CASE REPORT / OLGU SUNUMU

Blunt Renal Trauma: A Case Report

Künt Renal Travma: Bir Olgu Sunumu

Mehmet Berk Eyinç[1], İnan Beydilli[1], Fevzi Yılmaz[1], Engin Deniz Arslan[1]

ABSTRACT

Aim: The ratio of renal traumas among all abdominal traumas is undeniable. With the developing technology, the non-operative approach took place of the operative interventions in the management of renal trauma. In this paper, we compiled a short review about renal trauma and its management based on a patient who was admitted to the emergency department with post-traumatic hematuria.

Case: A 29-year-old man is admitted to the emergency department with a complaint of bloody urine and left flank pain. Medical history revealed that he fell down from a height of 1 meter 2 days ago. Left costa-vertebral angle (CVA) tenderness was positive on physical examination. Erythrocyte (1263 P/HPF) and Leukocyte (56 P/HPF) counts were elevated in urinalysis. The patient underwent contrast-enhanced abdominal computed tomography (CT) scan to rule-out kidney injury and left kidney contusion and perirenal hematoma that was in accordance with grade 2 renal injury was detected. No intervention was not considered for the patient, he was admitted to the ward, and he was discharged after an uneventful hospital stay.

Conclusion: The incidence of kidney injuries is higher in the young population aged between 31 and 38 years and men account for 72-93% of these cases. Blunt renal injuries, accounting for 71-95 % of renal trauma cases, are more common than penetrating injuries. Motor vehicle accidents are the main cause of blunt trauma, followed by falls, sports, and pedestrian accidents. Up to 95% of blunt renal injuries are minor and treated conservatively as in our case. Currently, conservative management is the preferred therapeutic modality in hemodynamically stable patients with low-grade kidney injury.

Keywords: Renal injury, hematuria, blunt trauma

ÖZ

Amaç: Batın yaralanmalarının içinde böbrek yaralanmaları göz ardı edilemeyecek sıklıktadır. Gelişen teknolojiyle birlikte böbrek yaralanmasının yönetiminde cerrahi olmayan yaklaşım cerrahi yönetimin yerini almıştır. Bu yazıda acil servise post travmatik hematüri ile başvuran olguya dayanarak böbrek yaralanması ve yönetimini kısaca gözden geçirdik.

Olgu: Yirmi dokuz yaşında erkek hasta, kanlı idrar ve sol yan ağrısı şikayeti ile acil servise başvurdu. Öyküsünde 2 gün önce 1 metre yükseklikten düştüğü bilgisi öğrenildi. Fizik muayenede sol kosta-vertebral açı (SVA) hassasiyeti pozitifti. Tam idrar tahlilinde eritrosit (1263 P/HPF) ve Lökosit (56 P/HPF) sayıları yükseldi. Hastaya böbrek hasarı ekarte etmek için kontrastlı karın bilgisayarlı tomografisi (BT) çekildi ve sol böbrek kontüzyonu ve evre 2 böbrek hasarına uygun perirenal hematom saptandı. Hastaya herhangi bir cerrahi müdahale düşünülmedi, servise alındı ve sorunsuz bir hastanede yatış sonrası taburcu edildi.

Sonuç: Böbrek yaralanmalarının insidansı 31-38 yaş arası genç nüfusta daha fazladır ve bu olguların %72-93'ünü erkekler oluşturmaktadır. Renal travma vakalarının %71-95'ini oluşturan künt renal yaralanmalar penetran yaralanmalardan daha yaygındır. Künt travmaların başlıca nedeni motorlu taşıt kazaları olup, bunu düşmeler, spor ve yaya kazaları izlemektedir. %95'e varan künt böbrek yaralanmaları minör yaralanmalar olup bizim olgumuzda olduğu gibi konservatif olarak tedavi edilir. Düşük dereceli böbrek hasarı olan hemodinamik olarak stabil hastalarda şu anda konservatif tedavi tercih edilen tedavi yöntemidir.

Anahtar Kelimeler: Renal yaralanma, hematüri, künt travma

Received: September 23, 2021 Accepted: February 8, 2022

[1] Department of Emergency Medicine, Health Science University Antalya Training and Research Hospital, Antalya/Turkey.

Corresponding Author: Engin Deniz Arslan, MD **Address:** Department of Emergency Medicine, Health Science University Antalya Training and Research Hospital, Antalya/Turkey. **Phone:** +905324889683 **e-mail**: engindeniz.arslan@gmail.com

Atıf için/Cited as: Eyinc MB, Beydilli I, Yilmaz F, Arslan ED. Blunt Renal Trauma: A Case Report. Anatolian J Emerg Med 2022;5(1):34-36. https://doi.org/10.54996/anatolianjem.999525

Introduction

Trauma is considered as a global health problem. When all abdominal traumas are examined, urinary tract injuries are seen in 10 percent (1). Kidney injuries are the most common injuries among urinary tract injuries and among all traumas, kidney injuries take place between 1-5% on average (2,3).

Case Report

A 29-year-old man is admitted to the emergency department with a complaint of bloody urine and left flank pain. He had no chronic disorder, and he didn't take any medication. He did not describe dysuria or reduced urine output. When questioned, he said he fell down from a height of 1 meter 2 days ago. He was conscious, oriented, cooperative and his general condition was good. The patient's vital signs on arrival were within normal limits. His physical examination was unremarkable except for left costa-vertebral angle (CVA) tenderness. Leukocytosis was determined on the complete blood count (WBC:12.2 K/uL). Hemoglobin level was in normal limits and so was creatinine, blood urea nitrogen, glomerular filtration rate, International Normalizing Ratio (INR), prothrombin time (PT), and activated prothrombin time (aPTT). Erythrocyte (1263 P/HPF) and Leukocyte (56 P/HPF) counts were elevated in urinalysis. The patient underwent a contrast-enhanced abdominal computed tomography (CT) scan to rule-out kidney injury. On CT, left kidney contusion and perirenal hematoma that was in accordance with grade 2 renal injury (Figure 1-2) were detected. Any intervention was not considered for the patient, he was admitted to the ward, and he was discharged after an uneventful hospital stay. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Figure 1: Coronal view. Black arrow indicating renal contusion and perirenal hematoma at the inferior pole of the right kidney.
Figure 2: Sagittal view. Black arrow indicating renal contusion and perirenal hematoma of right kidney.

Discussion

The incidence of kidney injuries is higher in the young population aged between 31 and 38 years. Men account for 72-93% of these cases. Blunt renal injuries, accounting for 71-95 percent of renal trauma cases, are more common than penetrating injuries (3,4). Motor vehicle accidents are the main cause of blunt trauma, followed by falls, sports, and pedestrian accidents (5,6). The kidneys are encircled by gerota fascia and fixed by ureter and vascular pedicles that exhibit a semi-mobile structure. Because of this poor fixation, kidneys are vulnerable to deceleration injuries leading to shearing forces resulting in organ laceration. We believe that the same mechanism effected our patient causing kidney contusion. Although the delayed presentation of hematuria may also be seen in arteriovenous fistulas, we did not detect any other injuries (7).

During the physical examination, special attention should be paid to symptoms suggestive of kidney injury such as gross hematuria, flank hematoma, flank ecchymoses and tenderness, pelvic pain, rib fractures, rebound tenderness (3,4,8-10). Laboratory tests should include standard trauma labs such as urine analysis, complete blood count, biochemistry panel including kidney function tests to detect hematuria and renal function (4,10). Between 80% and 95% of major kidney injuries in adults are manifested by hematuria (6,8). Although it is well known that the degree of hematuria does not correlate with the severity of the injury, the presence and increasing amount of blood in the urine are associated with a significantly higher risk for renal injury (11,12). On the other hand, microscopic hematuria on its own is not an absolute indication for kidney imaging. It's accepted that clinically important urinary tract damage doesn't occur in the absence of shock or gross hematuria (13). Imaging techniques should be used in patients with gross hematuria (8). Although Focused Abdominal Sonography for Trauma (FAST) examination is the first step to detect abdominal free fluid indicating hemorrhage; computed tomography (CT) with intravenous contrast is the preferred imaging technique in blunt trauma to evaluate intrabdominal and retroperitoneal injuries in stable patients. Also, a renal arteriogram should be done in case of suspected arterial injury (7,14).

In the management of renal trauma, mortality is avoided through bleeding control, nephron preservation, and the prevention of complications. Due to advances in tomography and angioembolization techniques, most traumatic kidney injuries are managed non-operatively (3,4,10). According to American Association for Trauma Surgery classification system conservative treatment approach is preferred in Grade 1 -2 and hemodynamically stable Grade 3-4 renal injuries. Expanding hematoma or active hemorrhage suggests the possibility of high-grade renal injury (4,10). Angiography and selective renal arterial embolization to control renal bleeding and arteriovenous fistulas can be alternatives to operative management (15). In addition, a non-operative approach with active monitoring was adopted in the presence of hemodynamical stability in Grade 4 -5 cases. Studies have shown that non-operative management provides approximately 84-100%

kidney preservation (4,10,16,17). Up to 95% of blunt renal injuries are minor and treated conservatively as in our case (18). Kidney injury that does not respond to resuscitative measures and patients who are hemodynamically unstable, bleeding that causes continuous red blood cell transfusion requires operative management (10).

Conclusion

Renal trauma has unique anatomical properties and the approach to the diagnosis and management of renal trauma continues to evolve. Currently, conservative management is the preferred therapeutic modality in hemodynamically stable patients with low-grade kidney injury.

Conflict of Interest: No conflict of interest was declared by the author.

Financial Disclosure: No financial disclosure was declared by the author.

Authors Contribution: This manuscript was written by one author.

Informed Consent Statement: Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review in this journal.

References

1- Lee YJ, Oh SN, Rha SE, Byun JY. Renal trauma. RadiolClin North Am. 2007 May;45(3):581-92
2- Alonso RC, Nacenta SB, Martinez PD, Guerrero AS, Fuentes CG. Kidney in danger: CT findings of blunt and penetrating renal trauma. Radiographics. 2009 Nov;29(7):2033-53.
3- Chouhan JD, Winer AG, Johnson C, Weiss JP, Hyacinthe LM. Contemporary evaluation and management of renal trauma. Can J Urol. 2016;23(2):8191-8197.
4- Erlich T, Kitrey ND. Renal trauma: the current best practice. Ther Adv Urol. 2018;10(10):295-303.
5- Voelzke BB, Leddy L. The epidemiology of renal trauma. TranslAndrol Urol. 2014 Jun;3(2):143-9.
6- Gourgiotis S, Germanos S, Dimopoulos N, Vougas V, Anastasiou T, Baratsis S. Renal injury: 5-year experience and literature review. Urol Int. 2006;77(2):97-103.
7- Rous SN. The value of serial selective renal angiography in the delayed management of renal trauma. J Urol. 1972 Mar;107(3):345-7.
8- Viola TA. Closed kidney injury. Clin Sports Med. 2013 Apr;32(2):219-27
9- Gourgiotis S, Germanos S, Dimopoulos N, Vougas V, Anastasiou T, Baratsis S. Renal injury: 5-year experience and literature review. Urol Int. 2006;77(2):97-103.
10- Singh S, Sookraj K. Kidney Trauma. [Updated 2021 Jul 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan
11- Bright TC, White K, Peters PC. Significance of hematuria after trauma. J Urol. 1978 Oct;120(4):455-6
12- Taylor GA, Eichelberger MR, Potter BM. Hematuria. A marker of abdominal injury in children after blunt trauma. AnnSurg. 1988 Dec;208(6):688-93.)
13- Goldman SM, Sandler CM. Urogenital trauma: imaging upper GU trauma. Eur J Radiol. 2004 Apr;50(1):84-95.
14- Harris AC, Zwirewich CV, Lyburn ID, Torreggiani WC, Marchinkow LO. Ct findings in blunt renal trauma. Radiographics. 2001 Oct;21 Spec No: S201-14
15- Uflacker R, Paolini RM, Lima S. Management of traumatic hematuria by selective renal artery embolization. J Urol. 1984 Oct;132(4):662-7.
16- Morey AF, Broghammer JA, Hollowell CMP, McKibben MJ, Souter L. Urotrauma Guideline 2020: AUA Guideline. J Urol. 2021;205(1):30-35.
17- Sujenthiran A, Elshout PJ, Veskimae E, et al. Is Nonoperative Management the Best First-line Option for High-grade Renal trauma? A SystematicReview. *EurUrolFocus*. 2019;5(2):290-300.
18- Veeratterapillay R, Fuge O, Haslam P, Harding C, Thorpe A. Renal trauma. Journal of Clinical Urology. 2017;10(4):379-390.