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Impaled Metallic Rod- a Serious Threat to a Child's Life

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Authors' contributions

This work was carried out in collaboration among all authors. Author MM has carried out the manuscript writing, drafting and prepared the final draft. Author TA completed the critical analysis of draft and literature search. Authors NS, MSL and AA have done the literature search. Author SJ gave the final approval to be published and contributed in literature search. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Penetrating chest wall injuries are life threatening necessitating prompt surgical management. Impaled foreign body in thorax requires major intervention and removal under direct vision. We report a 14 year old boy presenting to emergency department with impaled metallic foreign body to the posterior chest wall. He was anxious, however stable clinically. On examination, foreign body was found penetrating the left 7th intercostal space 2 cm away from midspinal line. Chest x-ray showed radiopaque sharp object within left hemithorax. After blood products were arranged, general anesthesia was given without manipulation of foreign body. Posterolateral thoracotomy was done one intercostal space above injury, metallic rod was found penetrating lung one centimeter from thoracic aorta. It was removed under vision, intercostal bleeder was ligated, lacerated lung repaired. Chest cavity was thoroughly irrigated, no cerebrospinal fluid leak was observed. Patient was extubated on table and shifted to ward. No neurological deficit was identified and the patient was discharged on third post-operative.

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Keywords: Impaled foreign body; penetrating chest injuries.

1. INTRODUCTION

Thoracic injuries are responsible for around 20 to 30% of mortalities secondary to trauma [1]. Up to 10-30% of penetrating chest injuries (PCI) require surgery as they lead to shock and eventually death [1,2]. Impaled foreign bodies (IFB) are secondary to fixed long structures [3]. They should be removed under direct field of vision with all prior obligatory preparations [1,3]. Here we wish to present a case of young boy presenting with impacted metallic rod in chest.

2. CASE DESCRIPRTION

A 14 year old boy presented in emergency department with history of accidental fall. According to the boy he fell onto a brick with exposed metallic rod inside an under construction house. On examination, young boy was found sitting on bed anxious, oriented with time place person, with a metal rod impacted in the back of his chest. His blood pressure was 110/70 mm Hg, pulse 140 beats per minute, respiratory rate of 24 breaths per minute, oxygen saturation of 97% on room air. There was decreased air entry on posterior auscultation at the left lower region of chest. No signs of tamponade could be appreciated. The clothing around the rod was carefully cut for exposure. Metal rod was identified penetrating the left 7th intercostal space 2 cm from midspinal line. No bleeding or emphysema could be appreciated Fig. 1.

Initially child was managed according to the ATLS protocol. Resuscitation was carried out with intravenous fluid, intravenous antibiotic, intramuscular anti tetanus were given and blood products were arranged. Strict immobilization with serial reassessment was carried out. Chest x-ray was done revealing a radiopaque sharp object penetrating the left hemithorax, no hemothorax or pneumothorax could be appreciated on initial x-ray (Fig. 2). No further radiological investigations were carried out in order to avoid excessive mobilization of patient.

Fig. 1. Metallic foreign body impaled in posterior chest

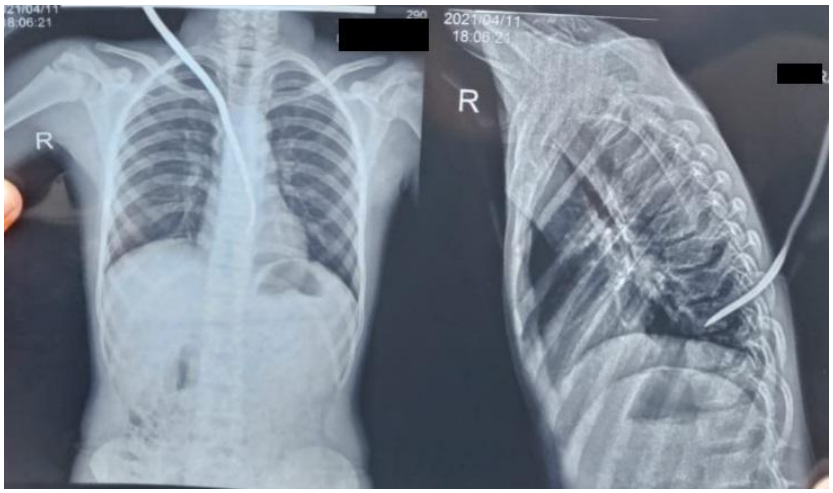

Fig. 2. Chest x-ray revealing metallic object penetrating chest cavity

With no further delay patient was shifted to emergency theatre. Child was supported in 45 degree position and ketamine was given. Patient was intubated in same position with expertise. Once endotracheal tube was passed right lateral decubitus position was attained. Posterolateral thoracotomy was done through the sixth intercostal space above the metallic rod. Metallic rod was found penetrating chest cavity few centimeters from thoracic aorta, two intercostal spaces above diaphragm, and impaled in left lower lobe of lung, around 50 ml of blood was evacuated. Rod was removed under vision, intercostal bleeder was observed and ligated, lacerated lung repaired in interrupted manner with absorbable 2/0 suture (Fig. 3).Chest cavity was thoroughly irrigated, no cerebrospinal fluid leak was observed. Patient was extubated and shifted to ward. No neurological deficit was observed post operatively and on third post-operative day tube was removed and patient discharged.

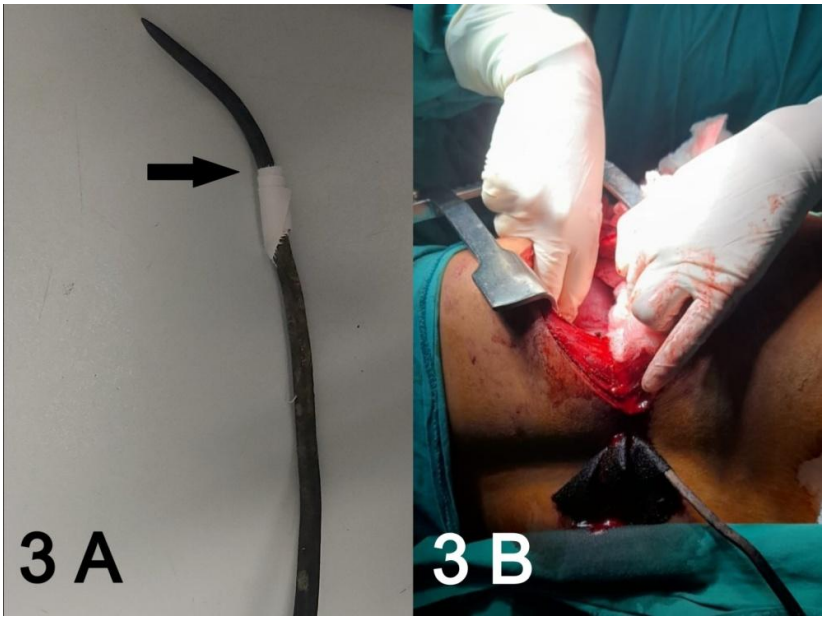

Fig. 3. A = Arrow representing extent of metallic rod within cavity, B= Posterolateral thoracotomy

3. DISCUSSION

Penetrating chest injuries are life threatening and require urgent care in a tertiary care facility [2,4]. A range of foreign bodies (FB) have been reported in literature to be retained in thorax after trauma such as bullets, glass, metallic pins etc [5]. In literature there is rarity of FB in chest wall post trauma in children [5]. Thoracic FB has been classified into three subtypes secondary to the mechanism; type I: aspirational, type II: trauma or accidental, type III: Iatrogenic [6].

Careful history is important in order to identify the mechanism and severity of injury with resuscitation and management planned accordingly [1,5,7]. Although for all IFB of thorax, focus should initially be directed towards airway, breathing and circulation, with injury specific examinations and serial reassessments [3,5]. Chest x-ray remains the initial investigation that helps identify the location, direction and presence of pneumothorax or hemothorax or emphysema that have been reported with IFB [7,8]. Computed tomography with reconstruction plays a more important role in evaluating the foreign body and possible injuries to the surrounding major structures [5,8].

Impaled thoracic FB should not be removed blindly, as injuries to aorta, lung parenchyma , heart and other major vessels have been reported [7,9,10]. Blind removal may result in hemorrhage from vessels occluded secondary to the impacted FB [1]. Preoperative preparations should include adequate amount of blood products and multidisciplinary team on board with experienced personal in their respective fields [2,3,4].

IFB of thorax should be removed under direct vision in operating theatre, thoracotomy remains an ideal procedure [3,8,10,11]. Ketamine should be considered for induction of anesthesia along with single lung ventilation if possible [1,9]. All dead and infected tissue should be removed, thorough inspection of chest cavity along with rigorous irrigation and decontamination of thoracic cavity should be carried out [2,3].

4. CONCLUSION

Impaled thoracic foreign body is a surgical emergency, removal should be carried out under vision in operating theatre with multidisciplinary team on board after necessary investigations and preparations have been carried out.

CONSENT

Informed and written consent was taken from patient guardian for publication of this case report and accompanying images.

ETHICAL APPROVAL

Case reports are exempted from ethical approval as per our institutional review board policy.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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