

Trauma and reconstruction

## Traumatic renal injury revealing a horseshoe kidney: A case report

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## ABSTRACT

Having a kidney disease is a major risk factor of renal injury during blunt traumas. We present a case of abdominal blunt trauma due to motor-vehicle accident in a 48 year old male patient. Abdominal computed tomography scan showed a high-volume retroperitoneal hematoma with rupture in the isthmus of the horseshoe kidney with active contrast-enhanced extravasation. He underwent a partial nephrectomy of the left lower pole.

## 1. Introduction

Horseshoe kidney is rare its prevalence is 0.2%.<sup>1</sup> Having a kidney disease is a major risk factor of renal injury during blunt traumas, in fact 19% of all renal injuries after traumas happened on preexisting abnormal kidneys.<sup>2</sup> Non operative treatment is the gold standard in the management of kidney injuries after blunt traumas and the advancement of embolization techniques offers more conservative alternatives. In some cases when embolization is not available, open surgery is the only way to save patient with active bleeding and hemodynamic instability.

## 2. Case report

We report the case of a 48-year-old male patient with no prior medical history who consulted emergencies for a left flank pain, gross hematuria after falling from his own high and reception on his left flank. The patient was a victim of abdominal blunt trauma due to motor-vehicle accident. On examination, the patient had a blood pressure of 100/80 mmHg, a heart rate of 120 beats per minute, a respiratory rate of 20 and Oxygen Saturation of 96%. Abdominal examination revealed guarding and diffuse tenderness, maximum at the left flank region. Contusions and ecchymoses were absent. Initial laboratory evaluation revealed a Hemoglobin of 9.2 g/dl. Urine output was within normal limits. All other tests, including blood and coagulation profile, electrolytes and tests of renal function were within normal limits. Abdominal computed tomography scan showed a high-volume retroperitoneal

hematoma and multiple-lacerated lower pole of the kidney, compatible with rupture in the isthmus of the horseshoe kidney with active contrast-enhanced extravasation from a left lower pole artery (Fig. 1). After 6 hours of hospitalization, his conditions were critical with hypovolemic shock due to haemorrhage. Blood pressure was 70 over 60 mmHg, heart rate was 150 beats per minute. Hemoglobin level dropped to 6g/dl. Therefore, the patient was taken immediately to the operating room to undergo surgical laparotomy since embolization was not available in our institution. Four unit of packed red blood cell were transfused. Urgent open surgery was performed. Surgical exploration found a left kidney with a posterior medial laceration with rupture of the isthmus of horseshoe the kidney. The bleeding artery was identified and ligatured it was the left lower pole artery. We decided to perform a partial nephrectomy of the left lower pole to prevent infectious complications. Post-operatively, the patient did well and was discharged home on post-operative day one. Post – operative renal function was normal. Post-operative course was uneventful and the patient left the hospital ten days after the intervention. No delayed complications were observed. Computed tomography follow-up was performed at 6 and 12 months both revealing normal anatomical findings (Fig. 2).

## 3. Discussion

Affecting about 0.25% of the population horseshoe kidneys were firstly described in 1522 by da carpi when performing autopsies.<sup>3</sup> Horseshoe kidneys consist of two functioning renal masses present on the both side of vertebral column connected by the isthmus which is in 80% of cases

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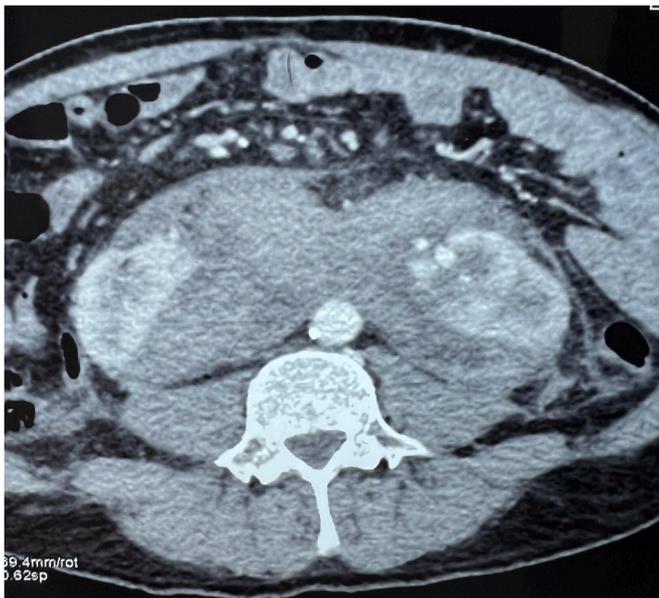
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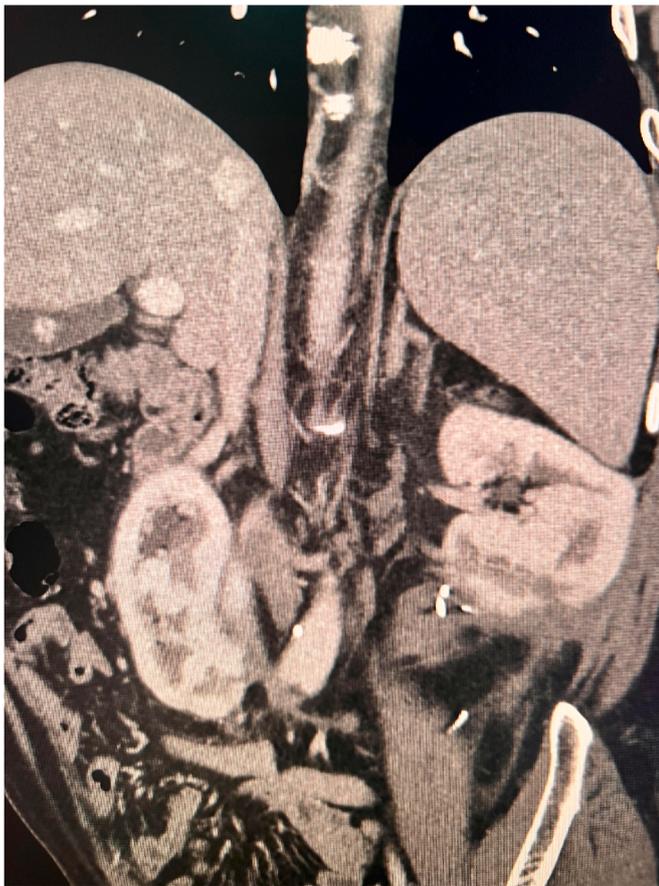
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**Fig. 1.** Abdominal computed tomography scan showed a rupture in the isthmus of the horseshoe kidney with active contrast-enhanced extravasation from a left lower pole artery.



**Fig. 2.** Computed tomography follow-up revealed normal anatomical findings.

composed by renal parenchyma in 90% of cases connection occurs in the

lower pole of the kidneys.<sup>3</sup> Horseshoe kidneys present several differences in position/rotation and vascular supply of the kidney that's why urologic surgeons face several difficulties when operating this type of kidneys.<sup>3</sup> Due to their ectopic position, horseshoe kidneys are also particularly susceptible to blunt abdominal trauma as they can be compressed or fractured against the lumbar vertebrae.<sup>4</sup> Thirty percent of patients with horseshoe kidneys are asymptomatic and the diagnosis is found incidentally after imaging.<sup>3</sup> In our case the blunt renal trauma revealed the horseshoe kidneys, after performing the computed tomography scan which is the gold standard in renal traumas the patient had no symptom before his trauma. Whatever the etiology is (tumor, stones, traumas ...) surgical management of horseshoe kidney is extremely challenging given their rarity, their anatomic differences and so the lack of experience of surgeons.<sup>5</sup> In our case vital prognosis of the patient was engaged and considering the unavailability of embolization open surgery was surely laborious but offered to the patient a survival chance.

#### 4. Conclusion

Given its rarity horseshoe kidney present a challenge in managing its complications particularly traumatic ones, studies should give more interest to this entity so that recommendations can be established.

#### Declaration of competing interest

The authors declare that they have no competing interests.

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