Case report

Endoscopic management of lower ureteric stone after ureterosigmoidostomy

H. B. KC, P. R. Chalise, A. Bhattarai, U. K. Sharma, P. Gyawali, G. K. Shrestha, B. R. Joshi

Department of Surgery, Tribhuvan University Teaching Hospital, Kathmandu, Nepal

Correspondence to: Dr. Hari Bahadur KC, Department of Surgery, TUTH

Email: hari_kc7@yahoo.com

Abstract

Ureterosigmoidostomy is one of the oldest technique for continent urinary diversion. Though less common nowadays, it is still a useful form of urinary diversion; simple to perform, offers good continence with minimal interference with life style. It still has a major role in conditions like ectopia vesicae and post-radical cystectomy for bladder carcinoma. We present a case of 33 years lady who underwent ureterosigmoidostomy at the age of 10 years for ectopia vesicae and later developed left pyonephrosis due to distal ureteric calculus. Left sided PCN was done and successful antegrade endoscopic removal of calculus relieved her symptoms.

Keywords: Ectopia vesicae, endoscopic management, lower ureteric stone, ureterosigmoidostomy

Introduction

Ectopia vesicae is caused by incomplete development of anterior bladder wall and infra-umbilical part of anterior abdominal wall owing to delayed rupture of the cloacal membrane, leaving the posterior bladder wall lying exposed on the abdomen. It is a rare condition with approximate incidence of 1 in 50,000 live births.[1] Recurrent urinary tract infection and gradual hydroureteronephrosis due to ureterovesical obstruction leads to progressive renal function deterioration if not treated in time. Bladder reconstruction is the treatment of choice but cystectomy and urinary diversion is performed for late presentation.

Ureterosigmoidostomy is one of the well known techniques of urinary diversion. Though technically easier, it is less popular due to high incidence of complications like fluid & electrolyte imbalance, recurrent pyelonephritis, ureterointestinal obstruction, calculus formation, adenocarcinoma of colon and progressive deterioration of renal function. Ureteric calculus is a common complication of ureterosigmoidostomy and can lead to renal insufficiency if neglected. Recurrent infection, urinary stasis and metabolic abnormality are the proposed causative factors for stone formation. Endoscopic procedures are widely accepted methods nowadays for removal of ureteral stone following ureterosigmoidostomy.

Case report

A 33 years lady presented with colicky left loin pain which became severe and associated with fever for one week. She also had had similar episodes in past. She under went surgery for ectopia vesicae (ureterosigmoidostomy) at the age of 10 years. On clinical examination, she was febrile with left renal angle tenderness. There was large lower midline scar, palpable defect in pubic bone and anomalous external genitalia. Routine blood investigation revealed leukocytosis with neutrophilia and normal renal function test (RFT). Serum chloride was slightly elevated (160 mEq/L) and ammonia was within normal range (45 umol/L). X-Ray KUB showed left distal ureteric calculus and widely separated pubic bones (Fig. 1). Ultrasound showed gross left hydro-ureteronephrosis with thinned out cortex and intravenous urography (IVU) revealed left hydronephrosis with dilated left ureter and distal ureteric calculus. The diagnosis of left lower ureteric calculus with pyelonephritis in a patient with ureterosigmoidostomy for ectopia vesicae

was made. Patient was kept on intravenous antibiotics and percutaneous nephrostomy (PCN) tube was inserted in left side which drained cloudy urine. Antegrade pyelography showed left distal ureteric calculus with dilated ureter (Fig. 2).

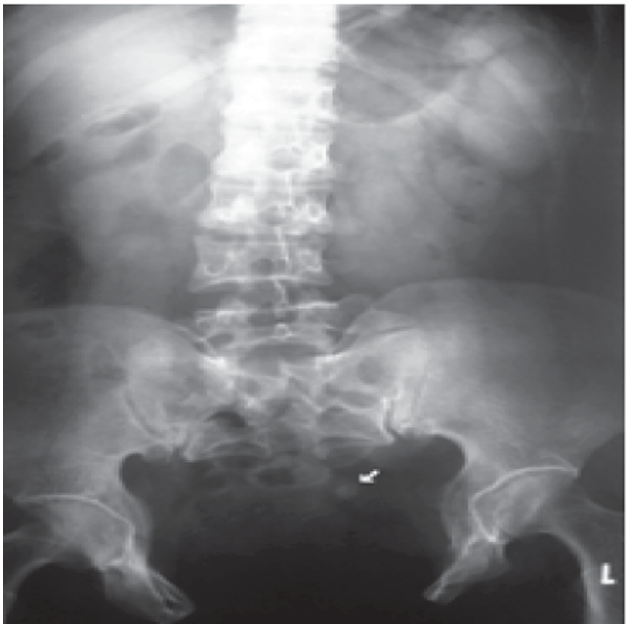

Fig. 1: X-ray KUB showing left distal ureteric calculus (arrow) and widely separated pubic bones.

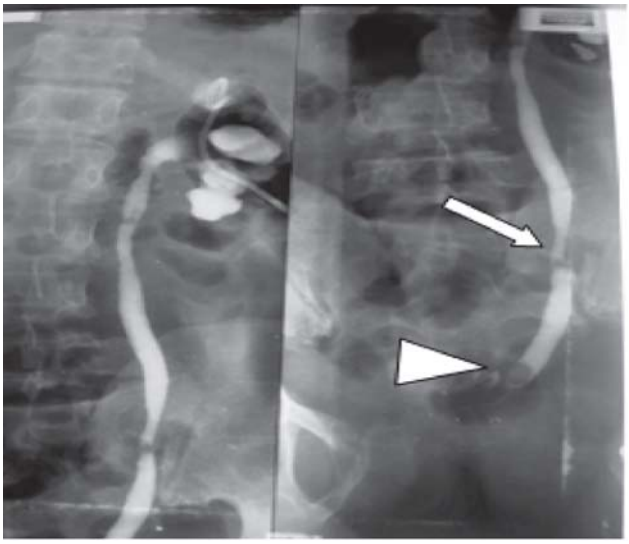

Fig. 2: Antegrade pyelography showing stricture in distal third of ureter (arrow) and stone at distal ureter (arrow head).

She was planned for antegrade endoscopic removal of calculus using flexible ureterorenoscope. Guide wire was inserted through the PCN tube, tract dilated and flexible ureterorenoscopy performed. A single stone was found in distal ureter proximal to anastomosis (Fig 3). The stone could not be pulled by dormia basket as there was a stricture in the middle part of ureter. It was pushed into the sigmoid colon and a stone of 1.5 × 1 cm size was retrieved from the rectum. A double J (DJ) stent and nephrostomy tube were kept. The DJ-stent was self expelled on 4th post-operative day and patient was discharged with uneventful recovery.

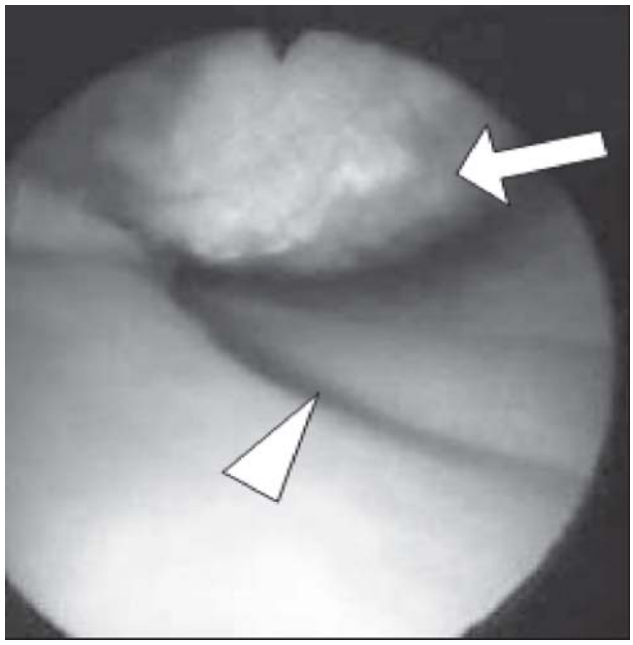

Fig.3 Endoscopic view of stone (arrow) with adjacent guide wire (arrow head)

Discussion

Ectopia vesicae or bladder exstrophy is an uncommon condition. It may be associated with many other congenital defects. Complete reconstruction of this defect is possible with improved surgical techniques and early surgery before the bladder deteriorates. When the patient presents late and there is small, fibrotic, inelastic bladder which is difficult for closure, then cystectomy and urinary diversion is the option. Another indication of urinary diversion is poor continence following bladder reconstruction. This can be done by ureterosigmoid anastomosis, ileal conduit, colonic conduit or continent urinary diversion.

Ureterosigmoidostomy is the oldest technique for continent urinary diversion which was first performed by Simon in 1852, but became popular since 1911 after Coffey introduced the idea of tunneling the ureter into the colon.[2] In 1949 Nesbit designed an elliptical mucosa-to-mucosa anastomosis of the ureters to the colon and Leadbetter and Clarke in 1951

described a combined technique with a long, extracolonic, seromuscular Coffey-type tunnel with Nesbit direct mucosal anastomosis.[3]

The advantages of ureterosigmoidostomy include urinary continence, a fast learning curve, relative easiness and rapidity of performance, no need for catheters or external appliances and wide acceptance by patients offering good continence with minimal interference in life-style.[4] However, it is associated with many complications and less popular nowadays. The important complications include ureterocolic stricture, reflux, acute and chronic pyelonephritis, hyperchloremic metabolic acidosis, incontinence, stone formation and late development of colonic malignancy at anastomosis site. However, these complications are not unique to ureterosigmoidostomy and can occur with other forms of urinary diversion.

Ureterolithiasis has been reported in 5% to 50% of all forms of urinary diversions.[5] The etiology includes recurrent and chronic infection, urinary stasis, metabolic abnormalities, self-imposed dehydration, presence of foreign material (e.g. staples), abnormalities of the composition of the urine, mucus production etc.[6] Urolithiasis leads to renal insufficiency and responsible for more than one third of deaths.[7]

These stones are commonly composed of struvite and form consequent to recurrent infections with Proteus mirabilis or other urea-splitting bacteria.[8] Additional factor for the formation of calculus includes metabolic acidosis with resultant hypercalciuria and hypocitraturia.[8] Several authors have focused on urine composition. In a Swedish study of 27 patients with continent ileal reservoirs the presence of urease-producing bacteria was associated with stone formation. Urine from these patients had high calcium and low citrate concentrations. There was a strong correlation between urinary calcium content and urinary pH when the urease-induced precipitation commenced.[9] Thus oral citrate supplementation and acetohydroxamic acid, a urease inhibitor, have been suggested for prophylaxis.

These stones should be promptly treated as they will accelerate the renal deterioration. The options include extracorporeal shock wave lithotripsy (ESWL), endoscopic procedures and open surgical procedures. In the past, such complications were treated by open operations, but with the current status of improved techniques, minimally invasive procedures are preferred[10] and open surgery is reserved for refractory cases where newer procedures failed. ESWL remains the first-line of treatment.[11] However, endoscopic procedures are the next step though can be challenging, owing to the absence of normal, familiar anatomic landmarks. Antegrade approach is often easier because of proximal dilation which provides improved endoscopic vision. Access to the pelcvicalyceal system is made through previous nephrostomy or new puncture. Upper pole puncture optimizes access to lower pole, pelvis, ureteropelvic junction, and ureter and thus preferred.[10]

Michael et al reported a 46 years man with bladder exstrophy, who was treated with ureterosigmoidostomy, presented with urolithiasis. An antegrade ureteroscopy was performed and stone was removed with dormia basket.[10] Molser et al reported a case of 24 years male, who underwent ureterosigmoidostomy at age of 12 months for bladder exstrophy, was found to have right distal ureteric calculus with hydronephrosis. The calculus was extracted successfully using duodenoscopes.[12]

Conclusions

The use of ureterosigmoidostomy as a urinary diversion has greatly reduced due to high incidence of complications and availability of other safer procedures. But it still has a role in selected cases including bladder exstrophy. Urolithiasis is an important complication after ureterosigmoidostomy requiring close medical surveillance and timely intervention. Treatment of ureterolithiasis following ureterosigmoidostomy presents technical challenges to endourologists, owing to lack of familiar anatomic landmarks, but can be managed with antegrade endoscopy with acceptable results.

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