occurred in the mother[6]. The results were also published by the *Société de Biologie de Paris*[7] —a brilliant start to his career in research. Until 1925, he devoted part of his investigative work to this subject along with other investigators at the *Laboratori Microbiològic Municipal* (P. Domingo, M. Dalmau, and P. González, among others), beginning his study into bacteriophages in that period.

For six months in 1922-1923, he was mobilised and sent as a military health worker to Melilla to help with the repatriation of Spanish prisoners after the Disaster of Annual (1921), a Spanish military defeat during the Rif War at Annual, in northeastern Morocco. This experience marked him for life.

In 1925 he obtained a grant from the *Junta para Ampliación de Estudios* (JAE) to work at *Institut Pasteur* with Professors A. Besredka and E. Wollman, both Russian scientists, on evaluating the organic reactions of animals subjected to experimental infection and techniques for studying bacteriophages[8] (shortly beforehand, he had, in all likelihood, been the first person in Barcelona to obtain bacteriophage viruses). In June 1926, Duran wrote a report to the JAE[4,5] justifying the need to change location and attend the Rockefeller Institute in New York:

> "Very recent research studies, especially those conducted by Professor Alexis Carrel of New York's Rockefeller Institute, have shown unsuspected relationships between the problem of cancer (in the novel aspect with which it is viewed after Peyton Rous's work) and the problem of bacteriophagy.
>
> In the critical review of the question published in *Revista Médica de Barcelona*, which I attach, I attempt to establish the analogies clearly.

> Furthermore, for the last month approximately I have been studying experimentally the Rous sarcoma virus in chickens, collaborating with Mlle Harde at the Pasteur Institute, within the means here possible and will continue to do so until the end of my grant.
>
> My plan is, specifically, to apply to the problem of infectious sarcoma all the questions that a full study of the problem of bacteriophages has suggested".

In 1910, Peyton Rous had discovered sarcoma affecting chickens, which he demonstrated was transmissible. This suggested that the sarcoma might be caused by a virus, supporting an infectious theory of cancer.

Using his grant extension, he travelled to New York's Rockefeller Institute, where he worked from 1926 until 1938, when he joined Yale University. His studies on the relationship between viruses and cancer multiplied and soon brought him worldwide fame[9].

## Duran-Reynals diffusion factor

In New York, Duran began to work with J. B. Murphy on the Rous chicken sarcoma and, in 1927-1928, while working on receptivity of viruses in different tissues and organs, he discovered that the addition of testicular extracts to the saline solution in which the infectious material was suspended had a spectacular effect on the viruses' infectious power. This is how Duran himself described this discovery[10]:

> "The spreading factors were discovered in 1928 during a study of the effect of testicular extracts on vaccinial infection. The finding came, both unexpectedly and expectedly, as the experimental answer to a question formulated (1) on the basis of the general principle of the indispensable dependence of viruses on cell's life, and (2) on the basis

> of previous studies on bacteriophages and sarcoma agents: how would a typical virus behave when brought in contact with cells or extracts from either susceptible or refractory tissues? The inoculation of the test mixtures containing testicular products revealed their enhancing effect through spreading of the virus".

The exact date of the discovery of the factor (which Duran called "T factor" because he first found it in testicular tissue) is unknown. The first report was in the June 1928 issue of *Comptes Rendus de la Société de Biologie de Paris*[11]. That summer he worked on this subject at the Barcelona's *Laboratori Microbiològic Municipal* with Jaume Sunyer Pi and, by the end of the year,

First publication of what would be known as "Duran-Reynals spreading factor"[11] (1928)

6 SOCIÉTÉ DE BIOLOGIE

EXALTATION DE L'ACTIVITÉ DU VIRUS VACCINAL PAR LES EXTRAITS DE CERTAINS ORGANES,

par F. DURAN REYNALS.

Au cours d'une étude sur l'absorption et l'inactivation du virus vaccinal par des extraits d'organes, il fut observé que le tissu testiculaire normal augmentait considérablement la puissance infectieuse de la neuro-vaccine. Cette observation nous amena à un examen plus détaillé du sujet.

La neuro-vaccine (Levaditi) fut préparée de la façon usuelle et diluée à 1 p. 50 avec du liquide de Ringer. A 0.25 c.c. de cette suspension on ajoutait 0,5 c.c. de Ringer et on injectait par voie intracutanée à un Lapin. Dans la peau de l'autre côté du même animal on injectait 0,25 c.c. de la dilution vaccinale additionnée de 0,5 c.c. de liquide surnageant d'un extrait frais de testicule de Lapin normal, ce tissu ayant été broyé avec son volume de solution de Ringer, et ensuite centrifugé. Cette expérience fut répétée sur 25 Lapins dont 21 montrèrent une lésion beaucoup plus prononcée du côté injecté avec le virus additionné d'extrait testiculaire. La lésion produite par le virus vaccinal seul était circonscrite comme c'est généralement le cas pour la neuro-vaccine. Celle produite par le mélange : virus + extrait testiculaire, se développe beaucoup plus tôt, est très hémorragique, et s'étend généralement au flanc entier et même à l'abdomen. La peau est fortement épaissie, suintante, d'une couleur rouge foncé ou violacé, et se couvre souvent de phlyctènes. Pendant cette période, l'animal est très malade, avec une température élevée, et maigrit rapidement. S'il survit, il se forme une croûte qui ne s'élimine que très lentement. Dans les cas mortels, la fièvre est suivie d'hypothermie, l'animal maigrit davantage, on voit généralement apparaître des complications pulmonaires.

Des recherches ultérieures ont révélé les points suivants.

1° Les lésions cutanées, produites par la souche testiculaire du virus de Noguchi, ne semblent pas être ou ne sont que très faiblement influencées par l'addition d'extrait testiculaire alors que les lésions (plus légères que celles de la neuro-vaccine) produites par le virus cutané de la génisse, sont considérablement augmentées par le matériel testiculaire.

2° Les extraits de rein ont les mêmes propriétés que les extraits testiculaires, mais à un degré plus léger.

3° Les extraits testiculaires de Rat et de Cobaye se montrent au moins aussi actifs que ceux du Lapin pour augmenter l'étendue de l'infection vaccinale chez cet animal.

Francesc Duran i Reynals at Yale University School of Medicine in 1945

*Comptes Rendus* published the results of a series of five experiments demonstrating that when the testicular extract was injected together with staphylococci into rabbits, it apparently always increased the infectious power of the microorganisms[4,5]. Duran studied the effect of the factor on a large number of substances. The studies he carried out using Indian ink suggested another effect of the T factor: an increase in host cells' permeability to exogenous factors. And finding large amounts of the factor in neoplastic tissues made him think that its action could clarify the mechanism by which cancer cells infiltrate normal tissue. It also pointed to the significance of the role of connective tissue in this process.

Years later, Josep Trueta became interested in the role of the T factor in the opposite phenomenon, the de-permeabilisation of tissue in bacterial invasion. E. S. Duthie would identify the T factor (already known as Reynals factor) with the enzyme hyaluronidase. Moreover, Duran continued studying neoplastic processes in mammals ("filterable chicken sarcomas", and sarcomas in dogs and rabbits).

In 1932, Duran thought about going back to Barcelona. The possibility of founding a research institute for biomedical research (the *Institut Miquel Servet per a l'Estudi del Càncer i d'altres Malalties d'Etiologia Desconeguda*), a broad and ambitious project, brought him home. Problems obtaining funding and the outbreak of the Spanish Civil War prompted him to request his reincorporation into the Rockefeller Institute and to leave Barcelona on 27 September 1936. From then on, he returned for only a few days in 1950, on his way to Paris. Three years before, in 1947, he had accepted an appointment as a corresponding member of the *Institut d'Estudis Catalans*[5].

In the United States, he continued his studies on the viral theory of cancer: he was still fascinated by the notion of a latent virus with carcinogenic properties. In autumn 1938, Duran re-joined the Department of Bacteriology at Yale University, where he continued his experiments. During the 1940s, he carried out a number of studies to show the viral action of chicken sarcoma. In 1953, the results of his studies led him to propound a ten-point theory of the viral aetiology of cancer. The ideas predominant at that time resulted in manifest hostility toward the viral theory among scientists. Even so, Duran's articles were often cited during the 1950s and 1960s. In fact, as has been widely recognised, Duran i Reynals researches were among the first to reveal the existence of oncogenes, and the research programme on virus-induced cancer he initiated proved highly productive.

His work was extensive, and various biographical studies of Duran i Reynals have been published[4,5]. In 1971, the V Biochemistry Congress, held in Barcelona, saw the publication of the book *Virus y cáncer. Homenaje a F. Duran Reynals*[12] (Virus and cancer: Homage to F. Duran Reynals), containing several biographical studies and an extensive bibliography on Duran, as well as reproducing some of his articles. A year earlier, Josep Pla had devoted a chapter of his series *Homenots*[13] (Great men) to him. Coinciding with the centenary of his birth, *Annals de*

*Medicina* published an article on the current state of his contributions to science[14].

In 1957, Francesc Duran i Reynals attended the 48th Annual Meeting of the American Association for Cancer Research (AACR) in Chicago, where he defended his fundamental contribution to the viral aetiology of cancer. He died shortly afterward, on 27 March 1958, in New Haven, Connecticut. Eight months earlier, he had fallen ill with a cancer of the small intestine that would soon metastasise to his brain.

Francesc Duran i Reynals' personal papers, known as the "Duran papers", have been deposited in the Countway Library of Medicine at Harvard University.

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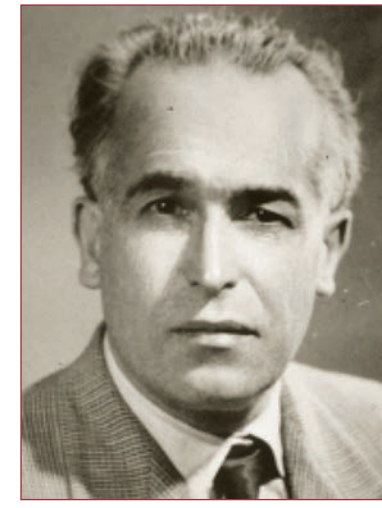
# PERE GABARRÓ I GARCIA
# GABARRÓ EPONYMS

## The eponyms

**Gabarró chessboard grafts**. Lamellar grafts cut into small squares from a large piece and placed with a small separation between them to cover a greater surface area of skin, thereby allowing the exudate produced to flow. They are also called postage-stamp grafts, Gabarró checkerboard grafts, and Gabarró postage-stamp grafts[1,2].

**Gabarró graft board**. A plate with squares that enables skin grafts to be cut accurately to a definite width. It is also known as the Gabarró board[3].

**Gabarró dermatome**. A specific type of dermatome (an instrument for cutting lamellar skin segments, employed in graft surgery) that obtains very thin and small laminates, with highly satisfactory results[1].



Pere Gabarró
i Garcia (1899-1980)

## Pere Gabarró i Garcia (1899-1980)

Pere Gabarró i Garcia was born in Igualada on 1 January 1899. He was the youngest of twelve children of the marriage between Aleix Gabarró i Castelló and Teresa Garcia i Fossas[4].

He studied at the *Universitat de Barcelona*, where he received degrees in pharmacy in 1918 ("my family wanted me to become a pharmacist") and medicine ("I wanted to be a surgeon") in 1924. Later, he moved to Madrid to do his doctorate[5]. He married Josefina Viader in 1928, and they had two daughters and a son[4].

He began his professional activity as a physician in 1924, establishing his consultancy in Barcelona. He completed his training at the Faculty of Medicine and was an assistant professor, teaching the laboratory classes of Legal Medicine and Toxicology (1923-1925), Topographical Anatomy and Operations (1929-1930), and Surgical Pathology I and II (1930-1933)[2,4,6,7]. From 1924 to 1939 he was also a member of Professor Joaquim Trias i Pujol's Clinic of Surgical Therapeutics[5]. He broadened his studies in digestive semiology at the *Hospital de la Santa Creu i Sant Pau* with Francesc Gallart (1929). For several years he also was a member of Joan Puig-Sureda's team, working as his assistant, above all in abdominal surgery. Following his teachers, he first specialised in general surgery, particularly in abdominal surgery[4]. In 1933, he also worked as a surgeon at *Institut Policlínic - Clínica Plató* in Barcelona[7].

He was a pioneer in plastic surgery in Catalonia and Spain[7], beginning to work in this specialty in 1930. Initially self-taught, his training entailed studying the works of Marion, Joseph, and Gillies[4]. In 1933, he presented the first important study in this specialisation at the *Societat de Cirurgia de Catalunya* of which he was the secretary[2,4,7]. It detailed the facial reconstruction of a miner who had been disfigured in an explosion,

losing his eyes, part of his nose, and one cheek *(Una plàstia important de la cara* – Substantial plastic surgery on the face)[8]. The same year the government of Catalonia's nursing school was founded, and Gabarró became one of its teachers[4].

During the Spanish Civil War, he continued working as a surgeon, joining the ranks of the Republican Army. The characteristics of the injuries he dealt with in that dramatic situation aided his practice as a plastic surgeon, an area in which he gained extensive experience. During the war, he was a representative for *Acció Catalana Republicana* (a Catalan political party) on the Catalan government's *Consell de Sanitat de Guerra*[9], and was later designated an army commander and head of the surgical team. During the years of conflict, he organised the treatment of burn victims on the Republican side in Catalonia and Valencia[5]. He was sent to the Aragon front (to Codo, Puebla de Híjar and Barbastro); from 1938 he was assigned to different Catalan hospitals, ranging from Gandesa in the south to Santa Coloma de Farners in the north, and finally to the hospital train, which on 5 February 1939, would carry him into exile[4].

Closely identified with the Catalan cause, he was undersecretary at the *IX Congrés de Metges i Biòlegs de Llengua Catalana* held in Perpignan in 1936[2,5,7]. He formed part of the Editorial Board of the journal *La Medicina Catalana* (Catalan Medicine), of which Leandre Cervera was editor-in-chief. Gabarró was editor-in-chief of the *Butlletí de la Societat de Cirurgia de Catalunya* (Bulletin of the Society of Surgery of Catalonia) when in 1931, the names of the journal and of the society (until then *Sociedad de Cirugía de Barcelona* – Society of Surgery of Barcelona) was changed. Gabarró was instrumental in changing the language of this journal from Spanish to Catalan[10]. He was the secretary of this society and, as such, delivered the speech *En defensa de l'ús exclusiu del català en totes les publicacions de la Societat de Cirurgia de Catalunya* (In defense of the exclusive use of Catalan in all publications of the Society of Surgery of Catalonia)[2,11,12]. After delivering this speech

he managed, after a fierce debate, to have Catalan declared the Society's sole language.

He was secretary of the *Comitè de Recerques i Investigacions Històriques de l'Associació de Metges i Biòlegs de Llengua Catalana* promoting the study of the history of Catalan surgery. He participated in the X International Congress on the History of Medicine in Madrid in 1935[4,6] and in the commemoration of the birth of Antoni de Gimbernat at the *VIIIè Congrés de Metges i Biòlegs de Llengua Catalana* (VIII Congress of Catalan Language Physicians and Biologists) (1934)[13], promoting the creation of a prize for the best studies on the history of Catalan surgery[4,11].

He was also a member of the *Sindicat de Metges de Catalunya* a professional organization), the *Acadèmia de Ciències Mèdiques de Catalunya*, the *Societat de Cirurgia de Catalunya* and the Congresses of Catalan Language Physicians and Biologists. He also collaborated on the Diccionari de Medicina (Catalan Dictionary of Medicine) edited by Manuel Corachán[4] (see the chapter on Manuel Corachán in this volume).

A Catalan nationalist, his ideas caused more than a few problems[14]. As early as 1922, he was arrested for participating in a "Pro-Catalan Rights" political meeting[15]. In 1939, he went into exile. He travelled first to France and 15 days later to England, settling first in London and finally in Manchester[2,4,6,7,16,17]. There, he entered Sir Harold Gillies's school, where he worked for several years (thanks to his skill as a draftsman he was able to enrol without having to pay; in exchange, he drew Sir Harold's operating diagrams). He also worked and trained under Archibald McIndoe, head surgeon of the Royal Air Force. During that period, he learned how they treated aviation burn victims during the Second World War[2,7,17].

Portrait of Pere Gabarró, surgeon in the Republican Army during the Spanish Civil War

In autumn 1942, he obtained a place in EMS Maxillofacial Unit 18 at Baguley Emergency Hospital while also working at the Christie Cancer Hospital and Holt Radium Institute and at the Duchess of York Hospital for Babies[2,4,6,7,14,19]. At Baguley, he began as a junior surgeon, becoming an assistant surgeon six months later and senior surgeon a year after that. So he acquired wide-ranging experience in treating patients with injuries caused by cancer, burn victims, and wounded combatants. That was when he developed a new type of tissue graft in a chessboard or postage-stamp format, and a plate that enabled the width of grafts to be set, both of which bear his name.

One of the founders of the *Moviment Escolta* (similar to the scout movement) in Catalonia, he was a keen hiker. He was a member of the *Centre Excursionista de Catalunya* and published medical articles for hikers. He also gave many conferences on medical subjects related to

hiking (e.g., "How to help an injured person in the mountains", at the *Centre Excursionista de Catalunya* in 1933)[20]. He described "Via Gabarró", a new route to climb the Pica d'Estats[4,6,7] (a three-peaked mountain in the Montcalm Massif in the Pyrenees, on the Spanish–French border; the highest in Catalonia). In his honour, the 3,115-meter Eastern peak, situated between Alins and Ariège, is called "Punta de Gabarró"[21].

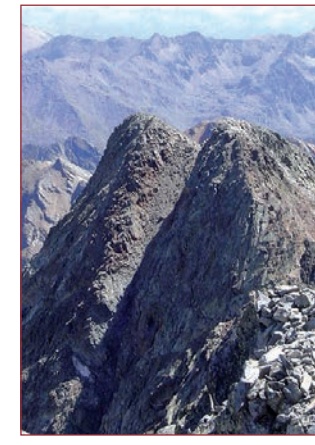
He also had other hobbies: he played the piano beautifully[19] and was a keen cyclist. Furthermore, as noted above, he was a talented artist, drawing the procedures and techniques he employed in surgery himself[14]. Many of the illustrations included in Gillies' *The Principles and Art of Plastic Surgery* are his work[19].

A member of several entities, he was a founding member of the British Association of Plastic Surgeons (1946)[5,7,16] and was the American Society of Plastic and Reconstructive Surgery's delegate in Spain (1950-1952)[5]. He was also one of the founders of the *Casal Català* of London[22].

He wrote many works on broad-ranging subjects, highlights of which include: *Pel país dels fjords. Viatge per Noruega* (Through the country of

Left: Pere Gabarró (standing with glasses on the left of the photograph) and his hiking partners in Mont Perdut (Lost Mountain) in the Pyrenees

Right: Punta de Gabarró (3,115 m), a mountain in the Montcalm Massif in the Pyrenees, between municipalities of Arins (Catalonia) and Ariège (France)



fjords: Journey to Norway, 1930), *Com cal auxiliar un ferit* (How to help a wounded person, 1930 and 1934), *Les publicacions científiques i la llengua catalana. En defensa de l'ús exclusiu del català en totes les publicacions de la Societat de Cirurgia de Catalunya* (Scientific publications and Catalan: In defence of the exclusive use of Catalan in all publications of the Society of Surgery of Catalonia, 1933), *La cirugía plástica y estética y la cirugía general* (Plastic and aesthetic surgery and general surgery, 1947), *La cirugía plástica en el tratamiento de los cánceres faciales* (Plastic surgery in the treatment of facial cancers, 1955), *Estado actual de la cirugía plástica* (Current state of plastic surgery, 1955), and *Visió gràfica dels Pirineus de Lleida* (Graphic view of the Lleida Pyrenees, 1973).

He also published numerous articles in scientific journals, including *Actas Dermo-sifiliográficas, Anales de Medicina y Cirugía, Anales de Medicina, Archivos Médico-Quirúrgicos y del Trabajo, Barcelona Quirúrgica, Butlletí de la Societat de Cirurgia de Catalunya, Treballs de la Societat Catalana de Biologia, Revista de Cirugía*, and *Revista de Sanidad Militar*, among others of international renown, such as *British Journal of Plastic Surgery, British Medical Journal, Surgery, Plastic and Reconstructive Surgery, Proceedings of the Royal Society of Medicine*, and *The Lancet*.

He returned to Barcelona in March 1947 to rejoin his wife, his children, and his mother. Since he was not reinstated in the positions he had attained by official exam before his exile, he began to work with Xavier Vilanova. Later on, he began to work at *Hospital de la Santa Creu i de Sant Pau*, with Joan Puig-Sureda (1947) and later with Jaume Pi i Figueres (1950). At this hospital he created the Plastic and Reparative Surgery Unit, the first of its kind in Spain[2,4,5,7,16]. He also worked at the *Institut and Clínica Corachán* where he was the director of the Department of Plastic and Facial Surgery. He established his professional office on Diagonal Avenue in Barcelona[7,16].

In 1953, he organised the I Course in Plastic and Reconstructive Surgery at *Hospital de la Santa Creu i Sant Pau* at a time when plastic surgery had

little recognition as a specialty. He would organise seven more through 1959[4].

In 1956, Vicente Mirabet Ippòlito invited him to form, alongside other Spanish specialists, the core of the *Sociedad Española de Cirugía Plástica* which held its first congress in 1959[2].

Gabarró is considered the pioneer of plastic surgery in Barcelona. He was a founding member and the first president (1961-1965) of the *Societat Catalana de Cirurgia Plàstica* of the *Acadèmia de Ciències Mèdiques de Catalunya* the point from which plastic surgery is considered consolidated as a specialisation in Catalonia[2]. Gabarró also collaborated with the *Societat Catalana de Biologia* from 1962.

Gabarró never received any support or consideration from the Spanish medical establishment during Franco's dictatorship even though he was an internationally renowned figure in plastic surgery and often invited to give conferences and participate in congresses, courses, and homages[4,5].

He died in Barcelona on 4 May 1980, after a few laps in the pool at a swimming club in Barcelona[5].

For several years, the *Societat Catalana de Cirurgia Plàstica* has awarded a Pere Gabarró i Garcia Scholarship and the City Council of Igualada, together with the Anoia Subsidiary of the *Acadèmia*, awards the Pere Gabarró Health Research Prize. The *Col·legi Oficial de Metges de Barcelona* declared 2009 "Dr Pere Gabarró Year"[4,5].

## Gabarró eponyms

Gabarró's scientific activity was highly important and he made several contributions to plastic surgery. Especially important was a new method

Pere Gabarró (far left) with fellow physicians from the "Foreign Legion" of Sir Harold Gillies' Plastic Surgery Service in London (1939)

for covering injured skin that enabled large areas to be covered using a small amount of healthy skin[5]: the checkerboard or chessboard graft, also called the postage-stamp graft.

Gabarró published a description of this new method first in *British Medical Journal*[23] in 1943 (*A new method of grafting*) and later (1944) in *Proceedings of the Royal Society of Medicine*[24], within an article titled *Discussion on modern methods of skin grafting*, where in addition to a detailed description of the method accompanied by numerous illustrations, he included new cases he had treated with photographs showing patients' evolution. This method was based on the use of lamellar grafts cut into small squares from a large piece and placed with a small separation between them to cover a greater area of the skin's surface while allowing the exudate produced to flow. This approach enabled large burnt or ulcerated surfaces to be covered using a minimum of skin, favouring autografts and avoiding excessive extraction[25].

in this work entailed; and Profs. O'Connor, Conway, and Kane, University College, Dublin, Dr. James McMurray and Dr. Robert Marshall, Belfast, for their interest, advice, and help.

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# A NEW METHOD OF GRAFTING

BY

**P. GABARRO**

*Former Secretary of the Society of Surgeons of Catalonia, Barcelona; Plastic Surgeon in Charge at an Emergency Hospital*

In order that the principles of the new method may be understood it will be useful first to give a short review of the usual types of skin graft. According to the thickness of the graft four types will here be considered: (1) the thin Ollier-Thiersch graft, which has been described—not quite accurately—as only epidermic; (2) the intermediate or split graft, which contains the whole epidermis and a portion of the dermis; (3) a thicker graft of about three-quarters of the skin, which leaves just enough epithelial elements from the sweat and sebaceous glands for the epithelization of the donor area; (4) the whole-thickness skin, or Wolfe, graft.

In the main, two considerations regulate the choice of graft: the thicker the graft the better the quality of the skin obtained; and the thinner the graft the easier it "takes." The area from which the graft is taken should epithelize in less than 15 days if the graft is thin. In thick grafts epithelization may be retarded, and subsequently some scar reaction may spoil the site for further use as a donor area. In the Wolfe graft there is a complete loss of skin, which must be replaced. It will be seen, therefore, that the donor area has its limitations. The kind of graft to be used depends, too, on the local condition of the area to be grafted and on the general condition of the patient, and is not an easy matter to decide upon. One of the chief problems arises when the area to be grafted is very big and the donor area is limited. When the donor area available is small, or the local and general condition of the patient is poor and none of the above-mentioned grafts is considered advisable, use is often made of small rounded grafts, of which there are two types: the thin or Reverdin graft, and the thick or deep graft devised by Davies and commonly called the "pinch" graft. Both are obtained by the same technique. The latter is the one generally adopted in England.

### The Pinch Graft

It is necessary to review the pinch graft for the better understanding of this article. It is usually a small graft (3 to 5 mm. in diameter), rounded, deep, and containing all the layers of the skin. To obtain it a needle is used to pick up a cone of skin, which is cut at its base with a knife. The same needle carries the graft to the recipient area. Usually the pinch graft "takes" in raw areas in which no other graft will properly do so. This is why it is so useful. Moreover, it is easy to carry out. Many reasons are given to explain why the pinch graft takes so easily. In my opinion, the main reason is that the grafts are so placed that enough room is left between them to allow of free discharge, and nothing intervenes between the graft and the recipient area. This is an application of the well-known principle of general surgery that no infected area will heal unless there is ample room for the discharge to escape.

From this consideration there arises a conclusion that is one of the main supports of the new method of grafting: *any graft will take more easily, and in poor raw areas, if there is enough room for discharge inside the whole area grafted.* Certainly, then, pinch grafts have many advantages, yet they have several very important disadvantages.

*Disadvantages of the Pinch Graft.*—(*a*) The donor area of a pinch graft is practically always spoiled as a further donor area for other types of graft. Numerous small scars or keloids are very common. (*b*) A big donor area is necessary if the pinch grafts are placed very close together—sometimes as big as the area to be grafted. (*c*) It is necessary to employ a large number of them, which may prove to be a very long and tedious job. (*d*) Because, through the instruments, contact is established between donor and recipient areas—very often slightly infected—infection may develop in the donor area. (*e*) Usually the site covered by pinch grafts consists of the good skin of the original pinch grafts surrounded by an area of fairly good skin; the rest is more or less keloidal tissue, in many cases with all the disadvantages of scar tissue.

*The Ideal Graft.*—It seems to me that if the pinch grafts were placed so close together that the distance between them was less than the possible easy spread of the grafts (from 6 to 9 times the original size of the pinch graft), the likelihood of the formation of good skin and quick epithelization would be much greater. Only experience can confirm this. If I am correct in my assumption, therefore, the ideal graft for the type of case mentioned must conform to the following rules:

1. Plenty of room must be left between the grafts for possible discharge.
2. The donor area must not be spoilt, so that it could be used again and again.
3. The graft should take easily—as well as or better than any other graft.
4. The technique must be fairly rapid in use and the number of grafts unlimited.
5. Contact, direct or indirect, must be avoided between donor and recipient areas.
6. The space between the grafts must be less than the possible easy and early spread of the epithelium.

### Technique of the New Method

A graft of the desired thickness and from one-sixth to one-ninth of the raw area to be covered is cut from the donor area. It is placed on stiff sticky paper (I have been using the greasy and sterile paper supplied with boxes of "tulle-gras") or any other material of similar qualities, and skin and paper are cut in strips as thin as convenient (Fig. 1). The strips are again placed on the same type of paper, at the distances desired,

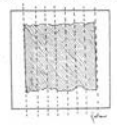

FIG. 1.—The graft, raw side up, is placed on sterile, stiff, sticky paper and cut into strips.

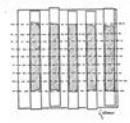

FIG. 2.—The strips, placed on another piece of paper, are cut horizontally.

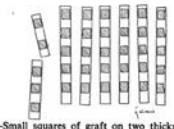

FIG. 3.—Small squares of graft on two thicknesses of paper (only one thickness shown here). The grafts, which retract somewhat, are ready to be placed in position, with the paper.

First page of the first article P. Gabarró published in 1943 in *British Medical Journal* on the new method soon to become known as "Gabarró chessboard graft"[23]



## New Inventions

### BOARD FOR CUTTING SKIN GRAFTS OF DEFINITE WIDTH

WHEN a skin-graft is being cut freehand, a wooden board is usually employed to flatten the skin in front of the knife,[1] so that the knife will have an even surface to work on. Kilner [2] devised a skin-stretching apparatus for this purpose, and Blair [3] used a suction-box. With the usual board the width of the graft cut depends on the width of the flat surface in front of the knife—it is not possible to cut a narrow graft from a broad thigh, and there is no other way of controlling the width of the graft than by choosing an appropriate donor area. The Blair suction-box permits definite control of the width


Fig. 1—Stainless steel board.

of the graft, but it is necessary to have a different box for each width, and a good suction apparatus is not always available. In practice the wooden board is most used because of its simplicity, but with a board it is not easy to cut a skin-graft freehand from such excellent donor areas as the abdomen, the chest or the back.

I have overcome these difficulties by devising a simple board made of stainless steel (fig. 1) to determine the width of surface for the knife to cut. It has four notches of different sizes—2, 2½, 3½ and 4½ in.—and when pressed down on the donor area produces a flattened salient the same width as the notch (fig. 2); the width of graft obtained is about half an inch less. It is necessary to hold the metal board more nearly perpendicular

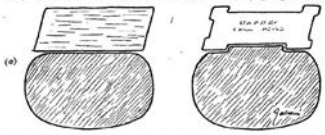


Fig. 2—(*a*) Flat surface obtained with the ordinary wooden board applied to a limb. The width of the graft depends on width of donor area. (*b*) Surface obtained with the new board applied to same limb. There is a flattened salient of a definite width which is independent of width of donor area.

to the surface than the usual board, and to apply slightly more pressure, but this adjustment is simple in practice.

This board has been employed, with satisfactory results, for over two years, using the Blair or Humby knife, or the old amputation knives (which I should recommend). With the Humby knife, which allows one to control the thickness of the graft cut, and this board, which controls its width, it has been possible to cut, free-hand, grafts of any width and thickness not only from the classical donor areas—the inner side of the arms and thighs—but also from the buttocks, chest, back and abdomen. The board is made to my design by Messrs. C. F. Thackray Ltd. of London.

P. GABARRO, M.D. BARCELONA,
Plastic surgeon at an EMS Hospital.

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2. Kilner, R. Plastic Surgery. Part 19 of Maingot's Post-Graduate Surgery, London, 1937, Vol. III.
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First publication about the plate that would be called the "Gabarró board" in *The Lancet*[29]

Gabarró presented this new method at meeting of the Royal Society of Medicine held on 1 December 1943 (which would give rise to the publication in *Proceedings*[24]), which was widely disseminated in *The Lancet*[26,27]. This method enabled the lives of many burn patients to be saved in a period when other techniques were not available and tissue banks did not exist. It soon became known as "Gabarró checkerboard grafts" or "Gabarró postage-stamp grafts"[28].

In December 1944, Pere Gabarró published a study in *The Lancet*[29] that would give rise to another eponym: *Board for cutting skin grafts of definite width*. This article described a metal plate that enabled the graft width to be controlled exactly, a considerable improvement on the wooden boards used up until that point. Gabarró board is useful when taking a graft of not too extensive an area: it holds the skin taut, and it has indentations on each side of a rectangle with a differing graft width that makes cutting easier[3].

The *Diccionari Enciclopèdic de Medicina*[1] includes another eponym, Gabarró dermatome, defined as a specific type of dermatome (an instrument for cutting lamellar skin segments, employed in graft surgery) that obtains very thin and small lamellae, with highly satisfactory results.

Pere Gabarró in the Pica d'Estats (Pyrenees, Spanish-French border)

As noted above, Pere Gabarró's name is immortalised not only in medical eponyms, but also in features of the Catalan mountains he knew so well: "via Gabarró" and "Punta de Gabarró".

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# EDUARD TOLOSA I COLOMER
# TOLOSA-HUNT SYNDROME

## The eponym

**Tolosa-Hunt syndrome**. A syndrome due to combined involvement of the common oculomotor, trochlear, trigeminal (first branch), and abducens nerves due to an aneurysm or thrombosis of the cavernous sinus and of the sella turcica that invades the external wall of the cavernous sinus[1].

Eduard Tolosa i Colomer
(1900-1981)

## Eduard Tolosa i Colomer (1900-1981)

Eduard Tolosa i Colomer was born in Barcelona on 24 October 1900. Graduating in medicine in 1921, he earned his PhD eight years later with the thesis *Algunas consideraciones sobre el diagnóstico diferencial de la enfermedad de Raynaud* (Some considerations on the differential diagnosis of Raynaud disease)[2]. Interested in internal medicine, he spent some time as an assistant at Ferrer i Solervicens' Medical Clinic, but soon became interested in studying neurological diseases. To that end, he worked for two years as an assistant in Barraquer i Roviralta neurology dispensary at the old *Hospital de la Santa Creu* and later with André Thomas at the *Hôpital Saint Joseph* in Paris. In France, he attended several of Guillain and Alajouanine's courses and also visited the departments headed by Foix, Lhermitte, and Barré. He completed his training with an internship in Madrid, where he worked in José Sanchís Banús's outpatient clinic. He also undertook an experimental study under the direction of Fernando de Castro in Gonzalo Rodríguez Lafora's department at the *Instituto Cajal*. Shortly afterward, he became interested in neurosurgery; in Tolosa's own words[2], due to "The wish to cure a significant group of neurological cases concerning which neurologists remained thoroughly impotent. Moreover, the direct experience of cerebral physiology and anatomy that neurosurgery provides led me irresistibly in that direction."

His first surgical interventions were conducted with Joan Puig-Sureda and in 1930, he began his neurosurgical studies at the *Hôpital de la Pitié* in Paris with Vincent and David. He would later visit many centres, among which Tolosa highlighted *Wenzel-Hanke Krankenhaus* in Breslau (nowadays Wroclaw), with Foerster, and the *Serafimerlasarettet* in Stockholm, with Olivecrona.

He was appointed associate professor of neurology at the *Universitat Autònoma de Barcelona* (1934), worked with Manuel Corachán i Llort

Eduard Tolosa i Colomer, 1960s

(perhaps the first Catalan neurosurgeon), was assistant neurosurgeon at Joan Puig-Sureda surgical clinic at *Hospital Clínic de Barcelona* (1935), and head of the Department of Neurology and Neurosurgery at Barcelona's *Institut Políclinic - Clínica Plató* (1934). But his major scientific and consulting activity began in 1940 when he was appointed director of the Department of Neurosurgery at the *Institut Neurològic Municipal de Barcelona*, founded four years earlier by Belarmino Rodríguez Arias[3], a responsibility he held until his retirement in 1970. He also worked as a neurosurgeon at the *Hospital de la Santa Creu i Sant Pau*, affiliated with Barraquer i Ferrer's dispensary (1944-1954), and at *Hospital del Sagrat Cor* and *Hospital de Nens Pobres* (1955). When in 1956 two departments of neurosurgery were created at what is today *Hospital Universitari Vall d'Hebron*, Tolosa was appointed to head one (Adolf Ley was appointed to head the other). The new department was organised with the help of Fuenmayor and Figuerola. In 1970, Tolosa retired and resigned from all his positions, although he would be appointed honorary professor at the Professional Neurosurgery School at the *Universitat Autònoma de Barcelona* in 1975. Eduard Tolosa died on 4 December 1981 after 17

years of fighting a disease he had treated many times: Parkinson disease[4].

Eduard Tolosa's intense scientific and consulting activity is reflected in nearly 200 publications. He is also remembered as a great clinician, and his contributions to both semiological and surgical aspects in the field of cancer and in the treatment of subdural and epidural hematomas merit special mention. He was a pioneer in stereotactic surgery in the 1960s, using it to treat Parkinson disease and to conduct cerebral biopsies[4]. Especially noteworthy is *Angiografía cerebral* (Cerebral angiography, 1953), one of the first publications in Spanish on this subject. He also penned *Síndromes extrapiramidals* (Extra-pyramidal syndromes) in *Monografies Mèdiques* (1931) and *Cirugía del dolor* (Surgery of pain, 1941). Moreover, he played an important role in scientific societies. He was a founding member of the *Sociedad Española de Neurología*, which he also served as treasurer and vice-president, and of the World Federation of Neurosurgical Societies. He was president of the *Sociedad Luso-Española de Neurocirugía* and of the *Associació de Neurologia i Psiquiatria de l'Acadèmia de Ciències Mèdiques de Catalunya i de Balears*[2-4].

To many, Tolosa, along with Adolf Ley, was the great initiator of Catalan neurosurgery and one of its earliest specialists in Spain. Eduard Tolosa and Sixto Obrador ("Dott-Obrador syndrome") are two Spanish neurosurgeons to have generated medical eponyms used worldwide.

## Tolosa-Hunt syndrome

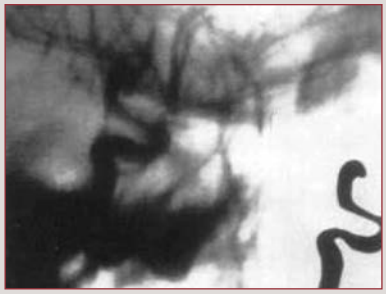
It is defined as unilateral ophthalmoplegia associated with retro-orbital or periorbital pain in the area innervated by the first branch of the trigeminal nerve. Attacks may alternate from one side to the other and may be accompanied or followed by paresis of isolated oculomotor nerves; alternatively, the full superior orbital fissure syndrome may appear.

Exceptionally, it affects the eye's sympathetic pupillary innervation. It is believed to be due to a non-specific inflammatory process and to granulomatous tissue in the superior orbital fissure or in the cavernous sinus[5]. It affects both sexes equally, and its onset is most common in the sixth decade of life. It is unilaterally localised, causing progressive retro-orbital pain and may manifest as a scintillating scotoma, sometimes recurring after remissions of months or years. Sometimes it progresses from blurry vision to total blindness. It may be due to diverse inflammatory processes of the cavernous sinus, and normally histopathologic study finds that the cavernous sinus is the only structure involved. Tolosa-Hunt syndrome is treated by treating its cause, although patients with granulomatous lesions improve with the administration of corticosteroids. The syndrome may last days or weeks; it may disappear spontaneously or after treatment, although it sometimes recurs[6].

This syndrome was first described in 1954 when Eduard Tolosa published a case report in *Journal of Neurology, Neurosurgery and Psychiatry*[7] that would immortalise him. Years later, he would describe it thus[2]:

> "In this study we reported the case of a 47-year-old man with a one-month history of pain in the left orbital region associated with left ophthalmoplegia that became complete within a week. Three years before, he had had a similar episode of some days' duration. Angiography of the left carotid ruled out an aneurysm of the infraclinoid carotid artery. Surgical exploration of the optochiasmatic region found no abnormalities. The patient died in the ward and the autopsy showed that the intracavernous portion of the left carotid siphon was wrapped in a sleeve of a cushiony tissue that encompassed the oculomotor nerves. Histological examination showed that this was nonspecific granulation tissue."

In 1961, Hunt and his collaborators[8] described six additional cases, employing their personal observations as well as clinical cases already



The image in the top shows the uniform narrowing of carotid siphon, whereas the image at the bottom is the granuloma wrapped around the carotid artery[7]

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# PERIARTERITIC LESIONS OF THE CAROTID SIPHON WITH THE CLINICAL FEATURES OF A CAROTID INFRACLINOIDAL ANEURYSM

BY

**EDUARDO TOLOSA**

*From the Neurosurgical Service of the Neurological Institute, Barcelona, Spain*

The clinical diagnosis of subclinoid carotid aneurysms is generally based on the characteristic association of two features : (*a*) pain in the first division of the trigeminal nerve ; and (*b*) progressive paralysis, partial or total, of the oculomotor nerve and occasionally of the fourth, sixth, and the fifth cranial nerves. Although the symptomatic association just described is highly characteristic, it is only through the use of cerebral angiography that we are able to establish the diagnosis with certainty.

In some cases of the syndrome, arteriography may indicate the presence of a tumour in the base of the skull (the carotid siphon running a zigzag course or showing an abnormal opening of its second curve, etc.), but in others there may be a non-aneurysmal vascular process of the intracranial carotid. In this paper I wish to deal with the latter possibility, and to report a case in which the evolution and clinical condition of the patient seemed to point to the diagnosis of intracavernous carotid aneurysm, while the arteriographic examination suggested the existence of disease of the wall of the carotid siphon, and this was subsequently confirmed at necropsy.

**Case Report**

S. M. M., a man aged 47, was admitted to the Neurological Service of the Neurological Institute in September, 1949. His present illness began three years before, the initial symptom being pain in the left orbital region. The ache was slight but continuous for a few days. A month before the patient's admission pain was again experienced in the territory of the first branch of the left trigeminus : it became violent and continuous, and was accompanied by vomiting. During the past eight days the patient had noticed ptosis of the upper left eyelid which increased rapidly into a total left ophthalmoplegia.

Funduscopic examination revealed no important pathological changes. The visual fields were full. Visual acuity : right eye, 1 ; left eye, 0·5.

The third, fourth, and sixth cranial nerves on the left side were completely paralysed. The left corneal reflex was weak. Objective sensibility was normal in the region of the left fifth nerve. No disturbances of the trigeminal motor functions or defects in the remaining cranial nerves were found. The neurological examination of the trunk and limbs was also negative. Blood pressure was 140/70 mm. Hg.

Wassermann's test in the blood was negative.

The radiological examination of the skull showed only an increase in density of the small sphenoidal wing on the left side, the upper limit of which appeared ill-defined.

In the angiographic pictures, the anterior and the middle cerebral arteries appeared in their normal positions but the carotid siphon showed in the lateral view (Fig. 1) a segmentary narrowing at the level of portion $C_2$.

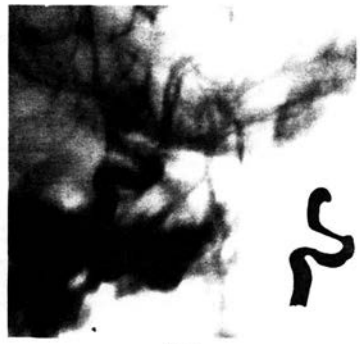

FIG. 1

This examination apparently excluded the diagnosis of saccular aneurysm or of meningioma. The existence of a malignant tumour in the base of the skull seemed



Reproduction of the first page of Eduard Tolosa's article in *Journal of Neurology, Neurosurgery and Psychiatry*[7]

published under the general denomination of painful ophtalmoplegia. They attempted to describe a new syndrome basically following the criteria of periorbital pain, ophthalmoplegia, trigeminal nerve dysfunction, frequent spontaneous remission and recurrence, and lack of involvement of other structures. Hunt asked Tolosa for his histological preparations[2], which enabled him to prove the existence of nonspecific granulation tissue within the cavernous sinus, with no primary arteritis. Tolosa published another case with spontaneous remission in 1961[9]. Then, five years later, Smith and Taxdall[10] published four new cases, designating the new anatomo-clinical entity Tolosa-Hunt syndrome, adding the response to corticosteroids as an additional diagnostic criterion.

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# FREDERIC DURAN I JORDÀ
# DURAN METHOD

## The eponym

**Duran method**. A set of procedures that enable blood to be extracted aseptically while conserving it and keeping it biologically active until it can be administered[1]. For the first time, this method enabled the extemporaneous use of extracted blood, gradually substituting the direct transfusion practised before. Conservation of blood for more than two weeks enabled its use far from blood banks and immediately saved an incalculable number of lives in the Spanish Civil War, the Sino-Japanese War, and the Second World War.

Frederic Duran i Jordà (1905-1957)

## Frederic Duran i Jordà (1905-1957)

Frederic Duran i Jordà was born on 25 April 1905 in Barcelona in the working-class Barceloneta neighbourhood. He was the youngest of five children of Amadeu Duran, a salesman from Martorell who moved to the Catalan capital in search of better opportunities for his family. Though chemistry was his greatest love, Duran eventually graduated in medicine from the *Universitat de Barcelona* in June 1928[1]. During his studies he was an intern in Antoni Trias i Pujol's Surgical Pathology Department and was in charge of the clinical analysis section of the Digestive Apparatus Dispensary from 1926 to 1934[1,2].

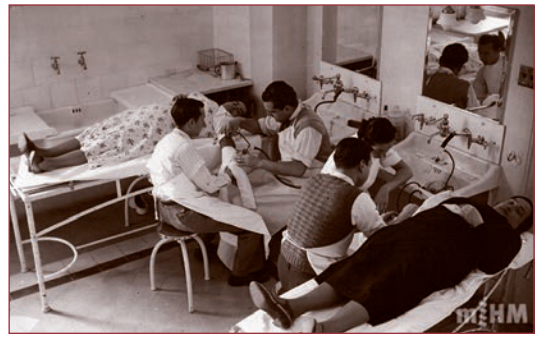
After graduation, he began to work for a general medical consultancy on Hospital Street, which later moved to Urgell Street. At 26 he published *Anàlisi i tècnica coprològica* (Coprological technique and analysis, 1931) as a medical monograph through the *Acadèmia de Ciències Mèdiques* and three years later he published a new volume entitled *Anàlisi i tècnica exploratòria de la glàndula hepàtica* (Exploratory technique and analysis of the hepatic gland, 1934). He gradually abandoned clinical practice to spend more time in the clinical analysis laboratory and was appointed municipal physician of *Institut Frenopàtic de les Corts* in 1934. By the following year, he became the director of this institution's clinical analysis laboratory[2].

The outbreak of the Spanish Civil War caught him in Barcelona. A vehement man, of firm left-wing, pro-Catalan politics, he had joined the *Unió Socialista de Catalunya* some years earlier and continued in the *Partit Socialista Unificat de Catalunya* (PSUC) when the former merged with the latter. So it was no surprise when, in the turbulent days following the military coup, the PSUC and *Unió General de Treballadors* (UGT) appointed him to create a blood transfusion service. It was on 10 October 1936 and installed in the clinic that the *Caixa de Pensions*

*Hospital d'Urgències nº 18* ("the 18th") on Montjuïc (Barcelona), nowadays the premises of the *Institut Cartogràfic i Geològic de Catalunya*

savings bank had on Montjuïc, now the premises of the *Institut Cartogràfic i Geològic de Catalunya*. It was immediately collectivised and placed under the control of the UGT and the PSUC. Duran was appointed director. The clinic was known as *Hospital d'Urgències nº 18*, popularly dubbed "the 18th", since there were already 17 military hospitals in the city. Initially, the hospital's function was to organise a blood transfusion service for the PSUC and UGT columns fighting on the Aragon front. But shortly afterwards, the Catalan government's *Consell de Sanitat de Guerra* was formed, incorporating this hospital and leading to a change in its organisation and functions[1-3]. In recognition of his merits, Duran was commissioned as a major in the Republican army[1].

Some time later, the hospital staff was incorporated into the *Cos de Sanitat de l'Exèrcit de Llevant* and transferred to a building at 216 Mallorca Street, a clinic that had been expropriated from the gynaecologist Carreras. This move was motivated by donors' difficulties in accessing the hospital and the need to expand the centre's functions. The new premises were officially inaugurated on 5 February 1938 with the name *Institut de Barcelona del Servei de Transfusió de Sang de l'Exèrcit de l'Est*[1]. Duran made an appeal on radio for donors, offering an increase in food rations in exchange for blood. The response was extremely positive and he soon had hundreds of people amassed before

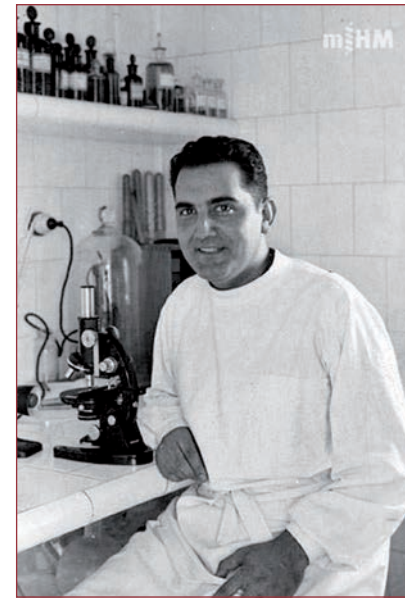


Duran i Jordà (upper centre of the photograph), extracting blood in the *Hospital d'Urgències nº 18* ("the 18th"), one of the clinics of the Transfusion Service

the laboratory door. The Transfusion Service was an overwhelming success. By the end of the Spanish Civil War, it had taken 20,000 extractions and obtained 9,000 litres of blood[2]. According to Broggi[4], Duran outlined his idea to Joaquim Trias i Pujol, a member of the *Consell de Salut Militar* created by the Catalan government, who quickly understood the project and extended him all manner of aid.

Duran knew of the experiments done by Serguei Judine, who he had met when the Russian physician visited Barcelona shortly before the Spanish Civil War[4]. In a number of conferences, Judine explained his method, which consisted of transfusing the blood of corpses to patients. But in Barcelona the method did not work very well, since the blood haemolysed, becoming quickly altered, and was therefore not useful for transfusions, perhaps due to a legal prohibition against touching corpses until a few days after death, which made their blood completely useless. So the blood of live donors was required, though this was not the only problem. It also had to be stored in such a way that it could be transported to where it was needed. Because of the war, a way of administering it easily was required, if necessary, on the front itself. Duran published the method in a small monograph in English in 1938[4] and later disseminated it in an article published in *The Lancet*[5] when he was in exile.

Frederic Duran i Jordà in the laboratory at the Transfusion Service




Changing political fortunes on the Republican side did not stop Duran from continuing his efforts until the end of the Spanish Civil War. The last blood bank was set up in the schools of the town of Amer, in Girona province, on the retreat to France[1]. Duran crossed the French border in February 1939. His reputation and his friendship with Josep Trueta helped him reach Great Britain, invited by the British Medical Mission through Janet Vaughan, of the British Red Cross. Yet his early days in exile were not easy[2].

Duran had to work as a laboratory technician at Ancoats Hospital until the British authorities recognised his degree in medicine in 1941. He continued working at the same centre as a pathologist, investigating digestive diseases and burns[1]. In Catalonia, the internal exiles did not forget him, and in 1947, the *Institut d'Estudis Catalans* awarded him the Prat de la Riba Prize for a study on digestive histology, a field far from his

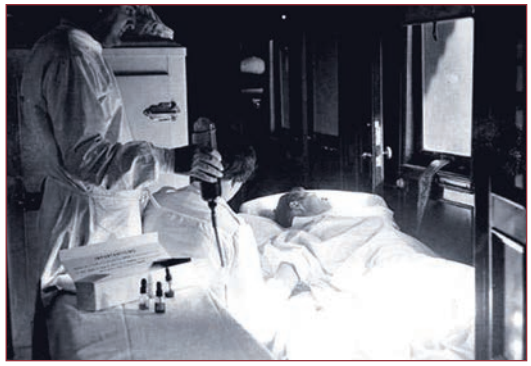
haematological studies[6]. In 1950, he became a British citizen and began returning to Catalonia on holiday. Unfortunately, some years later, he contracted leukaemia, which he himself diagnosed. He died on 30 March 1957 at Manchester's Royal Infirmary[2]. He was just 51.

## Duran Method

The idea of transfusing blood from one person to another was not new, and numerous experiments had been tried. It had even been tried in the early nineteenth century, albeit rather unsuccessfully, when James Thomas of London attempted it on 22 December 1818. However, that patient died, as did the next three on whom he tried it. The fifth, however, survived[2].

In the early twentieth century, things were not much better. It would be several years before the technique of employing a sodium citrate solution to avoid coagulation was used, special syringes were employed to administer it, and the beneficial effects of cooling the blood extracted from the donor were discovered. Yet the problem of how to keep the blood in perfect condition, to transport it from one place to another, persisted. This was crucial in wartime, since the wounded requiring blood on the front did not generally have a donor on hand to give it to them. So a method was needed that allowed blood to be extracted, stored, transported where needed, and administered quickly.

Duran soon recognised the problem of transfusions: you must obtain the blood, then classify it, store it, and transport it to the field hospitals at the front. How to do this? A few days after the outbreak of the Spanish Civil War he began to organise everything. Jars and other material were obtained from *Laboratoris Pujol i Collell*, who brought their experience to bear on the task Duran proposed[1].



Frederic Duran i Jordà doing a blood transfusion to a wounded soldier during the Spanish Civil War

The proposed method involved taking the donor's medical history and analysing the blood to ascertain the blood type and screen for transmissible diseases such as malaria and syphilis. In Duran's words[3]:

> "The scientific foundation of our organisation is as follows: the blood is mixed with a 4% sodium citrate solution (nine parts blood to one part solution). It is then preserved in a refrigerator at no higher than 1 °C or 2 °C. The same temperature is maintained during the transportation of the blood to the front, using for this purpose an especially constructed vehicle equipped with a refrigerated chamber and the necessary mechanism for its operation. The vehicle is a lorry with electric refrigerators that run off a set of batteries, a dynamo for charging the batteries, and an internal combustion motor to propel the vehicle."

From each donor, 300 ml to 400 ml was extracted every three or four weeks. Extractions were done in the morning with the patient fasting to avoid "postprandial colibacillary septicemia" or too many albuminous substances in the blood during the digestive process. Duran explained it thus[3]:

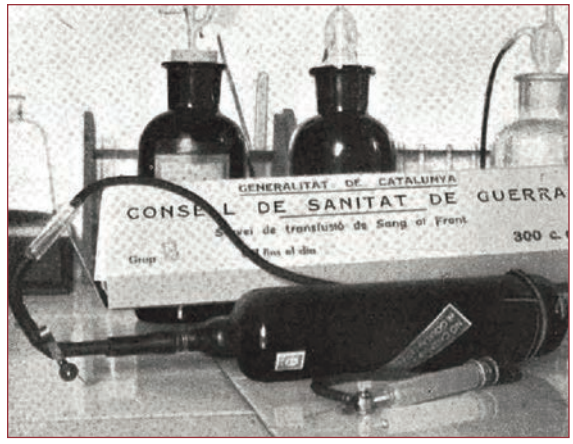
> "The technical process is very simple. The blood is collected in a matrass invented by us to avoid certain microbiological

> inconveniences. The suction-pump is first employed to place in the matrass some fifteen c.c. of the citrate solution. The arm of the patient is then punctured with a needle specially adapted for the purpose by us [...]. Once the vein is punctured, the blood is extracted by creating a slight suction inside the matrass by means of the aforesaid vacuum pump [...]. When the necessary amount of blood has been extracted, an additional 15 c.c. of the sodium citrate is pumped in, the whole is thoroughly shaken, and the filled receptacle is placed in the refrigerator."

At the end of the day, bacteriological cultures were taken from each sample and a test was done to establish the blood group so as to avoid any error that might have fatal consequences. The process ended by attaching labels stating that the blood had passed all controls. Twenty-four hours later, the cultures enabled accidental contamination when obtaining and handling the blood to be ruled out. Afterwards, the blood was prepared using a filtration process with a device of his own invention that allowed the blood to pass through a filter using a vacuum procedure to avoid contact with the air. Next, blood from several extractions was blended for the reasons that Duran explained[3]:

> "We make a mixture of various bloods, usually of six, for two reasons: one, that of technical simplification, and the other of a biological nature. There exist in the human race hematic groups insufficiently determinate [...]. If we mix the blood with other definitely determined bloods of the same groups, we find ourselves in the position as that the receiver is injected, at most, with a small amount of wrongly classified blood, an amount equivalent to that of the injection used as a biological test in direct transfusion, with the consequent slight ill effects. The larger injection which might have serious consequences is thus avoided."

The auto-injector designed by Duran i Jordà for performing transfusions on the front[3]




Once the blood was obtained and stored adequately, the problem was how to get it to the front using a system that enabled easy administration. Duran's ingenuity was notable yet again[3]:

> "The intubation of the blood is also done without contact with the air, thanks to the use of a vacuum, and the instruments invented by us for this purpose. The blood is envased in a tube known commercially by the name of 'Auto-injectible Rapide', placed at our disposal by the commercial house *Laboratori Químic Biològic Pelayo*, which supplies us, entirely gratis, with all the material for our front. This container has had to be modified in certain minor details, to make it useful: special filter, pressure clamp, and a gauge in the form of a two-way faucet, which places itself automatically in communication, either with the vein of the receiver or with the blood in the container, without need of any other operation."

The auto-injectable bottle that Duran prepared was transparent and had two compartments: the first containing blood and the second with filtered nitrogen under pressure. The two compartments were connected by two tubes. When the needle was inserted in the vein, the blood could

flow freely into the patient that needed it; thus, anybody who knew how to give an intravenous injection could administer it and no specialist was required[2].

The third challenge was getting the blood to the front before it went bad. To achieve this, Duran fitted out a fish distributor's refrigerated truck, in which he installed two generators to keep the temperature low if required. By late August, this system was used to transport blood over a distance for the first time (300 km). As a precaution, only type O blood was sent. With certain technical improvements, the blood could be stored for up to 18 days, which meant considerable progress and the chance to save thousands of lives. The truck was able to carry up to 30 L on each journey. The success of Duran method was recognised by the Republican army, which officially adopted it on 9 July 1937[2].

In the Central Republican Army, the official in charge of organising the blood bank was the Canadian physician Norman Bethune (1890-1939), who learned and incorporated Duran inventions, such as the mobile unit for taking blood to the front. Bethune, however, never recognised the Catalan physician's contributions in his publications. Due to conflicts with the Republican authorities, Bethune went to China in 1937 to help Mao's army in its fight against the Japanese who had invaded the country, dying there of an infection contracted while operating[2]. From then on, Duran also provided blood to the entire Republican Army.


The truck used to carry blood to the front, dubbed "el Rasgo"[3]

Despite the system's success, Duran still fielded critical considerations levelled at his own method[3]:

> "Nor is this the moment to discuss whether preserved and citrated blood is better or worse than blood from arm to arm. Logic makes it clear that direct transfusion is much more biological than the indirect, and still more so than with preserved blood; but the technical simplification that we have brought to transfusion (nine blood transfusions of blood made personally required less than two hours), to have the donor always at hand, without fear of complications in moments of extreme urgency, when life or death may hang in the balance, is a matter which makes us be very cautious in our judgment; and if we go over the therapeutics again, we see that in the case of severe anaemia, the physician has only the choice between arm-to-arm transfusion and an injection of a saline solution. It is therefore necessary to think whether between these two there is not an opening for indirect transfusion with preserved blood. And I offer as witnesses my colleagues who acted as transfusors in the days of last July, moments in which with all the preserved blood, direct transfusions and indirect were insufficient, as were all of ourselves, to supply the need."

Little could Duran have known that preserved blood would eventually become the standard for blood transfusions or that in the future direct transfusion would be used only in exceptional situations.

## Duran i Jordà: an example of the recovery of historical memory

The figure of Duran i Jordà exemplifies the situation of systematic oblivion practised against the losing side in the Spanish Civil War. For years, his contribution to creating blood banks was ignored, kept alive only in the memory of those who knew him, such as Moisès Broggi[4]. That is, apart

from a reference to Duran's works by Augusto Assia in *La Vanguardia* newspaper in 1946[7], where he stated that "for Dr Duran Jordá, the foremost authority on blood transfusion", the University of Manchester "has set up a clinic like those appearing in films". Very probably, the first modern reference to Duran was by Josep Carol, a writer from Martorell and the son of one of Duran's friends from school, also in an article published in *La Vanguardia* in 1976, after several decades of silence in the communications media[8]. Later on, his reputation continued to grow, and the true importance of his discoveries became known again. Carol published a short biography of Duran in 1978[9] and Joan Grífols wrote a comprehensive one several years later[1].

Duran's importance as a historical figure was finally recognised with an exhibition and series of events organised by the *Col·legi Oficial de Metges de Barcelona* upon the centenary of his birth in 2005[10]. This received extensive coverage in the press. On 28 April 2005, *La Vanguardia* published *El doctor Duran i Jordá vuelve a casa* (Dr Duran i Jordà returns home)[7] and Lluís Martínez devoted an article in his excellent historical series on medicine published in the supplement of the newspaper *Avui*[2]. In reference to the recognition that Norman Bethune had received in Canada and China and the oblivion forced upon Duran's figure at home, Martínez wrote[2]: "There are prominent personages who have been lucky enough to have been born in countries that honour them, remembering them with the means they have available." What would have become of Duran if the other side had won the Civil War or even if he had not been a member of the PSUC? Probably few discoveries that have been awarded the Nobel Prize for Medicine have saved as many lives as the method Duran invented.

In the end, the prophet Duran was recognised in his own land. On 26 July 2010, the president of Catalonia and the mayor of Barcelona inaugurated the new headquarters of the *Banc de Sang i Teixits de Catalunya*, which they named after Frederic Duran i Jordà. Thus, reparations were finally

*Banc de Sang i Teixits de Catalunya*
*Dr. Frederic Duran i Jordà* (Barcelona)

made for the years of disregard for one of the most important twentieth-century physicians in Catalonia's history, who had disappeared prematurely. His daughter, Carlota Duran, should be recognised for making this official recognition possible.

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# ANTONI PUIGVERT I GORRO
# PUIGVERT EPONYMS

## The eponyms

**Puigvert operation**. Intravesical ureterorrhaphy and cystorrhaphy[1], habitually used for tuberculosis infections of the urinary system (barely used today)[2]. It involved reimplanting the ureter in a urinary bladder affected by tuberculosis. Díaz-Rubio[3] claims that partial nephrectomy to treat kidney stones, first recommended by Puigvert, should also be called Puigvert operation.

**Megacalycosis or Puigvert disease**. A disease of the renal calyces described by Puigvert in 1963[4,5] consisting of dilation and deformation of all the calyces, with few or no changes in the renal pelvis and normal cortical parenchyma, resulting in only a decrease in the volume of the medulla and distortion of its shape, which in turn contributes to the enlargement of the calyceal cavity[6].

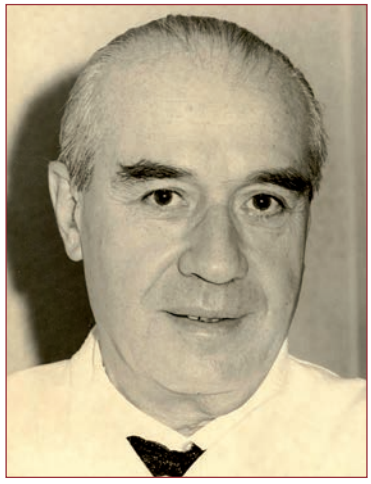
Antoni Puigvert i Gorro (1905-1990)

## Antoni Puigvert i Gorro (1905-1990)

Antoni Puigvert i Gorro was born in Santa Coloma de Gramenet (Barcelona) on 26 April 1905. He studied medicine at the *Universitat de Barcelona*, graduating in 1928[7]. He was an intern with Manuel Serés i Ibars (1888-1928), professor of anatomy and urology, with whom he began his training. Serés was a young man who had studied urology in Paris, becoming a professor at the age of 34. Serés had good political contacts at that time, and he was appointed dean of the Faculty of Medicine at the *Universitat de Barcelona* in 1924 by Primo de Rivera's government[8]. Unfortunately, he died prematurely of a serious renal infection, and Puigvert was left without a teacher or protector. For some reason, he did not get along with the new professor, Salvador Gil i Vernet, and had to practise his profession from below to make headway. Notwithstanding, a grateful patient financed an internship for him at the *Inselspital* in Bern, where he extended his studies with Wildbolz in 1932. He also visited the *Hôpital Lariboisière* in Paris where he trained with Félix Legueu and Georges Marion[3]. But the next year he returned to Barcelona and gained a post as an auxiliary physician in the urology department at the *Hospital de la Santa Creu i Sant Pau*.

The year 1941 was important for Puigvert; he earned his doctorate in Madrid and was appointed assistant physician. Three years later, he founded the journal *Archivos Españoles de Urología* (Spanish Urology Archives) with Cifuentes Delatte and Pérez Castro. In 1951, his professional capabilities were recognised when he was appointed head of the urology department at the *Hospital de la Santa Creu i Sant Pau*. Puigvert began to reorganise the department, transforming it into the Institute of Urology, which he also directed (1953)[9].

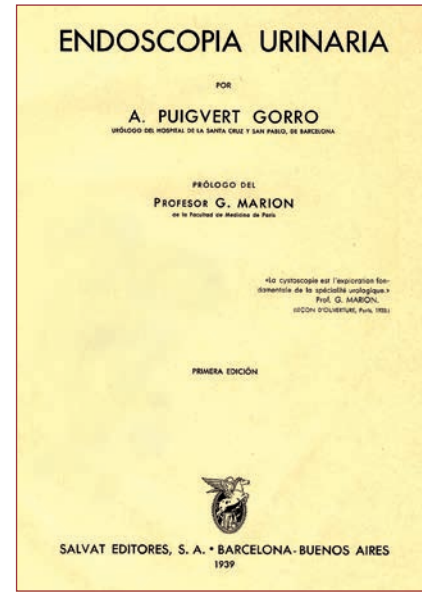
Yet Puigvert had his sights on an even greater goal. In 1961, he finally created the *Fundació Puigvert*, which is discussed later. At this institution, he took on significant teaching work in training new urology specialists from Spain and abroad. Recognition of this work arrived in 1971 when he



Antoni Puigvert i Gorro, c. 1960s

was appointed extraordinary professor of urology by the Ministry of Education, attached to the recently created Faculty of Medicine at the *Universitat Autònoma de Barcelona*, which in those early days was located at the *Hospital de la Santa Creu i Sant Pau*.

Antoni Puigvert's professional activity was wide-ranging. At a very young age, he began publishing works of great interest, such as the *Atlas de urografía* (Atlas of urography, 1933), just four years after doing the world's first urogram. His *Tuberculosi renal* (Renal tuberculosis, 1936-1937) made up issues 103-104 of the *Monografies Mèdiques de l'Acadèmia* (Monographs of the Academy of Medical Sciences). Other important books were *Endoscopia urinaria* (Urinary endoscopy, 1939), earning him the 1942 Rubio Prize of the National Academy of Medicine, *La tuberculosis genitourinaria* (Genitourinary tuberculosis, 1941), *Tratado de urografía clínica* (Treatise on clinical urography, 1944), *Tuberculosis urinaria y genital masculina* (Male genital and urinary tuberculosis, 1958), *Tratado de operatoria urológica* (Treatise on urological surgery, 1981), and *Semiología medular del riñón. Estudio clínico y radiográfico* (Medullary semiology of the kidney: clinical and radiographical study,


ENDOSCOPIA URINARIA

POR

A. PUIGVERT GORRO

PRÓLOGO DEL

PROFESOR G. MARION

PRIMERA EDICIÓN

SALVAT EDITORES, S. A. • BARCELONA - BUENOS AIRES

1939

Cover of Puigvert's work *Endoscopia urinaria* (Urinary endoscopy)

1981). Puigvert was also known for the invention of new surgical instruments such as Béniqué probe, a prostatoperineal surgery bascule[3], a 20 ml syringe for pyelography with propulsion with screw and special adjustment for urethral probes (known as the Puigvert tutor probe –another eponym), forceps with unequal arms, the double separator, and the dissecting and suture forceps[10].

Puigvert was honoured with numerous awards during his lifetime. On 20 April 1952, he was appointed a member of the *Reial Acadèmia de Medicina de Barcelona*; his acceptance speech was entitled "Bladder tumours: natural history and basis for anatomical and clinical classification", which was answered by Joaquim Trias i Pujol. Furthermore, he received several Spanish honours, such as the Gold Medal of Barcelona, and the *Creu de Sant Jordi* (one of the highest awards for civil achievement in Catalonia). His foreign honours included the *Croix de Chevalier de la Légion d'Honneur* (France), as well as others from Argentina, Brazil, Chile,

Santo Domingo, and Panama. He was also made honorary professor of universities in Argentina, Brazil, Chile, California, and Israel[9].

Puigvert was one of those rare characters who occasionally crop up in Catalan society. With a strong personality, and deeply rooted, if sometimes controversial, opinions, demanding that work be well done, a magnificent manager and tireless worker, he was during his lifetime what we might call a politically eclectic character. His cordial relations with Franco's dictatorship, to the extent that Franco inaugurated his Foundation in 1966, did not stop Puigvert from being chosen as a member of the Parliament of Catalonia by the party *Esquerra Republicana de Catalunya* in the first democratic elections just 11 years later. His skill at navigating the treacherous currents of politics was quite a feat for somebody who was basically a physician.

Antoni Puigvert died in Barcelona on 18 May 1990 after an 85-year life packed with work and achievements.

## Fundació Puigvert

This foundation is without a doubt Puigvert's greatest work, for which he lived and worked his entire adult life. When he was appointed head of the urology department at the *Hospital de la Santa Creu i Sant Pau*, Puigvert expressed the need to create a centre dedicated to urological diseases. His idea was to enlarge and improve the Institute of Urology he had created in 1943 in his private clinic. This institute had 38 beds, of which almost a third were for patients with limited financial resources. His desire to transfer it to the *Hospital de la Santa Creu i Sant Pau* was finally accepted after difficult negotiations. The hospital granted him a pavillion, *Pavelló de l'Assumpció*, where the urology department was based, which was renamed the Institute of Urology. Finally, the *Fundació* was created from the hospital's department of urology in a new building[11].

Puigvert contributed to the creation of *Fundació Puigvert* with the proceeds from the sale of his private clinic, the donation of his library, and 64,000 medical case histories[9]. In 1966, a new building was inaugurated, and the maximum political authorities of the time attended the ceremony. The following year a school to train specialists in areas related to the genitourinary system opened, where numerous Spanish and Latin American physicians were trained. With a vision for the future, rather than dedicate the institution solely to urology, Puigvert conceived it as a centre for the comprehensive treatment of diseases of the genitourinary system and thus also employed nephrologists and andrologists.

*Fundació Puigvert* was created with a vocation to offer the best possible treatment for the conditions that prompted its creation. Its founder may have had a difficult personality, but no one could refute his great dedication to his profession or his constant, thorough desire for things to work as well as possible. The prestige achieved by *Fundació Puigvert* from the very beginning, which only increased over time, made it one of the leading institutions in urological practice worldwide. After its founder's

*Fundació Puigvert*, within the grounds of the *Hospital de la Santa Creu i Sant Pau*

death, *Fundació Puigvert*'s continued success attests to Puigvert's knowing how to choose the best collaborators from among the finest professionals in each area.

## Megacalycosis or Puigvert disease

In 1963, Puigvert published an article in *Medicina Clínica*[4] analysing the problem of interpreting and naming the dilatations of renal calyces. Using radiological criteria, he distinguished between "megacalycosis", which according to Puigvert was incorrectly called "intrarenal" hydronephrosis, to refer to generalised caliectasis, "hydrocaliectasis" to refer to caliectasis of the hydrocalyx, and "calyceal diverticulum", whether nephrogenous or pyelogenous, to refer to caliectasis of the residual cavities connecting with the calyces where stones nested. After a review of the medical literature showing the general confusion, Puigvert proposed the term "megacalycosis" to define degenerative or hypoplastic diseases of the calyces characterised by an increase in the number, size, and volumes of the calyceal spaces with deformation of the latter and with no obstructive elements to explain their appearance. In contrast, hydrocaliectasis was the distension of one or a group of minor calyces that flow into a major calyx, due to obstruction of the calyx neck, with consequent accumulation of urine and accompanying dilation. This retention was one of the elements for the differential diagnosis with megacalycosis. After certain considerations on the origin, interpretation of urographic signs, and approach to treatment, Puigvert summarised his views: "In short, we must define megacalycosis as generalised calyceal malformation with distension of these cavities through hypoplastic medullary thinning without modifying the cortical tissue or functional abnormalities of the kidney or renal pelvis, and without retention in both cavities"[4]. The entity described by Puigvert was not immediately recognised; it was not until 1973 when Gittes, an American physician, first mentioned Puigvert's disease to the Anglo-Saxon world. Nevertheless, this proposal had no success and the entity described

is known as congenital megacalyces, megacalyces, or megacalycosis. The latter term is slightly different from the one Puigvert proposed[6]. Yet in this case, the eponym did not take hold, although this does not make the Catalan urologist's observation any less interesting.

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# FERNANDO MARTORELL I OTZET
# MARTORELL EPONYMS

## The eponyms

**Martorell ulcer**. An ulcer appearing on the legs in hypertensive patients with intense arteriosclerosis leading to cutaneous ischaemia. It is extremely painful and slow to heal[1]. It is also known as hypertensive ulcer or as Martorell I syndrome[2,3].

**Martorell syndrome**. A thrombotic or atheromatous obliteration of the branches of the aortic arch[2]. Also known as Martorell-Fabré syndrome, Takayasu-Martorell syndrome, occlusive disease of the supra-aortic trunks, aortic arch disease, supra-aortic trunk syndrome, and Martorell II syndrome[1-4].

**Martorell sign**. An angiographical sign typical of Buerger disease (thromboangiitis obliterans), consisting of segmental obliterations and a collateral circulation network characterised by abundant, fine, and convoluted arterioles[1].

Fernando Martorell i Otzet (1906-1984)

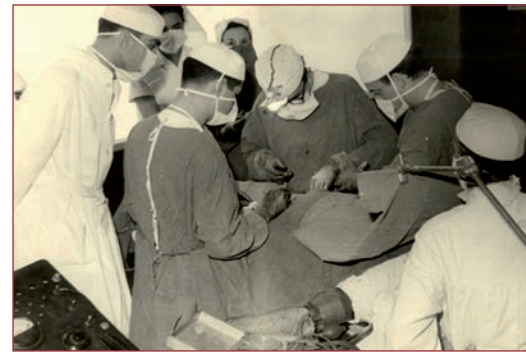
**Martorell phlebography test**. Application of phlebography to the surgical treatment of varices[5].

**Martorell stinger syndrome**. Pain in the leg, in the form of a whiplash due to intramuscular venous haemorrhage (of unknown aetiology), followed by cutaneous haemorrhages in the leg (ecchymosis), signs of thrombosis (mainly Homans sign), and arteriospasm[6].

## Fernando Martorell i Otzet (1906-1984)

Fernando Martorell i Otzet was born in Barcelona in 1906. He was the son of Vicenç Martorell i Portas, a military engineer, who held the post of chief engineer with Barcelona City Council's *Agrupación de Servicios Técnicos de Urbanismo y Valoraciones* after the Spanish Civil War. Fernando Martorell received his degree in medicine in Barcelona in 1929, though a year earlier, he was already an intern in the general surgery department headed by Joan Puig-Sureda at the *Institut Políclinic - Clínica Plató*. Over the following years, he became interested in pathology, undertaking his training under the direction of Lluís Celis i Pujol, and in general surgery, where he also worked with Puig-Sureda. As a result of his work, he was appointed associate professor of pathology and surgical therapeutics at the *Universitat Autònoma de Barcelona* in 1934 and even took on the duties of the chair in the three years in which the chairperson was absent. After the Spanish Civil War, he had to leave the university[5,7] and from then on all of his professional activity took place at Barcelona's *Institut Políclinic - Clínica Plató*[4].

In the years following graduation, he became interested in patients suffering from vascular diseases who would go from one department to another without receiving correct treatment. Furthermore, he realised that numerous conditions could be treated without the need for surgery and, therefore, there was a need for a specialty that covered both the



Fernando Martorell performing an open heart surgery. *Institut Policlínic - Clínica Plató,* Barcelona. c. 1970

medical and surgical aspects of these diseases. After a year travelling around the USA to extend his specialty training in 1940, he founded a department in the *Institut Policlínic - Clínica Plató* devoted exclusively to treating vascular diseases[8]. In his own words:

> "I immediately realised that only one in ten patients needed surgery. So I reached the conclusion that treatment of vascular diseases was medical-surgical. Along with my collaborators, we decided to call this specialisation angiology, of which vascular surgery would form part, as neurosurgery forms part of neurology"[5].

In 1941, he published his first book devoted to vascular pathology, *El tratamiento de las varices basado en la flebografía* (Treatment of varices based on phlebography), where for the first time he wrote about the application of this technique to treating varices, which he called Martorell phlebography test[5]. His goal of publicising the new specialty led him to organise, starting in 1956, over 20 courses on angiology at the *Institut Policlínic - Clínica Plató*, attracting over 600 participants. The outcome of these courses was the creation of an alumni association that brought together almost 400 members from over 20 countries[4,5]. Furthermore, he founded the journal *Angiología* in 1949, the first in the world devoted exclusively to vascular diseases[7]. Martorell was a prolific writer, producing

numerous monographs on his specialty, including *Tromboflebitis de los miembros inferiores* (Thrombophlebitis of the lower limbs, 1943), *Accidentes vasculares de los miembros* (Vascular accidents of the limbs, 1945), *Trombosis de la vena cava inferior* (Thrombosis of the inferior vena cava, 1948), *Úlceras de las piernas de origen neurovascular* (Leg ulcers of neurovascular origin, 1950), *Úlcera hipertensiva* (Hypertensive ulcer, 1953), and *Angiología. Enfermedades vasculares* (Angiology: vascular diseases, 1967), a magnificent treatise on the specialty that ran to several editions[7].

In the 1940s, Martorell insisted on the need for angiology to be internationally recognised as an independent field, and he promoted the creation of societies dedicated to its study. So in 1942 he wrote to René Leriche about creating an international society[9]. This passion led to the creation of the *Associació de Cardiologia i Angiologia* of the *Acadèmia de Ciències Mèdiques* in 1949[5]. Martorell's efforts were finally rewarded in 1951 with the creation of the International Society of Angiology, of which he was appointed vice-president. The new society held its founding congress in Atlantic City, New Jersey, on 9 June 1951. Martorell was the president and read the inaugural speech, substituting for Leriche, who was unable to attend[4,5]. Four years later, he also chaired the First Spanish Angiology Conference, leading to the creation of the *Sociedad Española de Angiología* of which he was the founder and Honorary President. During his professional career, many honours were bestowed upon him, such as his appointment as president of the European Society of Cardiovascular Surgery, awarded after Martorell organised its congress in Barcelona in 1960[5]. Two years later, he was elected a member of the *Reial Acadèmia de Medicina de Barcelona* to which he bequeathed a vast specialised library[7]. In 1967, he also organised the congress of the International Society of Angiology[5]. He died in Barcelona on 16 September 1984.

Fernando Martorell is one of the Catalan physicians who gave his name to many medical eponyms. We will examine two of his best-known eponyms, which have contributed to his recognition in medical history. But one cannot omit his significant contribution to the birth of angiology. In this sense, one of his disciples wrote: "If angiology has a father, it is Martorell"[5].

## Martorell ulcer and Martorell syndrome

Martorell's great sagacity and clinical observation allowed him to describe numerous medical conditions, some of which would remain linked to his name. This chapter describes two of them, probably the best known: hypertensive ulcer and supra-aortic trunks occlusive disease.

Martorell first described hypertensive ulcer of the leg in 1945[9]. Years later he recalled it as:

> "The name 'hypertensive ulcer of the leg' is given to an infrequent complication of hypertensive disease. In some patients with diastolic arterial hypertension, sluggish ulcers appear in the supramalleolar region as a result of the elimination of more superficial zones of ischaemic skin necrosis. Histologically, these ulcers show arteriolar lesions similar to those found in other organic regions in hypertensive patients, such as the retina, brain, kidney, etc."[10].

Martorell initial description was confirmed the next year by Hines and Farber at the *Mayo Clinic* and several authors from other countries later published numerous cases. Years later, some authors would argue that Martorell ulcer was in fact not due to arterial hypertension, but rather to other common conditions, such as chronic venous insufficiency or diabetes, which would mean it should not be classified as an injury exclusively due to hypertension, as Martorell had described it. Nevertheless, in 1995 a review concluded that there was not enough

Martorell hypertensive ulcer in a patient's leg[17]

evidence to stop classifying it as due exclusively to hypertension, recommending further studies to definitively resolve the issue[11].

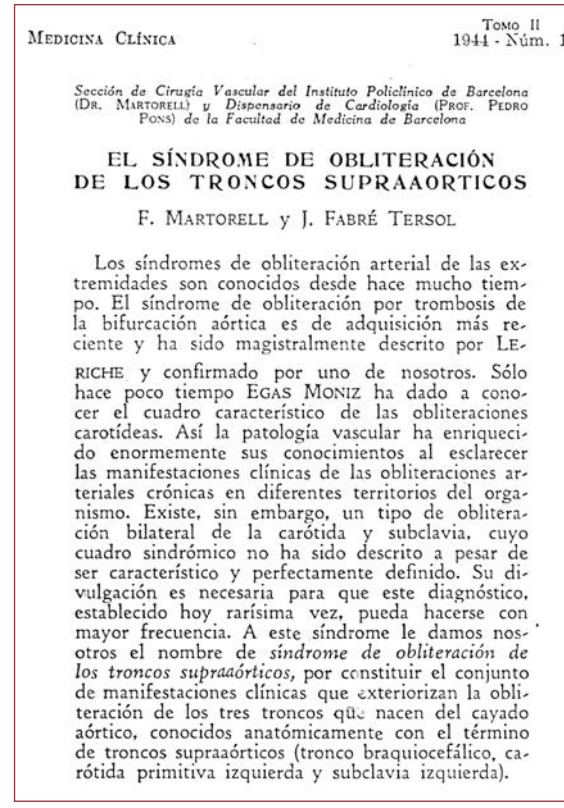
The second eponym, by which Martorell is better known, is the syndrome of obliteration of the supra-aortic trunks. Once more, we allow Martorell himself to explain the discovery of this syndrome[12]:

> "In 1943, I had the occasion to see a patient manifesting a strange set of symptoms: she suffered a transitory loss of sight and consciousness when she had to stand for a long time, but recovered immediately if she fell or was put in a horizontal position. On the other hand, the pulses in her upper limbs or carotids were absent, and it was impossible to measure the arterial pressure in her arms."

The next year Martorell and Fabré i Tersol published this case report and literature review, naming it "syndrome of obliteration of the supra-aortic trunks"[13]. In reality, isolated cases had already been reported in the medical literature, such as in the patient reported by Davy in 1839 due to a syphilitic aneurysm or in a patient with an aortic aneurysm published by Savory in 1856. Martorell always recognised that he had not described the first case, rather he had systematised the syndrome for the first time. In 1951, a similar syndrome was described in a Swedish journal with a wider distribution, and two years later, Ross and McKusick labelled it aortic arch syndrome. Yet finally, in 1953, Da Costa and Mendes recognised the authority of Martorell's discovery at the II Congress of the International Society of Angiology held in Lisbon[12].

Yet the controversy did not end here. In 1952, the American ophthalmologist Caccamise and the internist Whitman observed a case of occlusion of the supra-aortic trunks with strange lesions in the fundus of the eye. Their Japanese assistant, Okuda, informed them that in Japan the disease had been known since Mikito Takayasu, an ophthalmology professor, had described the same ocular manifestations in 1905. Caccamise believed that this was the first case described outside Japan and began to speak of Takayasu disease. A year before Caccamise's observations, Shimizu and Sano had compiled the characteristics of Takayasu arteritis and described the so-called "pulseless disease"[14].

Had Takayasu described Martorell-Fabré syndrome? Martorell himself[12], firstly, and later Alonso[15] and Planas[16], explained this confusion. In fact, Takayasu had only described the ocular manifestations in a 21-year-old woman who had "strange anastomosis in the fundus of the eye" at a meeting of the Japanese Ophthalmology Society held in 1905. At this same meeting, Onishi and Kagosha brought other cases and reported that their patients had no radial pulse[14]. In 1920, Ohta confirmed that the observations described were due to panarteritis and that the ocular manifestations were a consequence of vascular obstruction. So Takayasu



MEDICINA CLÍNICA — TOMO II — 1944 - Núm. 1

*Sección de Cirugía Vascular del Instituto Policlínico de Barcelona (DR. MARTORELL) y Dispensario de Cardiología (PROF. PEDRO PONS) de la Facultad de Medicina de Barcelona*

**EL SÍNDROME DE OBLITERACIÓN DE LOS TRONCOS SUPRAAORTICOS**

F. MARTORELL y J. FABRÉ TERSOL

Los síndromes de obliteración arterial de las extremidades son conocidos desde hace mucho tiempo. El síndrome de obliteración por trombosis de la bifurcación aórtica es de adquisición más reciente y ha sido magistralmente descrito por LERICHE y confirmado por uno de nosotros. Sólo hace poco tiempo EGAS MONIZ ha dado a conocer el cuadro característico de las obliteraciones carotídeas. Así la patología vascular ha enriquecido enormemente sus conocimientos al esclarecer las manifestaciones clínicas de las obliteraciones arteriales crónicas en diferentes territorios del organismo. Existe, sin embargo, un tipo de obliteración bilateral de la carótida y subclavia, cuyo cuadro sindrómico no ha sido descrito a pesar de ser característico y perfectamente definido. Su divulgación es necesaria para que este diagnóstico, establecido hoy rarísima vez, pueda hacerse con mayor frecuencia. A este síndrome le damos nosotros el nombre de *síndrome de obliteración de los troncos supraaórticos*, por constituir el conjunto de manifestaciones clínicas que exteriorizan la obliteración de los tres troncos que nacen del cayado aórtico, conocidos anatómicamente con el término de troncos supraaórticos (tronco braquiocefálico, carótida primitiva izquierda y subclavia izquierda).

First page of the original publication of Martorell syndrome where he first described it as the "syndrome of obliteration of the supra-aortic trunks"[17]

disease is a chronic vasculitis affecting the aorta and its main branches, such as the brachiocephalic, carotid, subclavian, vertebral, and renal arteries, as well as the coronary and pulmonary arteries[14]. Consequently, Takayasu disease is a clinical entity with a specific aetiology (an inflammatory arteritis), while Martorell syndrome can be due to multiple causes, basically arteritis (in half the cases, in which case it is Takayasu disease) and arteriosclerosis (40%)[16,17], but also to aneurysms or congenital anomalies[12]. Furthermore, Takayasu arteritis affects the entire aorta and not merely the supra-aortic trunks. When arteritis only involves the supra-aortic trunks, it manifests as Martorell syndrome[18]; however, if it

involves the aortoiliac bifurcation, it manifests as Leriche syndrome, and if it affects the renal arteries, it causes hypertension[16]. Despite such considerations, references to Takayasu disease are more common than those to Martorell syndrome.

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# PERE PIULACHS I OLIVA
# PIULACHS EPONYMS

## The eponyms

**Piulachs-Hederich syndrome**. Eponym used to indicate a sudden abdominal colic caused by a sudden idiopathic colic gas distension[1].

**Piulachs flank pinch**. With the thumb on and in the iliac spine and the other fingers in the lumbar fossa, the patient's flank is squeezed; if appendicitis is present, this manoeuvre causes pain and abdominal guarding that impedes the closing of the hand[2].

Pere Piulachs i Oliva
(1908-1976)

## Pere Piulachs i Oliva (1908-1976)

Pere Piulachs i Oliva was born in Barcelona in 1908. His father was an industrialist doing business related to construction. Despite the family's wish for him to continue the family business, after finishing secondary school he chose to study medicine. He attended the *Universitat de Barcelona*, graduating in 1931 with a brilliant academic record.

He had a younger brother, Jaume, who worked for a while in the family business, but entered the Society of Jesus, or Jesuits, before the Spanish Civil War, where he held various positions throughout his life[3]. He died suddenly one Christmas Day on his way to celebrate mass. Pere dedicated some of his most heartfelt poems to his brother.

His passion for surgery right from the start led him to sit the governmental exams for a post as night physician in the emergency department at *Hospital Clínic de Barcelona*, where he began to develop his skills and started training in surgery. Then in mid-1938, during the Spanish Civil War, he was detained and held, first in a steamship and later in Montjuïc Castle (Barcelona)[4].

In 1940, he earned his PhD with the thesis *La peritonitis biliar sin perforación* (Biliary peritonitis without perforation), winning the extraordinary prize[3]. The same year he won the Chair of Clinical and Surgical Pathology at *Universidade de Santiago de Compostela* through governmental examinations. In regard to these governmental examinations in 1940, the first after the Spanish Civil War[5], Bermejillo explained[6] that at the end of each of the four first tests one of the members of the tribunal, Laureano Olivares said in reference to Piulachs: "Yes, he is competent and well-versed in the subjects and information, but his intonation and diction are so Catalan!". Nevertheless, after the

fifth exercise, Olivares did not hesitate to tell him: "I have never known a colleague with greater knowledge of surgical and medical pathology, or of physiology, biochemistry, anatomy, and other wide-ranging subjects. You deserve the chair and it is only fair that we give it to you". Piulachs' performance in the sixth exercise was unsurpassable and he obtained the chair by unanimous decision of the tribunal.

Later he won competitions for positions available in Zaragoza (1941) and Barcelona, where he began in January 1943 and would remained until his death in 1976[4]. When he returned to Barcelona, he permanently occupied the chair of surgery in *Clínica Quirúrgica B*. In 1946 he also took on that of *Clínica Quirúrgica A*, until in 1952, Ramon Arandes i Adan, who was an assistant professor with Pere Piulachs, was awarded the chair by governmental examination, occupying it until his retirement in 1982. For a time, Pere Piulachs also took on a third chair, that of *Clínica Quirúrgica C*, when Josep Maria Bartrina i Thomàs retired in 1948. This position, which Romà Julià i Bonet had occupied for many years, first as associate professor and later as the titular professor, was not permanently filled until 1967, with the arrival of Cristóbal Pera Blanco-Morales. Piulachs managed the department and exercised the professorship in a highly personal way, with all the authority and weight of a "classic" professor. He taught well, operated well, and governed strictly, aware of his own superior status. He had a very heavy workload as a surgeon, and he had the physical strength that enabled him to do it[7].

## Pere Piulachs: the surgeon

Pere Piulachs was a great surgeon. He focused especially on abdominal surgery, neck surgery, and vascular surgery. Those who knew him highlight his prodigious memory, knowledge of anatomy, manual dexterity, measured and precise gestures, and the care he took over technical aspects down to even the tiniest details in all his operations[3].

They also emphasise his teaching ability, which he demonstrated over the 34 years he held the professorship in Barcelona. In addition to his lectures, he always had a special preference for presenting patients during rounds, since he was convinced that students had to learn at patients' bedsides if they were to develop their observation and examination skills (seeing, listening, touching, palpating, smelling, etc.).

He created the Surgery School where he trained outstanding surgeons and was dean of Faculty of Medicine of *Universitat de Barcelona*[5]. His teaching work led him to publish a first book called *Lecciones de patología quirúrgica* (Lessons in surgical pathology, 1948), of which he was the sole author. Over the years (1955) it became five volumes, constituting a singular surgical treatise in that period, setting a milestone in the teaching of surgery, especially for Spanish-speaking surgeons.

He published other books, including *Shock traumático* (Traumatic shock), *Pancreopatías agudas* (Acute pancreatic diseases), *Esplenectomía en las anemias hemolíticas* (Splenectomy in haemolytic anaemias) and *Úlceras de las extremidades de origen vascular* (Ulcers of the limbs of vascular origin) to name a few. In 1956, he published an extensive book in English, Ulcers of the legs. Rudolph Matas (a surgeon of Catalan origin that worked at New Orleans, who also contributed some eponyms) wrote the prologue for this book shortly before his death. Piulachs also published several works in collaboration with students and colleagues, including *Heridas vasculares* (Vascular injuries), *Tromboflebitis autóctonas de las extremidades superiores* (Autochthonous thrombophlebitis of the upper limbs), *Adenitis mesentérica aguda* (Acute mesenteric adenitis), and *Enfermedades del tiroides* (Thyroid disease). He compiled the works of his surgical clinic and published them in seven volumes as *Anales de la Clínica de Patología Quirúrgica* (Annals of the Surgical Pathology Clinic). He also collaborated in writing many other books on surgery and other areas of medicine, such as the *Enciclopedia médico-quirúrgica Salvat* (Salvat medical-surgical encyclopaedia) and *Historia universal de la*

Portrait of Pere Piulachs.
c. 1974

*medicina* (Universal history of medicine), the latter edited by Pedro Laín Entralgo. He published over 200 works, making many original contributions to surgery[3]. In 1974, the monograph *Repercussió enzimàtica de l'agressió* (Enzymatic impact of aggression), written with A. Corominas, R. Balius, and his son, X. Piulachs, earned him the Joaquim i Antoni Trias i Pujol Prize for the best research paper written in Catalan. Previously, in 1972, he had won the Pere Virgili Surgery Prize[5].

One of his works[8], published with H. Hederich in the journal *Acta Médica Hispánica* in February 1947, gave rise to the eponym Piulachs-Hederich syndrome (eponym used to indicate a sudden abdominal colic caused by a sudden idiopathic colic gas distension)[1]. This paper was entitled "*La dilatación aguda del colon, complicación del dolicomegacolon*" (Acute

colonic dilatation: a complication of dolichomegacolon). He began this article stating:

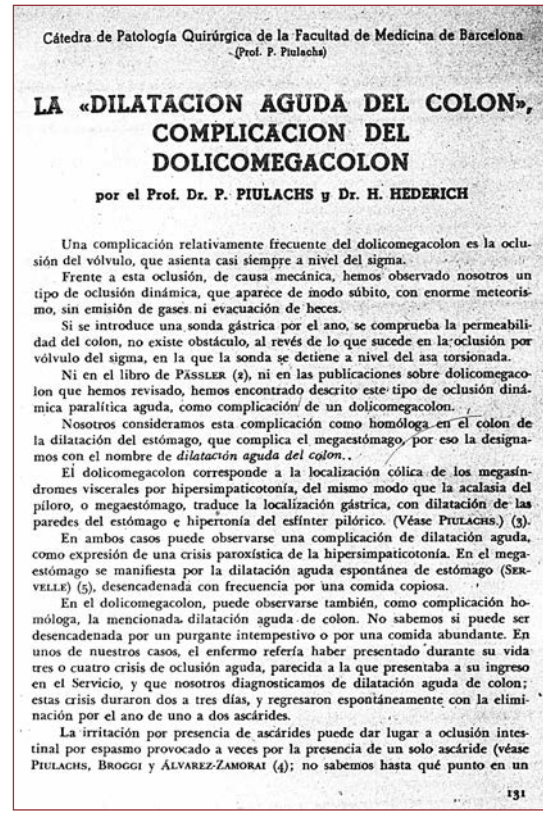
> "A relatively frequent complication of dolichomegacolon is occlusion due to volvulus, which is nearly always located at the level of the sigmoid. In addition to this occlusion of a mechanical cause, we have observed a type of dynamic occlusion, which appears suddenly, with enormous meteorism, with no emission of gases or evacuation of faeces. Introducing a gastric probe into the anus confirms that the colon is patent and that there is no obstacle, unlike in occlusion by sigmoid volvulus, in which the probe cannot advance beyond the level of the twisted loop".

The authors' own summary of the work states:

> "We describe a previously unreported complication of dolichomegacolon, denominated acute colonic dilatation.
>
> This is a paralytic occlusion, without obstacles, that appears brusquely. It is considered homologous to acute spontaneous dilatation of the stomach, observed as a paroxysmal accident in individuals with megastomach. So it is a crisis caused by excessive sympathetic tone, which develops in an individual who habitually presents a localised hypersympatheticotonia, the expression of which is dolichomegacolon.
>
> We propose a treatment analogous to gastric lavage, introducing a Faucher probe with a piston-like device to aspirate and empty the contents of the colon.
>
> Due to the supra-umbilical location of meteorism, which occurs because of the preferential dilatation of the transverse colon, it may be confused with acute gastric dilatation; the gastric probe resolves these doubts.

It can be differentiated from a crisis due to sigmoid torsion by the absence of an obstacle to penetration of the probe and entrance of the opaque enema".

Piulachs played a decisive role in several societies. He was president of the *Asociación Española de Cirujanos*[9], the Latin Mediterranean Surgery Society[10] and the Societat Catalana de Cirurgia (1953-1961)[11]. It is worth recalling, however, that when Piulachs took over the presidency of the Catalan society from Joaquim Trias i Pujol after the Spanish Civil War,



Cátedra de Patología Quirúrgica de la Facultad de Medicina de Barcelona
(Prof. P. Piulachs)

**LA «DILATACION AGUDA DEL COLON», COMPLICACION DEL DOLICOMEGACOLON**

por el Prof. Dr. P. PIULACHS y Dr. H. HEDERICH

Una complicación relativamente frecuente del dolicomegacolon es la oclusión del vólvulo, que asienta casi siempre a nivel del sigma.

Frente a esta oclusión, de causa mecánica, hemos observado nosotros un tipo de oclusión dinámica, que aparece de modo súbito, con enorme meteorismo, sin emisión de gases ni evacuación de heces.

Si se introduce una sonda gástrica por el ano, se comprueba la permeabilidad del colon, no existe obstáculo, al revés de lo que sucede en la oclusión por vólvulo del sigma, en la que la sonda se detiene a nivel del asa torsionada.

Ni en el libro de PÄSSLER (2), ni en las publicaciones sobre dolicomegacolon que hemos revisado, hemos encontrado descrito este tipo de oclusión dinámica paralítica aguda, como complicación de un dolicomegacolon.

Nosotros consideramos esta complicación como homóloga en el colon de la dilatación del estómago, que complica el megaestómago, por eso la designamos con el nombre de *dilatación aguda del colon*.

El dolicomegacolon corresponde a la localización cólica de los megasíndromes viscerales por hipersimpaticotonía, del mismo modo que la acalasia del píloro, o megaestómago, traduce la localización gástrica, con dilatación de las paredes del estómago e hipertonía del esfínter pilórico. (Véase PIULACHS.) (3).

En ambos casos puede observarse una complicación de dilatación aguda, como expresión de una crisis paroxística de la hipersimpaticotonía. En el megaestómago se manifiesta por la dilatación aguda espontánea de estómago (SERVELLE) (5), desencadenada con frecuencia por una comida copiosa.

En el dolicomegacolon, puede observarse también, como complicación homóloga, la mencionada dilatación aguda de colon. No sabemos si puede ser desencadenada por un purgante intempestivo o por una comida abundante. En unos de nuestros casos, el enfermo refería haber presentado durante su vida tres o cuatro crisis de oclusión aguda, parecida a la que presentaba a su ingreso en el Servicio, y que nosotros diagnosticamos de dilatación aguda de colon; estas crisis duraron dos a tres días, y regresaron espontáneamente con la eliminación por el ano de uno a dos ascárides.

La irritación por presencia de ascárides puede dar lugar a oclusión intestinal por espasmo provocado a veces por la presencia de un solo ascáride (véase PIULACHS, BROGGI y ÁLVAREZ-ZAMORAI (4); no sabemos hasta qué punto en un

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First page of the article *La "dilatación aguda del colon", complicación del dolicomegacolon* (The "acute dilatation of the colon", a complication of dolichomegacolon)[8], which gave rise to the eponym Piulachs-Hederich syndrome

the society had become the *Asociación de Cirugía de la Academia de Ciencias Médicas* because its name had to be in Spanish. Piulachs, together with the society's secretary, Antoni Sitges i Creus, promoted the old Society, without losing its link to the Academy. The Civil Government approved its continuation under the name, also in Spanish, of *Asociación de Cirugía de Barcelona* and its inaugural session was held on 24 November 1956. The following year, *Barcelona Quirúrgica* the Association's journal, began to be published; in 1958, they reached 100 members and in 1960 held some conferences to commemorate the second centenary of *Reial Col·legi de Cirurgia de Barcelona*. It was not until the presidency of Ramon Arandes i Aran (1971-1973) when the name could revert to the *Sociedad Catalana de Cirugía*. Finally, under the presidency of Antoni Sitges i Creus (1977-1981), the original Catalan-language name approved in the Society's founding articles in 1927, *Societat Catalana de Cirurgia*, was restored[11].

Pere Piulachs was awarded numerous distinctions, including the *Gran Cruz de Sanidad*[3] (Grand Cross of the Civil Order of Health) and the *Gran Cruz de la Orden de Alfonso X el Sabio* (Grand Cross of the Order of Alfonso X the Wise)[10]. He was a member of several international medical societies, as well as of the *Reial Acadèmia de Medicina de Barcelona* (from 1961), the *Acadèmia del Far de Sant Cristòfor* (from 1964), and the *Real Academia Nacional de Medicina*. In the latter, he took possession of his numerary seat on 4 June 1974, bearing medal number 6. He succeeded Agustí Pedro i Pons[12], who also contributed eponyms, which are dealt with in another chapter.

## Pere Piulachs: humanist, writer and poet

Pere Piulachs was an insatiable reader: "It was common to see him sitting in a Barcelona restaurant, with a book open before him, tirelessly underlining lines while he ate"[3]. He was not merely interested in

medicine, but also cultivated the humanities, philosophy, and literature. He was also a great collector of artwork, having a magnificent collection of ancient carvings[7].

This humanist side was shown in numerous conferences and many writings, where he demonstrated his mastery of words, which he used clearly and precisely. An example that testifies to his mastery is the speech he gave on acceptance to the *Reial Acadèmia de Medicina de Barcelona*, *La enfermedad y el enfermo* (Illness and the ill) in 1961[5]. Likewise, his acceptance speech to the *Acadèmia del Far de Sant Cristòfor*, *La palabra en la ciencia y en la poesía* (The word in science and poetry, 1964) is an extensive essay of more than 100 pages analysing the phenomenon of words in general, man's attitude toward science and poetry, the characteristics of scientific language and poetic language, and the convergence of scientific expression and poetic expression.

The work he read to enter the *Real Academia Nacional de Medicina*, *El sentido del dolor* (The sense of pain), is a further example. A great

Pere Piulach i Oliva taking possession of his numerary seat in the *Real Academia Nacional de Medicina* on 4 June 1974

conversationalist, with deep knowledge of language, his acceptance speech to the *Sociedad Española de Médicos Escritores y Artistas* in 1975 dealt with a subject he was especially passionate about: *La etimología de las palabras médicas* (The etymology of medical words)[3].

He was also a consummate poet. His book *El viento encadenado* (The wind enchained) won the *Premi Ciutat de Barcelona* (City of Barcelona Prize) in Spanish poetry. Unfortunately, he did not live to see his last book published, a collection of poems and verses for children, *La luna salió del campo* (The moon rose out of the field), which was published a few days after his death[3]. Part of his body of poetry was published posthumously. He also wrote humorous poetry and it was known, as Corbella explains[7], that he had penned the unsigned verses circulating in certain surgery congresses and that the pseudonymous author of humorous medical poetry "Vate Apaceo" was Pere Piulachs.

Pere Piulachs i Oliva died suddenly on 25 March 1976 at home in Barcelona, just as he was preparing to depart for the Faculty of Medicine.

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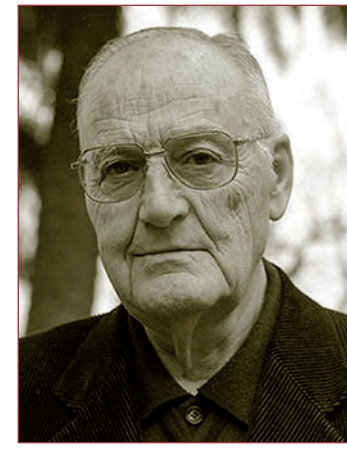
# JAUME ROTÉS I QUEROL FORESTIER-ROTÉS QUEROL DISEASE

## The eponyms

**Forestier-Rotés Querol disease**. Ankylosing vertebral hyperostosis, diffuse idiopathic skeletal hyperostosis[1-3], or senile ankylosing hyperostosis of the spine[4]. A disease characterised radiologically by the presence of ossification of the anterolateral parts of at least four contiguous vertebral bodies. It is also known as Forestier-Rotés disease[1], Forestier disease[5], ankylosing hyperostosis of Forestier and Rotés-Querol[3], and Forestier-Rotés-Querol syndrome[6]. Other names this disease has received include deforming spondylosis, spondylitis ossificans ligamentosa, and hyperostotic spondylosis[3].



Jaume Rotés i Querol (1921-2008)

**Forestier-Jacqueline-Rotés Querol sacroiliac point**. In the palpation of the sacroiliac joint, a point situated immediately under the posteroinferior iliac spine, where the base of the articulation is revealed and the finger can detect the presence of pain, evidence of synovitis[7].

## Jaume Rotés i Querol (1921-2008)

Jaume Rotés i Querol was born on 15 January 1921 in Balaguer, where his father had a shop. He lived there until the end of the Spanish Civil War. He then began to study medicine at the *Universitat de Barcelona*, where from his fourth year on, he did an internship in medical pathology with Agustí Pedro i Pons[9]: "I discovered medicine when I met Professor Pedro i Pons in my fourth year and began to study with him. [...] I became a doctor during those years, doing patient rounds with him, which had a profound effect on my profession"[10]. He joined *Clínica Mèdica A,* at *Hospital Clínic de Barcelona* with Nicolàs Magriñà Ferrer[11]. From starting work at Pedro i Pons' clinic until 1947, he alternated working on the ward with working in the Rheumatology Dispensary, above all studying the patients with rheumatic disease.

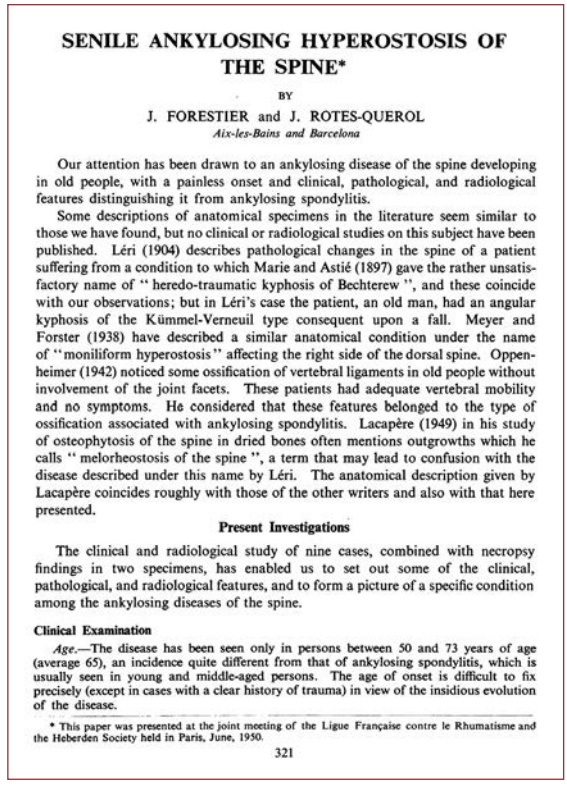
On completing his university studies, he decided he wanted to devote himself to rheumatology, so, encouraged by Pedro i Pons, who had studied both French and German medicine, he travelled to complete his training in Paris. There he worked with Stanislas de Sèze at *Hôpital Lariboisière*, remaining there from October 1947 to July 1948[11]. During those months, he became de Sèze's assistant, undertaking fascinating studies with him: "We published the first study on pain-avoiding postures in patients with herniated discs, which was a complete novelty"[10]. Two of the papers they wrote were *La hernie retromarginale anterieure* (The anterior retromarginal hernia) and *Les actitudes antalgiques par hernie discale* (Antialgic postures due to herniated discs). A year later, however, he spent the summer in Aix-les-Bains, where he worked with Jacques Forestier, who was already a renowned rheumatologist, helping to compile clinical histories. Rotés proposed to Forestier that they analyse the patients' dossiers. From that study arose a first work on peripheral arthritis in spondyloarthritis, which he followed up with publication of a book on spondyloarthritis ("writing

that book, which was quite successful, was when I made the first discovery", Rotés said[10]).

## Forestier-Rotés Querol disease

To write this book, Rotés and another of Forestier's assistants, François Jacqueline, analysed 200 cases of ankylosing spondyloarthritis. Rotés became aware of something he found strange: "In some extremely rare cases, spondyloarthritis sets in when the patients are very young, but when these patients are old, they have never had pain from spondyloarthritis, have no sacroiliitis, and have some highly particular formations"[10]. He mentioned this to Forestier, who immediately became interested in the subject and gave them two new cases (autopsies). Rotés studied them and reached the conclusion that they were not dealing with spondyloarthritis or spondyloarthrosis. It was then that they described ankylosing vertebral hyperostosis. They presented this study at the joint meeting of the *Ligue Française contre le Rhumatisme and the Heberden Society* held in Paris in June 1950. It was published in *Annals of the Rheumatic Diseases* that same year[12]. The summary of this study[12], written by the authors themselves reads:

> "1) An ankylosing disease of the spine in old people is described, which may be distinguished from ankylosing spondylitis.
> 2) The pathological and radiological features have been studied in nine patients and two necropsy specimens.
> 3) X-ray films reveal the presence of bony outgrowths or hyperostoses, mainly in the dorsal region, but sometimes extending from the upper part of the sacrum to the axis. They arise from the antero-lateral aspect of the vertebral bodies and grow upwards in a 'candle-flame' formation over the lumbar disk spaces; at the level of the dorsal disks they are often thickened. They have a bony structure with a dense cortex similar to that of the head of the femur, the



SENILE ANKYLOSING HYPEROSTOSIS OF THE SPINE*

BY

J. FORESTIER and J. ROTES-QUEROL

*Aix-les-Bains and Barcelona*

Our attention has been drawn to an ankylosing disease of the spine developing in old people, with a painless onset and clinical, pathological, and radiological features distinguishing it from ankylosing spondylitis.

Some descriptions of anatomical specimens in the literature seem similar to those we have found, but no clinical or radiological studies on this subject have been published. Léri (1904) describes pathological changes in the spine of a patient suffering from a condition to which Marie and Astié (1897) gave the rather unsatisfactory name of " heredo-traumatic kyphosis of Bechterew ", and these coincide with our observations; but in Léri's case the patient, an old man, had an angular kyphosis of the Kümmel-Verneuil type consequent upon a fall. Meyer and Forster (1938) have described a similar anatomical condition under the name of "moniliform hyperostosis" affecting the right side of the dorsal spine. Oppenheimer (1942) noticed some ossification of vertebral ligaments in old people without involvement of the joint facets. These patients had adequate vertebral mobility and no symptoms. He considered that these features belonged to the type of ossification associated with ankylosing spondylitis. Lacapère (1949) in his study of osteophytosis of the spine in dried bones often mentions outgrowths which he calls " melorheostosis of the spine ", a term that may lead to confusion with the disease described under this name by Léri. The anatomical description given by Lacapère coincides roughly with those of the other writers and also with that here presented.

**Present Investigations**

The clinical and radiological study of nine cases, combined with necropsy findings in two specimens, has enabled us to set out some of the clinical, pathological, and radiological features, and to form a picture of a specific condition among the ankylosing diseases of the spine.

**Clinical Examination**

*Age.*—The disease has been seen only in persons between 50 and 73 years of age (average 65), an incidence quite different from that of ankylosing spondylitis, which is usually seen in young and middle-aged persons. The age of onset is difficult to fix precisely (except in cases with a clear history of trauma) in view of the insidious evolution of the disease.

* This paper was presented at the joint meeting of the Ligue Française contre le Rhumatisme and the Heberden Society held in Paris, June, 1950.

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First page of the article *Senile ankylosing hyperostosis of the spine* (1950), where J. Forestier and J. Rotés i Querol first described the disease bearing their name[12]

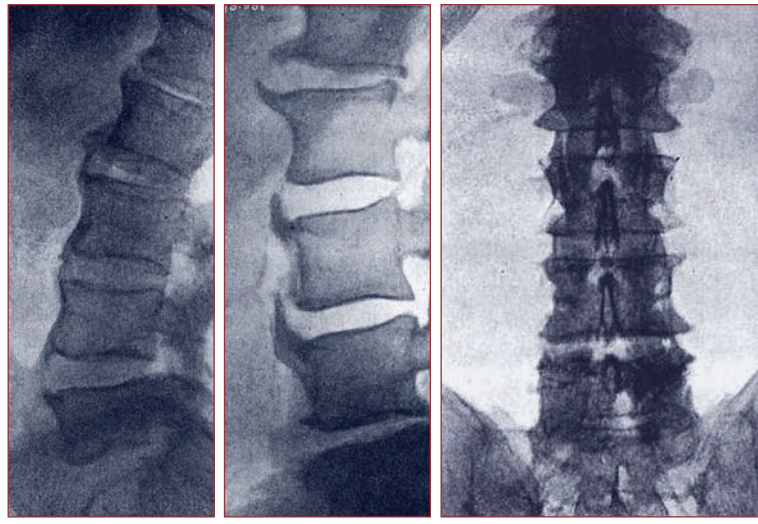
cancellous bone being in continuity with that of the vertebral bodies. They may co-exist with osteophytes, but have entirely different anatomical features.

4) Points of difference between this disease, ankylosing spondylitis, and spinal osteo-arthritis are tabulated.

5) The aetiology and pathogenesis of the condition are discussed.

6) The condition is defined as 'senile ankylosing hyperostosis of the spine'.

7) The mild nature of the symptoms gives little indication for active treatment".



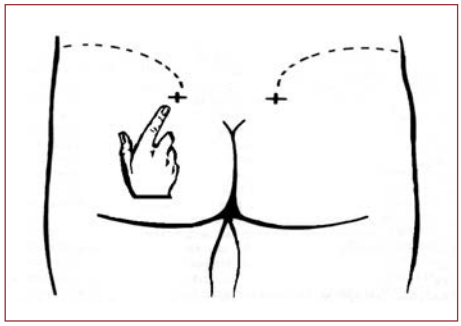
Three of the figures illustrating lumbar involvement in Forestier-Rotés Querol disease[12]

Rotés gave an interesting and detailed review of this disease in one of the chapters of his book *Reumatología clínica* (Clinical rheumatology)[1], starting with Lobstein's introduction of the term hyperostosis to describe increased bone mass in 1833. Even though this disease was not described until 1950, it is very common among vertebrates (it is also found in cats, horses, dogs, whales, and dolphins, and evidence has also been found in fossilised animals: crocodiles, dinosaurs, etc.). In humans, it is found radiologically in 6% of people over 40 years of age and in 12% of those over 70. Rotés also explained that even though in their first description they labelled it "senile", because the patients in the nine cases they studied were between 50 and 73 years old, with a mean age of 65, they dropped this adjective after they discovered numerous cases in 40 to 50 year-olds. However, the disease's link to the aging process in the broader sense was evident.

So, in summary, Forestier-Rotés disease[1], ankylosing vertebral hyperostosis or diffuse idiopathic skeletal hyperostosis[2], as described by

E. Lience, is a diffuse disease of the locomotor apparatus characterised by the calcification and ossification of the common anterior vertebral ligament, which attaches to the body of the vertebra. This condition bears no relation with vertebral osteoarthritis and its aetiology is unknown. It is more frequent in diabetics (with manifest or hidden diabetes). The generally painless process should be suspected when examination reveals rigidity in the lumbar or dorsal region —especially in patients over 50 years of age. The lateral X-ray shows an ossified band that descends attached to the anterior aspect of the vertebral body (above all between T4 and T12); the anteroposterior X-ray shows the band as a bridging shape similar to syndesmophytes on the right-hand side of the thoracic spine. It tends to be absent on the left side, apparently due to the aortic pulse. In the lumbar region, the band is discontinuous and ascending osseous proliferations appear in a candle-flame shape. In the cervical region, the lateral X-ray shows bony formations, sometimes huge, attached to the anterior face of the vertebral bodies, which do not generally form a continuous band. Extra-spinal locations have been reported, including ossifications in insertion sites of tendons and ligaments in the shoulders, knees, hips, feet, ankles, and hands[2,3].

The criteria for diagnosis are threefold: calcification or ossification of the common anterior vertebral ligament on the anterolateral aspect of at least four contiguous vertebral segments; relative sparing of the intersomatic spaces in the affected vertebral segments; and normal radiographic findings for the sacroiliac segments. The prognosis is benign, since it causes little disability. In general, it requires no treatment, apart from analgesics[2]. Although it is often an X-ray finding without repercussions, it can sometimes cause ankylosis and vertebral destabilisation, spinal-cord or visceral compressions, and disorders in the peripheral joints due to para- and juxta-articular ossifications[1]. Occasionally, extrinsic compression of the oesophagus due to exuberant ossifications in the cervical spine can cause dysphagia[3].



Forestier-Jacqueline-Rotés Querol sacroiliac point[7]

Another eponym is derived from Jaume Rotés: "Forestier-Jacqueline-Rotés Querol sacroiliac point"[7]. In the palpation of the sacroiliac joint, this point is situated immediately under the posteroinferior iliac spine, where the base of the articulation is revealed and the finger can detect the presence of pain, evidence of synovitis. One must search carefully and compare it with the symmetric side: it is painful, occurring relatively frequently in any type of sacroiliitis and is, in some cases, the only positive sign. It is recommended to seek it while the patient lies prone across the examination table, so that the base of the joint is maximally revealed and is easier to palpate. It is also the point of choice for the puncture of possible abscesses in infectious sacroiliitis, as well as the incision site for a biopsy.

## Return to Barcelona

Rotés worked for three years with Forestier and then returned to Barcelona. He had also published other works: *Études statistiques sur les simptômes de début de la spondyloarthrite ankylosante* (Statistical studies of initial symptoms of ankylosing spondyloarthritis) and *La spondyloarthrite ankylosante* (Ankylosing spondyloarthritis) with Forestier and Jacqueline.

In 1956, he defended his doctoral thesis at the *Universitat de Barcelona*; entitled *Contribución al estudio de las manifestaciones osteoarticulares de la brucelosis* (Contribution to the study of osteoarticular manifestations of brucellosis). His thesis was supervised by Agustí Pedro i Pons and was published as a book in 1959.

He continued working at *Clínica Mèdica A*, in *Hospital Clínic de Barcelona*, until 1957, when he was appointed head of the Rheumatology Dispensary of the General Pathology Clinic. In 1968, Alfons Balcells i Gorina took over this post, and shortly afterwards the Rheumatology School of the Faculty of Medicine was created. The director was Jaume Rotés[11]. He retired from hospital activity at 67, becoming an honorary consultant of the *Hospital Clínic de Barcelona*.

In his extensive professional life, he was head of the Central Rheumatology Department at *Hospital Clínic de Barcelona* as well as the founder and director of the Professional Rheumatology School at the School of Medicine of *Universitat de Barcelona*, where he was also assistant professor of pathology and professor in charge of the rheumatology courses.

Among other posts, he was president of the *Sociedad Española de Reumatología* of which he was later honorary president. Furthermore, he was a founder and editor-in-chief of *Revista Española de Reumatología* (Spanish Journal of Rheumatology). He was also an honorary member of the American Rheumatism Association (1980).

He published many articles and books. The latter include *Tratamiento actual de los reumatismos, para el médico práctico* (Current treatment of rheumatisms, for the practical doctor), a book that has gone through several editions; *Estudios sobre el síndrome psicógeno del aparato locomotor* (Studies on the psychogenic syndrome of the locomotor apparatus); *La gota* (Gout), with J. Muñoz Gómez; *Semiología de los*

*reumatismos* (Semiology of rheumatisms), with E. Lience and D. Roig i Escofet; *Tratamiento de la artritis reumatoidea: saberes y práctica* (Treatment of rheumatoid arthritis: Knowledge and practice), with R. Sanmartí i Sala; and *Reumatología clínica* (Clinical rheumatology).

Apart from the 1950 article discussed above, he published numerous articles in prestigious national and international journals (*Annals of the Rheumatic Diseases, Arthritis and Rheumatism, British Journal of Rheumatology, Clinical and Experimental Rheumatology, Journal of Rheumatology, The Lancet, Medicina Clínica, Minerva Medica, Revista Clínica Española, Revista Española de Reumatología, Revue du Rhumatisme et des Maladies Ostéoarticulaires, Rhumatologie*, etc.). Two of these articles are especially noteworthy. In 1957, he published with A. Argany in *Revista Española de Reumatología* the article *La laxitud articular como factor de alteraciones del aparato locomotor* (Joint laxity as a factor in abnormalities of the locomotor apparatus), which was the first discussion of this topic to be published. In 1996, he published an editorial in the *British Journal of Rheumatology*[13] where he reviewed, after

On 3 December 2002, the *Generalitat de Catalunya* (Government of Catalonia) awarded Jaume Rotés i Querol the *Creu de Sant Jordi* (Cross of Saint George)

almost half a century, the disease that bears his name under the title *Clinical manifestations of diffuse idiopathic skeletal hyperostosis (DISH)*.

Rotés' work has been widely recognised, as is evident, for example, in the *Liga Reumatológica Española's* prize bearing his name: the Rotés Querol Prize on Quality of Life in Patients with Ankylosing Spondylitis. In 2000, a virtual library was created, specialising in rheumatology. Unique in its category, it bears the name *Biblioteca virtual Jaime Rotés Querol*[14], with the support of the *Sociedad Española de Reumatología*.

On 3 December 2002, the *Generalitat de Catalunya* (Government of Catalonia) awarded him the *Creu de Sant Jordi* (Cross of Saint George), "in recognition of his prestige as a rheumatology specialist, a significant symbol of which is the virtual library in this discipline bearing his name. Among his scientific contributions, his description of a new disease excels: ankylosing vertebral hyperostosis, also known as Forestier-Rotés disease"[15]. A few days later, the *Societat Catalana de Reumatologia*, on the occasion of awarding this prize, paid him homage[16]. He died in Barcelona on 29 January 2008.

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# JOSEP MARIA GIL-VERNET I VILA
# GIL-VERNET OPERATIONS

## The eponyms

Josep Maria Gil-Vernet i Vila (1922-2020)

**Extended pyelotomy or Gil-Vernet operation**. Approach to the renal sinus that enables extraction of kidney stones without injury or trauma to the parenchyma or the excretion channels[1]. It is an extension of standard pyelotomy into the lower pole infundibulum through the avascular plane between the basilar and posterior segmental renal arteries[2]. It allows nearly trauma-free treatment of staghorn calculi[3].

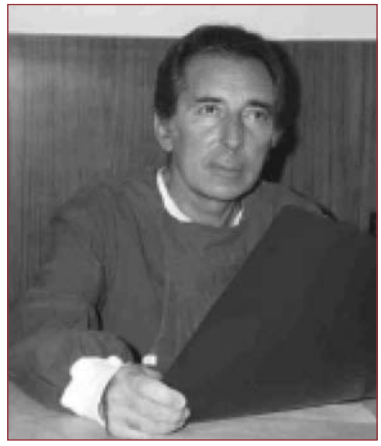
**Trigonoplasty or Gil-Vernet operation**. An intervention to correct vesicoureteral reflux by approximating the ureteral orifices in the trigone; the distal section of the ureters is preserved, preventing the development of obstruction[4]. This procedure can also avoid contralateral reflux[5]. Also known as the Gil-Vernet anti-reflux procedure.

**Vesical autoplasty with a posterosuperior vesical flap or Gil-Vernet operation**. Autoplastic closure of a vesicovaginal fistula[6,7].

## Josep Maria Gil-Vernet i Vila (1922-2020)

Josep Maria Gil-Vernet i Vila was born in Barcelona in 1922 into a family of physicians. His father, Salvador Gil i Vernet, was an anatomy professor and prestigious urologist who also gave rise to a medical eponym[8]. His paternal uncle Emili was a specialist in gynaecology and obstetrics and a professor in this discipline from 1958 until his death (1970), who also founded a dynasty of gynaecologists[9].

Gil-Vernet i Vila received his degree in medicine from the *Universitat de Barcelona*, and undertook his doctoral studies in Madrid, receiving his PhD in 1951. He studied directly under his father, completing his training in urology in 1956. He was head of the Urology Department at *Hospital Clínic de Barcelona*. In 1972, he was appointed extraordinary professor of urology and took on the chair of the professional school from 1973 onward. In collaboration with Antoni Caralps, he conducted the first kidney transplant in Spain (1965). He also was the first surgeon in the world to transplant a human testicle, an operation he undertook with the aid of a team of twenty specialists (1978). In 1983, with Laureano



Josep Maria Gil-Vernet i Vila. c. 1970s

Fernández-Cruz, he conducted the first simultaneous pancreas-kidney transplantation in Spain[10]. He served as vice-rector of the *Universitat de Barcelona* from 1973 to 1980.

On reaching the age of 65, he retired from his positions at *Hospital Clínic de Barcelona* and was succeeded the following year by his disciple, Pablo Carretero[9]. This did not interrupt his professional activity and he continued working at *Clínica Teknon* in Barcelona and other Catalan health institutions during many years. He was appointed professor emeritus at the *Universitat de Barcelona* (1988) and taught at the *Universitat Autònoma de Barcelona* from 1994.

Gil-Vernet's numerous contributions to urological technique have helped to improve the prognosis of many conditions, increasing safety and efficacy: using colonic segments to repair the bladder in bladder cancer and tuberculosis (colocystoplasty); removing kidney stones through the renal sinus; using the recipient's entire urinary tract in renal transplantation; a new retroperitoneal access route to the splenic vessels; renal surgery under hypothermia; orthotopic kidney transplantation; extracorporeal renal surgery for vascular, oncologic, and congenital diseases affecting the kidneys and urinary tract; surgical instruments; a method for obtaining the intraoperative third dimension in operations to remove kidney stones; introduction of intraoperative microscopy in urology and andrology; and microsurgery techniques, to name just a few. He continued to make important contributions after retirement, as demonstrated in his work in urethral reconstructive surgery in paraplegic patients: using flaps from the scrotum, Gil-Vernet managed to replace the damaged urethra successfully[11], solving these serious lesions that result in deterioration in the quality of life of paraplegics and can even lead to death.

Gil-Vernet was also an innovator in teaching his specialty. He began the International Urology Courses, which in their latest editions attracted

over 2,000 participants who could follow operations at *Hospital Clínic de Barcelona* from Barcelona's *Palau de Congressos* conference centre. He made over 90 high quality scientific films, some of which have been recognised through international prizes, such as the first Golden Eagle Prize[12].

He also received highly prestigious honours in Catalonia and Spain as well as international distinctions. Furthermore, he was a visiting professor at different Spanish and foreign universities and an academic of the *Reial Acadèmia de Medicina de Catalunya*. He received the Narcís Monturiol (1986) and Josep Trueta (1999) prizes from the *Generalitat de Catalunya* (Government of Catalonia), as well as the prestigious Francisco Díaz Medal from the *Sociedad Española de Urología* (2002). In April 2001, the International Exhibition of Inventions of Geneva awarded him the Gold Medal for an "adjustable prosthesis for correction of urinary incontinence" which managed to eliminate urine leakage in women in whom surgical treatments had failed.

Josep Maria Gil-Vernet died in Barcelona on 5 March 2020.

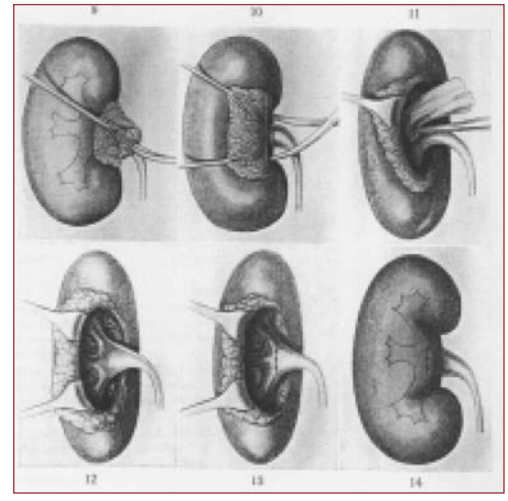
## Gil-Vernet operations

Like other physicians, such as Barraquer i Roviralta or Arruga, Josep Maria Gil-Vernet is known for several operations bearing his name, some of which are listed at the head of this chapter. In fact, over 40 procedures are associated with his name. We will discuss only three of these: extended pyelotomy, trigonoplasty or anti-reflux operation, and vesical autoplasty with a posterosuperior vesical flap.

In 1965, Gil-Vernet published a detailed article entitled *New surgical concepts in removing renal calculi*[3], where he reviewed the status of surgery for renal lithiasis. The article began: "We must admit that our

techniques now in use for the surgical treatment of renal lithiasis do not always allow an easy and safe removal of the calculi. They are not always innocuous to the kidney and leave a considerable number of postoperative complications". Gil-Vernet went on to criticise common surgical procedures such as oblique lumbotomy, exteriorising the kidney from its capsule, and vertical pyelotomy, while describing the complications derived from these procedures. The article continued with a description of his surgical technique based on a posterior vertical lumbotomy, *in situ* renal surgery, intrasinusal approach to the pelvis and the renal calyces, transverse pyelotomy, and longitudinal calicotomy. Gil-Vernet's innovations were the extracapsular renal sinus approach, allowing greater visibility of the renal sinus and access to all the calyces up to the fornix, the absence of bleeding in the parenchyma and the excretory ducts, visual localisation of the kidney stones in the calyces, and extraction of inarticulate staghorn calculi in a single piece. In Gil-Vernet's own words:

> "The technique which we present is extremely simple. It consists of identifying the ureteropelvic junction reflecting towards the kidney the




Gil-Vernet pyelotomy technique for extracting kidney stones[3]

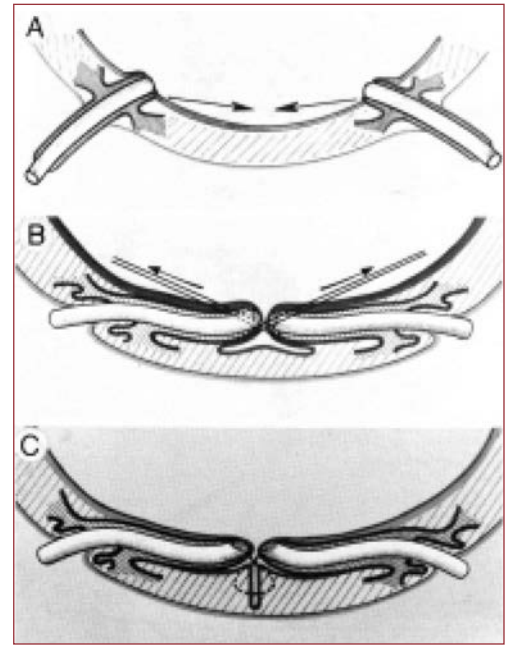
> peripelvic cellular tissue with the aid of very curved blunt-pointed scissors. By a blunt dissection, the adventitia of the pelvis is freed from the peripelvic adipose cellular tissue. The scissors must enter in direct contact with the adventitia. When entering underneath the capsular diaphragm, the scissors will be opened energetically thus tearing the diaphragmatic circle which offers a slight resistance. We are at present at the entrance of the sinus placing immediately an adequate retractor which pulls the mass of the peripelvic adipose tissue, the internal lip of the posterior edge of the kidney and the retropelvic vessel: the whole of this is reflected upwards without the danger of tearing the parenchyma, which, being protected by the capsule and peripelvic fat has a great resistance and elasticity. At this moment, a wet and unfolded gauze is progressively introduced into the sinus until filling it, the gauze is withdrawn and another retractor of the same size or smaller size is introduced. With both retractors the posterior part of the kidney is firmly lifted up making the organ turn, so that the sinusal space offers itself perpendicularly to the surgeon with a complete view of the pelvis and the posterior aspect of the major calices. When this manipulation is correctly carried out, it is completely bloodless"[3].

This description by Gil-Vernet revolutionised operations for renal lithiasis, opening a new field in the options for reconstructive surgery of the renal excretory tracts. Later in the same article, Gil-Vernet would describe the second part of the operation, with the phase of incision by transverse intrasinusal pyelotomy. He rejected the vertical incision employed until then as not respecting the anatomy and resulting in complications. Basing his case on his anatomical knowledge, Gil-Vernet defended transverse pyelotomy in the same direction as the pyelic musculature that, if it was done in the upper part of the pelvis, enabled a view of the entrance of the calyces, making it easier to explore them. This approach also made it possible to detect stenosis and perform corrective pyeloplasty if necessary. According to Gil-Vernet, transverse pyelotomy reduced the number and severity of complications, avoided the leakage of urine, and

significantly reduced hospital stays. Gil-Vernet summarised his historical article affirming that "… this new surgery is secured for renal lithiasis: undoubtedly less traumatic, more selective, more efficacious and safer than that which is performed nowadays"[3]. Time has proved him right.

Another of Josep Maria Gil-Vernet's contributions was a technique for correcting vesicoureteral reflux. In 1984, he published an article entitled *A new technique for surgical correction of vesicoureteral reflux*[4]. Until then –and even nowadays in many centres– correction of this anomaly meant dissection and re-implantation of the affected ureter, complex and difficult procedure. Gil-Vernet proposed a much simpler, faster procedure.

In this case, Gil-Vernet employed the anatomical knowledge he had gained from his father and his fathers' disciples. He indicated that there existed a

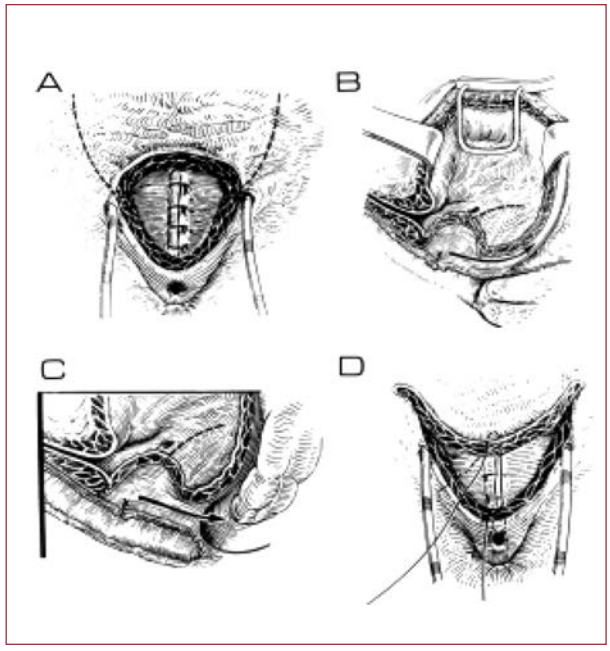



Schematic representation of Gil-Vernet anti-reflux procedure. A) Advancing the ureters across the trigone. B) Traction sutures are used to show the desired result. C) On completion, the ureteral orifices are near the midline and the submucosal ureter has been elongated, preserving the intrinsic and extrinsic periureteral musculature[4]

megatrigone associated with reflux and that the intrinsic muscular fibres of the transmural ureter could provide a sphincteric action that would avoid reflux. Furthermore, conservation of the musculature in the terminal ureter could be important for preventing reflux. Bearing in mind such considerations, Gil-Vernet proposed that stitching the trigone to reduce the space around the ureterovesical junctions would be sufficient to prevent reflux. This simple procedure was employed in cases of unilateral and bilateral reflux with notable success: a study published fifteen years later showed that the frequency of contralateral reflux was much more common after the ureteral re-implantation procedure (26%) than after Gil-Vernet procedure (6%)[5].

In 1988 Gil-Vernet turned his attention to correcting vesicovaginal fistulas[6]. Problems often appeared in patients who had undergone complex or complicated operations, or multiple re-operations that caused significant changes to the perifistulous tissue close to the ureteral meatus or bladder neck or significant changes to bladder capacity as well as in those who had alterations from irradiation. Gil-Vernet described a procedure to treat these complex fistulas[6].

Gil-Vernet and colleagues proposed a transversal incision in the bladder dome to obtain a clear image of the lesions. They placed ligatures in the fistulous orifice and the fibrous tissue; the excision had to be extended to the well-vascularised tissue and the healthy bladder wall. During the process of dissecting the layers of tissue involved in the fistula, the plane between the vaginal walls and bladder had to be separated carefully. The resected area was closed with a flap obtained through a bilateral, symmetric incision diverging from the upper part of the injury toward the bladder dome. Finally, an incision made through the cul-de-sac allowed the flap to advance. The flap with the wide upper base was easily brought down in the direction of the bladder neck and attached with single-layer sutures. This procedure has since been employed by numerous surgeons, some of whom have reported significant success rates[7].




Autoplasty procedure for vesicovaginal fistulas with a posterosuperior bladder flap. A) Autoplasty. A flap is obtained from two bilateral, symmetrical divergent incisions towards the bladder dome. B) Lateral view of the extraperitoneal approach with the detachment of the bladder dome from the peritoneum. C) Transperitoneovesical approach. When the uterus is absent, incision through the cul-de-sac allows for peritoneuvesical flap advancement. D) View of the correct method of suturing the flap, excluding mucosa[6]

Gil-Vernet operations meant improvements in many surgical procedures that were previously associated with significant complications. Some of these directly threatened the patient's life; others worsened their quality of life. His good anatomical knowledge, magnificent surgical technique, and imagination gave rise to solutions to common problems that were difficult to resolve. Sometimes he accomplished this with new surgical approaches, other times with new procedures, instruments, or devices, but always with the same objective: ensure the urologist's actions improve prognoses, so patients can enjoy an improved quality of life. It is no wonder that Llobera[12] considered Josep Maria Gil-Vernet "one of the twentieth century's most eminent urologists".

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# JOSÉ MARÍA CAÑADELL I CARAFÍ
# CAÑADELL TECHNIQUE

## The eponym

**Cañadell technique**. A surgical procedure used on malignant tumours in long bones in children, consisting of physeal distraction, tumour excision preserving the epiphysis, and replacement of the extracted tissue with a bone graft. It avoids amputation of the limb while achieving a high cure rate, often preserving the functionality of the affected limb[1].

José María Cañadell i Carafí (1923-2014)

## José María Cañadell i Carafí (1923-2014)

José María Cañadell i Carafí was born in Barcelona in 1923. He graduated in medicine in 1946 and worked in Prof. Piulachs' department[2], where he specialised in traumatology. He would later work at the *Hospital del Sagrat Cor*, in the Department of Orthopaedic Surgery and Traumatology, then headed by Santos Palazzi, where he remained for six years. During that time he undertook specialisation internships at the Tuscan Orthopaedic Institute in Italy. In 1953, he joined the *Hospital de la Creu Roja* as head of the Department of Orthopaedic Surgery and Rehabilitation, focused especially on paediatric orthopaedics. He was appointed assistant director five years later. The previous year, his qualifications as a specialist in orthopaedic surgery and traumatology were recognised. He earned his doctorate in 1966 with the thesis *Verificación de los factores locales que influyen en la actividad del cartílago de crecimiento*[3] (Verification of the local factors that influence the activity of growth cartilage).

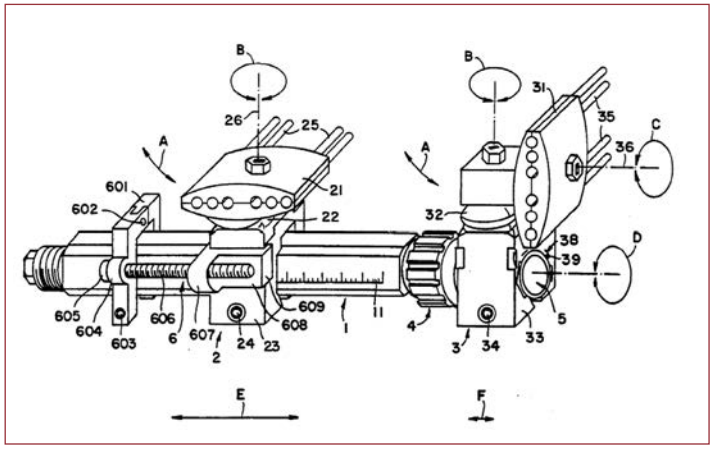
In 1968, he took the decision that would determine the course of his professional career when he accepted the post of permanent professor and director of the Department of Orthopaedic Surgery and Traumatology at the *Clínica Universidad de Navarra*[4]. The decision was not easy, since Cañadell was giving up a comfortable professional situation to take on a new challenge, albeit an exciting and potentially significant one. Time would show he had made the right choice.

At the *Universidad de Navarra* there was much to be done. Created in 1952, it opened its faculty of medicine two years later, but from the consulting standpoint it began its activities in 1962 with the opening of the first phase of a 19-bed clinic. Shortly afterwards, work began on the second phase, increasing its capacity to 200 beds; the expanded clinic opened in 1969[5]. That was when Cañadell was invited to join the team, to

lead the new department of orthopaedic surgery and traumatology. In the following years, Cañadell took on extensive academic responsibilites. He was appointed full professor and director of the clinic in 1968, the latter post one he would occupy until 1989. These years coincided with the centre becoming recognised as a first-class consulting and research institution. He was also vice dean of the Faculty of Medicine[3].

During this entire period, Cañadell's activity was ceaseless. He edited over 20 books and monographs, directed or co-directed 35 doctoral theses, and participated in numerous meetings in his specialty. His innovative activity also led him to design, jointly with Juan Lazo de Zbikowski an external fixator for which he even obtained a patent in the USA[6]; the device was marketed by the company Stryker Howmedica. In 2009, he published, with Mikel San Julián, the book *Pediatric bone sarcomas: Epiphysiolysis before excision*, compiling his extensive experience in treating these bone tumours.

He was president of the *Societat Catalana de Cirurgia Ortopèdica i Traumatologia* (1964-1966), the *Sociedad Española de Cirugía*




External fixator with *"controllable damping"*, invented by Cañadell and Lazo[6]

*Ortopédica y Traumatología* (1970-1972), the *Sociedad Española para el Estudio de la Osteosíntesis* (1972-1981), the AO Foundation (1972-1981), and the European Paediatric Orthopaedic Society (1993-1995). He was an honorary member of the *Sociedad Española de Microcirugía*, the *Sociedad Andaluza de Cirugía Ortopédica y Traumatología* and the *Asociación Española de Medicina y Cirugía del Pie* among others. He was a founding member of the European Musculo-Skeletal Oncology Society. Outside Europe, he was an honorary member of the societies of Orthopaedic Surgery and Traumatology of Venezuela, Chile, and Argentina, as well as of the *Asociación Médica Argentina*. He was awarded the Gold Medal of the Spanish Red Cross (1968) and the Gold Medal of the *Universidad de Navarra* (1997). His achievements were also recognised in 2006 when he was nominated honorary president of the 43th Congress of the Society of Orthopaedic Surgery and Traumatology, held in Barcelona[4]. In 2008, he was named honorary president of the European Federation of National Associations of Orthopaedics and Traumatology (EFORT).

After retirement, Cañadell continued to live in Pamplona, where he had arrived over 40 years before. He continued to visit the *Clínica*, where he was affectionately acknowledged for his contributions to making it a medical centre of reference. He died on 19 March 2014 in Pamplona.

## Cañadell technique

Until the 1970s, primary malignant bone tumours in children, especially osteosarcoma and Ewing sarcoma, had an extremely poor prognosis. Early metastases meant that amputation of the limb for tumours in leg bones had virtually no effect on survival, which was 12 to 18 months after diagnosis. At that time Cañadell considered that amputations were of little value to treat the disease, since he observed practically no

José María Cañadell i Carafí (right), and Mikel San Julián Aranguren (left), presenting the book they co-edited, *Pediatric bone sarcomas: epiphysiolysis before excision.* Pamplona, 2009

improvement in the prognosis and outcomes were so poor[7]. This all changed with the application of chemotherapy.

When chemotherapeutic treatment began to be employed to treat childhood osteosarcoma, it became possible to halt systemic dissemination and improve survival. Cañadell challenged traditional thinking regarding limb amputation, proposing to undertake conservative surgery excising the bone tumour, generally located in the diaphysis, while conserving the rest of the limb. This option was not universally accepted at first, and Cañadell was berated at international meetings for his willingness to assume the risk of avoiding amputation, the unanimously accepted treatment at that time[7]. Cañadell was convinced that the problem of the disease was not the primary tumour but dissemination, especially pulmonary metastases. In this sense, he defended the concept, which was slowly gaining ground, that cancer was in fact a disease that had to be treated systemically and that excising the tumour was just one part of the treatment.

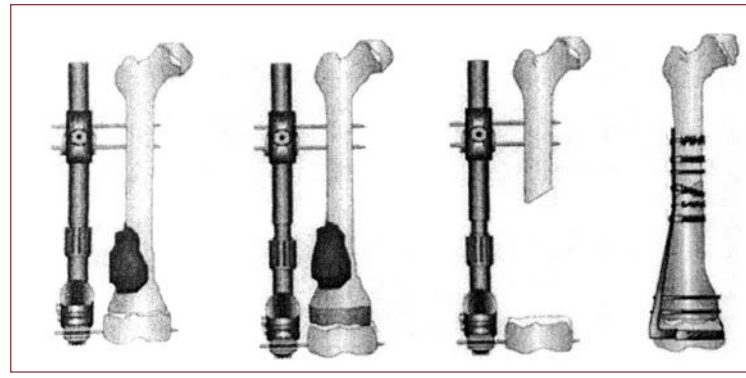
If chemotherapy improved the prognosis, was there a difference between limb amputation and excision of the tumour? Cañadell believed there was not. Furthermore, he thought excision might be able to

maintain the functionality of the limb —an especially important factor in children. These premises led Cañadell to devise his technique.

In July 1984, his surgical team first used his new technique to operate on a first child[7] with an osteosarcoma, and the following month they used it for the second time, on a child with an osteoblastic osteosarcoma. Both children were alive in 1994 when Cañadell published his article explaining the technique in detail and the results of the first eight operations[1]. First, he recommended that it should only be applied when the tumour was located in the metaphysis, when the epiphyseal cartilage can be opened and the tumour did not invade it. The latter was an important point, ensuring that the cartilage could be kept completely free of disease with absolute certainty. Cañadell verified this with all the methods at his disposal: radiology, angiography, CT scans, magnetic resonance imaging, and histological examination.

Once the decision to excise the tumour is taken, the technique is applied as follows. First, two needles are positioned in the epiphysis and in the diaphysis, the latter 8 cm to 10 cm above the tumour. Then the needles are connected to a retractor, and progressive distraction is begun until a 2 cm opening is achieved. This procedure takes nearly 15 days and is carried out while the patient is undergoing chemotherapy. The second phase consists of excising the entire tumour in a single piece with wide margins yet without touching the epiphysis or its cartilage. The third phase starts after histological confirmation that the margins of the surgical specimen are free of tumour. Then a bone graft is inserted. When the epiphysis is affected, it is resected and the limb is rebuilt using other methods, which might include a prosthesis or arthrodesis[1].

In his first article[1], Cañadell reported a series of 20 patients with a mean follow-up of 54 months. Only one case had recurred and only three patients had died from pulmonary metastases. So the survival rate was 85%; the function of the affected limb was deemed good or excellent in

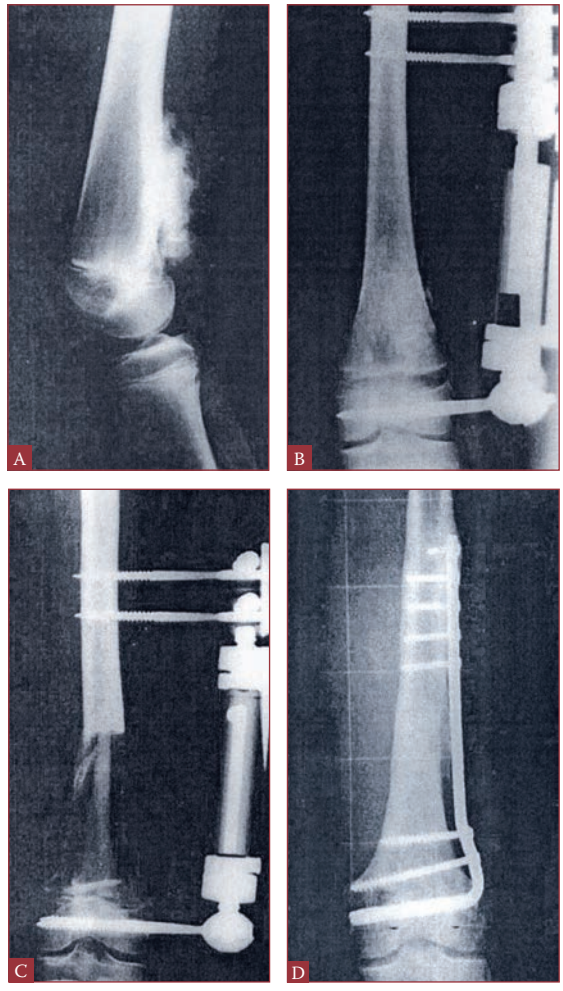


Representation of the various stages of Cañadell technique, in this case on a tumour in the femur[1]

half the patients. The huge contribution of Cañadell's technique was to avoid amputation and conserve the epiphysis with its cartilage, enabling the preservation of the joint's functionality. As he wrote in his article[1]:

> "When resecting a tumour, the surgeon must be certain that no malignant tissue is left behind and most authors agree that a 5 cm margin is safe. This means that, when the tumour is in the metaphysis, resection requires the loss of the adjacent joint. Our technique, using previous physeal distraction, avoids the loss of the epiphysis. We believe that when the growth cartilage is present, a margin of safety is provided by the cartilage itself and that the 5 cm margin suggested by most authors may in fact be unnecessary. The view is supported by the fact that no tumour recurred locally in the retained epiphyses."

Twenty years after the first operation, Mikel San Julián and his group, who have continued Cañadell's work in surgical treatment of bone tumours, published a review of their experience[8]. In the article, they described the application of the technique in 40 children under 10 years old with osteosarcoma or Ewing sarcoma who were monitored for 5 to 19 years. The survival rate was 75% and functional recovery was deemed good or excellent in 70% of cases. Twenty years of experience allowed




X-rays showing an osteosarcoma in a 14-year-old boy: (A) before treatment, (B) after epiphyseal distraction, (C) resection of the tumour and graft from the contralateral tibia, and (D) eight years after the operation[1]

them to conclude: "Limb salvage is a real possibility even in young children with bone sarcomas". Cañadell technique has meant that, for many children and their families, bone cancer has become a nightmare that will end, often enabling them to go on to lead a nearly normal life.

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# JOAQUIM BARRAQUER I MONER
# BARRAQUER CATARACT EXTRACTION TECHNIQUE

## The eponym

**Barraquer technique or enzymatic zonulolysis**.
A cataract extraction technique using α-chymotrypsin. Zonulolysis consists of luxating the zonule of Zinn using locally instilled α-chymotrypsin. It is a method conceived by Joaquim Barraquer to aid surgical extraction of cataracts[1].

Joaquim Barraquer i Moner (1927-2016)

## Joaquim Barraquer i Moner (1927-2016)

Joaquim Barraquer i Moner was born in Barcelona on 26 January 1927. He was the son of Ignasi Barraquer i Barraquer[3] and Josefa Moner i Raguer; like his brother Josep Ignasi[4], Joaquim studied medicine at the *Universitat de Barcelona*, graduating in 1951. A few years later (1955), he defended his doctoral thesis *Potencialización farmacodinámica en oftalmología* (Pharmacodynamic potentialisation in ophthalmology)[2] at the *Universidad de Madrid*[5]. From a very young age he was interested in the natural sciences, biology, and mechanics. Despite a keen interest in engineering, coming from an important family of ophthalmologists, he chose ophthalmology early on.

While just 13 years old and still in secondary school, he helped his father in cataract operations. As he explained: "I began to watch my father's work at 11 years old. He spent many hours attending patients, working in the laboratory, studying medical histories, and doing surgery. In fact, I recall my father operating on a cataract when I was 13, and I was watching and helping him"[6]. During his studies at the faculty he continued to train alongside his father, and when he graduated he joined the *Centre d'Oftalmologia Barraquer* permanently, where from the start he combined visiting patients with research and teaching[6,7]. Two years after graduating, he was already running specialised ophthalmology courses for postgraduates at the *Institut Barraquer* while working as chief surgeon at *Clínica Barraquer*. Four years after that, he was named vice-president of the *Institut Barraquer* and in 1961 he became the centre's executive director[8]. He founded the *Banc d'Ulls de Barcelona* (the first eye bank in Europe) and was its director. When his father died, it was he who removed his corneas, transplanting them the same day; likewise, years later when his mother died, he was the one who transplanted her corneas.

Joaquim Barraquer i Moner at the age of 13 with his father, Ignasi Barraquer i Barraquer[6]

He and his wife, Mariana Compte, whom he had met in 1952, had three children, two of whom, Elena (1954) and Rafael Ignasi (1956), continued the family's ophthalmologist tradition.

His teaching activity was always intense, both as an adjunct to his research and consulting and at university, where he was professor of ocular surgery at the *Universitat Autònoma de Barcelona* and director of the *Escola Professional d'Especialització Oftalmològica* at the I*nstitut Barraquer*, ascribed to the same university.

His best-known contribution in the field of ophthalmology was enzymatic zonulolysis, a technique that bears his name. He was a pioneer in the inclusion of intraocular lenses, having also designed some. In 1964, along with his brother, Josep Ignasi, he developed a special microscope for microsurgery using a slit microscope that allows biomicroscopy and a view of an "optical cut" of the transparent areas of the eye. In 1965, in collaboration with the optical engineer Hans Littmann, he invented another special microscope for filming microsurgery procedures.

Furthermore, he designed numerous instruments and developed diverse original operating techniques for treating different ocular symptoms[6]. Examples of the instruments he designed are a keratoprosthesis model, an anterior chamber lens model, anterior chamber lens pincers, an eyelid separator-aspirator, a multi-perforated cannula for aspirating vitreous humour, and a pincer for extracting sutures. Examples of the techniques he devised include peripheral iridectomy in penetrating keratoplasty to avoid pupillary block, and the simultaneous operation consisting of keratoplasty, trabeculectomy, cataract extract, inclusion of the lens in the posterior chamber, vitrectomy, and reconstruction of the iris diaphragm[5].

He published many books and about 400 scientific articles; he also made over 100 films on surgical or experimental techniques (the earliest in 1953), some of which won prizes at scientific film festivals.

His professional and personal prestige were recognised through numerous prizes and awards, including the Josep Trueta Medal for Health Merit (2000), awarded by the *Generalitat de Catalunya* (Government of Catalonia), and the Gold Medal accrediting him as "Ophthalmologist of the Millennium", awarded by the International Academy for Advances in Ophthalmology at the III International Conference on Advances in Ophthalmology in Mumbai (India), also in 2000.

Joaquim Barraquer died in Barcelona on 26 August 2016.

## Barraquer cataract extraction technique: enzymatic zonulolysis

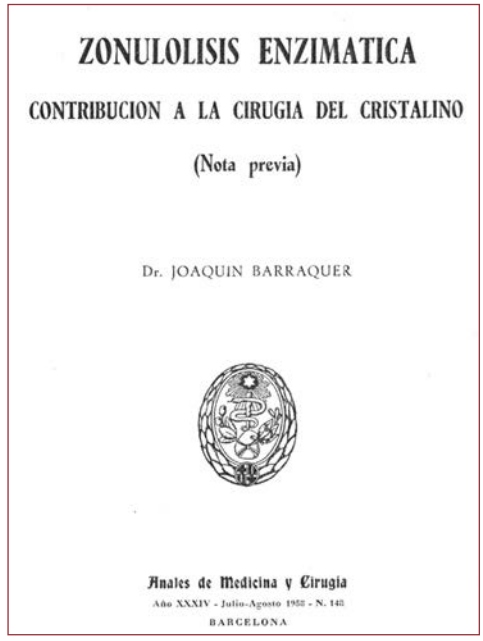
In 1957, Joaquim Barraquer discovered the action of α-chymotrypsin on the zonule and developed the technique known as "enzymatic zonulolysis" or "Barraquer technique". This discovery was the result of extensive research that, as he explained, to a certain extent continued a line of research begun by his father[3]:

> "You ask me whether I managed to finish any of my father's research that he was unable to complete? —I recall that in the conversations we had, he would often toss around a particular idea. He said: 'We need to find something to soften the zonule, which is the ligament that holds the cataract within the eye, so we can extract it more easily'. In 1917, my father had invented the erysiphake that bears his name […] but the problem persisted in young patients as that ligament was too firm and made the operation difficult. Until one day I discovered the effect of a digestive enzyme, α-chymotrypsin, that, when injected during the operation into the eyeball's posterior chamber about two minutes before the extraction, produces a lysis of the zonule, enabling effortless extraction. I was thereby able to put one of my father's wishes into practice"[7].

From left to right, Joaquim Barraquer i Moner, his father Ignasi Barraquer i Barraquer, and his older brother Josep Ignasi Barraquer i Moner. Barcelona, c. 1963

Joaquim Barraquer presented the early results of this novel technique on 8 April 1958 at the *Reial Acadèmia de Medicina de Barcelona* in a paper entitled: *Zonulolisis enzimática. Contribución a la cirugía del cristalino (nota previa)* (Enzymatic zonulolysis: Contribution to lens surgery [preliminary note])"[9] published in *Anales de Medicina y Cirugía* the same year[10]. As he introduced the paper, Joaquim Barraquer explained:

> "For some time our investigations have been directed towards finding a 'chemical zonulotomy'. As often occurs in research, serendipity pointed to the solution. After we injected a 1/500 α-chymotrypsin solution into the vitreous chamber of a patient with massive haemorrhage in the vitreous humour that had not been reabsorbed after a year of treatment, during the first wound care a day later, we observed that the lens had luxated in the vitreous humour".


ZONULOLISIS ENZIMATICA

CONTRIBUCION A LA CIRUGIA DEL CRISTALINO

(Nota previa)

Dr. JOAQUIN BARRAQUER

Anales de Medicina y Cirugia

Año XXXIV - Julio-Agosto 1958 - N. 140

BARCELONA

Cover of the article reproducing the conference given by Joaquim Barraquer at the *Reial Acadèmia de Medicina de Barcelona* on 8 April 1958[9], in which he first presented enzymatic zonulolysis

And later: "Luxation of that lens suggested that α-chymotrypsin might be the substance we had sought for years, and, with the aim of verifying that such luxation was not due to the mechanical effect of lavage, we carried out the following [...]". The experimental research on the technique was done in several stages: first on rabbits, later on enucleated human eyes from cadavers, and, lastly, *in vivo* on blind human eyes (functionally useless human eyeballs). They used different concentrations of α-chymotrypsin, from 1/1,000 to 1/30,000. The results, which enabled them to systematise a new operating technique using α-chymotrypsin 1/5,000, showed that:

> "In all cases we have been able to verify during the operation, along with zonular lysis, the absolute integrity of the hyaloid membrane and the lens capsule. The course of the operation was completely normal; we observed no inflammatory reactions in the neighbouring structures or alterations in the transparent media. Our experiences lead us to believe that enzymatic zonulolysis opens a new path in lens surgery that will allow the erysiphake technique to be used in patients of all ages, supplanting extracapsular extractions [...]. Total extraction of the transparent lens in extreme myopia can be performed in patients of all ages".

This new technique, enzymatic zonulolysis, was also published in 1958 in *Acta Ophthalmologica*; last paragraph of this publication said:

> "Our experience makes us believe that the enzymatic zonulolysis opens a new field in the surgery of the crystalline lens, making it possible to perform intra-capsular lens extraction at any age. Total intracapsular extraction of the transparent crystalline lens will be possible at any stage, eliminating the classical Sperino-FuLala-Vacher operation with all its inconveniences. The presumed risks of retinal detachment will diminish, since the tractions required for the mechanic rupture of the zonula are avoided"[11].

ACTA OPHTHALMOLOGICA 1958

*From the Barraquer Institute, Barcelona*

ENZYMATIC ZONULOLYSIS

*Contribution to the Surgery of the Crystalline Lens**)
*(Preliminary Note)*

BY

*Joaquin Barraquer*

It is well known that the usual cataract operation holds many dangers to the eye. This is true whether the extracapsular or intracapsular method is used. Especially in young persons, the zonular resistance is usually so great that attempts at intracapsular extraction are fraught with dangers of vitreous loss, retinal detachment, etc. Many authors have, therefore, tried various procedures for safer zonulotomy (Stock, Lopes D'Andrade, Kirby, Larmande, etc.).

For some time our investigations have been directed towards finding a chemical zonulotomy. We discovered by chance that the lens was luxated at the first dressing three days after an injection into the vitreous of a solution of Alpha-chymotrypsine, diluted 1:5000. This was done in order to dissolve a one-year old haemorrhage into the vitreous.

Alpha-chymotrypsine is a proteolytic enzyme like trypsine, but differs from it in its chemical composition. Several types, alpha, beta, gamma, delta, and pi, may be distinguished. They are obtained from the pancreas of a calf by activation of the chymotrypsinogen. Alpha-chymotrypsine is more stable and has a greater ability to diffuse than the other types. Like crystallised trypsine, it is an endopeptidase, but Alpha-chymotrypsine especially attacks the chains containing aromatic amino-acids (phenilalanine, tyrosine, tryptophane, methionine, norleucine and norvaline).

The proteolytic capacity of Alpha-chymotrypsine is greater than that of trypsine because it also acts as an exopeptidase, hydrolysing external amino-acids which have a free aminic group (amino peptidase). It has further an esterific action on different esters like those of phenylacetic acid. It also seems to possess a dissolvent action on some types of molecular structures.

In the commercial product, »Quimotrase«*) (P.e.v.y.a.), which has been

*) Received April 22nd 1958.
*) Made by Laboratorio P.E.V.Y.A., Barcelona.

803

Acta Ophthalmol. Vol. 36, V

First page of the article on enzymatic zonulolysis by Joaquim Barraquer, published in A*cta Ophthalmologica* (1958)[11]

So this procedure hugely aided intracapsular or total extraction of the cataract (also in Barraquer's words): "We can compare the old method to the modern one as if, instead of tearing a dry stamp off an envelope, we soak it first so that, once the glue has softened, it comes unstuck smoothly and more easily"[6].

As well as the exposition and publication of the results, that year (1958) he made different films showing this technique, including, among others, *Zonulolisis enzimática. Estudio experimental* (Enzymatic zonulolysis: experimental study) and *Zonulolisis enzimática. Acción de la alfa-quimotripsina sobre la zónula. Práctica de la intervención. (Un ojo mediante fermento, el otro por el método clásico)* (Enzymatic zonulolysis:

action of alpha-chymotrypsin on the zonule. Doing the intervention [one eye using the digestive enzyme, the other the classic method]). He presented the results at the *LXV Congrès de la Société Française d'Ophtalmologie* and at *Les Entretiens Annuels d'Ophtalmologie* in Paris, where he showed his film *Zonulolyse enzymatique*[5] (Enzymatic zonulolysis).

News of the technique's success spread rapidly worldwide and enzymatic zonulolysis has become one of the most commonly employed techniques for total cataract extraction.

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# PERE, JOSEP AND RAMON BRUGADA I TERRADELLAS
# BRUGADA SYNDROME

## The eponym

**Brugada syndrome**. A clinical and electrocardiographic syndrome described in 1992 by the Brugada brothers. Genetically determined, it is caused by a mutation in the genes that control the sodium channel. The clinical syndrome is characterised by sudden death in the absence of demonstrable heart disease; the electrocardiographic features are right bundle branch block and elevation of the ST segment in the right precordial leads (V1-V3)[1].

From top to bottom: Pere, Josep and Ramon Brugada i Terradellas

## Pere, Josep and Ramon Brugada i Terradellas

It is not common for a medical eponym to be linked to several members of the same family. There are certainly families we could label "eponymous", such as the Barraquer or Gil-Vernet families, but only on rare occasions do different members of the same family contribute to the genesis of a single eponym. For this reason, Brugada syndrome is an exceptional case among medical eponyms worldwide. This is one of the most significant contributions in the recent history of Catalan medicine.

Pere, Josep and Ramon Brugada i Terradellas were born in Banyoles, the sons of Ramon Brugada and Pepita Terradellas. They also had a sister, Dolors, who died prematurely in 2007. Their father managed a poultry and rabbit slaughterhouse, where he worked long hours every day. Her husband's long hours in an unpleasant job convinced Pepita that her sons had to study hard to achieve a different professional standing. She also ensured they studied English, convinced that the language would be necessary for their futures. The couple's efforts paid off when all three brothers chose careers in medicine and have become internationally renowned in the field of cardiac arrhythmias.

## Pere Brugada i Terradellas (1952)

Pere Brugada was born on 11 August 1952 and graduated in medicine from the *Universitat de Barcelona* at the age of 22. He specialised in cardiology at *Hospital Clínic de Barcelona* (1976-1979) and later transferred to the *Universiteit Limburg* (the Netherlands) to train in cardiac electrophysiology (1979-1980). He was assistant professor at this centre (1980) and later, director of the Clinical Electrophysiology Laboratory (1982-1990). He earned his doctorate at the same university (1982). In 1984, he was appointed associate professor, head of the

## Pere Brugada i Terradellas

Division of Coronary Diseases at the Interuniversity Cardiology Institute (1988) and chair of cardiology (1989) at the *Universiteit Limburg*. In 1990, he resigned his posts at the Dutch institutions and transferred to Belgium, where he was appointed member of the Cardiovascular Centre of the OLV Hospital in Aalst, a post he occupied until 2007. That year he was appointed head of the Centre for Arrhythmia Treatment at *Vrije Universiteit Brussel* and director of the Postgraduate Program in Cardiac Electrophysiology at the same university, where he currently does research and consulting. He has received numerous professional accolades, including the Fritz-Acker Stiftung award from the German Cardiac Society (1999), the Mirowski Prize (twice, in 1999 and 2008), the Josep Trueta Prize (1999), Cardiologist of the Year in France (2001), the Josep Trueta Medal from the *Generalitat de Catalunya* (Government of Catalonia) (2001), the Finland's Paavo Nurmi Foundation medal (2003), the Gold medal of the European Society of Cardiology (2003), and the *Grand Prix scientifique* from the *Fondation Lefoulon-Delalande - Institut de France* (2019).

Josep Brugada i Terradellas

## Josep Brugada i Terradellas (1958)

Josep Brugada was born on 13 June 1958. He graduated in medicine from the *Universitat de Barcelona* (1981) and earned his PhD from the same university (1987). From 1983 to 1987 he worked in the cardiology department at the *Hôpital Saint Eloi* in Montpellier (France), obtaining the qualification of specialist in cardiology from the *Université de Montpellier* where he was a researcher in the Cardiovascular Physiology Laboratory. In 1988, he transferred to Limburg (the Netherlands), where he remained until 1991. At the *Universiteit Limburg*, he was a researcher for the Royal Dutch Academy of Arts and Sciences as well as a professor in the department of physiology. He returned to Catalonia in 1992 when he was appointed director of the arrhythmias section at *Hospital Clínic de Barcelona* a post he occupied until 2004. From 1992 onward, he also directed the Paediatric Arrhythmias Unit at *Hospital Sant Joan de Déu* and the Arrhythmias Unit of the *Centre Cardiovascular Sant Jordi* in Barcelona. In 2004 he was appointed director of the *Institut Clínic del Tòrax* and the following year head of the cardiology department at *Hospital Clínic de Barcelona*. From 2009 to 2015, he was the medical director of *Hospital Clínic de Barcelona*, where he is now senior consultant in cardiology and full professor of medicine at the *Universitat de Barcelona*.

Josep Brugada has collected numerous acknowledgments. In 1991, he was the first non-resident researcher in the USA to receive the first prize in cardiology from the American College of Cardiology. He received the Fritz-Acker Stiftung award from the German Cardiac Society (1999), the Josep Trueta Prize (1999), and the Jaume I Prize in Clinical Medicine in 2015. He was named *Doctor honoris causa* by the *Universidad San Pablo CEU* in Argentina, by the *Universidad de Tucumán* and by the *Universidad del Sur*, Bahía Blanca (Argentina). He is past-president of the European Heart Rhythm Association and was a member of the Consulting Council of the North American Society of Pacing and Electrophysiology and the Research and Training Committee of the European Society of Cardiology. He was vice-president of the *Sociedad Española de Cardiología* (2003-2005).

## Ramon Brugada i Terradellas (1966)

Ramon Brugada was born on 1 September 1966. He graduated in medicine from the *Universitat Autònoma de Barcelona* (1990) and two years later moved to the USA to specialise. Beginning his postgraduate training in internal medicine at Emory University in Atlanta, he obtained

Ramon Brugada i Terradellas

his specialist qualification in 1995. Later, he began his specialisation in cardiology at the Baylor College of Medicine in Houston (1995-2000), where he was also an assistant professor (2000). The following year he was recognised as a specialist in cardiology, thereby completing his postgraduate training. In 2002, he moved to the state of New York on being appointed director of the Molecular Genetics Program at the Masonic Medical Research Laboratory in Utica; he was also employed as a cardiologist at the New York Heart Center in Syracuse, a post he occupied until 2005. That year he decided to move to Montreal to head the Clinical Cardiovascular Genetics Centre at the *Institut de Cardiologie de Montréal*. During those years he was very active academically, as a visiting professor in the Department of Medicine at the *Université de Montréal* (2005-2008), at Mount Sinai Medical School in New York (2006), and at Keio University in Japan (2006-2007). Ramon Brugada lived in Montreal until 2008 when he decided to return to Catalonia to help launch the Faculty of Medicine at the *Universitat de Girona*, serving as its dean. He is currently chief of cardiology at Girona's *Hospital Universitari Doctor Josep Trueta*, director of the Cardiovascular Genetics Centre at the *Institut de Recerca Biomèdica de Girona* and associate professor of medicine at the *Universitat de Girona*.

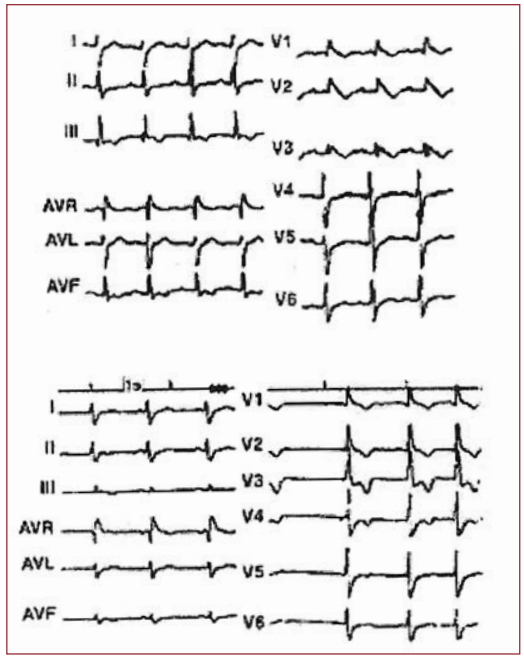
Ramon Brugada has received numerous accolades for his scientific contributions, such as first prize for Young Researchers from the American College of Cardiology (1997), the Fritz-Acker Award from the German Cardiac Society (1999), the Josep Trueta Prize (1999), the Mirowski Prize (1999), and first prize from the Heart Foundation of the *Sociedad Española de Cardiología* (2001). In 2010, he was appointed as permanent member of the *Reial Acadèmia de Medicina de Catalunya*.

## Brugada syndrome

The first reference to Brugada syndrome thus labelled is in Miyazaki et al.[2], who wrote in 1996: "In the present report, we refer to such unique ECG findings associated with symptoms most likely due to ventricular tachyarrhythmias as Brugada syndrome. High take-off ST segment elevation of either the coved or saddleback type in precordial leads $V_1$ to $V_2$/$V_3$ seems to be a prominent feature of this syndrome".

But, where did it all start? In Limburg, Pere and Josep Brugada had visited the first patient with this syndrome in 1986. The patient was a three-year-old Polish boy who had had several episodes of syncope that had even led to his father performing resuscitation techniques on him. The boy's sister had died suddenly when just two years old, after several episodes that might have caused sudden death but which they had been able to avert. When they reviewed the children's ECGs, they observed they were clearly abnormal yet shared very similar characteristics. Over the following years, they discovered two patients with similar characteristics. This enabled them to prepare a paper that they delivered at the meeting of the North American Society of Pacing and Electrophysiology, held in 1991[3]. After gathering data from four more patients, thanks to the cooperation of other colleagues, they published their first article reporting the series in 1992[4]. The findings observed on the ECGs were not new, but until then they had been interpreted as normal variants rather than abnormalities related to sudden death[5].

In fact, specialists had suspected that something was going on, but had been unable to identify the cause. During the 1980s, members of the Centers for Disease Control and Prevention in the USA had observed an increase in sudden deaths in young immigrants from Southeast Asia. It was not an unknown phenomenon for these communities. For example, in Thailand this manner of death was known as *Lai Tai* (death during



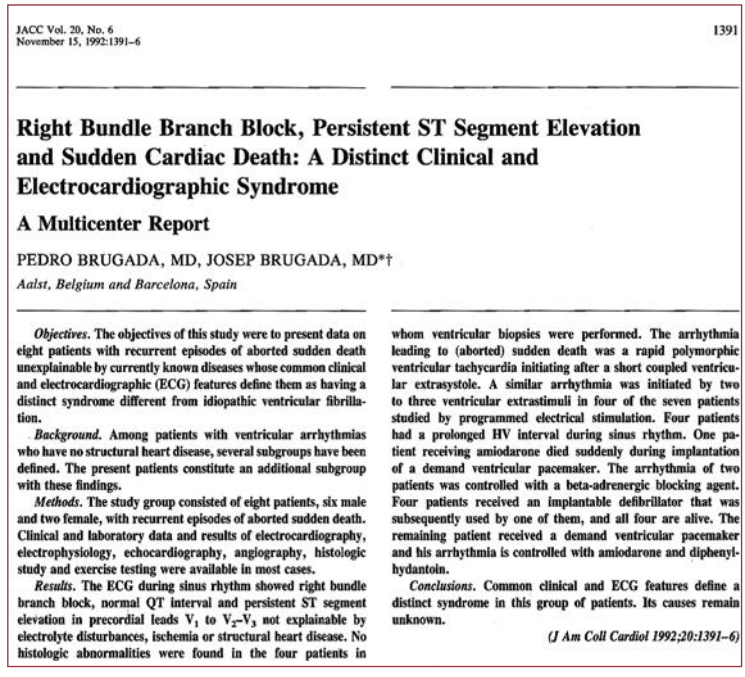

Electrocardiograms of the first patients diagnosed with Brugada syndrome[5]

sleep) and was interpreted magically as due to the action of the ghosts of widows carrying off the victims, generally young men. To avoid this fate, it was not uncommon for young men to dress in women's clothing when going to bed, to trick the ghost. In the Philippines, the phenomenon was called *Bangungut* (a cry of grief followed by sudden death during sleep) and in Japan, *Pokkuri* (unexpected sudden death during sleep)[6]. In some of these countries, the incidence of sudden death was high. In Thailand, it was the most frequent cause of death in young men[6]. It is now known that many of these young men could have suffered from Brugada syndrome and that the high prevalence in this geographic area is due to genetic transmission. It has been calculated that the incidence of sudden death is 26 to 38 per 100,000 men/year in some regions of Thailand[6]. It is believed that Brugada syndrome could be the most frequent cause of sudden death in people under 50 years old without heart disease[7].

In the years following the initial description, numerous research projects defined the characteristics of the disease. Nearly 60% refer to prior cases of sudden death in the family or cases of the syndrome itself. Its transmission is autosomal dominant, and it affects more men than women. This genetic link was definitively established in 1998 when it was discovered that the intimate mechanism was due to defects in chromosome 3 that affect the expression of the cardiac sodium channel[8]. Three mutations have been described, affecting exon 28, intron 7, and subtraction of a nucleotide A in gene SCN5A (locus 3p21) of this channel. The mutations are different from those present in other cardiac alterations that can produce arrhythmias, such as the long QT syndrome or right ventricular dysplasia[7]. The biophysical consequence is a decrease in the entry of sodium, whether due to a quantitative reduction or to a qualitative dysfunction of the channels[9]. Notwithstanding, in recent years four new genes have been found that could be associated with the syndrome and which would complicate its definition more. Thus, the mutation A280V to GPD1-L (glycerol-3-phosphate dehydrogenase I-like) would give rise to decreased function of the sodium channel[10]. But it is not just the sodium channels that are implicated. More recently, mutations have been found in the genes CACNA1c and CACNB2b, which codify the calcium channels[11], and in KCNE3, which codifies a beta protein regulating the transient potassium Ito currents[12]. Such variants would explain that not only the sodium channel is involved, as had originally been suggested. What must occur for the syndrome to appear is an imbalance in the ionic currents in phase I of the cardiac action potential[9].

It is not entirely clear how genetic alterations are finally linked to sudden death. For example, apparently healthy people have the characteristic ECG abnormalities, but have never had symptoms (syncope, arrhythmia, or sudden death)[7]. That does not mean that one day the syndrome might not appear with sudden death as its first manifestation. Neither is what causes the precipitation of arrhythmias thoroughly understood. So,

patients with a completely normal heartbeat suddenly present fast, polymorphic ventricular arrhythmias. In some cases, there may be a link to vagal or adrenergic stimulation, but sometimes it is not associated with any stimulation of the autonomic nervous system[7]. From the pathophysiological viewpoint, it would seem that the ventricular arrhythmias would be the consequence of the difference in the duration of the action potential among the epicardial and endocardial cells of the ventricle. As a result, the predominance of the transient potassium current in the epicardium would give rise to a shortening of the duration of the action potential due to the absence of phase 2. In the endocardium, the action potential remains normal, and that originates an electric gradient in phase 2 that can produce renewed epicardial excitation in the endocardium in phase 2[7].



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1391

**Right Bundle Branch Block, Persistent ST Segment Elevation and Sudden Cardiac Death: A Distinct Clinical and Electrocardiographic Syndrome**

**A Multicenter Report**

PEDRO BRUGADA, MD, JOSEP BRUGADA, MD*†
*Aalst, Belgium and Barcelona, Spain*

*Objectives.* The objectives of this study were to present data on eight patients with recurrent episodes of aborted sudden death unexplainable by currently known diseases whose common clinical and electrocardiographic (ECG) features define them as having a distinct syndrome different from idiopathic ventricular fibrillation.

*Background.* Among patients with ventricular arrhythmias who have no structural heart disease, several subgroups have been defined. The present patients constitute an additional subgroup with these findings.

*Methods.* The study group consisted of eight patients, six male and two female, with recurrent episodes of aborted sudden death. Clinical and laboratory data and results of electrocardiography, electrophysiology, echocardiography, angiography, histologic study and exercise testing were available in most cases.

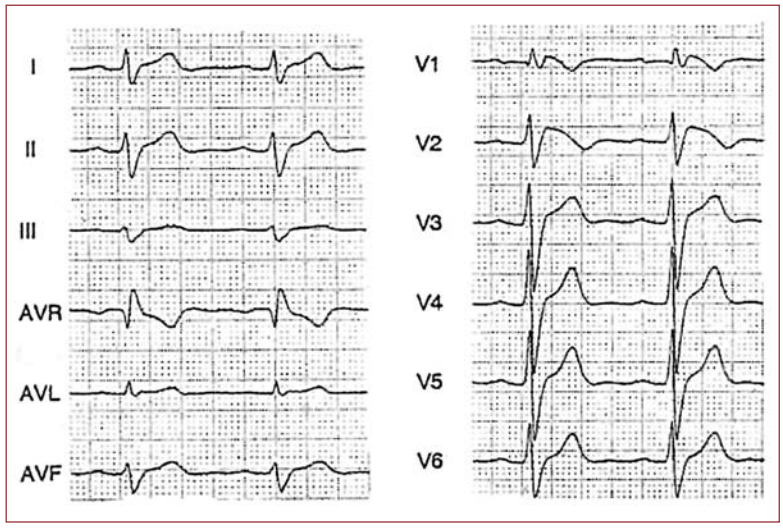
*Results.* The ECG during sinus rhythm showed right bundle branch block, normal QT interval and persistent ST segment elevation in precordial leads $V_1$ to $V_2$–$V_3$ not explainable by electrolyte disturbances, ischemia or structural heart disease. No histologic abnormalities were found in the four patients in whom ventricular biopsies were performed. The arrhythmia leading to (aborted) sudden death was a rapid polymorphic ventricular tachycardia initiating after a short coupled ventricular extrasystole. A similar arrhythmia was initiated by two to three ventricular extrastimuli in four of the seven patients studied by programmed electrical stimulation. Four patients had a prolonged HV interval during sinus rhythm. One patient receiving amiodarone died suddenly during implantation of a demand ventricular pacemaker. The arrhythmia of two patients was controlled with a beta-adrenergic blocking agent. Four patients received an implantable defibrillator that was subsequently used by one of them, and all four are alive. The remaining patient received a demand ventricular pacemaker and his arrhythmia is controlled with amiodarone and diphenylhydantoin.

*Conclusions.* Common clinical and ECG features define a distinct syndrome in this group of patients. Its causes remain unknown.

*(J Am Coll Cardiol 1992;20:1391–6)*

First page of the article describing the first series of patients with Brugada syndrome[4]

Clinically, the full syndrome is manifested as episodes of polymorphic ventricular tachycardia with a pattern of right bundle branch block of the ST segment in V1-V3[7]. The result is a syncope that is resolved spontaneously if the episode ends, but leads to sudden death if it persists. It is not always clear at the start. It is relatively frequent for affected patients to be diagnosed with vasovagal syncope or idiopathic syncope. Over time, ECG monitoring enables the problem to be detected; in other cases, everything becomes clear when the administration of anti-arrhythmic drugs finally enables the syndrome to be diagnosed[7]. In contrast, the diagnosis is relatively easy if there is a typical ECG in a person who has recovered from a syncopal episode. Sometimes, however, the ECGs are atypical and special care must be taken when monitoring until it appears. In the ECG, elevation of the ST segment greater than or equal to 2 mm in more than one right precordial lead (V1-V3), followed by negative waves, is considered conclusive for the diagnosis[7].




Characteristic ECG in Brugada syndrome, showing ST-segment elevation and findings similar to right bundle branch block in the precordial leads V1–V3[7]

The prognosis of the disease is not good. If the patients recover from the syncope or the situation that could have led to sudden death, it is highly likely that a further episode will appear (in a third of cases, within the next two years). In asymptomatic cases, the prognosis is the same. However, implanting a defibrillator notably improves the prognosis, since the apparatus detects and effectively treats the episodes of ventricular fibrillation[7]. Drug therapy is also being developed. Several drugs have been assayed, including drugs that inhibit outward potassium currents and those that increase ICaL calcium currents. Among the former, quinidine has been successfully used[13], while among the latter, isoproterenol, a β-adrenoreceptor agonist, has also shown efficacy in cases of repeated arrhythmias[14].

Investigations into Brugada syndrome represent an excellent example of medicine in the early twenty-first century. The conjunction of diverse disciplines —epidemiology and genetics to explain the illness in the affected populations, molecular biology and biophysics to understand its mechanism, and cardiology to reach the diagnosis and establish treatment— has enabled progress from magical explanations of ghostly widows to tracing the disorder's molecular basis.

Recently, a new electrocardiogram phenomenon, known with the eponym Brugada phenocopy, has been described. Brugada phenocopies are clinical entities that are etiologically distinct from true congenital Brugada syndrome. Brugada phenocopies are characterized by type 1 or type 2 Brugada electrocardiogram (ECG) patterns in precordial leads V1-V3. However, Brugada phenocopies are elicited by various underlying clinical conditions such as myocardial ischemia, pulmonary embolism, electrolyte abnormalities, or poor ECG filters. Upon resolution of the inciting underlying pathological condition, the Brugada phenocopy ECG subsequently normalizes[15-18].

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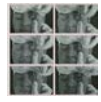

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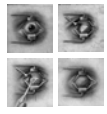

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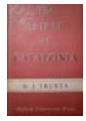

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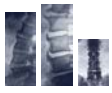

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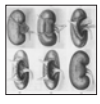

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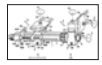
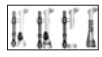
p. 265: Autoplasty procedure for vesicovaginal fistulas with a osterosuperior bladder flap. A) Autoplasty. A flap is obtained from two bilateral, symmetrical divergent incisions towards the bladder dome. B) Lateral view of the extraperitoneal approach with the detachment of the bladder dome from the peritoneum. C) Transperitoneovesical approach. When the uterus is absent, incision through the cul-de-sac allows for eritoneuvesical flap advancement. D) View of the correct method of suturing the flap, excluding mucosa. In: Gil-Vernet JM, Gil-Vernet A, Campos JA. New surgical approach for treatment of complex vesicovaginal fistula. J Urol. 1989;141:513-6.

p. 269: José María Cañadell i Carafí (1923-2014). ©SECOT.

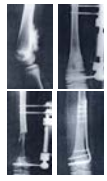


p. 271: External fixator with "controllable damping", invented by Cañadell and Lazo. In: Cañadell J, Wagenknecht MH, Lazo de Zbikowski J, inventors; Stryker Trauma SA, assignee. External fixator with controllable damping. United States Patent. Patent Number: 5,207,676. Date of patent: May 4, 1993.

p. 273: José María Cañadell i Carafí (right), and Mikel San Julián Aranguren (left), presenting the book they co-edited, Pediatric bone sarcomas: epiphysiolysis before excision. Pamplona, 2009. ©Universidad de Navarra.



p. 275: Representation of the various stages of Cañadell technique, in this case on a tumour in the femur. In: Cañadell J, Forriol F, Cara JA. Removal of metaphyseal bone tumors with preservation of the epiphysis. J Bone Joint Surg Br. 1994;76-B:127-32.



p. 276: X-rays showing an osteosarcoma in a 14-yearold boy: (A) before treatment, (B) after epiphyseal distraction, (C) resection of the tumour and graft from the contralateral tibia, and (D) eight years after the operation. In: Cañadell J, Forriol F, Cara JA. Removal of metaphyseal bone tumors with preservation of the epiphysis. J Bone Joint Surg Br. 1994;76-B:127-32.

p. 279: Joaquim Barraquer i Moner (1927-2016). ©Barraquer Archive.

p. 281: Joaquim Barraquer i Moner at the age of 13 with his father, Ignasi Barraquer i Barraquer. In: Centro de Oftalmología Barraquer. Barcelona: Centro de Oftalmología Barraquer; 1991. p. 27-37.

p. 283: From left to right, Joaquim Barraquer i Moner, his father Ignasi Barraquer i Barraquer, and his older brother Josep Ignasi Barraquer i Moner. Barcelona, c. 1963. ©Barraquer Archive.

p. 284: Cover of the article reproducing the conference given by Joaquim Barraquer at the *Reial Acadèmia de Medicina de Barcelona* on 8 April 1958, in which he first presented enzymatic zonulolysis. In: Barraquer J. Zonulolisis enzimática. Contribución a la cirugía del cristalino (nota previa). Comunicación a la Real Academia de Medicina de Barcelona. Barcelona, 8 April 1958.

p. 286: Barraquer J. Enzymatic zonulolysis. Contribution to the surgery of the crystalline lens (preliminary note). Acta Ophthalmol. 1958;36(5):803-6.

p. 289: Pere Brugada i Tarradellas (1952). ©Editorial Panamericana.

p. 289: Josep Brugada i Tarradellas (1958). ©Editorial Panamericana.

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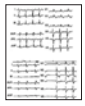
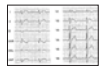


p. 296: Electrocardiograms of the first patients diagnosed with Brugada syndrome. In: Brugada.org [Internet]. Fundació Ramon Brugada Senior. Available at: http://www.brugada.org/. Accessed 20 February 2020.

p. 298: Brugada P, Brugada J. Right bundle branch block, persistent ST segment elevation and sudden cardiac death: a distinct clinical and electrocardiographic syndrome. J Am Coll Cardiol. 1992;20:1391-6.



p. 299: Characteristic ECG in Brugada syndrome, showing ST-segment elevation and findings similar to right bundle branch block in the precordial leads V1–V3. In: Brugada J, Brugada R, Brugada P. La síndrome de Brugada. Ann Med. 2000;83:44-6.

Medical eponyms are names that derive from other proper nouns,such as the name of a person, an institution, a city or even a country. Eponyms are used to describe any medical concept, such as diseases, syndromes or tests.

The authors' professional background as medical doctors and their interest in language, terminology and history of medicine led them to research the origins and history behind medical eponyms of their homeland, Catalonia. They have published more than 100 articles on medical eponyms of Catalan origin, mainly in Catalan language, in the last twenty years.

This book compiles, for the first time in English, a selection of Catalan medical eponyms. Each chapter not only describes the origins of each eponym but a brief biography and the work of the individuals who gave their name to a medical term.

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