

COMMON ILIAC ARTERY PERFORATION CAUSED BY BLUNT TRAUMA: A CASE REPORT

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Abstract

Introduction: Retroperitoneal hemorrhage from iliac artery injury is a potential cause of hemorrhagic shock and death if not diagnosed early and treated promptly.

Case Report: A 55-year-old man, who had non-penetrating blunt trauma, presented with hemorrhagic shock due to retroperitoneal hemorrhage from right common iliac artery. Although non-penetrating blunt trauma is not a common cause of iliac artery injury, this case demonstrates that deployment of a peripheral drug-eluting stent can successfully treat a common iliac artery (CIA) perforation caused by a blunt trauma.

Conclusion: In this case report, we want to share our experience on the successful endovascular treatment of iliac artery perforation after a non-penetrating blunt trauma in patients with hemorrhagic shock. We indicate that this approach is a less invasive treatment modality than conventional surgical repair of iliac artery perforation.

Keywords: Common iliac artery; computed tomography; endovascular treatment; peripheral stent; non-penetrating blunt trauma

Introduction

Non-penetrating blunt trauma to the abdominal and pelvic area can cause intra-abdominal injuries and perforation or dissection of the aorta. However, perforation or dissection of isolated common iliac artery (CIA) due to blunt trauma is unusual. Only rare cases of CIA injuries resulting from blunt abdominal trauma have been reported, and most of these were attributed to seat-belt syndrome and were associated with visceral organ perforation or pelvic fracture (1-3). Most acute traumatic injuries of the aorta are usually fatal before medical or surgical interventions.

We present a rare and life-threatening CIA perforation that presented with hemorrhagic shock after a blunt abdominal trauma in a pedestrian hit by a motorcycle. This case highlights the importance of understanding the nature of the trauma, the value of multi-slice computed tomography (CT) scan as an emergency diagnostic tool, and the early management of the traumatic injury with a catheter-based endovascular intervention.

Case Presentation

A 55-year-old male was transferred to our hospital after being hit by a motorcycle while walking. He developed groin pain with severe hypotension. The patient was intubated in the

ambulance because of lack of consciousness and inability to maintain breathing. The patient was admitted to the emergency room in a critical state. In the emergency room, the patient had signs of hemorrhagic shock, with a blood pressure of 90/45 mmHg and a heart rate of 121 beats per minute. Immediate intravenous fluid resuscitation was started and a massive blood transfusion protocol was initiated. Examination of the patient revealed paleness in the right lower extremity and weak pulse on the right femoral and right popliteal arteries. . An immediate diagnostic contrast enhanced CT scan revealed contrast extravasation in the right pelvic area arising from the CIA. A dissection flap was seen to limit the blood flow. The acute antegrade collaterals provided flow for the internal and external iliac arteries (Figure 1a). There were no pelvic fracture and solid organ injury in the abdominal CT scan.

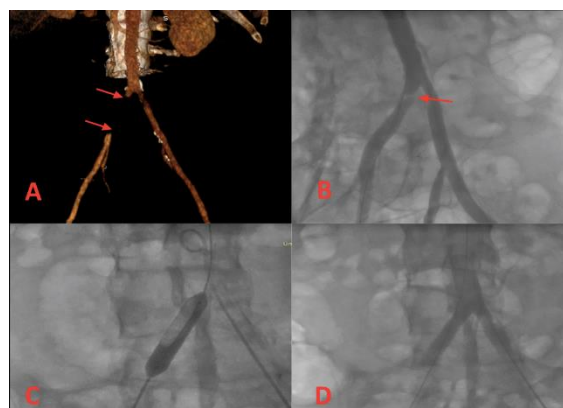


FIGURE 1. A; Diagnostic imaging of aortic and iliac arteries using contrast enhanced multi-slice computed tomography. B; Spiral dissection of common iliac artery was shown using peripheral artery angiography. C; Implantation of peripheral stent. D; The angiographic image of the iliac artery after the deployment of the peripheral stentouter diameter with surrounding inflammation and hyperemia anemia in the form of schistocytes and polychromasia

The patient was transferred to the angiography laboratory. Femoral sheaths (7Fr) were implanted in both right and left femoral arteries for the antegrade and retrograde approaches. A digital subtraction angiogram did not reveal any obvious extravasation of blood at the vascular injury site because the dissection flap had covered the related segment with the antegrade blood flow. Both the antegrade and retrograde contrast injection showed a spiral dissection of the CIA (Figure 1b). Given this situation,

our peripheral interventional team decided to deploy a drug-eluting peripheral stent to the related segment of the CIA, because of the hemodynamically unstable clinical condition of the patient. A 6.0×80 mm SUPERA (Abbott Vascular, CA, USA) stent was deployed to the CIA and successfully sealed off the perforation and dissection (Figure 1c & 1d). The patient required three units of packed red blood cells transfusion. His hospital course was uncomplicated and he was discharged with optimal medical therapy. After three months follow-up, the patient was asymptomatic and the optimal femoral artery was normal in color Doppler ultrasonography imaging.

Discussion

Internal bleeding after blunt trauma most commonly occurs in the thoracic, abdominal, and retroperitoneal spaces. After trauma, these internal bleeds are identified by imaging tools that include chest/pelvic X-rays and focused assessment with sonography for trauma (FAST) examinations. However, these techniques cannot detect retroperitoneal or non-cavitary hemorrhages (4). Pedowitz and Shackford reported that about half of the trauma patients who present with shock are suffering from non-cavitary hemorrhages (5).

Acute blunt traumatic injury rarely causes rupture of the CIA. However, if this type of rupture occurs, the clinical scenario might be life-threatening due to the occurrence of hemorrhagic shock. The patient's hemodynamic state might be stabilized with the right approach and management by an early diagnosis (6). The management should involve intravenous fluid administration to control the hypotension until the surgical or percutaneous intervention is performed. Open surgery and percutaneous interventions are the treatments of choice for these major vascular injuries. However, especially if the patient is in a state of shock due to acute hemorrhage, percutaneous intervention might be the quickest solution for stopping the bleeding from a perforating segment (7,8).

Endovascular treatment options not only provide prompt diagnosis and timely hemostasis, but also prevent from the surgical trauma and leads to decreased time of limb ischemia. Various endovascular therapies including stent grafts, coated stent, hand-made stent graft implantations have been performed successfully in patients with traumatic and iatrogenic vascular injuries (9-11). With the help of endovascular management options as a primary treatment strategy to seal vascular injuries, outcomes of iliac artery injuries have significantly improved in patients with life-threatening perforations (12). To the best our knowledge, our case is the first case report that presented the endovascular treatment of CIA perforation caused by blunt trauma in a patient with hemorrhagic shock.

Conclusion

Non-penetrating blunt trauma is an unusual reason of common iliac artery perforation. However, because this is a highly fatal situation, early diagnosis and appropriate management are very important. The regular screening procedures of X-ray and FAST have limitations during the diagnosis of vascular injuries after blunt trauma. Emergency clinicians have critical roles in managing such entities by careful physical examination and choosing accurate diagnostic tools. Contrast enhanced CT scan can identify the source of critical injury and a team approach for catheter-based percutaneous interventions might be a successful treatment modalities in selected cases.

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