

Common Iliac Artery and Vein Injury Associated with Pelvic Fracture

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INTRODUCTION

Despite evolution in the care of trauma patients, treatment of hemodynamically unstable pelvic fractures has been one of the biggest challenge for trauma surgeons.^{1,2}

Death from pelvic injury is attributable to pelvic exsanguination, concomitant injuries or complications of the injury. Exsanguinating hemorrhage accounts for up to 65% mortality of trauma patients with known pelvic fractures.³ Most pelvic hemorrhage are caused by bleeding from venous plexuses, fractured cancellous bones and 10 - 15% from arterial bleeding from small arteries. However, injury to the common iliac arteries with bleeding or thrombosis is uncommon and difficult to diagnose.⁴ Injury to common iliac artery is a devastating condition associated with significant consequences including limb loss or even mortality if prompt diagnosis and management is not

ABSTRACT

This study reports a case of pelvic fracture associated with left common iliac artery and vein injury that was managed with vascular repair and fracture fixation. A 65 years old female presented to another center with fractures of the left iliac wing, anterior wall of left acetabulum, both alae of S1 vertebra and hypovolemic shock after a road traffic accident. She was initially admitted to the center and later transferred to our center 5 days post injury after hemodynamic stabilization. On admission, there was no obvious neurovascular deficit and the vitals were stable. Pre-op consultation was taken from the Vascular surgeons. A definite vessel injury could not be confirmed preoperatively. During surgery for the fracture fixation on 8th day of injury, there was bleeding from left common iliac artery and vein. Vascular repair was done and the fracture was stabilized. Postoperatively, the patient made slow but uneventful recovery and she was discharged .

KEY WORDS

Pelvic fracture, Vascular injury, Common Iliac artery and vein injury, Vascular repair

undertaken. The diagnosis can only be made with a high index of suspicion and CT angiography.⁴

In this report, we describe the case of pelvic fracture with left common iliac artery and vein injury that was managed with vascular repair and fracture fixation.

CASE REPORT

A 65 years old female with fracture of the pelvis and hypovolemic shock after a road traffic accident was referred to us on the 6th day of injury from a center outside Kathmandu after hemodynamic stabilisation. On admission to our center her distal neurovascular status was seen to be intact and the vitals were stable. Her X-rays and CT scan

with 3D reconstruction revealed comminuted displaced fractures of the left iliac wing, left quadrilateral plate, anterior wall and anterior column of left acetabulum, bilateral superior and inferior pubic ramus, both ala of S1 vertebra and retroperitoneal hematoma .

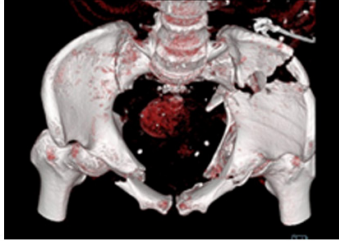


Figure 1. 3D CT scan showing bony injury

As the patient was initially hemodynamically unstable after injury when being treated in the other center and retroperitoneal hematoma was seen in our CT evaluation, we suspected a vascular injury of the pelvic vessels which had been controlled by the retroperitoneal hematoma. Pre-op consultation was taken from the vascular surgeons to rule out any vessel injury but a definite vessel injury could not be confirmed preoperatively. She was taken up for surgery on the 8th day following injury. The vascular surgeons were kept standby during surgery because we anticipated bleeding after the retroperitoneal hematoma would be evacuated for exposure during pelvic fracture stabilization.

Surgery was done under spinal analgesia. Skin incision given through lateral window of ilioinguinal approach. Iliac muscle was erased off the ilium and hematoma was seen lying underneath. As we gently tried to remove the hematoma, there was brisk active bleeding and the patient rapidly went into hypovolemic shock. We were not able to identify the exact source of the bleeding. Therefore, we packed the local bleeding area and the vascular surgeons were called in. In the mean time, management of hypovolemic shock was done by a team of anesthetists. The vascular surgeons were also not able to locate and stop the bleeding from same wound access. Therefore, they did a laparotomy and clamped the aorta and thereafter were able to locate the bleeding sites from left common iliac



Figure 2. Injured vessels

artery and vein. There was partial tear of common iliac artery and vein with intact lumen.

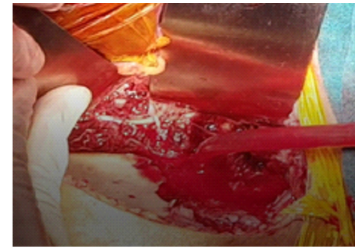


Figure 3. After repair of vessels



Figure 4. Fixation of bony injury

Repair of injured vessels were done by direct repair with prolene 5-0. The bleeding was stopped and the vitals gradually stabilized.

Through the lateral window of the ilioinguinal approach the fracture was reduced and fixed with two 3.5 mm recon plates and screws and two lag screws were placed in the quadrilateral plate. Postoperatively, the patient made slow but uneventful recovery.

DISCUSSION

Major vessel injuries occur in approximately 1% of patients with pelvic fractures and these injuries have mortality rates as high as 75% to 83%.^{3,5} Although vascular injury is extremely common, major pelvic arterial injury is rare.⁴ The cause of major pelvic vessel injury can range from direct laceration by fracture fragment, complete tear from stretching, compression or kinking resulting also in intimal tear and thrombosis.⁴

In our case, both the common iliac artery and vein was seen to be injured. Literature review did not reveal common iliac vein injury in association with common iliac artery as seen in our case.

Klein et al. reported not a single case of common iliac artery injury in 429 consecutive patients with pelvic fracture.⁶ In Carrillo's series, a 3.5% incidence of iliac artery injury was noted association with pelvic fracture.⁷ Thomford et al. reported common iliac artery injury in association with disruption of the posterior pelvic elements as seen in sacroiliac separation.⁸ Theodre et al. suggested a specific type of traction vertical shear pelvic ring fracture with inferior displacement of hemipelvis should alert the possibility of massive arterial injury.⁹

Iliac artery injury in pelvis fracture poses a diagnostic challenge. The signs of arterial insufficiency may be masked by hypovolemic and hypotensive status of the patient. Delayed presentation in case of evolving thrombosis further complicates the situation.

Clinical suspicion and repeated careful examination is extremely important.⁴

In this case there was partial tear in the wall of vessel which was sealed with hematoma, so there was no further bleeding till the clot was disturbed during manipulation of fracture.

The treatment of major iliac artery injury associated with pelvic fracture range from direct repair, reconstruction,

anatomical and extra-anatomical by pass surgeries of the injured vessel. Successful endovascular procedures have also been reported in selected cases.¹⁰

As there was partial injury of vessel, we managed this case by direct repair of vessel with prolene 5-0.

This case suggests that a high index of suspicion of major vessel injury should be entertained when treating patients with pelvic fractures associated with retroperitoneal hematoma.

These catastrophic injuries require anticipation, preparedness and planning beforehand with the help of vascular surgeons for immediate appropriate management, should the situation arise.

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