

Trauma and reconstruction

## Distal ureteric rupture caused by blunt abdominal trauma: A rare case report

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### ABSTRACT

Ureteral trauma is a rare case and generally results from severe trauma events. A 6-year-old boy came with the chief complaint open wound in the lower right abdomen after falling from the bike. Abdominal MSCT with contrast showed the free liquid in the peritoneal cavity, and *Retrograde Pyelogram* showed the contrast extravasation. According to the algorithm, a surgical exploration must be performed because of the contrast extravasation. In this case, there found a total rupture of right distal ureter. Debridement was performed, and *Double J Stent* was implanted. This patient got treatment quickly so he didn't suffer disability and death.

### Introduction

Ureter trauma is a rare case and it can cause serious morbidity and mortality if not identified.<sup>1,2</sup> Ureter trauma can caused by abdominal blunt trauma or penetrating trauma.<sup>3</sup> Traumatic ureter injury caused by blunt trauma is a rare case because it is protected in retroperitoneal by the pelvic bone, psoas muscle, and spine.<sup>1</sup>

With a small prevalence of ureteric trauma, there is often a misdiagnosis of ureteric trauma. Immediately action must be taken to prevent morbidity and mortality events caused by ureteric trauma.

### Case presentation

A 6-year-old boy came to emergency room Dr. Kariadi Hospital because of pain in the lower right abdomen after falling from the bike. Two hours before admitted, patient was falling down from his bike after hitting the wall. His head hit the wall and his lower right abdomen was hit by the steering wheel. There was an open sores on the lower right. He felt dizzy, but not faint or amnesia. The patient didn't have any previous disease history and history of routine medication.

In physical examination, found body weight 20kg, height 115cm, general appearance looks moderately ill, less active because of the pain. His *Glasgow Coma Scale* (GCS) was 15, with normal vital signs, and pain score 4–5 *Visual Analogue Scale* (VAS). There wasn't any sign of increasing intracranial pressure. Chest examination revealed within normal limit. The abdomen looked normal with open sores about 7 × 1 cm, flat edge, muscle base, with no active bleeding at the lower right abdomen (Fig. 1). The abdomen was tender, felt pain only in open sores. Genitalia were normal. Motoric and sensory status were normal.

Laboratory findings showed Hemoglobin 11,9 gr%, Hematocrit 33%, Leucocyte 23.600 mmc, thrombocyte 421.000 mmc, Urea 33 mg/dL, Creatinine 0,7mg/dL, Sodium 131 mmol/mL, Potassium 3,0 mmol/L, Chloride 95 mml/dL, PPT 11,6, APTT 32,9. Imaging studies were performed including abdominal MSCT with contrast (Fig. 2), and retrograde pyelogram (Fig. 3).

The patient was diagnosed with mild head injury, open abdominal blunt trauma with stable hemodynamic, and rupture of 1/3 distal of right ureter. He was planning to take operation procedures (debridement and ureteral repair).

### Discussion

Ureter trauma is a rare case, estimated about 1% of all cases of urological trauma.<sup>1,2,4</sup> The most common causes are usually due to iatrogenic trauma (75%), followed by blunt trauma (18%), and sharp trauma (7%).<sup>4</sup> Over the past few decades, the possibility of injury to the genitourinary tract caused by external trauma, where the ureter is involved, has increased where previously less than 1%, now to 2.5%. In external trauma, ureteric damage can occur in less than 4% (penetrating trauma), and 1% (blunt trauma) cases. Blunt trauma can cause ureteral injury from several mechanisms. That injuries can occur due to high-speed motor vehicle crashes, falling from significant altitudes, or direct trauma to the L2-3 vertebral region.<sup>2</sup>

In diagnosing ureteral injuries from trauma, the most important factor is a high index of suspicion of the presence of the hematuria after trauma.<sup>1,4</sup> If there is suspected urine leakage, it is necessary to do retrograde pyelography and abdominal MSCT with contrast.<sup>4</sup>

The primary objective of ureteral repair is preservation of renal

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Fig. 1. The open sores in the lower right abdomen caused by blunt trauma.

function. The early diagnosis of ureteral injury is important and related to the patient's prognosis. The late diagnoses were correlated with higher rates of morbidity and mortality.<sup>1</sup>

Pereira et al. (2010) mentioned that it is recommended to carry out surgical exploration or installation of stents in the case of ureteral injury with contrast extravasation from abdominal MSCT and Retrograde Pyelogram (Level of Evidence 4).<sup>1</sup>

The patient got the blunt trauma with an open sores in his lower right abdomen. From the anamnesis found the existence of high-velocity impact to the abdomen. From the abdominal physical examination found open sores at the lower right abdomen. From the imaging studies, abdominal MSCT with contrast and retrograde pyelogram was found a contrast extravasation at the distal ureter.

Because of the contrast extravasation, and according to Pereira et al., we had to perform a surgical exploration. There was a total rupture of right distal ureter (Grade IV). Then, we performed debridement, and implantation of *Double J Stent* 5 Fr in the right ureter.

According to EAU guideline, immediate diagnosis of a ligation injury during an operation can be managed by de-ligation and stent placement. Stenting is helpful because it provides canalisation and may decrease the risk of stricture. Distal ureteral injury are best managed by ureteral reimplantation (ureteroneocystostomy) because the primary trauma usually jeopardises the blood supply to the distal ureter (Level of Evidence 3).<sup>5</sup>

### Conclusion

Ureteral trauma though rare but can lead to disability and even death. Appropriate and rapid managements also need to be taken in case of ureter trauma in order to get the better prognosis and avoid the further complications.



Fig. 2. Abdominal MSCT with contrast showed the contrast extravasation.

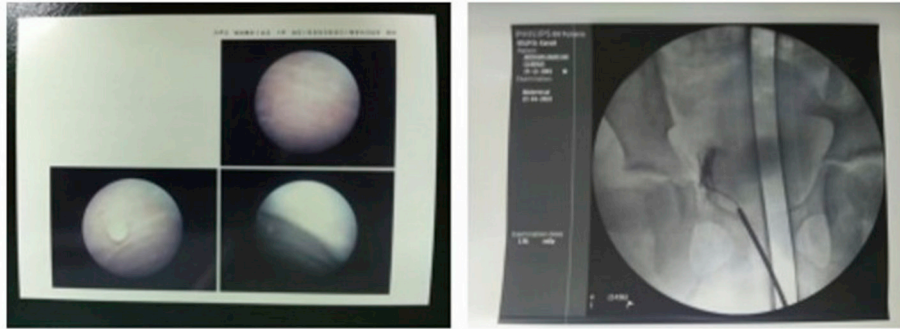


Fig. 3. Retrograde pyelography showed contrast extravasation.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.eucr.2019.100917>.

#### Conflicts of interest

The authors declare that they have no conflicts of interests.

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