

Case report

Post-traumatic occlusion of the renal artery: A case report

Abstract

The present case report highlights about Post-traumatic occlusion of the renal artery. Renal artery thrombosis is a rare complication of blunt abdominal trauma, described for the first time by Von Recklinghausen in 1861. Our case is of a 32-year-old male admitted to the emergency department to manage a polytrauma due to a car accident occurring three hours before admission. The higher mobility of the left kidney on its vascular pedicle is thought to be the cause of the increased frequency of left renal artery injuries. Because of the various therapy choices available, it is especially important to distinguish between these two conditions. The management of traumatic renal artery occlusion is controversial and opinions are divided between immediate surgical revascularization and observation.

Keywords: Post-traumatic occlusion, artery occlusion, renal artery injuries, thrombosis

INTRODUCTION:

Blunt abdominal trauma is routinely encountered in the emergency department. It is the main cause of mortality and morbidity amongst the population below of the age of 35 years worldwide. Renal artery thrombosis is a rare complication of blunt abdominal trauma, described for the first time by Von Recklinghausen in 1861, however, few cases have been reported in the literature (less than 400 cases). Pathophysiologically, this pathology can result from either intimal injury (inelastic) or compression of the renal artery against the spine by an impact on the anterior abdominal wall. The therapeutic management of this pathology is still a subject of controversy. In view of the particularly rare complication, the authors allowed themselves to report a clinical case of post-traumatic thrombosis of the renal artery.

CASE PRESENTATION :

Our case is of a 32-year-old male admitted to the emergency department to manage a polytrauma due to a car accident occurring three hours before admission. The clinical examination found a patient conscious GCS 15/15 isochorous pupils, without deficit or notion of convulsions, hemodynamically and respiratory stable, he also had an epigastric and left lumbar pain. The temperature was 37.3 ° C, a blood glucose level of 1.23 G/ L. A urine test strip was made, showing traces of blood. Our initial conditioning was based on effective pain management. Laboratory

investigations revealed an hemoglobin level of 9.0g/dl, WBC $13 \times 10^3/\mu\text{L}$ and platelets $88 \times 10^3/\mu\text{L}$. His blood urea nitrogen was 5.16 mmol/L, serum creatinine was 63,5 $\mu\text{mol/L}$. Lipasemia was increased to 902 IU /L. A radiological assessment was therefore launched, including normal cerebral, cervical and thoracic CT-scan, whereas abdominopelvic Contrast-enhanced CT-scan showed pancreatic contusion with hematoma and ischemic involvement of the lateral-external portion of the left kidney.

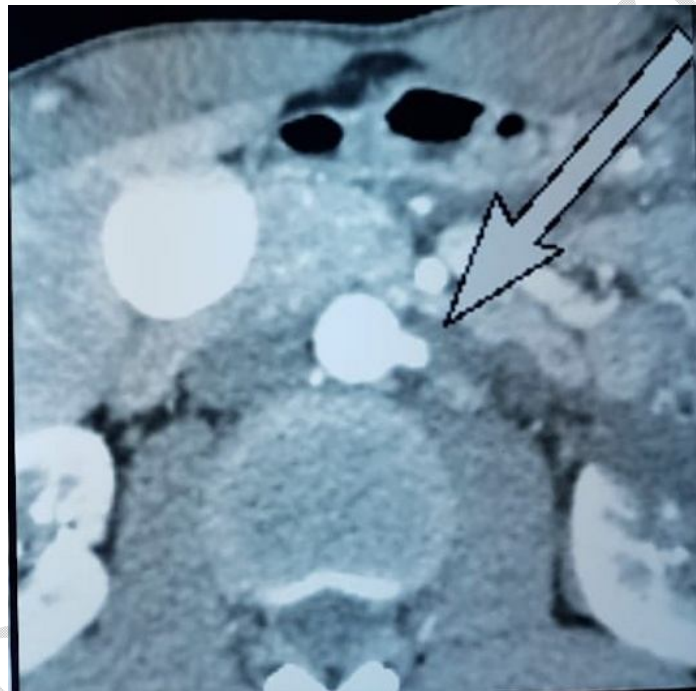


Figure 1: CT angiogram of the abdominal aorta showing total thrombosis of the accessory left renal artery.

To complete the assessment a CT angiogram of the abdominal aorta was requested having shown total thrombosis of the accessory left renal artery (Fig 1.). . Our management afterwards included a treatment of pancreatitis, and after multidisciplinary consultation we opted for respect of the vascular lesion.

DISCUSSION:

A very uncommon side effect of forceful abdominal trauma is renal artery damage. However, in situations where the renal artery occlusion was thought to acceleration/deceleration injury to the renal artery and subsequent intimal tearing, exercise and sports activities have been linked to the condition. People hurt in auto accidents usually experience several traumas. Polytrauma is described as two or more physical injuries to organ systems or locations, one of which may be life-threatening, leading to functional invalidity and physical, cognitive, psychological, or psychosocial impairments [1]. Arterial spasm and arterial occlusion are the two kinds of subsequent traumatic renal vascular damage.

The secondary effect of contusion is thought to be arterial spasm.

This syndrome shouldn't be confused with traumatic renal artery obstruction brought on by thrombosis or intimal flap formation, which might result in kidney devascularization. According to tests, the arteries' intima is the least elastic tissue and tears first when tension is applied. Due to the maximum angulation and traction on the artery at the site of fixation close to the aorta, many researchers have stated that the injury occurs inside the renal arteries 1 to 2 cm from the aorta.

The higher mobility of the left kidney on its vascular pedicle is thought to be the cause of the increased frequency of left renal artery injuries.

Because of the various therapy choices available, it is especially important to distinguish between these two conditions.

The most serious type of renal damage is devascularization of the entire kidney as a result of vascular laceration or renal artery thrombosis (grade 5). Extensive retroperitoneal bleeding and hematuria may not be seen if the kidney is devascularized as a result of a single intimal renal artery damage that causes thrombosis.

As animal investigations have shown that kidney damage is permanent after 90 minutes of complete ischemia [2], prompt diagnosis is crucial. There aren't many particular signs or symptoms that indicate renal artery occlusion.

Reviewing 65 cases of unilateral and bilateral traumatic renal artery thrombosis from 1980 revealed that vomiting was common [3], and flank and epigastric pain were frequently observed.

All 65 patients had proteinuria upon urinalysis. Thirty percent of the patients had gross hematuria, and forty-three percent had microscopic hematuria. In 27% of cases, there was no hematuria noted.

In 1976 [4], it was shown that among 21 patients with unilateral and bilateral traumatic renal artery thrombosis, 24 percent did not have hematuria. Radiological imaging may be helpful in detecting renal artery

pathology, such as renal artery thrombosis [5]. The usual CT features of traumatic renal infarction include abrupt truncation/irregularity of the renal artery lumen at the point of occlusion with contrast extravasation, retrograde opacification of the renal vein from the inferior vena cava, and aberrant enhancement of the damaged kidney.

Alternate linear hypodensities to delayed or reduced enhancement of the afflicted kidney are all examples of abnormal renal enhancement.

When the degree of injury grows, this "asymmetric nephrogram" becomes more noticeable, suggesting the severity of renal parenchymal ischemia [6] .

The first step in treatment is to start heparin-based anticoagulation.

Enoxaparin therapy may not be necessary given the prospect of interventional radiology intervention with local thrombolysis.

This is true particularly when there is underlying renal impairment.

Anticoagulation therapy and continuing management require close collaboration between the interventionalist and the nephrologist [7]. If there has been considerable blunt abdominal trauma and there is hemodynamic instability, surgical intervention should be pursued.

CONCLUSION:

The management of traumatic renal artery occlusion is controversial and opinions are divided between immediate surgical revascularization and observation. This controversy has been complicated by several factors: First, the experience of each center with this type of injury is limited because of the rarity of this disease. Second, immediate revascularization has rarely resulted in a return to normal renal function, although surgeons report that the operation was technically effective at the time of the operation. Third, prolonged ischemic time due to delay in diagnosis, if beyond 12 hours, the chances of recovering renal function are gloomy.

References :

1. Polytrauma/TBI system of care. US Department of veteran affairs. <http://www.polytrauma.va.gov/news-and-resources/terminologyand-definitions.asp>
2. McAninch JW: Acute renal artery thrombosis following blunt trauma. Urology 1975; 6: 74-77.
3. Barlow B, Gandhi Fi: Renal artery throBarlow B, Gandhi Fi: Renal artery thrombosis following blunt trauma. J Trauma 1980; 20: 614-617.
4. Stables DP, Fouche RF, De Villiers Van Niekirk JP: Traumatic renal artery occlusion: 21 cases. J Urol 1976; 115: 229-233.

5. Pyo Kang and al, : Renal infarction resulting from traumatic renal artery dissection
The Korean Journal of Internal Medicine : 23:103-105, 2008
6. Dobrilovic N, Bennett S, Smith C et al: Traumatic renal artery dissection identified with dynamic helical computed tomography. J Vasc Surg, 2001; 34: 562–64
7. Sauerberg N, Khan YS. Renal Artery Thrombosis. [Updated 2022 Oct 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from:
<https://www.ncbi.nlm.nih.gov/books/NBK564380/>

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