SIGNA VITAE 2015; 10(1): 110 - 114

A Giant Hydronephrotic Kidney with Ureteropelvic Junction Obstruction with Blunt Renal Trauma in a Boy

BY **JUNYA TSURUKIRI, HIDEFUMI SANO, YOSUKE TANAKA, TAKAO SATO, HIROKAZU TAGUCHI**

Abstract

An 18-year-old male soccer player was transferred from the clinic to our emergency center with suspected blunt renal trauma. A giant ureteropelvic junction (UPJ) obstructed hydronephrosis in blunt renal trauma was revealed by enhanced computed tomography and angiography. The patient then underwent insertion of a double “J” stent and was placed under close observation in the intensive care unit. His improvement was rapid, and he subsequently underwent pyeloplasty. Although UPJ obstruction is one of the common pre-existing renal lesions (PERLs), hydronephrosis of such a giant size, associated with blunt trauma, is relatively rare. Hydronephrosis in the kidneys may easily lead to rupture, even with minor trauma.

Key words: injury, hydronephrosis, urine, angiography, pyeloplasty

Introduction

Ureteropelvic junction (UPJ) obstruction is one of the commonly encountered pre-existing renal lesions (PERLs), but delayed diagnosis and/or treatment of UPJ injury is not common. (1–4) Pre-existing renal lesions may complicate an otherwise negligible renal trauma. This report details the initial survey,

accompanied by radiological images, of renal injury with a giant UPJ obstructed hydronephrosis after minor sport trauma that was treated successfully with an indwelling ureteral stent in a teenage boy.

Case report

An 18-year-old male soccer player developed flank pain after a direct foot blow to his left flank. He was transferred to our emergency center from the clinic with suspected blunt renal trauma. He had no notable past medical history. On examination, he had an eye4 verbal5 motor6 Glasgow Coma Scale score, blood pressure of 158/107 mmHg, heart rate of 87 beats/min and respiratory rate of 12 beats/min. Although he was hemodynamically stable, he complained of left abdominal pain and initial urine drained red blood. Focused assessment with sonography for trauma (FAST) detected a perirenal hypoechoic lesion and left grossly dilated pelvicalyceal system with thinning of the renal cortex. After receiving initial trauma resuscitation, contrast-enhanced computed tomography (CT) showed that the left ureter was not dilated, suggesting a left UPJ obstruction. Fluid collection within the pelvicalyceal system and pararenal space, suggested the rupture of the left UPJ obstructed hydronephrosis (figures 1A and 1B). The extravasation of contrast medium was also detected. Following the completion of CT scans, the patient was transferred to the angiography suite and renal angiography revealed no contrast medium extravasation (figure 1C). Therefore, he underwent an insertion of a double "J" ureteral stent, after which he was admitted to the intensive care unit (ICU) (figure 2A). The condition of the patient rapidly improved, and he was discharged from the ICU with no medical event (figure 2B). The red urine disappeared on day 6 after injury. The patient was discharged with no evidence of stricture on day 15 and underwent pyeloplasty at a later date.

Discussion

This patient was admitted to the hospital after low–energy trauma with macroscopic hematuria and suspected ureteral injury. Ureteral injuries caused by sports trauma are uncommon; they mostly involve the ureteropelvic junction. The diagnosis is usually difficult and late, and a high index of suspicion, using multiple modalities, should determine the appropriate evaluation. Focused assessment with sonography for trauma is generally a noninvasive and effective diagnostic

method in an emergency setting.

In this case, PERL was incidentally found during the initial survey of trauma. The most common PERLs are cyst, tumor, horseshoe, or hydronephrosis. Ureteropelvic junction obstructed hydronephrosis is the most common type of congenital renal obstruction, with a prevalence of 3 in 1,000 live births, more frequent in boys than in girls, and more often on the left flank than on the right flank. Although the frequency of PERLs associated with blunt trauma is 5%–36% in children, a giant UPJ obstructed hydronephrosis associated with renal injury is rare. However, such kidneys easily lead to rupture because of the high–pressure system caused by UPJ obstruction, even with relatively minor trauma. (5) Injuries to the renal pelvis obstructed at the UPJ can result in hemorrhage from the attenuated renal vessels or the rupture of the renal pelvis.

Patients with a PERL, who have renal injury with minor trauma, are more likely to require surgery than those without a PERL. In the normal kidney, most injuries classified as grade IV resolve with bed rest. Intervention should be considered only for persistent bleeding or urine leakage. In kidneys with PERLs, grade IV injuries are prone to require subsequent endoscopic or open surgical intervention following percutaneous nephrostomy or stenting.

Figure 1.

A. Delayed contrast-enhanced computed tomography image revealed contrast medium extravasation within the pelvicalyceal system and fluid collection.

B. A giant ureteropelvic junction obstructed hydronephrosis was diagnosed.

C. Angiography revealed no active bleeding.

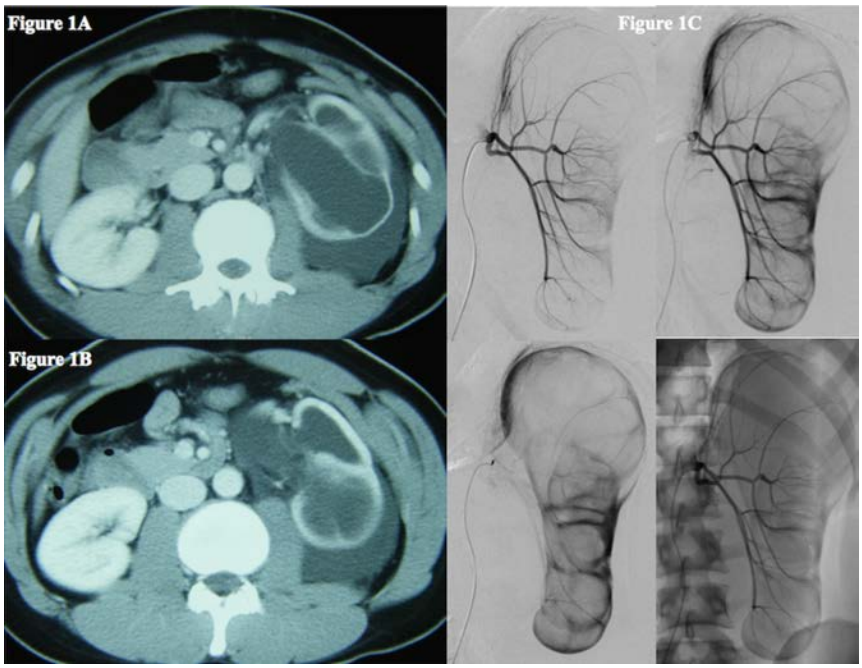
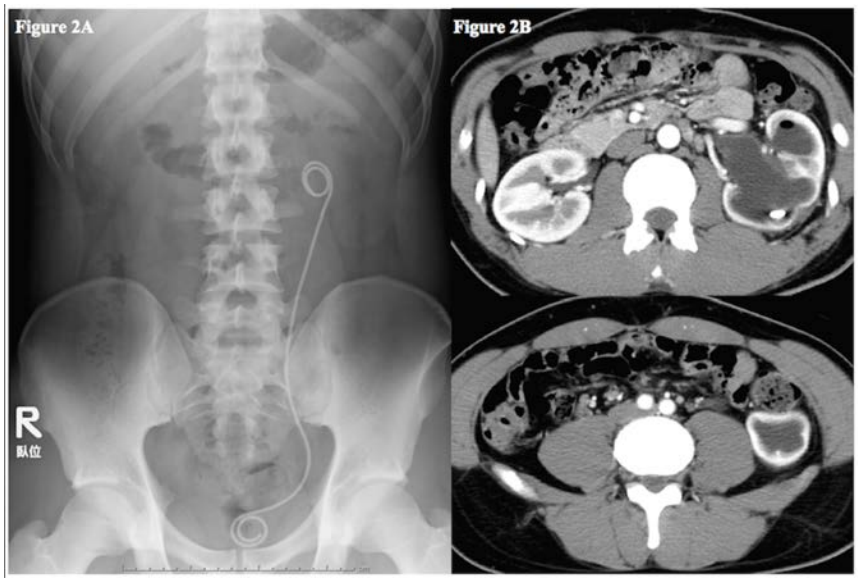


Figure 2.

A. Abdominal X-ray after insertion of a double “J” stent.

B. Computed tomography showed resolution of the urinoma



References

1. Onen A, Kaya M, Cigdem MK, Otçu S, Oztürk H, Dokucu AI. Blunt renal trauma in

child with previously undiagnosed pre-existing renal lesions and guidelines for effective initial management of kidney injury. BJU Int 2002;89:936-41.
2. Fernbach S. Congenital renal anomalies. In: Kuhn JP, Slovis TL, Haller JO, editors. Caffey's Pediatric Diagnostic Imaging. 10th ed. Philadelphia: Mosby; 2004. p. 1759-86.
3. Boone TB, Gikking PJ, Husmann DA. Ureteropelvic junction disruption following blunt abdominal trauma. J Urol 1993;150:33-6.
4. White MA, Kepros JP, Zuckerman LJ. Bilateral partial ureteropelvic junction disruption after blunt trauma treated with indwelling ureteral stents. Urology 2007;69:384.
5. Schmidlin FR, Schmid P, Kurtyka T, Iselin CE, Graber P. Force transmission and stress distribution in a computer-stimulated model of the kidney: an analysis of the injury mechanism in renal trauma. J Trauma 1996;40:791-6.

Junya Tsurukiri, Hidefumi Sano, Yosuke Tanaka, Takao Sato
Emergency and Critical Care Medicine, Tokyo Medical University Hachioji Medical Center
Hirokazu Taguchi
Critical Care and Emergency Medicine, Osaka City University Graduate School of Medicine
Corresponding author:
Junya Tsurukiri
Emergency and Critical Care Medicine
Tokyo Medical University Hachioji Medical Center
1163 Tatemachi, Hachioji
Tokyo 193-0998, Japan
Phone: +81-426655611
Fax: +81-426655639
E-mail: junya99@tokyo-med.ac.jp