



# UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO

FACULTAD DE MEDICINA  
DIVISION DE ESTUDIOS SUPERIORES

INSTITUTO NACIONAL DE PEDIATRIA S. S. A.



## MANAGEMENT OF ECTOPIC URETEROCELE

TESIS

QUE PARA OBTENER EL TITULO DE ESPECIALISTA EN  
CIRUGIA PEDIATRICA  
PRESENTA EL DOCTOR

MARIO ABERTO RIQUELME HERAS



## CONTENIDO

MANEJO DEL URETEROCELE ECTOPICO.

AGANGLIOSIS TOTAL DEL COLON (ATC)  
ASPECTOS DEL DIAGNOSTICO RADIOLOGICO.

TUMOR DE WILMS QUISTICO, BILATERAL,  
METACRONICO.

VENTAJAS DEL BISTURI ULTRASONICO EN LA  
RESECCION DEL HEPATOBLASTOMA.



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INVESTIGACION

SUBDIVISION DE ESPECIALIZACIONES  
MEDICAS

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ASUNTO: Autorización del trabajo de investigación  
del Dr. Mario Alberto Riquelme Heras.

**DR. ISIDRO AVILA MARTINEZ**  
**SECRETARIO DE SERVICIOS ESCOLARES**  
**DE LA FACULTAD DE MEDICINA**  
Presente.

Estimado Dr. Avila Martínez:

Me permito informar a usted que el **Dr. Mario Alberto Riquelme Heras**, alumno del curso de especialización en **Cirugía Pediátrica** en el **Instituto Nacional de Pediatría**, presenta el trabajo de investigación intitulado **"MANEJO DEL URETEROCELE ECTOPICO"**.

De conformidad con el artículo 21 capítulo 5º. de las Normas Operativas del Plan Unico de Especializaciones Médicas (PUEM) se considera que cumple con los requisitos para validarlo como el trabajo formal de Investigación que le otorga el derecho de la diplomación como especialista.

Sin otro particular de momento, reciba un cordial saludo.

**Atentamente**  
**"POR MI RAZA HABLARA EL ESPIRITU"**  
Cd. Universitaria, D. F. a 22 de abril de 2003

JEFE DE LA SUBDIVISION

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# MANAGEMENT OF ECTOPIC URETEROCELE

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**ABSTRACT**—We present our experience with 32 cases of ureterocele in children treated between 1972–1984. Five children with ureterocele in a single system underwent ureterocelelectomy and ureteral reimplantation. Ten cases were managed by ureteropyeloanastomosis with ureterocelelectomy and reimplantation with good results. Nine heminephrectomies and eight nephrectomies were done. The most common complication was ureterovesical stenosis in a “double barrel” reimplant. We were able to preserve renal parenchyma drained by a ureterocele in 15 cases.

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The ectopic ureterocele appears most frequently in the pediatric age group. Each case must be dealt with separately, bearing in mind various factors, i.e., type of ureterocele (simple or ectopic), patient's general physical condition, renal functional reserve, possibility of sepsis on the affected side, association with a duplicate collecting system, degree of the obstruction and/or reflux, and functional condition of the kidney's superior pole which is frequently dysplastic or poorly functioning.

The goals of surgical treatment are preservation or improvement of renal function, elimination or decrease in urinary tract infections, and elimination of symptoms. We believe that our analysis of 32 cases provides some useful concept and criteria for appropriate treatment.

## Material and Methods

Thirty-two cases of ectopic ureterocele diagnosed and treated at the Instituto Nacional de Pediatría during a twelve-year period (1972–1984) were reviewed. Each file provided information pertaining to clinical history, complete blood count, complete blood chemistry, prothrombin time, urine culture, intravenous pyelogram, and preoperative cystourethrography. Additional studies such as renal scan

and/or preoperative cystoscopy; as well as the histopathologic findings in cases of partial or total nephrectomy were also recorded. In all patients one or more procedures were performed for the removal of the ureterocele which are described under surgical results.

## Results

The children's ages ranged between newborn and eleven years, with an average of 5.3 years. More than 50 per cent of the patients were younger than three years. There were 12 males and 20 females (1 to 1.6). The left side was affected in 19 cases and the right in 13. The ureterocele was found to be associated with duplicate ipsilateral collecting system in 23 cases (71.8%) (bilateral ureteral duplication, accompanied by bilateral ureterocele was present in only 1 case) and with a single system in 9 cases (28.1%). Duplicate collecting system was present in 16 females and in 7 males; single collecting system was present in 4 males and 5 females.

Of the 32 patients studied, 26 (81.2%) had a history of urinary tract infection. In 4 cases (12.5%) there was ureteral lithiasis on the affected side. Macrohematuria was present in 2 cases (6%).



Surgical treatment of the 32 children resulted in complete renal unit preservation in 15 and partial preservation in 9. Eight children underwent nephrectomy.

In 5 patients (15.6%) with ureterocele of a single collecting system, ureterocelectomy and ureterovesical reimplantation were done, following the technique described by Cohen,<sup>1</sup> with good results in all.

In 10 patients (31.2%) with ureterocele and duplicate collecting system, ureteropyeloanastomosis from the superior to the inferior segment through a lumbar approach and ureterocelectomy with reimplantation, using the Pfannenstiel incision, were done in one operation. Two children operated on previously in whom stenosis of the terminal ureter had developed, were salvaged by ureteropyeloanastomosis. There were no complications in this group.

In 9 patients (28.1%) heminephrectomy of the superior pole was performed; 2 of 9 had reimplantation of the ureter previously, but stenosis of the reimplanted ureter developed. In 3 of these cases following heminephrectomy and leaving the ureteral segment and the ureterocele, it became necessary to reoperate because of reflux not present originally in the adjacent ipsilateral ureter after the collapse of the ureterocele.

In 8 patients (25%) nephrectomy was the primary treatment; in 2 the ureterocele was associated with sepsis and ureterostomy was done. The infection was controlled satisfactorily, but no functional recovery of the renal segment ensued. One patient underwent a "double-barreled" reimplantation complicated by ureterovesical stenosis, and subsequently the kidney was removed.

#### Comment

Ectopic ureterocele is a cystic dilatation of the distal ureter with an abnormal insertion into the bladder.<sup>2</sup> Seventy-five per cent of the ureteroceles in children are ectopic.<sup>3</sup> It is the most frequent cause of obstruction of the lower urinary tract in girls. This diagnosis is suspected in a nursing baby girl with severe hydronephrosis and infection. This would be similar to the urethral valves in a male child of the same age and with the same clinical picture.<sup>4</sup> The cause for its larger incidence in females is unknown.

It is frequently associated with a double collecting system, the ureterocele drains the upper renal segment which is generally dysplastic. In 15 per cent of the cases it is associated with re-

flux in the same ureter<sup>5</sup> and in two thirds of cases reflux in the ipsilateral ureter of duplicate system is encountered.<sup>4</sup>

Opinions regarding the management of an ectopic ureterocele vary. The transurethral incision or unroofing of a ureterocele endoscopically generally produces vesicoureteral reflux and ascending infection<sup>4-6</sup>; hence some authors recommend it only in patients presenting with sepsis and as an urgent and temporary procedure.<sup>8</sup> In dealing with these patients we prefer the high urinary diversion by means of nephrostomy or ureterostomy to insure an adequate drainage without risking the integrity of the complete unit. We had no difficulty in performing ureterostomy in 2 patients with sepsis in this series and the problem was adequately solved. Following eradication of urinary tract infection, the renal function is reevaluated. Ureterocelectomy with ureterovesical reimplantation is indicated when renal function is present, but, if lacking, nephrectomy or heminephrectomy is indicated.

Ureterocele is usually associated with severe hydroureter and in the duplicate collecting systems dysplasia of the superior renal segment is encountered. The superior renal segment usually functions poorly and in most cases requires heminephrectomy, but on occasion it is worthwhile to preserve it when its function is sufficient.<sup>8</sup> To decide which procedure to follow in our series, the function of the superior pole was evaluated by means of an intravenous pyelogram, radionuclide scan when possible, and intraoperative appearance of the renal parenchyma. Although 2 patients suffered post-reimplantation double ureterovesical stenosis and pyelonephrosis as complication resulting in heminephrectomy, we were able to salvage 10/23 renal units by ureteropyeloanastomosis from the superior to the inferior segment using the lumbar approach and ureterocelectomy with ureterovesical reimplantation using the Pfannenstiel incision. Contrary to other authors' experiences,<sup>4,6</sup> we were able to preserve 15/32 renal units in our series.

When confronting giant ureteroceles we chose the technique described by Johnston and Johnson<sup>9</sup> in which the ureterocele is partially removed leaving the mucosa of the floor intact to be used for the reimplant. The distal third of the adjacent ureter shares the same sheath with the ureterocele. Therefore, we recommend extra care in its resection. Extirpation of the ureterocele on the adjacent wall of the ureter that

drains the inferior pole can produce ischemia in one segment and necrosis in the reimplanted end. We recommend leaving the lateral wall of the ureterocele adhered to the ureter to avoid devascularization of the ureter to be reimplanted. In 2 of our cases with this anomaly, this technique yielded excellent results.

Our experience with duplicate ureteral reimplantation in both ureters or in a "double-barreled" procedure has been disappointing. Complications led to the partial or total loss of the renal unit. Therefore, we do not recommend this type of implantation. Other authors share this opinion.<sup>10</sup>

Controversy also exists in the handling of the ureterocele in its intravesical portion when the renal segment functions poorly and requires extirpation. In these cases upper pole partial nephrectomy extravesical ureterectomy resulting in spontaneous collapse of the ureterocele is recommended by some authors,<sup>11-13</sup> but this is rejected by others when the following situations arise: when collapse does not occur; when there are late complications such as reflux to the ipsilateral ureter or development of vesical diverticuli accompanied by prolapse of the mucosa in the ureterocele; in the presence of infection; or in pyoureter which would require a second operation.<sup>7,14-16</sup> In some cases the duration of surgery should not be prolonged because of the poor condition of the patient or because of the smallness of the bladder in newborns. In these cases the ureterectomy should be performed in a second operation.

The ureterocele associated with a single collecting system does not usually represent a problem with the choice of procedure. Ureterectomy and reimplantation offer satisfactory results when infection is absent and renal function is adequate.

We do not recommend the duplicate reimplantation in a "double-barreled" procedure be-

cause of the high incidence of complications. On the other hand, judging from our experience, the high pyeloureteral anastomosis and single lower pole ureterovesical reimplantation yielded the best results in this series.

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