Actas Urológicas Españolas. 2011;**35(2)**:115–118

Actas Urológicas Españolas

www.elsevier.es/actasuro

DEXTERITY AND INGENUITY

Ureterocalicostomy: a forgotten surgical technique?

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Received March 10, 2010; accepted September 20, 2010

KEYWORDS
Ureterocalicostomy;
Anastomosis;
Hydronephrosis

Abstract
Introduction: Ureterocalicostomy is a surgical technique that is rarely indicated and that urologists currently apply very occasionally.
Materials and method: Patient suffering from phymical consequences with a right pyelical retraction cicatricial process, which resulted in obstructive uropathy of the upper and mid caliceal system, excluding the lower caliceal system. We performed a surgical exploration and ureterocalicostomy with successful results. In the very long term, the patient is cured and has normal kidney functionalism.
Results: We present the technical results of the surgery and, from a present-day perspective, we review the indications of this technique and the determining factors required to obtain good results.
Conclusion: Ureterocalicostomy is a technique that present-day urologists have almost forgotten, which is still indicated in some cases and still has effective premises. For this reason, urologists that perform reconstructive surgery must know this technique and include it in their surgical arsenal.

PALABRAS CLAVE
Ureterocalicostomía;
Anastomosis;
Hidronefrosis

La ureterocalicostomía: ¿una cirugía olvidada?

Resumen
Introducción: La ureterocalicostomía es una técnica quirúrgica que tiene escasas indicaciones y que los urólogos utilizan muy raramente en la actualidad.
Material y método: Se presenta una paciente con un proceso cicatricial de retracción piélica derecha, que condicionaba uropatía obstructiva sobre los sistemas caliciales superior y medio, y que excluía el sistema calicial inferior. Se llevó a cabo exploración quirúrgica y se efectuó ureterocalicostomía con resultado exitoso. A muy largo plazo la paciente se encuentra curada y con normofuncionalismo renal.
Resultados: Se presentan los detalles técnicos de dicha cirugía y se revisan, desde una perspectiva actual, las indicaciones de esta técnica y los condicionantes necesarios para obtener un buen resultado.

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0210-4806/$ - see front matter

Conclusión: La ureterocalicostomía es una técnica casi olvidada por el urólogo actual, que mantiene vigentes aún algunas indicaciones y premisas. Por ello, debe conocerse y tenerse presente en el arsenal quirúrgico del urólogo dedicado a la cirugía reconstructiva.

Introduction

Ureterocalyceal anastomoses or ureterocalicostomies are classic surgical interventions that are rarely indicated today, given that initial or repeated kidney stone surgery is hardly performed; neither is there a need to perform reconstructive surgery on a pyelic retraction or lumbar ureter stricture process secondary to urinary tuberculosis. Currently, the technique mostly indicated is paediatric hydronephrosis and its reoperation.[1] In fact, the average urologist may perform a ureterocalicostomy once or twice throughout his/her professional life.[2] Despite being indicated very rarely, a urologist must be familiar with this type of operation, given that it may prevent performing nephrectomies in the case of a healthy contralateral kidney or permanent urinary diversion in the case of a single kidney.

Problem

We present the clinical case of a 42-year old woman diagnosed with renal tuberculosis in 1990, for which she had received conventional medical treatment (triple-drug for three months and double-drug during the following six months). We could say that the process was cured from a clinical and bacteriological point of view. However, despite the absence of micturition syndrome, she continued to feel a dull and frequent pain in her right lumbar fossa. The urographic control examination showed a pyelic retraction healing process of the right kidney, which conditioned obstructive uropathy on the upper and median calyceal systems (fig. 1a). A renal scan showed good conservation of the kidney cortical both in its middle third and in its upper third. We decided to apply surgical treatment and proposed an alternative decision between a nephrectomy or conservative surgery, depending on our intraoperative findings.

By means of a right posteroexternal lumbotomy with subperiosteal resection of the XII rib, we exposed the kidney, which had an acceptable upper and middle morphological appearance, although its lower part presented an indented contour. The pelvis was totally retracted in the renal sinus with abundant sclerolipomatosis. We performed a partial guillotine excision nephrectomy and proceeded with the ureterocalicostomy on a medial calyx with mucomucosal sutures, attaching them to the surrounding parenchyma given the weakness of the calyceal wall. We checked that this calyceal system communicated amply with the rest of the renal cavities and we applied an unload nephrostomy and at the same time we tutorized the anastomosis with a double J catheter (fig. 2). There were no postoperative complications and we removed the nephrostomy and ureteral catheter after 12 and 14 days respectively after checking permeability and the absence of urinary extravasation at any level.

Figure 1 Preoperative (A) and postoperative (B) urographic image.

The pathological anatomy of the partial nephrectomy part presented parenchyma with areas of both medullary and cortical destruction with frequent areas of granulomatous inflammation formed by epithelial cells, Langhans-type multinucleated cells and lymphocytes. Other areas showed lymphoplasmacytic infiltration in the interstice and focal glomerular hyalinosis. The urographic control carried out three months after the operation showed progressive recovery of the right intrarenal urinary tract, with good passage through the ureterocalyceal anastomosis. The patient had no symptoms and was not examined until

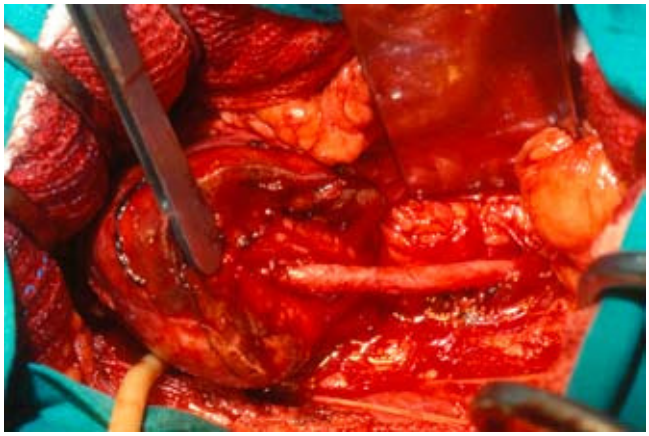

Figure 2 Details of the surgery with the anastomosis completed.

2009, when a complete urological study was performed, highlighting the intravenous urography with images of full recovery of the right kidney with normal function of the ureterocalyceal anastomosis performed 19 years before (fig. 1b).

Commentary

One of the first references of a ureterocalicostomy with good results is owed to Neuwirt in 1947.[3] The first successful communication in French literature was that of Cibert and Durant.[4] That same year, Manetti and Siracusano carried out an experimental study of ureterocalyceal anastomosis in dogs. They united the ureter to the lower calyx between the two valves of a nephrotomy and only obtained four good results out of ten dogs operated.[5] Subsequently, Covelaire et al. provided fifteen personal cases and completely reviewed the subject, correctly establishing the technique and its indications.[6]

The procedure may be indicated initially or in the case of surgical findings that oblige to change the surgical approach. These are basically: syndrome of the pyeloureteral union in which a conventional pyeloplasty cannot be performed, whether it is the first treatment or repeated surgery;[7] complications of kidney stone surgery;[8] treatment of the renal consequences of renal tuberculosis;[3,9] drainage of horseshoe kidneys;[5] in the treatment of renal trauma, although exceptionally; drainage of the lower calyceal diverticula and finally, in the conservation of a kidney transplant associated with ureteropyelic ischemia, which cannot be repared by other means. The primary indications for a ureterocalicostomy also include hydronephrosis in infants and children.[1] Certain kidney anomalies such as renal ectopia, renal fusion anomalies and malrotation in which the lower calyx may be the most dependent area for urinary drainage, may make ureterocalicostomy preferable to conventional pyeloplasty.

In our case, it was the consequences of the healing and fibrosis of treated and sterilized kidney tuberculosis. This type of lesions with pyelic retraction are the first indications for this technique, provided that ample intercommunication of the rest of the calyces is guaranteed and there is no stricture of their neck and anastomosis on an excluded calyx is avoided. Retractions and exclusions of the excretory tract are evidence of the sclerotic-reactive organization that materially "suctions" to the urinary tract towards the stenotic lesion.

From a physiopathological point of view, we observed how the intrarenal urinary flow can continue through the calyceal path after the renal pelvis and the ureteropyelic union are removed. In kidneys dilated due to urinary obstruction, urinary drainage in the most dependent area can be successful. Pyelic contraction and its physiological reflux is taken advantage of for free evacuation through the calyx following a pyelocalyceal anastomosis. Experimentally, we found that the anastomosized lower calyx is progressively covered with a stratified pavement epithelium similar to the renal pelvis epithelium,[4,5] which facilitates the functionalism of the new ureterocalyceal anastomosis.

The preoperative study may suggest the need for this surgery when imaging tests (urography, renal scan) show significant calyceal and minimum pelvic dilatations are shown. The discovery of both a significant dilatation of the lower calyx with a more dependent and more accessible situation than the pyeloureteral union may lead to an inclination to choose this technique. To obtain a good result, the selection of patients is fundamental and the technical principles established must be complied with.

Applying technical details meticulously achieves better results. The extremitas inferior renis must be resected transversally until the mucosa of the calyx that must protrude by 1 or 2 cm outside the margin of the parenchymatous section is amply exposed. The anastomosis must not be included and covered by the renal parenchyma, as fibrosis inevitably leads to anastomotic stricture. The renal capsule is approximated and attached with some sutures to the wall of the infundibulum, covering the renal section. The operation concludes with a small nephrostomy and intubation of the anastomosis with a fine catheter inserted in the bladder. The drainage is removed 24-48 hours later when there is no collection; the ureteral catheter is removed after 7-9 days. A week later, a descending pyelography is performed by means of a nephrostomy tube and if there is no extravasation, it is removed. After 5-6 weeks, a control intravenous urography is performed.

Postoperative complications include urinary fistula following removal of the catheters, lumbar abscesses and anastomotic stricture.[6] The success rate of the operation is between 50-75%, where failure is due to the disease itself, especially in the case of tuberculosis with a stenosis tendency due to retraction and fibrosis or due to defects in the surgical technique, especially if parenchymatous valves that cover the anastomotic area are left; hence the need to perform secondary nephrectomy.[10]

Conclusions

Extrasinusal ureterocalyceal anastomosis is a required intervention of either primary indication or secondary indication in the case of intraoperative complications or surgical findings that do not allow for other more conventional techniques in favour of the drainage of the intrarenal urinary tract through the lower calyx. This surgical intervention has good results provided it is indicated and performed correctly. The conditions of the case must also be favourable: functioning kidney, healthy subanastomotic ureter, mucomucosal anastomosis with well-vascularized tissue and normal lower urinary tract. The technical requirements must be complied with to achieve ample extraparenchymatous anastomosis without retraction and occasionally protected by an epiploplasty. Good postoperative drainage must be ensured and, in the case of failure, conservative surgical reintervention must be performed.

Conflict of interest

The authors declare not to have any conflict of interest.

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