

Pediatrics

Traumatic rupture of hydronephrosis secondary to UPJ obstruction in a child: A case report



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Introduction

The kidney in a child is more susceptible to trauma owing to a decrease in the physical renal protective mechanisms found in childhood. When compared to an adult, the pediatric kidney is protected by an immature, more pliable thoracic cage, weaker abdominal musculature, and less perirenal fat and moreover it lies in a lower abdominal position.¹ Pre-existing renal abnormalities such as ureteropelvic junction (UPJ) obstruction, hydronephrosis and horseshoe kidney are three-to five fold more common in pediatric patients undergoing a screening computed tomography (CT) scan for trauma than in the adult population.² A pre-existing congenital renal abnormality usually presents with a history of haematuria disproportionate to the severity of trauma. It is believed that a pre-existing congenital genitourinary (GU) anomaly would be associated with a higher stage of renal injury, though not documented.³ We report a case of a 12 year old male child who presented with pain and an episode of haematuria following fall while playing.

Case report

A 12 year old male presented to the casualty with history of right upper abdominal pain and an episode of haematuria following fall while playing, of one day duration. The pain was severe associated with nausea and vomiting. The child was conscious, well oriented and afebrile. Abdominal examination revealed tenderness in right hypochondriac and lumbar region. No mass was palpable. Serum creatinine was 0.64 mg%, total counts were within normal range and blood Haemoglobin level was 12.7 gm%. Chest x-ray was normal. In view of gross haematuria, CT abdomen (Fig. 1) was done, which revealed right kidney with moderate to gross dilatation of pelvicalyceal system, thickening of perinephric fat with fluid collection along the right perirenal space extending into parapelvic space and along right psoas muscle. The right ureter was not visualized and there was extravasation

of the contrast around the kidney.

The child was started on antibiotics, advised complete bed rest and followed up with serial ultrasonography examination (Fig. 2). The severity of pain increased and the child was taken up for cystoscopy, right retrograde ureterogram and double J (DJ) stenting. Post DJ stenting the pain subsided and the child was asymptomatic. Four weeks later the DJ stent was removed and DTPA (diethylene triamine pentaacetate) scan was done, which revealed right UPJ obstruction with delayed drainage. The child underwent an open Anderson Hynes pyeloplasty. The post-operative period was uneventful and repeat DTPA scan done three months after surgery showed improved drainage.

Discussion

Genitourinary anomalies are known to increase the risk for blunt renal trauma related genitourinary injuries. The most common pre-existing anomalies include, horseshoe or ectopic kidneys, hydronephrosis or dilatation of pelvicalyceal system and rarely renal cysts and tumours.^{2,3} However, injuries of the renal pelvis attributed to a blunt mechanism are exceedingly rare. Injuries involving the UPJ and renal pelvis are more common and severe among children.³ Rupture of congenital UPJ obstruction is thought to be more likely due to hyper-extension associated with rapid deceleration or falls from higher than 20 feet.⁴ Moreover, UPJ hydronephrosis is a high-pressure system and blunt abdominal trauma would increase the pressure within the hydronephrotic renal pelvis and cause rupture. This amplifies the force of the impact, thereby increasing the concentration of stress at the outer surface of the kidney, resulting in a higher probability of tissue rupture.^{3,4}

Ultrasonography may provide important information regarding a renal injury. Extravasation or collection of fluid/urine may be seen. CT scan of the abdomen is a very sensitive radiologic staging technique that accurately assesses injuries of the kidney, the excretory system, and other abdominal organs.⁵ The constellation of good renal contrast

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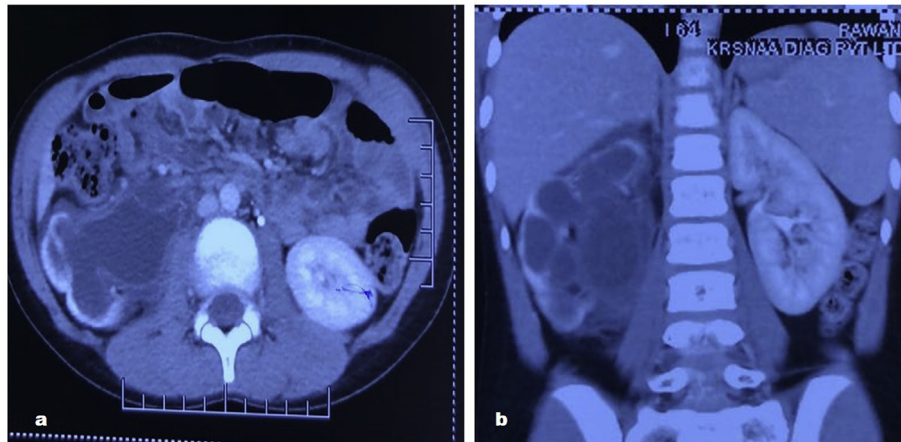


Fig. 1. CT reveals right kidney with moderate to gross dilatation of pelvicalyceal system, thickening of perinephric fat with peri-pelvic extravasation.



Fig. 2. Ultrasonography shows dilated pelvicalyceal system with peri-pelvic extravasation.

excretion with extravasation of contrast into the medial perirenal space with an intact calyceal system and non-visualization of the unilateral ureter is virtually diagnostic of complete or partial UPJ disruption.

The aim of management is to primarily conserve the kidney and its function, reduce immediate and long-term morbidity. Controversy remains as to initial management. Primary pyeloplasty at initial presentation has been performed for traumatic renal pelvic disruption.⁴ Partial injuries of the UPJ obstruction can often be managed successfully with stenting for about 6–8 weeks. Immediate surgery after blunt renal trauma may result in a nephrectomy at times. Subsequent pyeloplasty may be done either through open, laparoscopic or robot assisted route.⁵

References

1. Husman DA. Pediatric genitourinary trauma. In: Wein AJ, Kavoussi LR, Partin AW, Peters CA, eds. *Campbell-walsh Urology*. eleventh ed. Philadelphia: Elsevier-Saunders; 2016:3538.

2. Nerli RB, Metgud T, Patil S, et al. Severe renal injuries in children following blunt abdominal trauma: selective management and outcome. *Pediatr Surg Intern*. 2011;27(11):1213.
3. Chopra P, St-Vil D, Yazbeck S. Blunt renal trauma-blessing in disguise? *J Pediatr Surg*. 2002;37:779–782.
4. Reddy MN, Nerli RB. The laparoscopic pyeloplasty: is there a role in the age of robotics? *Urol Clin*. 2015;42(1):43–52.
5. Al-Qudah HS, Santucci RA. Complications of renal trauma. *Urol Clin*. 2006;33:41–53.