Boletín del
Colegio Mexicano de Urología

Volumen *Volume* 18 Número *Number* 1 Enero-Marzo *January-March* 2003

*Artículo:*

# Anterior urethral valves endoscopic fulguration. Single-stage management

*Caso clínico*

**Vol. XVIII, Núm. 1 • Enero-Marzo 2003**
pp 28-32

# Anterior urethral valves endoscopic fulguration. Single-stage management

Atlántida Margarita Raya Rivera,* José Ramón Garrido Rodríguez,** Luis H Eraña Guerra***

* Jefe del Departamento de Urología y Ginecología.
** Médico residente de II año de Urología Pediátrica.
*** Profesor Titular del Curso de Urología Pediátrica.

Hospital Infantil de México Federico Gómez.

Dirección para correspondencia:
Atlántida Margarita Raya Rivera
Dr. Márquez 162, Col. Doctores
C.P. 06720 Tels. 5228-9917 ext. 1027, 1057

## INTRODUCTION

Anterior urethral valves have a broad spectrum of clinical presentation, ranging form mild dribbling urination and urinary tract infection (UTI) to bilateral hydronephrosis with azotemia.[1-4] Endoscopic fulguration has been classically considered just as the initial management. However in many cases it should be indicated as the single-stage management. Modern advances in fiber optics and miniaturization of pediatric endoscopic equipment have decreased the incidence of vesicostomy as alternative temporal treatment.[1] We present our experience with 10 cases.

## CASE REPORTS

**Case 1.** A 18 months old male infant presented with dysuria, dribbling urination associated wit a lower abdominal midline mass secondary to bladder distension. He has history of three episodes of acute urinary retention during the last 3 months, associated with *E coli* UTI. Laboratory examination revealed normal urinalysis, urinary creatinine of 0.4 mg/dL. Voiding cystourethrography revealed an anterior urethral valve with dilatation of the proximal urethra and bilateral vesicoureteral reflux, grade III on the left and grade II on the right side. Urethroscopy at this time revealed urethral valves located at the bulbar urethra, and electro fulguration was performed. After 10 years of the procedure the patient has been asymptomatic and the bilateral reflux has resolved *(Figure 1)*.

**Case 2.** A 13 months old male infant presented with a history of three UTI episodes during the last six months associated with dribbling urination. At admission physical exploration was unremarkable except for right cryptorchidism. Urianalysis revealed abundant sediment, 10-15 + white blood cells, 5-10 erythrocytes. Serum creatinine of 0.6 mg/dL, and urine culture yielded *E. coli*.

Voiding cystourethrography revealed grade II right vesicoureteral reflux associated to urethral valve located at the anterior urethra. Cystourethroscopy confirmed the presence of valves and fulguration was carried on. Prophylaxis antibiotics were maintained for 4 months. At the present, 19 years latter, voiding cistourethrography revealed no reflux and adequate micturition and the patient remains asymptomatic.

**Case 3.** A 4 years old male child, presented with history of failure to thrive associated with constant urinary dribbling and acute urine retention episodes associated with recurrent UTI episodes. Urianalysis showed white and red blood cells too numerous to count, + bacteria, + nitrites. Urine cultures yielded E. coli. Creatininte of 0.3 mg/dL. IVP revealed normal upper tract. Voiding cistourethrography revealed anterior urethral valve with proximal urethral diverticula. Cystoscopy confirmed the presence of valves at the bulbar urethra and fulguration

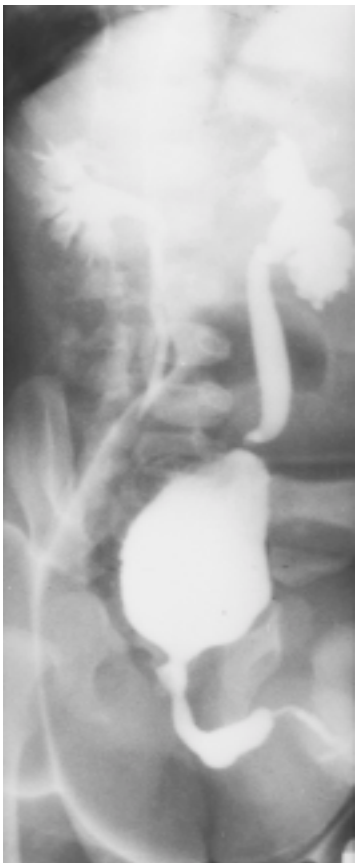

***Figure 1.*** *Case 1. Voiding cystourethrogram shows marked dilatation of proximal urethra with abrupt crescent-shaped obstructing point and extremely poor flow in distal urethra. Bilateral vesicoureteral reflux associated.*

was performed. He has 22 years of follow up and is reported asymptomatic.

**Case 4.** A 11 years old schoolchild presented with primary diurnal and nocturnal enuresis associated to Straining to void, Poor urinary stream, urinary dribbling and Recurrent UTI and has been under psychological management for enuresis. Laboratory examination revealed a serum creatinine of 0.4 mg/dL. Voiding cystography revealed anterior urethral valves with proximal urethral diverticula. Cystourethroscopy confirmed the diagnose and fulguration was carried on. After 18 years of follow up the patient remains asymptomatic. *(Figures 2 A and B)*.

**Case 5.** A 11 years old male schoolchild presented for primary enuresis and recurrent UTI. Urianalysis showed 20-25 white blood cells, 20-25 erytrocytes, ++ bacteria, + nitrite. Serum creatinine revealed 0.5 mg/dL. Voiding cystourethrography revealed anterior urethral valves and left grade II vesicoureteral reflux. Cystoure-

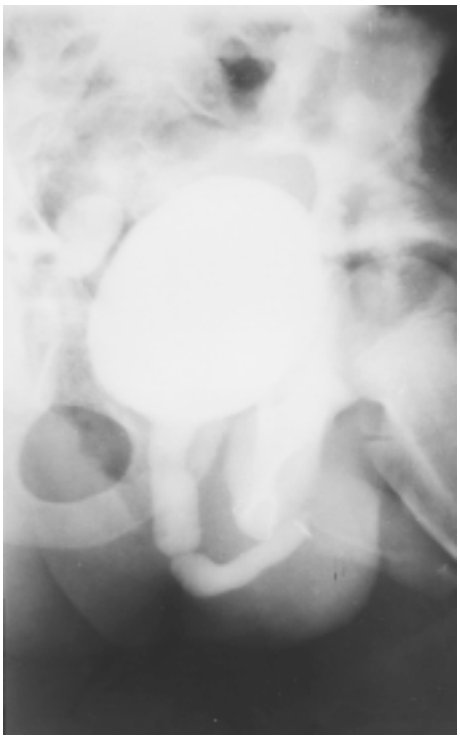

***Figure 2A.***

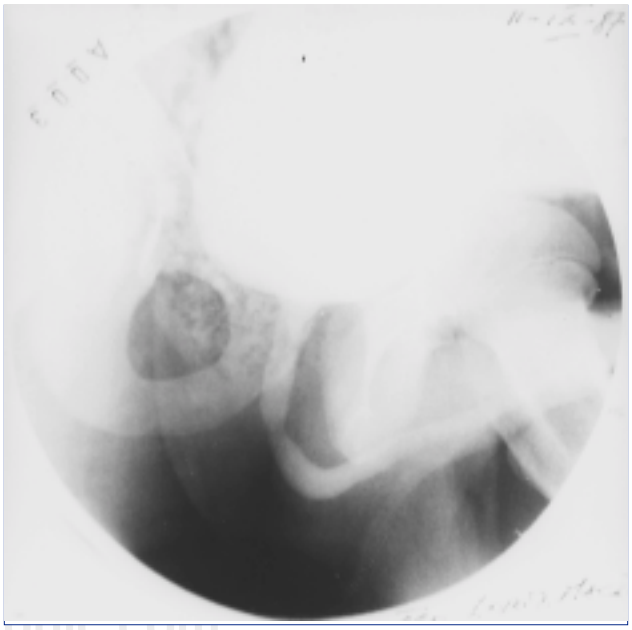

***Figure 2B.***

***Figure 2.*** *Case 4.* ***A.*** *Preoperative voiding cystourethrogram reveals anterior urethral valve with dilated posterior urethra and extremely poor flow in distal urethra.* **B.** *Post endoscopic valve fulguration, anterior urethral flow is normal.*

Vol. XVIII, Núm. 1 • Enero-Marzo 2003

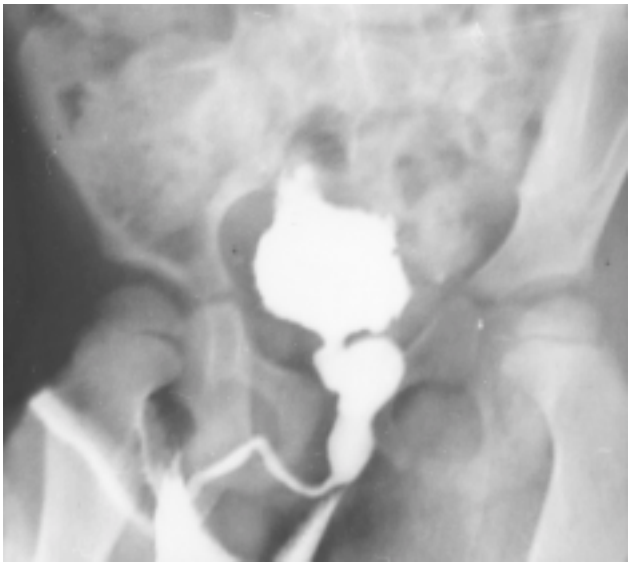

***Figure 3A.***

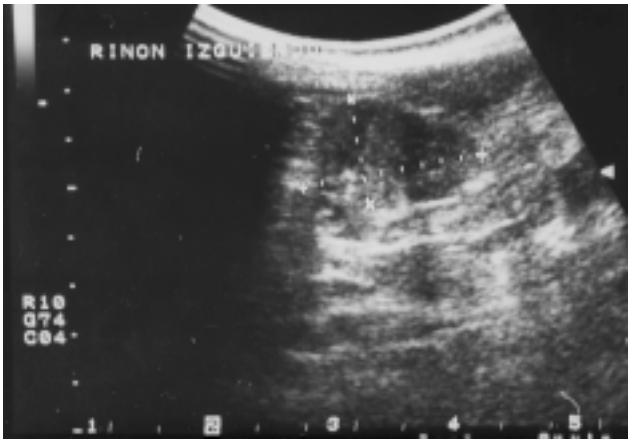


***Figure 3B.***

throscopy confirmed clinical impression and valve fulguration was performed. Prophylaxis antibiotics were administrated for 6 months. At 23 years of follow up he has reported asymptomatic and the reflux has resolved.

**Case 6.** A 9 years old male school child presented with straining to void, changes during the stream, poor and good associated to UTI. Laboratory examination revealed normal urianalysis and renal function. Voiding cystourethrography revealed urethral valve located at the anterior urethra. Cystoscopy confirmed the clinical diagnosis, valve fulguration and circumcision were performed. After 22 years of the procedure the patient has reported asymptomatic.

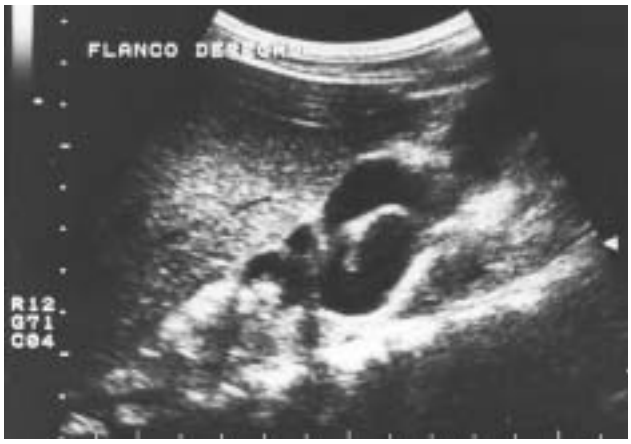


***Figure 3C.***

***Figure 3.*** *Case 3.* ***A.*** *Voiding cystourethrogram demonstrates marked dilatation of posterior urethra, severe bladder neck obstruction and extremely poor flow in distal urethra.* ***B.*** *Renal ultrasonography exploration shows hypoecogenic and small size left kidney.* ***C.*** *Severe uretero pelvic hydronephrosis on the right side.*

**Case 7.** A 10 years old male Schoolchild presented with history of a year with dysuria associated to diminished urinary stream and recurrent UTI. Laboratory examination revealed urine cultures yielded *E. coli* and serum creatinine of 0.3 mg/dL. Voiding cystourethrography revealed anterior urethral valves at the anterior urethra and valve fulguration was performed. At 22 years of followup the patient has reported asymptomatic.

**Case 8.** A 4 month old infant was presented with history of 1 year with recurren UTI episodes, described as fever 39 C, poor appetite, irritability and dysuria and bad smelly urine. Physical examination revealed lower abdominal midline mass. Laboratory examination revealed a serum electrolytes with sodium of 132 mEq/L potassium of 3.8 mEq/L, chloride of 110 mEq/L, non ionized calcium of 10 mg. Blood cell count showed 24,800 white blood cells, 9% bands, 70% segmented, 19% lymphocytes. Serum creatinine of 0.3 mg/dL. Urinalysis revealed too numerous count of white and red blood cells, 3+ bacteria, + nitrites. Urine culture yielded *E. coli*. Ultrasonic examination showed normal upper tract. Voiding cystourethrography revealed anterior urethral valve at the anterior urethra. Cystourethroscopy confirmed the diagnosis, valve fulguration and urethral dilatation were performed. Antibacterial treatment was administrated for three weeks. The patient has been asymptomatic at 6 years of follow up.

**Case 9.** A 4-month-old male infant presented with UTI episodes characterized by fever 38ºC, poor appetite, irritability and vomit. Physical examination revealed bipalpebral and lower limbs edema with no cardio-respi-

ratory symptoms. Serum blood cells examination revealed hemoglobin of 10.3 g/dL, white blood cell count of 11,900, 2% bands, 84% segmented, 14% lymphocytes. Serum electrolytes showed potassium of 5.9 mEq/dL, sodium of 130 mEq/dL. Creatinine of 12.3 mg/dL, Urea of 56 mg/dL. Arterial gasometry revealed pH of 7.29, bicarbonate of 9, total $CO_2$ of 30%, $O_2$ of 93%, base excess –9, a 02 93%.

Acute peritoneal dialysis was performed and maintained for 4 days, renal ultrasound with unremarkable findings. Voiding cystourethrography revealed anterior uretral valve with no reflux. Renal ultrasonographic examination revealed hypoecogenic and small left kidney and severe hydropyeloureteronephrosis on the right side. Cystourethroscopy confirmed the diagnosis of anterior urethral valve and cystic cystitis. Valve fulguration was performed. At 5 years of follow up the patient present terminal renal disease and is in continuous ambulatory peritoneal dialysis (CAPD) for renal transplantation, but he has reported asymptomatic of urinary tract. *(Figures 3, A, B and C)*.

**Case 10.** A 12 years old male School child presented with a 6 years history of recurrent urinary tract infections. His mother noticed that he presented poor stream, failure to thrive and dribbling urination. Serum blood cells examination revealed hemoglobin of 8.3 g/dL, white blood count of 9,300, segmented of 83%, bands of 1%, lymphocytes of 16%, platelet of 113,000. Serum electrolytes showed potassium of 6.3 mEq/dL, sodium of 131 mEq/dL, chloride of 108 mEq/dL, non ionized calcium of 8.2 mg. Serum creatinine of 8.3 mg/dL. Gasometry revealed pH of 7.30, bicarbonate of 9, $CO_2$ of 24, $O_2$ of 73, base excess of –11, Sat $O_2$ of 91%. Renal ultrasound revealed inflammatory response. Voiding cystourethrography revealed anterior urethral valve with no reflux. Ultrasonographic examination revealed several bilateral hydronephrosis. Cystourethroscopy confirmed clinical findings and valve fulguration was performed. At 2 years of follow up he is in hemodyalisis. A renal transplant has been scheduled, but has been asymptomatic from urinary tract.

## DISCUSSION

Anterior urethral valve is a cusp or iris diaphragm configuration lesion located anywhere along the anterior urethra.[4] Several etiologic mechanisms has been proposed. An abortive attempt at urethral duplication, or incomplete formation of the ventral corpus spongiosum of the urethra, and when associated to urethra diverticula have suggested that congenital cystic dilatation of normal or accessory periurethral glands in communication with the urethra results in the flap like pseudo valve.[2] For valves in the fossa navicularis, has been failure of alignment between the urethra formed distally by invagination at the glans, and proximally by closure of the urethral folds.[6]

UTI was present on all the patients, and *E. coli* has detected in all cultures. UTI was always associated to a broad spectrum of low urinary tract obstruction symptoms. Overflow incontinence, dribbling and diminished urinary stream were the most common low urinary tract obstruction signs and symptoms presented by the patients as well as mentioned by others.[1-4] Acute urinary retention was present in two patients but none have required vesicostomy drainage as suggested by others it may be because the urinary retention was transitory and none of these patients had associated severe hydronephrosis.[1] Enuresis was presented in two patients in both cases it was associated to urinary tract obstruction symptoms and UTI. Enuresis and UTI disappeared after valve fulguration in both cases.

Voiding cystourethrography was the study of choice to diagnose anterior urethral valves in all the cases. The American Academy of Pediatrics recommend to perform ultrasonography and cistourethrography to all infants and young children 2 months to 2 years of age with UTI.[7] This recommendation was ignored in all of the cases and anterior urethral diagnose was delayed. Vesicoureteral reflux was detected in two patients and urethral diverticula in other three patients.

The wide spectrum of symptoms in patients with anterior urethral valves was demonstrated by the presence of chronic renal failure in two patients. One of the patients presented as an infant and currently is underwent to CADP and the other was diagnosed at 11 years old and has been scheduled for kidney transplantation.

The type of anterior urethral valves was no associated with the patients who developed renal failure as reported by others.[1,4] But we are agree in terms of establish a prognostic route for these patients. The serum creatinine levels and the presence of bilateral hydronephrosis or unilateral hydronephrosis in one side and hypoplasic kidney on the other side as we found in one of our patients are a strong prognostic factor as mentioned in the literature.[1] The possible determinant factor of the associated urologic abnormalities presented is the severity of the obstruction developed in the early gestation, as it has been demonstrated in experimental studies.[8]

Valve ablation was performed with electrofulguration in all cases with no complications and none required any other urologic procedure. All the patients are free from urinary tract symptoms. The reflux has resolved after valve fulguration in the two cases that presented such diagnosis. This conservative criteria is similar as the used for posterior urethral valves management and is not dependent of the reflux grade.[9] But if the patient remains with recurrent UTI or the reflux has no changes, the surgical correction should be performed.[9] The surgical correction of the urethral diverticula was no required because all the

Vol. XVIII, Núm. 1 • Enero-Marzo 2003

patients have shown adequate micturition and are asymptomatic. But we agree with the early surgical correction in case of large size diverticula.[1-4]

Conclusions: The anterior urethral valves is a rare cause of lower urinary tract obstruction, and include a broad spectrum of symptoms. But the diagnosis should be considered in all the patients with UTI and lower urinary obstructive symptoms.

Endoscopic valve fulguration is currently considered the initial treatment of choice and in many cases, as above presented, were the only required treatment.

## REFERENCES

1. Van Savage JG, Khoury AE, Mclirie GA, Bagli DJ. An algorithm for the management of anterior urethral valves. *J Urol* 1997; 158: 1030-1032.
2. Williams DI, Retik AB. Congenital valves and diverticula of the anterior urethra. *Br J Urol* 1969; 41: 228-234.
3. Firlt CF, King LR. Anterior urethral valves in children. *J Urol* 1972; 108: 972-975.
4. Firlt RS, Firlit CF, King LR. Obstructing anterior urethral valves in children. *J Urol* 1978; 119: 819-821.
5. Cromie WJ, Cain MP, Bellinger MF, Betti JA, Scott J. Urethral valve incision using a modified venous valvulotome. *J Urol* 1994; 151: 1053-1055.
6. Sherz HC, Kaplan GW, Packer MG. Anterior urethral valves in the fossa navicularis in children. *J Urol* 1987; 138: 1211-15.
7. American Academy of Pediatrics: Practice parameter: The diagnosis, treatment and evaluation of the initial urinary tract infection in febrile infants and young children. *Pediatrics* 1999; 103: 843-852.
8. Peters CA, Mandell J. Experimental congenital obstructive uropathy. *Urol Clin North Am* 1990; 17: 247-62.
9. Nguyen HT, Peters CA. The long-term complications of posterior urethral valves. *BJU Int* 1999; 83 suppl. 3: 23-8.