Preliminary experience with ureteral intussusception in exclusive retroperitoneoscopic nephroureterectomy: a simple and safe option for the resection of the distal ureter and bladder cuff.

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Summary.- OBJECTIVE: To describe a surgical option in the resection of the distal third of the ureter and bladder cuff.

MATERIAL AND METHOD: Three nephroureterectomies were performed by the extraperitoneal access. The first was performed in a patient with vesicoureteral reflux, recurrent urinary infection and chronic renal failure; and two nephroureterectomies were performed for the treatment of upper urinary tract transitional cell cancer.

RESULTS: Nephrectomy, according to the technique described by Gill, and treatment of the distal ureter were done based on the principles of open surgery, with exposure of the kidney by enlargement of one of the portals, sectioning the ureter, insertion of a catheter in the ureter anterogradely and eversion of the ureter endoscopically, followed by the removal of the bladder cuff.

CONCLUSION: Among the techniques utilized for this procedure, we believe that the technique described herein presents some advantages because it does not require an incision for the removal of the distal ureter, it is easy to perform and provides more comfort to the patient after the surgery. Furthermore, only materials used by the urologist in routine practice are required and there is no contamination of the surgical space by neoplastic cells.

Keywords: Nephroureterectomy. Laparoscopy. Transitional cell cancer. Ureterectomy.

Resumen.- OBJETIVO: Describir una opción quirúrgica en la resección del tercio distal del uréter con rodete vesical.

MÉTODO: Hemos realizado tres nefroureterectomías con acceso extraperitoneal. La primera se realizó en un paciente con refluo vesico ureteral, infecciones urinarias recidivantes e insuficiencia renal crónica. Las otras dos se realizaron por tumores de células transicionales.

RESULTADOS: La nefrectomía se realizó según la descripción de Gill, para cirugía abierta, así como la exéresis ureteral, con exposición renal ampliando una de las incisiones para el trócar, se secciona el uréter y se introduce anterogradamente un catéter, se evierte endoscópicamente el uréter seguido a continuación de la resección del rodete vesical.

CONCLUSIÓN: De entre las técnicas descritas para la realización de esta técnica, creemos que ésta tiene ciertas ventajas ya que no requiere incisión para la exéresis ureteral, es fácil de realizar y aporta un postoperatorio confortable para el paciente.

Además, se utiliza material rutinario en urología y no hay contaminación del lecho quirúrgico por células neoplásicas.
INTRODUCTION

Since 1934, nephroureterectomy with the removal of the bladder cuff is the treatment of choice, established by Kimball and Ferris, for patients with upper tract transitional cell cancer (1, 2).

In 1991, the Washington University described this surgery by videolaparoscopy for the treatment of upper tract transitional cell cancer, using the endoscopic approach for the resection of the ureter and bladder cuff, and the transperitoneal laparoscopic approach for the removal of the kidney and proximal ureter (2).

The retroperitoneoscopic access has been gaining wider acceptance due to its advantages in comparison to the transperitoneal access, such as: reduced risk of organ or vascular lesion, less difficulty in moving out the bowel and other advantages related to the non-violation of the peritoneum (3-5).

Recently, Gill and Abbou described the nephroureterectomy with the removal of a bladder cuff done completely by the retroperitoneal approach (2, 6, 7).

Herein we describe our experience with this approach, developed from the open surgery principles for the resection of the distal ureter with the bladder cuff in retroperitoneal nephroureterectomy. In our view it presents advantages over the technique previously described for the complete extraperitoneal approach.

MATERIAL AND METHODS

Radical nephrectomy is done through four ports as in the technique described by Gill (2, 6), without ureteral incision (3 ports in the subcostal region and one port above the iliac crest, for the introduction of the optics).

The ureter is dissected of the ureter to the iliac vessels or as distally as possible. The optic is passed to the subcostal port and the kidney is entrapped in a sac. The incision near the iliac crest is enlarged (up to 6 cm) to allow for the removal of the kidney without ureteral incision, external ligation of the proximal ureter is done and its distal portion is repaired. A ureteral catheter is passed through the ureter all the way up to the bladder and fixed onto the ureteral wall (Fig. 1). An X-ray or urine aspiration of the catheter is carried out to verify the catheter position.

The enlarged incision and the ports are sutured, with the catheter inside the retroperitoneal space. The patient is then placed in the lithotomy position to void the bladder. Identification of the catheter inside the bladder through the ureteral meatus is done, with biopsy device and eversion of the ureter inside the bladder.

Fig. 1. Technique for the removal of the distal ureter and the bladder cuff in the nephroureterectomy. A) Exposure of the kidney through the enlarged port and external ureteral ligation before placement of the ureteral catheter. B) The ureteral catheter fixed onto the ureteral wall and the ureteral eversion by endoscopic access.
Removal of the bladder cuff with Collings loop and homeostasis of the bladder fat are then performed. The Foley catheter is passed and the cystogram is done before removal of the Foley catheter.

RESULTS

Three nephroureterectomies through the retroperitoneal approach were performed in our hospital. The first was done in a patient from our kidney transplant program who presented several episodes of urinary tract infection due to a vesico-ureteral reflux (grade IV) in the primitive kidney in the left side. In the other two patients, the nephroureterectomies were indicated because of upper urinary tract transitional cell cancer. The surgeries were completely performed through retroperitoneoscopy and the ureter was resected using the technique previously described. No procedures were performed prior to the surgery such as insertion of a ureteral catheter, resection of the ureteral meatus or transvesical dissection of the ureteral meatus as described in other techniques. The average surgical time was 2 hours and 30 minutes (first case), 4 hours and 30 minutes (in the tumor cases), including the bladder step. The patients remained in the hospital for about 3 days (2-4 days). The Foley catheter was removed on the 5th day following surgery on an outpatient regimen, after the cystogram without contrast flow out in all cases.

The average bleeding was approximately 250ml (100-350ml), and none of the patients required blood transfusion after surgery.

The analgesia after the surgery was satisfactory with minor analgesics. All patients returned to daily activities with no restrictions thirty days after surgery. The anatomopathologic analysis showed transitional low cell carcinoma, stage PT1, with surgical margins free of tumor. At 6-months' mean follow-up, no signs of local or distant relapse were found in the control exams (abdominal and pelvis CT, intravenous urography and cystoscopy with biopsy)

| Table I. Possibility of access for resection of the distal ureter after nephroureterectomy and potential disadvantage. |
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| Access | Reference | Resection of distal ureter | Disadvantage |
| Extravesical | Clayman et al. | Stapler | Difficult access |
| | Abbou et al | Abdominal incision | Additional incision |
| | Gill | Mini laparoscopic ports | Expensive material 2 additional ports |
| Intravesical | Grapa et al | Abdominal incision | Additional incision |
| | Pluck procedure | Endoscopic resection | Urine in the work space |
| | Stifelman et al | Laparoscopic transvesical access | Additional port |
| | Intussusception | Endoscopic intussusception | Not recommended for ureteral tumors |
DISCUSSION

Many different ways to perform the ureteral removal and the bladder cuff have been described for the treatment of the upper urinary tract transitional cell cancer (Table I). Clayman et al. described the ureteral and bladder cuff removal, securing the bladder cuff with the use of a 12mm laparoscopic GIA tissue stapler (8).

Grapa et al. described this step using a stone basket to fix the ureter, with the removal of the ureter with the bladder after resection of the ureter by the endoscopic technique (9).

The Western General Hospital (Pluck procedure) described the technique of endoscopic resection of the meatus and the bladder wall prior to nephroureterectomy, with the distal ureter avulsed from the bladder after resection of the ureter by the endoscopic technique (10).

When Abbou et al. described the surgical technique by the retroperitoneal approach, a Gibson incision was used for safe removal of the distal ureter and bladder cuff (2). The technique for the removal of the distal ureter and the bladder cuff through an incision was also described for the hand-assisted nephroureterectomy. The incision for the hand port is the same for the removal of the ureter and bladder cuff (11). In the gasless laparoscopic nephroureterectomy, an incision of 8 to 9 cm in the lower abdomen is used for the removal of the distal ureter (12).

Stifelman et al. recently described transperitoneal nephroureterectomy performed by the hand-assisted technique, which they consider to be the procedure of choice in the treatment of upper urinary tract transitional cell carcinoma. For the removal of the ureter, Stifelman used the endoscopic access in combination with a 5mm percutaneous transvesical access. He used a Collings loop for the resection of the bladder cuff and through the 5mm transvesical port he performed the closure of the ureter with a 2-0 chromic Surgi-til, thus preventing contamination of the surgical work space with neoplastic cells (13).

Suzuki described the removal of the bladder cuff in the same way done by the Western General Hospital (Pluck procedure), using two intravesical 5mm ports and an endoloop in the ureteral meatus, to prevent contamination of tumor cells in the retroperitoneal cavity (2).

REFERENCES AND RECOMMENDED READING (**of special interest, **of outstanding interest)


*4. GUILLONNEAU, B.; BALLANGER, P.; LUGAGNE,


