July-December 2019 Volume 28 Issue 2
PRINT ISSN: 2277-1867
ONLINE ISSN: 2277-8853

JOURNAL OF FORENSIC MEDICINE SCIENCE AND LAW

Official Publication of Medicolegal Association of Maharashtra

MULTISPECIALITY, MULTIDISCIPLINARY, NATIONAL
PEER REVIEWED, OPEN ACCESS, MLAM (SOCIETY) JOURNAL

Editorial Office Address
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(Official Publication of Medicolegal Association of Maharashtra)
Email.id: mlameditor@gmail.com

PRINT ISSN: 2277-1867

ONLINE ISSN: 2277-8853

Case Report

Penetrative Pelvic Trauma with Isolated Iliac Artery Injury: A Case Report

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Article Info

Key words
Pelvic,
Vascular Trauma,
Road Traffic Accident,
Massive blood loss.

Abstract

Iliac vessel injury has a high mortality rate, within the first 24 hours, due to massive blood loss. The pattern of pelvic vascular trauma can range from isolated vessel injury to complex arterio-venous injuries. The deceased was an 80-year-old female, who sustained a penetrative injury to her right gluteal region from a projecting screw of the horizontal iron bar of a truck, leading to fatal bleeding due to internal iliac artery tear. This case highlights the isolated lacerated injury of the right internal iliac artery which is an uncommon phenomenon in road traffic accidents.

1. Introduction

Penetrative pelvic trauma (PPT) cases are usually uncommon, presenting as a challenging medical case to the emergency medicine department. 'Penetrating pelvic trauma (PPT) is defined as a wound extending within the bony confines of the pelvis to involve the vascular, intestinal or urinary pelvic organs'. [1] The pelvic compartment has a very compact and complex anatomy which makes every penetrative injury unique and potentially fatal. Every case of PPT is unique in its own way which may be related to the foreign material causing the injury like a bullet, knife, metal rods, etc or in relation to the path taken by the foreign object to cause the injury.

Patient's with PPT present to the emergency medicine in an extreme haemodynamically unstable condition or to the Forensic pathologist with history of sudden death or survival for very short duration following the trauma incident. Exploration in most cases show injury to the soft tissues, pelvic bones, genitourinary system, rectum, vessels, nerves and intra-abdominal organs. Among these vascular injuries are usually a surgical emergency with high percentage of mortality. Arterial and venous vascular injuries are equally common following PPT and both are highly fatal. [2] The major vessel seen in pelvis is the iliac artery and veins.

How to cite this article: Kumaran S, Devnath GP, Abhilash S, Penetrative Pelvic Trauma with Isolated Iliac Artery Injury. J For Med Sci Law 2019;28(2):40-43.

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Mortality rate of iliac vessel injuries range from 30-50%.[3] The most major factor contributing to mortality are blood loss and related haemorrhagic shock.[4,5]In cases which survive the acute event, risk of fatal infection is very high.[1]In 80% of cases, pelvic injuries happen as a result of road traffic accidents (50% cars, 20% bikes and 30% pedestrians).[6]In literature, pelvic vascular injuries are more common due to blunt traumas as they are associated with pelvic fracture.[7] Isolated iliac vessel injury without pelvic fracture is uncommon in road traffic accidents. We report a case of a female pedestrian who sustained an iliac vessel tear due to penetrative injury in road traffic accident.

2. CASE REPORT

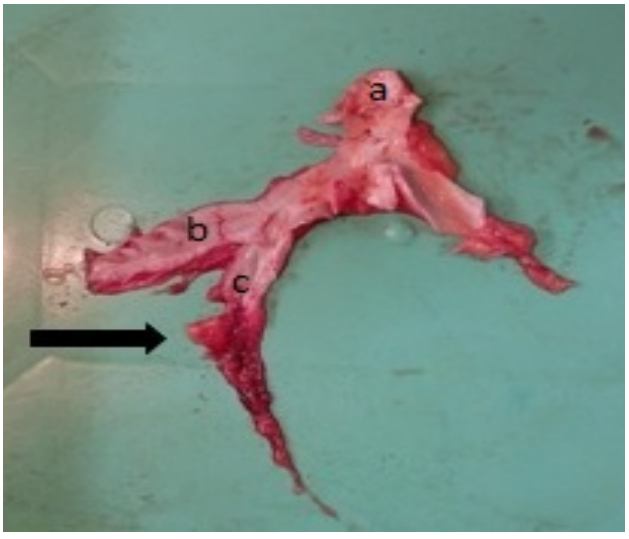
A 80-year-old lady, was a pedestrian walking along the left side of road, road did not have a cemented pedestrian walk station. A mini truck which had a transverse iron bar which was part of the locking mechanism of the metal door at the rear end of vehicle got loosened and became oblique in position extending towards the road. A 2-inch-long screw, which connected the iron bar and the main frame of the vehicle, was projecting outwards at the free end of the iron rod. While the truck passed by the pedestrian**,** she was hit by the iron rod with the screw which was projecting out of the vehicle and the pedestrian was thrown out of balance (Refer to **Figure 1**).

Figure 1: Iron rod with projecting screw being loosely suspended at the rear of the mini truck

She was immediately shifted to the nearest tertiary care hospital where the initial trauma management was done and she expired within few hours of arrival at the hospital. The screw which had caused the injury had a grooving surface all along its length and was covered with dried blood stains. It had caused a penetrative pelvic injury which had resulted in severe haemorrhage and death of the pedestrian. On autopsy, the body appeared pale on general examination. On external examination a sutured lacerated wounds of size 5 cm X2 cm X bone deep on was present over the right gluteal region placed 4 cm lateral to the gluteal cleft and 10 cm below the posterior superior iliac spine.

On internal examination of the abdomen, 1000 ml of blood was present, on suctioning out the blood; an organized clot was present on the right pelvic cavity. The clot measured 10 cm x 7 cm and on removing the clot the right internal iliac artery was lacerated, 3 cm distal to common iliac artery bifurcation (Refer to **Figure 2**).

Figure 2: Laceration of right internal iliac artery (black arrow)



The margins of the tear were contused and serrated. On probing the wound from the external injury, the track passed through skin, gluteal muscles, the right obturator foramen, and obliquely passed upwards to pierce the right internal iliac artery along its posterior wall. The uniqueness of this PPT was that pelvic bone was intact and there was no injury to any other pelvic viscera except for the right internal iliac artery. Hence the cause of

death was opined as Haemorrhagic shock due to laceration of the right internal iliac artery.

3. DISCUSSION

Pelvic injuries are very common cases in medical practice. They could be either blunt pelvic trauma or Penetrating/perforating pelvic traumas. Among them blunt traumas are very common and mostly is associated with road traffic accidents. [8,9]PPT even though is comparatively less than blunt trauma but has higher chances of fatality with a risk of visceral injury in up to 90% cases.[10]Impalement pelvic injuries are a category of PPT where the object which causes the penetrating injury is still in-situ, this to some extent has a protective effect due to the tamponade effect of the object on the injured organ and prevents haemorrhage. In cases where the object causing the PPT gets dislodged or is removed, it usually causes severe uncontrolled bleeding as in the case presented here where the screw which caused the injury got dislodged as the vehicle was still in motion and the pedestrian lost balance and moved away.[11]

PPT patients present with history of usually accidental injury, less commonly homicidal injury and very rarely suicidal injuries. At presentation to the casualty these patients will be usually in an extreme haemodynamically unstable condition especially following the dislodgement/removal of foreign object as in this case. There can also be a history of sudden death following the trauma incident due to the high fatality of these injuries. Radiological investigations like X-ray and CT scan are of immense importance in handling such cases but stabilization before these procedures take the priority. Exploration in most cases show injury to the soft tissues, pelvic bones, genitourinary system, rectum, vessels, nerves and intra-abdominal organs. Among these vascular injuries are usually a surgical emergency with high percentage of mortality and account to about 10.6% cases of PPT. Arterial and venous vascular injuries are equally common following PPT and both are highly fatal. [2]

The major vessel seen in pelvis is the iliac artery and veins. Isolated vascular injury in PPT as was the condition in the case presented above is very rare and very limited literature is available regarding this type of injury. There are numerous studies available on pelvic vascular injuries. According to Tyburski et al, who studied the mortality rates of 470 patients with an abdominal vascular injur**y,** blunt trauma and gunshot wounds had the highest mortality (57%) and stab wounds had the lowest mortality (30%). Among iliac vessel injuries, common iliac and internal iliac artery vessels are associated with higher mortality.

As far as iliac veins are considered, common iliac veins injuries have high mortality.[12,13]In general, penetrating vascular trauma is often due to stab or gunshots injuries.[14] In European countries stab wounds are more frequent than gunshot wounds due to strict firearms law contrary to the pattern in the United States.[15] Pelvic vessel injuries due to blunt force are commonly associated with pelvic fractures. Isolated pelvic vessel injuries without pelvic fracture in road traffic accident are barely reported in the literature.[16] Hence isolated penetrative iliac vessel injuries following a road traffic accident is uncommon in this context. In accessibility to the pelvic cavity structures is the main practical problem faced by forensic pathologists which leads to limited exploration of structures and in many cases causes the Forensic pathologists to miss many key injuries. Meticulous complete dissection of pelvic structures at autopsy is required for detailed examination of the organs injured and this usually needs a wider approach by removing part of the pelvic bone.

Use of radiological investigations like X-ray and CT scan before starting autopsy can help in better understanding the path traversed and also structures damaged. Death mostly occurs due to haemorrhagic shock and in cases which survive the risk of infection is very high. The protruding screw of the vehicle acted as a projectile causing a deep penetrative injury to the right internal iliac artery. The track followed was unique because it had pierced the obturator membrane and caused the deep cut of the vessel. The pathophysiology of death in this case i.e. haemorrhagic shock is simple, however, the mechanism of isolated vessel injury is uncommonly encountered in forensic practice.

4. CONCLUSION

Pelvic injuries are always a challenge to the doctors handling them and also to the forensic

pathologists in particular during autopsy. Radiological studies should be made use of for better understanding and handling of such cases. Pelvic injuries especially penetrative pelvic trauma needs more aggressive and active management.

At autopsy such cases mandates in detail pelvic exploration for better understanding of the mechanism of injury and cause of death. Isolated right internal iliac artery tear in penetrative pelvic injury are highly uncommon entity and must be anticipated by the forensic pathologist while encountering such cases.

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