

## Post traumatic urinary extravasation in occult urinary obstruction: Report of three cases

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### **Abstract**

Urinary extravasation after blunt abdominal trauma is seen often and generally treated conservatively. However a blunt renal trauma causing huge amount of extravasations and symptoms disproportionate to the severity of trauma should alarm the surgeon towards an underlying occult renal pathology usually an obstruction. In this case series, we share three such experiences and their management.

### **Keywords**

Blunt renal trauma; urinomas; urinary extravasation; occult renal obstruction.

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### **Introduction**

Kidneys are commonly injured organs in children subsequent to blunt abdominal trauma [1]. Occasional case reports in literature highlight the incidental detection of pre-existing urinary obstruction following renal trauma. In a previously affected kidney, trivial trauma can cause alarming symptoms. Although the paradigm of

management has shifted towards conservative treatment for all solid organ injuries, some intervention followed by definitive repair is required in this subset of patients. We present here three such cases of occult obstruction in children which presented with urinary extravasation following blunt trauma to the abdomen.

### **Case Report**

#### **Case 1**

A 9 year-old girl with history of blunt trauma to the abdomen presented with massive abdominal distension, respiratory distress and anuria. Ultrasound (US) of the

abdomen showed urinary ascites. An US guided percutaneous drain insertion was done as an emergency intervention to relieve the severe respiratory distress. Computed tomography (CT) of the abdomen revealed a solitary left kidney with a huge pelvis and urinary ascites [Fig. 1].



**Fig. 1.** Computed tomography (CT) of the abdomen revealed a solitary left kidney with a huge pelvis

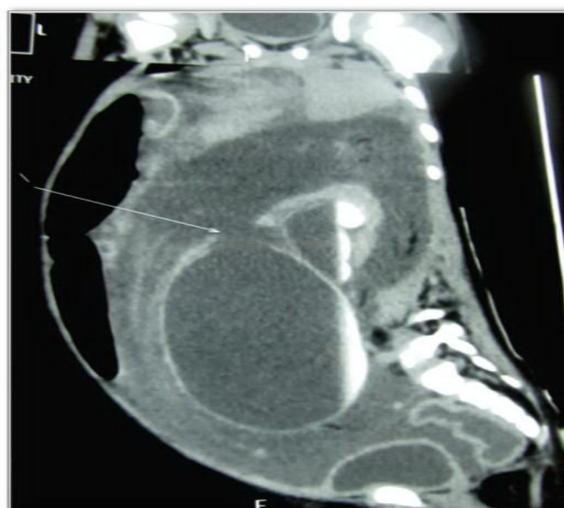
Descending nephrogram and retrograde urethrogram (RGU) revealed hydronephrotic kidney with upper ureteral stricture. A repeat CT of abdomen showed complete resolution of the urinoma with a solitary, massively enlarged malrotated left kidney. Renal scan was suggestive of an obstructive pattern of drainage with GFR of 46ml/min. An interval Anderson-Hynes dismembered pyeloplasty was done for a dilated renal pelvis with stricture at proximal ureter [Fig. 2].



**Fig. 2.** Proximal ureteral stricture treated with Anderson-Hynes dismembered pyeloplasty.

### Case 2

A one year old male presented with abdominal distension and fever with chills following an accidental fall. A CT of abdomen showed a dilated left renal pelvis measuring 8.5x8.2x5cms with a peri-renal urinoma due to a tear in the superior aspect of the pelvis [Fig. 3].



**Fig. 3.** Abdominal CT scan showed a dilated left renal pelvis with a peri-renal urinoma.

Ultrasound guided nephrostomy tube insertion was done. Renal scan revealed bilateral obstructive pattern (Lt>>Rt) with a GFR of 39ml/min on left side. An interval Anderson-Hynes dismembered pyeloplasty was done after 6 weeks.

### Case 3

An eleven year-old boy presented with abdominal lump following trivial blunt abdominal trauma at home. He was found to have left dilated pelvis with an antero-posterior diameter of 7cm. Abdominal CT scan revealed a left sided peri-renal urinoma with a tear in the pelvis [Fig. 4].



**Fig. 4.** A CT revealed a left sided peri-renal urinoma with a tear in the pelvis.

Internal drainage by cystoscopic double-J stent insertion was unsuccessful. Nephrostomy tube was inserted by guidance of ultrasound scan. A descending

nephrogram and nuclear scan done at 6 weeks was indicative of an ureteropelvic junction (UPJ) obstruction. An interval Anderson-Hynes dismembered pyeloplasty was done to relieve the obstruction.

All the three patients are doing well post-operatively with SPU Grade 2 hydronephrosis with preserved renal function.

### Discussion

With advances in renal imaging modalities, the incidence of early detection of renal obstruction is on the rise. Kidney in children is more susceptible to injury as a result of blunt abdominal trauma due to thin abdominal wall musculature, lack of peri-renal fat and comparatively mobile kidney due to laxity of ligaments; namely spleno-renal and reno-colic ligaments [2]. A distinct subset of these injuries has been identified, occurring in patient having occult hydronephrosis secondary to an obstruction [3]. This particular subset is seen more commonly in children and occurs as a consequence of a minor or a trivial trauma to the abdomen which goes unnoticed in a majority of cases [4]. The patient generally presents with non-specific pain in abdomen with or without distension of abdomen. A diagnosis of urinoma secondary to a renal injury is usually made on further imaging

studies of the abdomen. An attempt needs to be made to specifically look for an underlying pathology in these patients. This can be accomplished by a variety of techniques as CT or magnetic resonance (MR) urography [5,6]. Urinomas can be encapsulated or manifest as free fluid. The protocol for CT imaging in these cases has to be followed strictly for an informative study. An initial screening of abdomen followed by injection of contrast and delayed images will help to delineate the urine leak, its site and shape of the urinoma [7]. Another mode of investigation for urinary leak in patient with high creatinine levels or allergy to contrast is renal scintigraphy. Excretion of radiotracer outside the genitourinary system aids the diagnosis [7].

The standard consensus on management of such urinomas involves insertion of a nephrostomy tube either into the urinoma or onto the renal pelvis to facilitate drainage of the collection. This controlled drainage helps in complete resolution of the urinoma. Further, a descending nephrogram may be done to dispel any doubt regarding the existence of an obstruction. Alternately retrograde double-J stenting for decompression and resolution of urinoma can also be done [4]. Cystoscopic internal stenting is more comfortable for patient and

equally effective for drainage [8]. A combined antegrade and retrograde ureteral stent passage has also been described in few difficult cases of infected urinomas when traditional approaches fail [9].

Once the presence of the obstruction is confirmed it is generally managed by a delayed Anderson-Hynes dismembered pyeloplasty. Literature shows that conservative approach has lesser nephrectomy rates in contrast to immediate exploration [10]. The renal function as assessed by renal scans post surgery generally demonstrates a preserved renal function with varying grades of residual hydronephrosis.

Hence, a high index of suspicion should be exercised in young children presenting with inordinately severe abdominal pain following a seemingly trivial trauma to the abdomen. A high degree of clinical suspicion coupled with specific radiological investigation is imperative for timely diagnosis and appropriate treatment of occult obstruction with hydronephrosis presenting as urinary extravasation in order to salvage the residual renal function and prevent the associated long term complications and morbidity.

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