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Close Call to Life and Death –Penetrating Injury in Childhood by Trishula

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Abstract: Penetrating abdominal injuries are uncommon in the paediatric age group and are involved in a high mortality. The management of penetrating injuries can be very challenging due to the associated haemorrhagic shock and visceral injury and often requires rapid assessment and intervention. Specific management principles are guided by the anatomic location of injury, the determination of the trajectory, and the suspected organs injured. Management of these injuries possess specific challenges in pre-hospital care, transport and management strategies. We report a case of penetrating injury to back and abdomen when he fell onto the trident implanted on the top of small worship place. Despite delayed presentation, the child survived following surgery.
Keywords: Abdominal impalement, penetrating injuries, trishula injury

INTRODUCTION

Impalement injury is an uncommon presentation in the emergency department and demands immediate life-saving measures and prompt care. Management of impalement injuries possess specific challenges in pre-hospital care and transport. There is consistent agreement that the impaling object should be left in-situ until management at a tertiary trauma centre can be started [1].

CASE REPORT

A 5-year-old boy while playing on the roof of the house fell onto the trishula fixed on the top of the small temple. The trishula entered the back near renal fossa, traversed the abdomen and made an exit through the anterior abdominal wall. The peoples around there dismantled the trishula from the top of the temple while it remained in situ. Interventions such as fluid resuscitation were not conducted on scene or en route. Further, due to severe rural setup and poor communication, the transport time was about 5 hours.

The child was presented on a plank with the trishula in-situ to the emergency unit. He was in extreme pain. On presentation the patient's airway was intact and was fully alert. His first blood pressure was 80/60 mmHg with a pulse of 165 per min. Fluid resuscitation was initiated via two wide bore intravenous canula and a bolus of normal saline given. The abdomen was tender, with guarding and mild rigidity. He was pale and tachypneic. The entry and exit wounds were oozing fresh and clotted blood. The entry wound was about 2.5cm and the exit wound was 1.5cm in diameter. Both the wound openings were sealed by the iron rod. Urinary catheterization revealed 150 ml of reddish urine. After fluid resuscitation his vitals improved (BP 118/60 mmHg, pulse of 96 per min) and oxygenation was maintained, patient was started with antibiotics and tetanus vaccination was administered. Blood transfusions were started. Portable abdominal and chest X rays were obtained which did not demonstrate any bony injury, pneumothorax, or pneumoperitoneum. The iron rod was gradually withdrawn under direct observation in operation theatre. The child underwent exploratory surgery through midline incision, colon was reflected and kidney exposed. There were rent in the anterior and posterior surfaces of the kidney with bleeding and perirenal hematoma .The wound was thoroughly irrigated with saline and packed .When the bleeding stopped the rent on the kidney was repaired with vicryl sutures. The descended colon was perforated through and through .Thereafter, the small bowel was perforated at two sites (30 and 10cm proximal to the ileo-caecal junction). The rents in the bowel wall were freshened and repaired in two layers. The entry and exit wounds were irrigated with hydrogen peroxide and repaired. Left pararenal and peritoneal tube-drains were secured and the abdomen closed after thorough peritoneal lavage.

The child remained intubated and was transferred to the ICU. After extubation at 24 hours, he was shfited to the surgical ward. His postoperative period was complicated by superficial infection of the entry wound on the sixth hospital day, which was managed by local dressings and topical antibiotics. The postoperative recovery was quick and uneventful. Oral diet was instituted on the fifth postoperative day. Drains were removed after feeding was set up. The patient was discharged on the 12th postoperative day. Six months after the accident, the patient is thriving well.

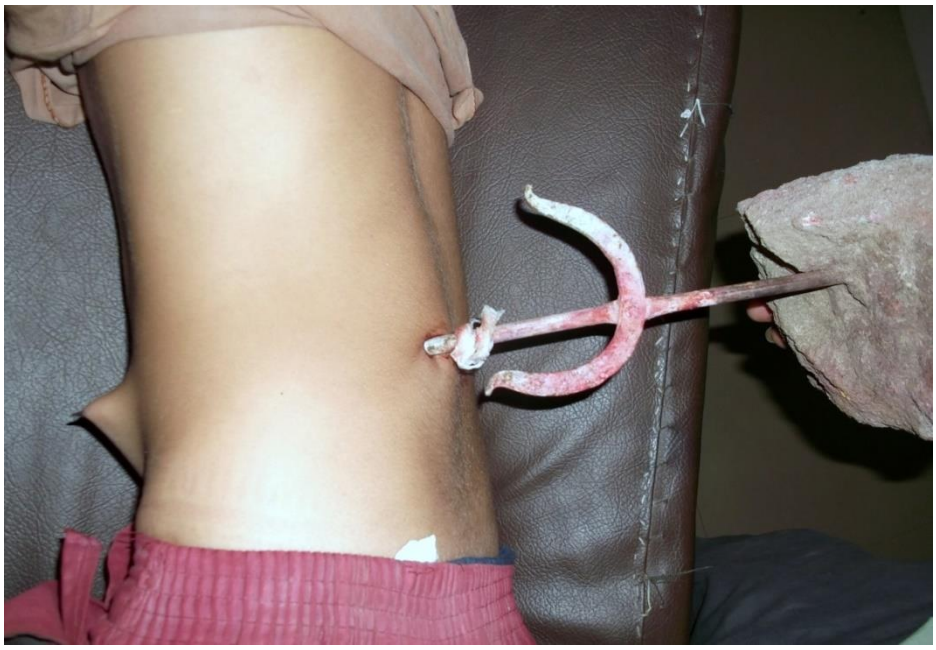

Fig-Trishula impaled from loin exiting at anterior abdomen

DISCUSSION

Impalement injuries are a consequence of penetration of elongated, usually fixed objects through the body. It is an acute emergency [2] Pre-hospital care is quite crucial to the survival of these patients. There are certain basic principles which must be complied with in such a situation. The impaling object must be secured so as to avoid any movement in relation to the body of the patient. This is to prevent further soft-tissue damage and bleeding. Care must be taken not to remove the penetrating object while the patient is being transported to a nearby hospital where definite treatment is to be provided otherwise fatal haemorrhage may occur [3]. The impaling object may cause a tamponade effect on the organs through which it has penetrated, thus preventing bleeding following trauma. As a rule, the impaling object must be removed under direct vision in a controlled environment such as in the operation theatre. Moreover, with the foreign body in place it is always easier to physically visualize the organs through which it has traversed, thus preventing missing of any organ injury during surgery. There are very few exceptional situations, wherein immediate removal of the impaling object is indicated such as if the patient needs cardio-pulmonary resuscitation and the object is interfering with it or if the impaling objects is in the way of the patient's airway. Resuscitation and close monitoring prior to and during surgery are vital with anticipation of major organ and vascular injuries compromising the normal physiology of respiration and circulation [4]. Hypovolemia should be rectified in the emergency ward.

Trauma with impalement can be categorised as those with: (A) Cardiovascular injury, (B) injury of hollow organs, (C) injury of parenchymatous organs and (D) combined injuries. Group A patients have the worst prognosis and death may result within 30 min of the accident. Injuries of groups B and C variety have a good chance of a positive outcome if patients can be treated at a tertiary trauma centre with the capability of prompt diagnosis. To assess the complexity of trauma-induced injuries, a computed tomography scan should be made in addition to chest radiography and abdominal ultrasound [5]. Adequate amount of blood and blood products should be arranged prior to operating these patients.

CONCLUSION

Penetrating injuries demand immediate life-saving measures, appropriate resuscitative care, urgent shifting of patient to tertiary care centre, prompt diagnosis and immediate surgical intervention by a multi-disciplinary team of surgeons. Timely intervention can improve the patient outcome and minimise mortality.

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