Penetrating injury caused by the gear pedal of a motor-cycle

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Case report

Abstract
This is a case of a penetrating injury to the left lower extremity caused by the gear pedal of a motor-cycle that pierced through the foot of one of the 3 passengers on a motor-cycle involved in a road traffic accident. He had no neurovascular injury but was found radiologically to have an ipsilateral tibia fracture. The object was removed in the operation theatre under general anaesthesia by gentle manipulation. The fracture was reduced conservatively on the 8th post-operative day using an above knee cast.

Blessure perforante causé par la pédale d'engrenage d'un moto

Rapport de cas

Resume
Ceci est un cas d'une blessure pénétrante à l'extrémité inférieure gauche causé par la pédale de vitesse d'un moteur à cycle qui a percé à travers le pied de l'un des 3 passagers sur un moteur à cycle impliqué dans un accident de la circulation routière. Il avait aucune blessure neurovasculaire mais il a été trouvé radiologiquement d'avoir une fracture du tibia ipsilatéral. L'objet a été enlevé dans la salle d'opération sous anesthésie générale par une manipulation douce. La fracture a été réduite de façon conservatrice sur le 8ème jour post-opératoire en utilisant une distribution dessus du genou.

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INTRODUCTION

A penetrating trauma occurs when an object pierces through the skin and enters the body tissue creating an open wound. The object could go through the tissue and create an exit point or remain in the tissue. It could affect any part of the body. Most penetrating traumas have been attributed to gunshot injuries and stab wounds (1, 2, 3).

Besides the general damage to the skin, it can also cause secondary damages depending on the structures involved such as the neurovascular structures, bones and other structures. It may also be complicated with infection. Therefore the management of penetrating injury requires thorough evaluation both clinically and with good imaging techniques such as X-ray, CT scan and angiography.

Penetrating injury to the extremities accounts for 50% of penetrating traumas (4). Despite this figure, penetrating injury to the extremities usually present unexpectedly to the emergency department. Such is the presentation of the index case caused by the gear pedal of a motor-cycle. A search of literatures could not reveal a similar kind of injury from this type of object.

The most predicted injuries from motor-cycle accidents are head injuries and burns while penetrating injuries are rarely seen. With the growing use of motor-cycles as means of transportation in developing countries, (5) perhaps due to their affordability and the ability to bypass traffic jams, more of such injuries should be anticipated and a well-outlined management protocol should be developed in a trauma centre.

CASE REPORT

A 7year old boy was brought to the Accident and Emergency Unit of our Hospital on account of bleeding from his left leg following a road traffic accident 30 minutes prior to his presentation. There was a metallic object, identified as a motor-cycle gear pedal that penetrated through his left foot. He was one of the 3 passengers on the motor-cycle when they were hit by another motor-cycle as they were trying to negotiate a bend. The motor-cycle subsequently fell on the boy's leg. The gear pedal entered from the medial aspect of the left foot penetrating the plantar soft tissue, superficial to the calcaneus just distal to the ankle joint. It passed out from the lateral aspect approximately 6 cm distal to the lateral malleolus. He also sustained a laceration measuring about 10cm on the medial aspect of the left leg. (Fig1).

There was no marked difficulty in moving the foot, no peripheral sensory or motor deficits. The dorsalis pedis pulse was palpable in the involved foot. An X-ray of the affected leg showed a mid-shaft left tibia fracture and no obvious abnormality in the bony structures of the foot.

In the theatre, examination under general anesthesia showed that the gear pedal had penetrated through the subcutaneous plane only without damaging any other structures. It was then extricated with gentle manipulation. The wound was thoroughly cleaned and irrigated with normal saline and the wound edges were tagged with nylon suture. The fracture was splinted and planned for reduction.

Post operatively, the patient was placed on intravenous antibiotics and analgesics. The tibia fracture was splinted and later reduced conservatively with an above knee POP cast applied on the 8th post-operative day with windows over the wounds. The patient was discharged on bi-axillary crutches and to be followed up in the clinic on outpatient basis. There was no adverse event following the choice of the management as the wound healed with minimal scar formation and the POP cast was removed on the 4th week of application.

DISCUSSION

Generally, the severity of damage from penetrating trauma depends on the body part involved, features of the penetrating object and amount of energy dissipated to the tissue. All these features must be put into consideration in the management of a penetrating trauma. The foot being a multi-jointed structure with tiny space for the neurovascular structures to traverse, there is a high tendency that any penetrating injury will disrupt the anatomy of the foot. As such proper evaluation must be done.

The initial step in the management of such case is to resuscitate according to the Advanced Trauma Life Support (ATLS) guidelines and the discretion of the casualty officer attending to the patient. The hemodynamically stable patient can then be evaluated thoroughly by taking a detailed history which must include the duration and mechanism of the injury.

The physical examination will entail checking for the possible movement of the

affected foot in order to assess the degree of injury to the skeletal frame work and the connective tissues. Sensory deficits, motor deficits and peripheral pulses must be meticulously assessed too. Diagnostic investigations must be done especially the routine X-ray of the affected extremity and CT scan in places where it is readily available and affordable to assess further the extent of theinjuries.

It is very imperative to note that no attempt must be made to remove the object in the emergency room as such attempt can worsen the insult. This is best done in the operation theatre in order to prevent complications such as reflex bleeding that can occur as a result of the sudden removal of the tamponading effect of the object. Wound debridement and irrigation must then be done to remove dead tissues and debris. (6)Post operatively, the patient should be given appropriate antibiotics, analgesics and tetanus toxoids for optimal outcome.

All patients mustbe monitored for symptoms of vascular injury that could have been missed during the initial evaluation such as loss of "vascular integrity" in the affected limb that will be evidenced byskin changes, expanding haematoma, loss of pulse, pallor and coolness, or loss of sensation and function of the affected limb.(7,8) Infection is another common complication of penetrating trauma,thus general signs of infection (fever, erythema, swelling and warmth) must be looked out for and treated appropriately with the right antibiotics.(9)

There was no neurovascular damage in the index case after the initial wound care, the patient was admitted in orderto monitor for the alarm symptoms of neurovascular injury and infection.

CONCLUSION

With the rising use of motor-cycles in this part of the world, management protocol for the rare and unexpected injuries from motor-cycle like the index case should be made available in trauma centres.

Conflict of interest: No conflict of interest was declared.

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Fig 1

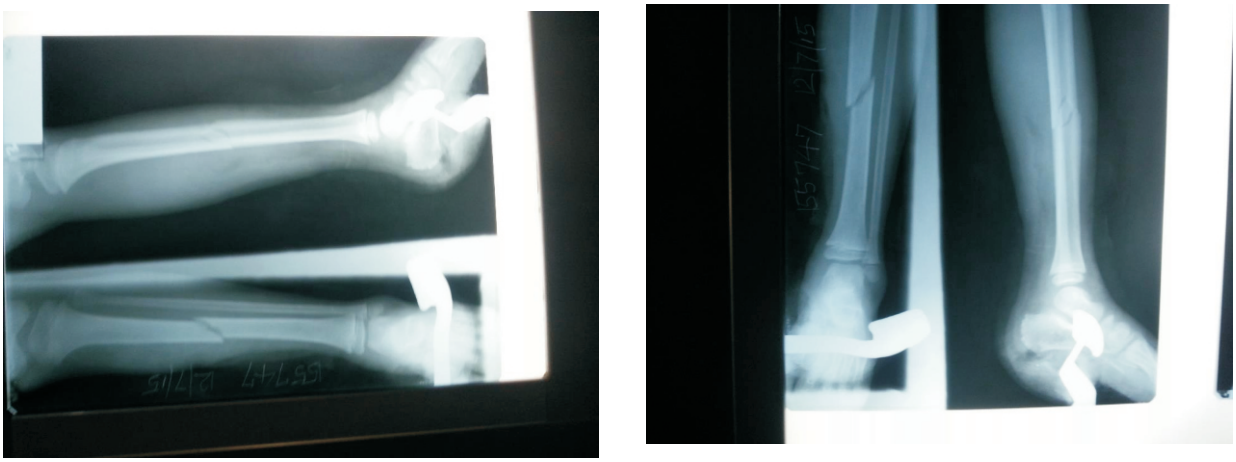

Fig 2