

# JOSEP MARIA GIL-VERNET I VILA

## GIL-VERNET OPERATIONS

### The eponyms

**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<sup>1</sup>. It is an extension of standard pyelotomy into the lower pole infundibulum through the avascular plane between the basilar and posterior segmental renal arteries<sup>2</sup>. It allows nearly trauma-free treatment of staghorn calculi<sup>3</sup>.

**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<sup>4</sup>. This procedure can also avoid contralateral reflux<sup>5</sup>. 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<sup>6,7</sup>.



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

## 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<sup>8</sup>. 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<sup>9</sup>.

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<sup>10</sup>. 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<sup>9</sup>. 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<sup>11</sup>, 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<sup>12</sup>.

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

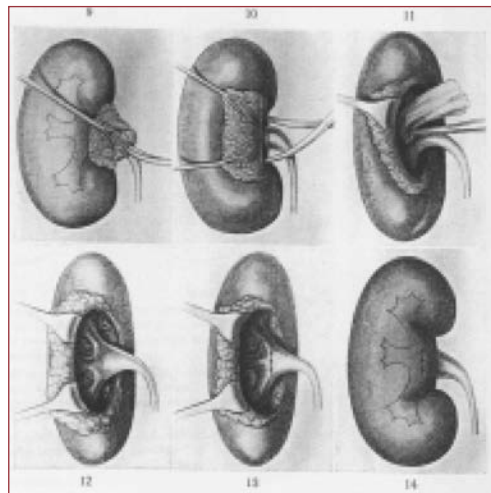
Like other physicians, such as Barraquer i Roviralta or Arruga, Josep Maria Gil-Vernet is known for several operations bearing his name, some of which are listed at the head of this chapter. In fact, over 40 procedures are associated with his name. We will discuss only three of these: extended pyelotomy, 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*<sup>3</sup>, 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<sup>3</sup>



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"<sup>3</sup>.

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

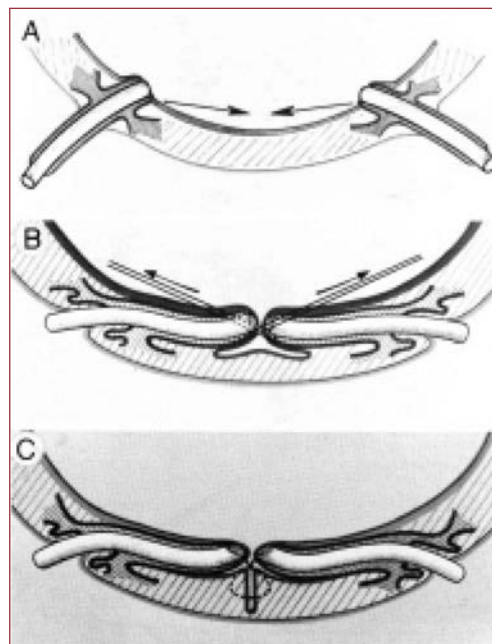
significantly reduced hospital stays. Gil-Vernet summarised his historical article affirming that "... this new surgery is secured for renal lithiasis: undoubtedly less traumatic, more selective, more efficacious and safer than that which is performed nowadays"<sup>3</sup>. Time has proved him right.

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*<sup>4</sup>. 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<sup>4</sup>

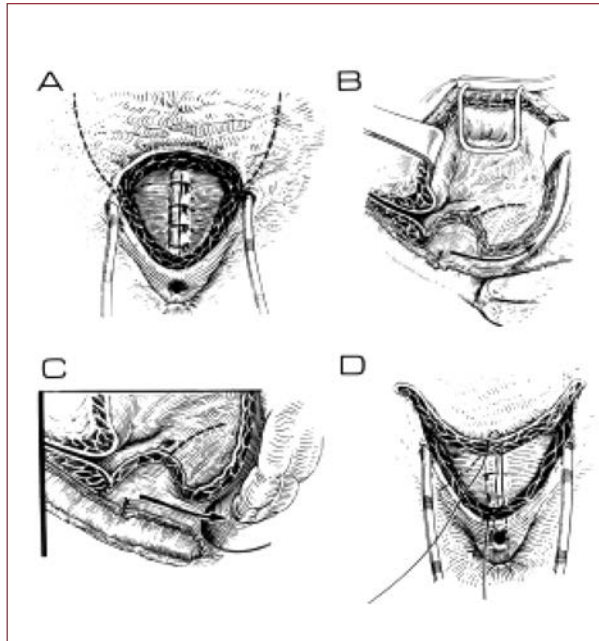


megatrigone associated with reflux and that the intrinsic muscular fibres of the transmural ureter could provide a sphincteric action that would avoid reflux. Furthermore, conservation of the musculature in the terminal ureter could be important for preventing reflux. Bearing in mind such considerations, 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%)<sup>5</sup>.

In 1988 Gil-Vernet turned his attention to correcting vesicovaginal fistulas<sup>6</sup>. 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<sup>6</sup>.

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<sup>7</sup>.





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 peritoneovesical flap advancement. D) View of the correct method of suturing the flap, excluding mucosa<sup>6</sup>

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<sup>12</sup> considered Josep Maria Gil-Vernet "one of the twentieth century's most eminent urologists".

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