Emergency Pediatric Imaging Quiz – Case 2

A 5-year-old boy presented to the Emergency Department of our hospital with acute onset of left quadrant abdominal pain after being pushed, fallen and run over by his classmates. The boy’s chest X-ray was normal. Urinalysis showed microscopic hematuria. Focused Assessment with Sonography in Trauma (FAST) ultrasound (US) exam was performed. Perinephric collection and upper pole renal cortex’s irregularity of left kidney was identified (figures 1a, 1b, 1c). Signs of chronic non obstructive hydronephrosis of left kidney were also observed, possibly due to pelviureteric junction stenosis. The child was hemodynamically stable and it was transferred, after referral by surgeons, to our Computed Tomography (CT) department for emergency abdomen CT imaging. Focused non-enhanced (NECT) and contrast enhanced CT (CECT) was performed; two lacerations of left kidney’s upper pole extending to the collecting system and one contusion of the lateral cortex of upper pole (downwards) was found. A perinephric collection with densities similar or slightly higher to urine was also shown (figures 2, 3a, 3b, 3c). No contrast extravasation consistent with active bleeding was noticed (figures 4a, 4b). The patient underwent conservative treatment; subsequent US exams showed shrinkage of the perinephric collection and the boy was discharged in good clinical condition after one week of hospitalization.

Comment
The kidneys are injured in about 10% of patients with blunt trauma abdominal injuries. Renal injuries are graded by the American Association for the Surgery of Trauma (AAST) according to the depth of injury and the involvement of renal vessels or the collecting system in 5-grade severity scale. In the pediatric population,
Diagnosis: Renal trauma (cortical renal rupture and perinephric urinoma). 

grade I−III blunt renal trauma resolve without intervention (grade I: hematuria, normal imaging or small contusions, nonexpanding subcapsular hematoma; grade II: perinephric hematomas confined to the retroperitoneum, superficial lacerations <1 cm in depth without communication with collecting system; grade III: renal lacerations >1 cm with no involvement of collective system). In the same population, most cases of grade IV blunt renal trauma can be treated conservatively (grade IV: lacerations extending through the kidney into the collecting system, involvement of renal vessels with contained hemorrhage, segmental infarctions, large hematomas compressing the kidney). When a symptomatic urinoma develops, percutaneous drainage provides the complete resolution of persistent urine leakage. Patients with complete renal fracture or significant urinary extravasation on initial radiographic imaging may be less likely to undergo spontaneous resolution. Patients with a persistent urinary leak can be successfully treated with internal drainage. Grade V injuries (shattered or devascularized kidney, ureteropelvic avulsions, complete laceration or thrombus of the main renal vessels) in most cases require open operative intervention.

References

1. BUCKLEY JC, McANINCH JW. Revision of current American Association for the Surgery of Trauma renal injury grading system. J Trauma 2011, 70:35−37

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