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Conservative Management of an Isolated Renal Vein Injury Following Blunt Abdominal Trauma: A Case Report

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ABSTRACT

Renovascular injury following blunt abdominal trauma typically demands immediate attention and definitive repair. We report an isolated, partial-thickness rent in the left renal vein with a contained leak and perinephric hematoma in a 22-year old male following a motor vehicle accident. The injury was thoroughly evaluated and monitored. The patient had a drop in hematocrit on the first day following the injury that responded to blood replacement. Repeat imaging 48 hours after the injury confirmed spontaneous sealing of the venous rent and preservation of renovascular integrity. The case was successfully managed with conservative treatment.

KEYWORDS: Renal vein tear; CT scan; Conservative management

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Abbreviations and Acronyms
CT, computed tomography

INTRODUCTION

Renal injury is a common result of blunt abdominal trauma. In contrast, renovascular injuries are sustained in only 5% of blunt renal injuries [1]. These injuries are associated with hemodynamic compromise and demand immediate attention. In most situations, they herald definitive reconstruction of the injured vasculature [2]. We report a case of isolated renal vein injury that was sustained from blunt abdominal trauma. The patient had preservation of the renal parenchyma and renal artery and responded to conservative treatment. There are few known cases such as this in the literature.

CASE REPORT

A 22-year-old male presented to the hospital with blunt trauma to the abdomen and a head injury following a motor vehicle accident. On initial evaluation, he was unconscious with a Glasgow Coma Scale (GCS) of 5/15. No external abdominal or limb injuries were identified. He also demonstrated tachycardia and hypotension. The patient was resuscitated with endotracheal intubation, ventilatory support, and crystalloid infusion. Abdominal evaluation revealed mild distension with preserved peristalsis.

Initial blood evaluation revealed a hemoglobin of 10.8 g/dL with preserved renal profile. Perurethral catheter showed clear urine. Computed tomography (CT) of the abdomen (Figure 1; Figure 2) revealed an isolated tear of the left renal vein with preservation of the renal artery. A perinephric hematoma was identified. The renal parenchyma demonstrated good contrast uptake and excretion. There was no evidence of any other abdominal viscus injury. A CT of the brain was noncontributory. Skeletal survey exposed an undisplaced fracture of the second and third lumbar vertebra. The patient regained consciousness within the first 2 hours of admission and was extubated after a few more hours. The recorded pulse and blood pressure at this time were 96 bpm and 110/70 mmHg, respectively. We resorted to an expectant

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Figure 1. Initial CT of the abdomen demonstrating isolated renal vein injury with preserved renal parenchyma and renal artery and no neighboring organ injury.
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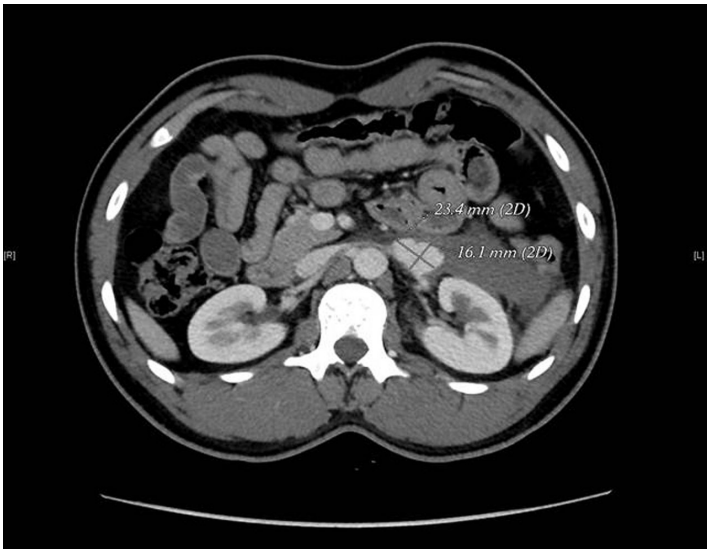

Figure 3. Systolic blood pressure (mmHg) and average pulse (bpm) from admission (day 0) to 5 days following the injury.
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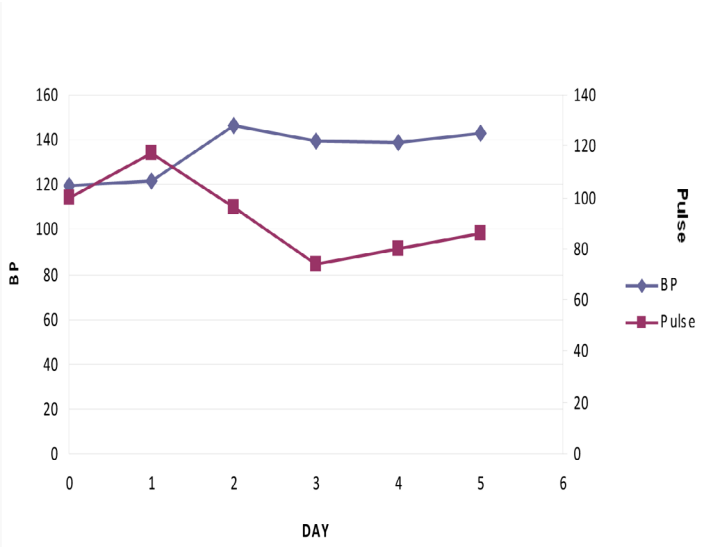

line of management in view of the patient's maintainance of hemodynamics without any pressor support, stable abdominal parameters, and CT findings. The provisions for exploratory laparotomy were kept ready at all times.

Figure 2. Three-dimensional reconstructed CT angiogram image revealing a contained leak from the left renal vein.
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The daily records of the patient's vital statistics and blood profile are depicted in Figure 3 and Figure 4. A drop in hematocrit was encountered on the first day following the injury; we administered blood replacement. Vital parameters and abdominal signs remained stable on the following days without the need for any additional intervention. A repeat CT urogram was conducted after 48 hours to appraise the status of the vascular injury. This revealed spontaneous sealing of the venous rent (Figure 5). After 2 days of additional observation, the patient was sent home under supervision of a caregiver and instructions for restricted ambulation. Weekly revisits were scheduled for 1 month. Two months after the injury, the patient is well with a stable clinical profile.

DISCUSSION

Renovascular injuries following blunt abdominal trauma are usually associated with major insults to the neighboring abdominal viscus [3]. The patient usually presents with hemodynamic compromise, flank pain, or gross hematuria. On most occasions this culminates in exploratory laparotomy. If vascular reconstruction fails, nephrectomy is contemplated [4]. In our case, the presentation was unusual because this patient experienced a short duration of hemodynamic instability that responded immediately to resuscitative measures. He had stable abdominal signs and no evidence of hematuria.

CT imaging holds paramount importance in decision making

Figure 4. Hemoglobin (g/dL) and creatinine (mg/dL) from admission (day 0) to 5 days following the injury.
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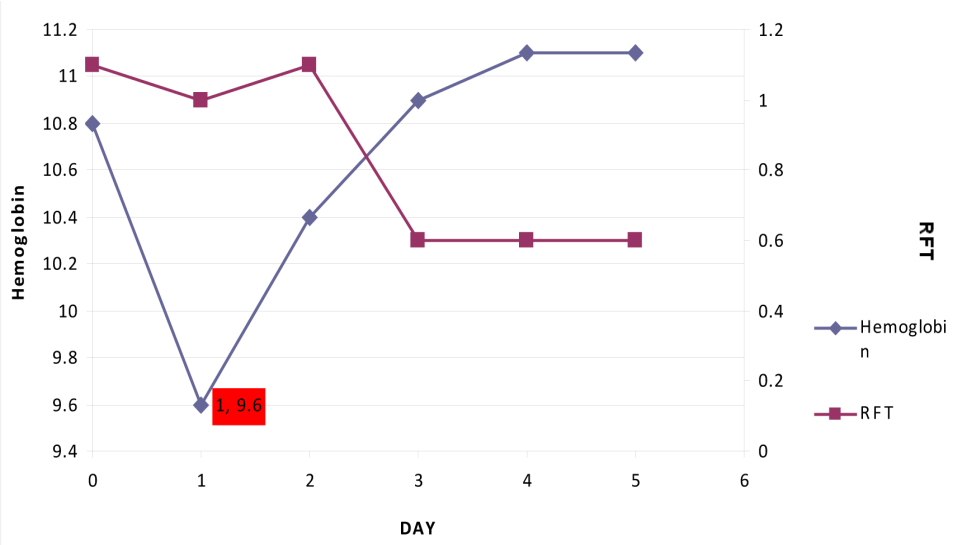

Red block indicates blood transfusion.
Abbreviation: RFT, renal function test.

for patients who are hemodynamically stable following an accident that involves the kidney. Apart from identifying neighboring organ insults, CT enables stratification of renal injuries [5]. In our case, CT clearly delineated a partial-thickness rent in the left renal vein with a contained leak and perinephric hematoma.

Figure 5. Follow-up CT angiogram revealing spontaneous sealing of left renal vein rent.
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Conservative management of Grade V renal injuries have been attempted on a few occasions with variable success [3]. In this case, conservative management was adopted based on the patient's vital parameters, abdominal findings, and appearance at imaging. At all times, the patient was kept under close observation with plans for immediate exploratory laparotomy if any hemodynamic instability was encountered. Our patient exhibited satisfactory response to conservative management. His vitals consistently remained within acceptable limits without any need for additional pressor support. Although there was a decline in hematocrit on the first day following the injury, it responded to blood replacement. The repeat imaging confirmed preservation of renovascular integrity. With such a management plan, exploratory laparotomy with consequent morbidity could be avoided. Exploratory laparotomy in cases of major renovascular trauma may culminate in nephrectomy secondary to release of the tamponade effect of the perinephric hematoma; therefore, the goal of renal salvage may remain unfulfilled. Fortunately, in this case renal preservation was possible. This case is mentioned in view of the unique presentation and successful management with a conservative approach.

CONCLUSION

Isolated renal vein tear with preserved renal parenchyma and arterial supply may be encountered occasionally following blunt abdominal trauma. CT imaging is of utmost importance in detecting such injuries. It may be possible to manage the patient who is hemodynamically stable using a conservative approach with close monitoring. Exploratory laparotomy should be undertaken immediately if the patient fails to respond to conservative measures.

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