

## CASE REPORT

# DECELERATION INJURY TO THE LOWER URETER AN UNUSUAL CASE

G.R. SHARMA

Solapur Kidney Care and Research Centre, Solapur, India

### INTRODUCTION

In more than 95% of cases, ureteral injuries are the result of penetrating trauma<sup>1-3</sup>. Injuries from blunt trauma are rare and usually the result of falls from a height or a rapid acceleration or deceleration<sup>4</sup>. Such injuries also usually occur at the ureteropelvic junction where the ureter is injured by being stretched by the upper lumbar and lower thoracic vertebral bodies during hyperextension of the back. This predominantly occurs in children because of the increased mobility of the paediatric vertebral column and perhaps the lack of perirenal fat<sup>5-7</sup>.

Herein I report on an unusual case of deceleration injury to the lower ureter, to my knowledge the first case of its kind reported in the literature.

### OBSERVATION

A 35-year-old male laborer presented to our institute with complaints of abdominal distension for the past three months. He had no other urinary or bowel complaints.

About three months before he had had a fall from a height of nearly 30 feet while constructing a well. He had landed on his buttocks. He was taken to a local hospital in his village. Examination by the local surgeon revealed a small-contused lacerated wound in the perineum, which was sutured. Routine blood parameters and urine examination were within normal limits. The ultrasound examination of the abdomen was normal. An X ray of the pelvis showed a fracture of the superior and inferior rami of the pubic bone on the left side. At that time the patient passed urine normally. He was kept under observation for

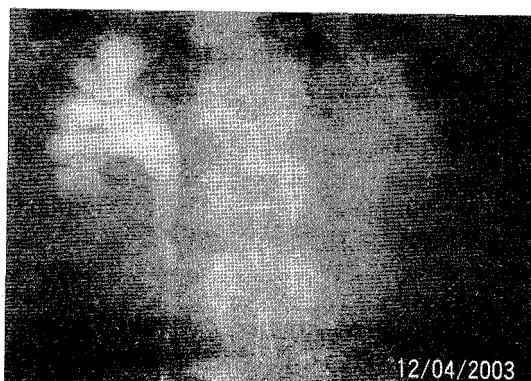
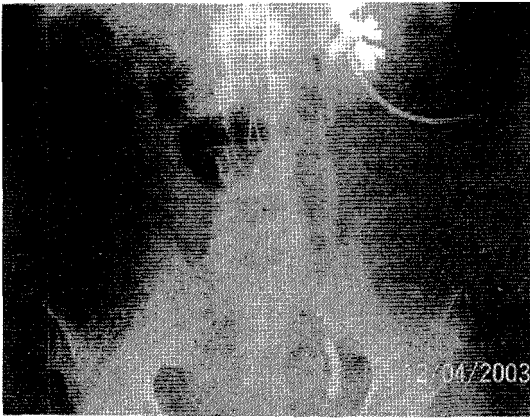


Fig. 1: Intravenous urogram showing poor concentration with moderate hydroureteronephrosis on the left side with a good concentration and mild hydronephrosis on the right side.

two days and then discharged. When he returned for the removal of the sutures he complained of abdominal distension. Clinical examination detected a fluid collection. The patient was admitted and the fluid aspirated. Its biochemical evaluation showed it to be a transudate. As the fluid collection was progressively increasing, a repeat ultrasound examination was done which showed a left-sided moderate hydroureteronephrosis with pelvic fluid collection. The patient was referred to our institute but came to our hospital after two months. He had developed a moderate degree of abdominal distension and had complaints of anorexia and loss of weight. His urine examination was normal. Routine biochemical parameters including renal function tests (BUN and Sr. Creatinine) were normal. Antibody tests for Kochs and PCR for the detection of mycobacteria were negative. An intravenous urography was done which



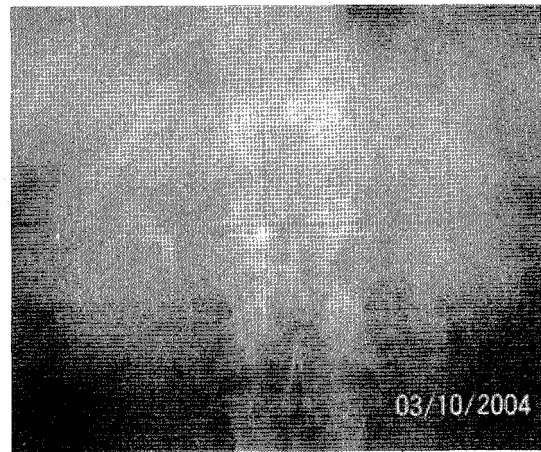
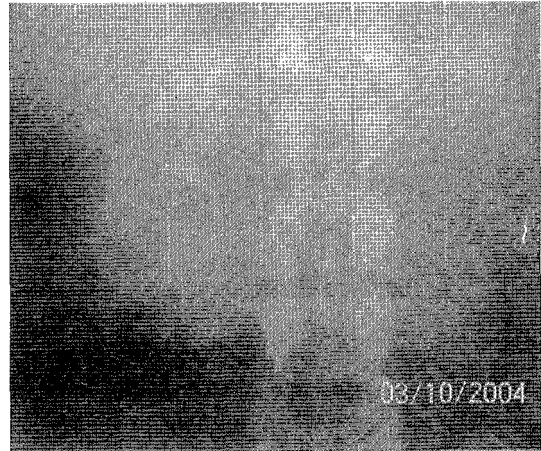
**Fig. 2:** Nephrostogram showing obstruction at the lower end of the left ureter

showed delayed concentration and excretion on the left side with moderate hydronephrosis and hydroureter with some extravasation of the contrast at the lower end. There was also a mild hydronephrosis of the right side ( Fig. 1). The fluid was aspirated and its creatinine estimation done which was 2.5 mg%. Cystoscopy was done which showed a normal bladder and no findings suggestive of Kochs. A left retrograde pyelography was done to localize the site of obstruction. The contrast went only up to the juxtavesical ureter and extravasation was seen. An attempt to pass a guide wire in the ureter failed. Hence, percutaneous nephrostomy was done. Over the next few days the urinoma disappeared. Also the output from the nephrostomy ranged from one to one and a half liters. After 15 days a nephrostogram was done which revealed obstruction at the lower end of the left ureter (Fig. 2). The patient underwent a left-sided ureteric reimplantation with psoas hitch. The postoperative recovery was uneventful.

A follow-up IVP of the patient three months after ureteric reimplantation showed that the hydronephrosis on the right side had resolved completely. The patient is entirely asymptomatic at present (Fig.3 A, B).

## DISCUSSION

The above case is unusual from the fact that a deceleration injury occurred at the lower end of the ureter. This part of the ureter is not mobile. It has a good periureteral support not only from the surrounding tissues and structures but also from the Waldeyer's sheath,



**Fig. 3:** Intravenous urogram, 5 minutes (A) and 15 minutes (B) after contrast injection taken nearly 3 months after ureteric reimplantation, showing complete resolution of the hydronephrosis on the right side.

which extends longitudinally over the lower 2-3 cm of the ureter and follows it to the trigone<sup>6</sup>.

It is not unusual for ureteral injuries to be missed initially. Clinical signs of ureteral or renal pelvis injury usually do not become obvious for days. Thus for the early diagnosis of ureteral injury a high index of suspicion and a low threshold for urinary tract imaging needs to be present<sup>1,6</sup>. Haematuria, gross or microscopic, is not a reliable sign and is absent in 23% to 45% of ureteral injuries<sup>1,3,6,9</sup>. Early physical signs are usually nonspecific. A history of rapid deceleration or direct flank tenderness or ecchymosis on physical examination is suggestive and needs evaluation<sup>5</sup>.

Ultrasonography might not pick up a ureteral injury in the early stages. The primary imaging modality to diagnose a ureteral injury

is intravenous pyelography with a reported accuracy of 95%<sup>10</sup>.

McAninch and Santucci have recommended abdominal CT scan with contrast material and delayed images in patients with hypotension or a history of significant deceleration, despite the absence of haematuria<sup>11</sup>. On CT scans a ureteral injury is detected by the presence of extravasation of contrast or non-opacification of the ipsilateral ureter. Modern helical CT scanners can obtain images before intravenous contrast dye is excreted in the urine. Hence, delayed images, 5 to 20 minutes after contrast injection, must be obtained to allow contrast material to extravasate from the injured ureter<sup>12</sup>.

In the case described the unusual aspect was a deceleration injury producing injury to the lower end of the ureter. This is in strong contrast to most of the ureteral injuries due to sudden deceleration which mainly affect the ureteropelvic junction. Also this injury occurred in an adult as against the fact that children are predominantly affected by deceleration injuries. The delay, of about three months, in having a urinary diversion in the form of percutaneous nephrostomy resulted in the increase in the size of the urinoma that led to compression and development of mild hydronephrosis of the opposite side. In fact, one would expect that a urinoma which is large and tense enough to compress the contralateral ureter would also compress the bladder, leading to urinary frequency and the appearance of an extra-vesical mass on the IVP and at cystoscopy. To rule out other explanations for the patient's clinical picture, antibody tests for Kochs and PCR for the detection of mycobacteria were carried out and proved to be negative. A possible diagnosis of Bilharziasis could be ruled out, because Bilharziasis in our country is anecdotal and has only been found in patients who had been to the Middle East.

Luckily for the patient, despite the delay in the final management of urinoma and the injury, the patient did not develop infection in the urinoma, nor did any fistula result.

This case thus gives credence to the dictum of evaluation of the urinary tract in patients with a history of significant sudden deceleration. Either an intravenous pyelogram or a CT scan with contrast material and delayed images, if done in such patients as a protocol, would certainly help in the early diagnosis and early management of such injuries.

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All correspondence to be sent to:

Dr. G.R. Sharma, "Onkar Nilayam", 3/27 Samarth Nagar, North Sadar Bazar, Solapur – 413003, Maharashtra, India  
 drgrsharma@yahoo.co.in