

Case Report

Case report of isolated impaling lung injury with successful outcome

Tushar Goel^{1*}, Sameer Bhate²

¹Department of General Surgery, Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana, Haryana, India

²Department of Cardio-Thoracic, Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana, Haryana, India

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*Correspondence:

Dr. Tushar Goel,

E-mail: drtushargoel2014@gmail.com

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ABSTRACT

Impalement thoracic injuries are rare of great importance due to severity and high chances of mortality. It is essential to prevent possible vascular injury by the object avoiding major haemorrhage. This study's primary objective is to discuss 22-year-old male patient admitted in emergency with impaling thoracic trauma by metallic sharp object post battery blast at home. X-ray reveals linear foreign body: penetrating thorax and lung. CT Chest was done and assessment was made for further management with cardiothoracic department. Patient details were collected by patient's IPD file. Complete detailed history, patient vitals, hemogram, ABO, ABG, CXR along with USG chest and abdomen and CECT chest was done. Post op daily chest X-ray and hemogram along with chest physiotherapy and spirometry was done. Treatment diagnosis was impaled linear foreign body penetrating thorax and lung, patient was shifted to OT, under GA sternotomy was performed. Foreign object passing just lateral to subclavian penetrating upper pole of lung was identified and under specific vision pulled out carefully through entry wound keeping in mind vascular trauma. Necrosed lung part was stapled and wedge resected, on POD 8 patient was discharged with satisfactory condition. Impalement thoracic traumas are rare and have high mortality. Selection of line of treatment is necessary. Indication of surgery under high risk is performed for further trauma. In our case sternotomy was planned and under specific vision impaled object which was passing just by subclavian penetrating through lung was removed safely and patient went home in good condition.

Keywords: Cardiovascular thoracic surgery, Impalement injury, Wedge resection

INTRODUCTION

Impaling injury is defined as a wound resulting from a foreign object being lodged into the body of a patient along its long axis, through a puncture wound on the skin and up to an unknown depth.¹ This type of injury can be differentiated into:

- Type I, when a moving body strikes an immobile object
- Type II, in which a mobile object strikes an immobile body.²

The impaled foreign body may be apparent on examination or may go unnoticed due to being imbedded up to its entirety.³ Victims of the impalement wounds of the thorax rarely ever make it to the operating table due to high mortality owing to life threatening hemorrhage, on the scene of the injury or during transportation.

This is a case report of a patient with an impalement injury of the thorax and, the subsequent management with a successful outcome.

CASE REPORT

A 22-year-old, male presented to the emergency with complaints of pain in right side of chest, after being injured by a sharp object to right side of the chest wall due to blast of the inverter battery a few hours ago.

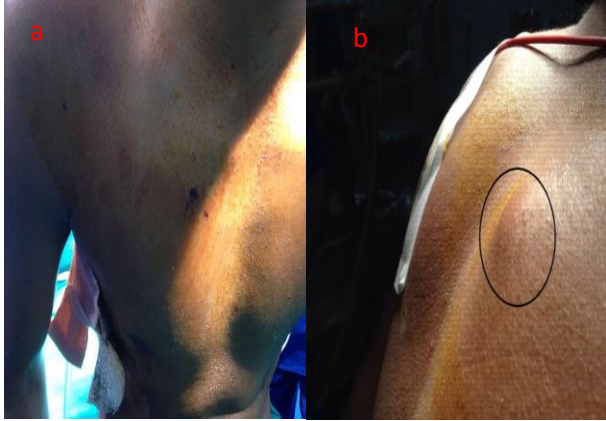


Figure 1: a) and b) protrusion of the foreign object, seen on the back, medial to the scapula border. Shown in the circle.

On admission his vitals were stable, with SpO₂ of 98% on room air, and he was calm, conscious and cooperative, and well oriented to time, place and person. On examination, he had a normal Jugular Venous Pulse Pressure (JVPP), with small abrasions of the face and hand, congestion of the conjunctiva in both eyes and a 0.5 cm x 0.5 cm wound in the right third intercostal space with a protrusion felt on the back, just medial to the medial border of the right scapula (Figure 1). His systemic examination was unremarkable, except for decreased air entry on the right side of the chest and normal heart sounds. He had surgical emphysema in the right infra mammary area. His vitals on admission and on discharge have been mentioned.

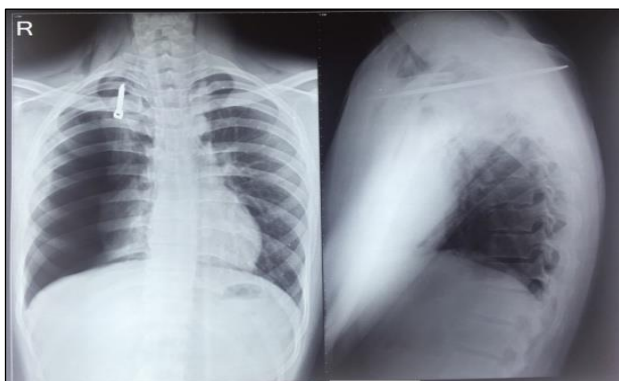


Figure 2: Chest radiograph of the patient on admission.

Chest radiograph showed the presence of a long opaque foreign body in the upper part of the chest on the right side, traversing the entire antero-posterior diameter of

the thoracic cavity with clear costophrenic angles, and surgical emphysema (Figure 2). The abdominal ultrasonography was normal, and Electrocardiography (ECG) was unremarkable. Contrast Enhanced Computed Tomography (CECT) showed evidence of presence of a metal object in the thoracic cavity (Figure 3 and 4).

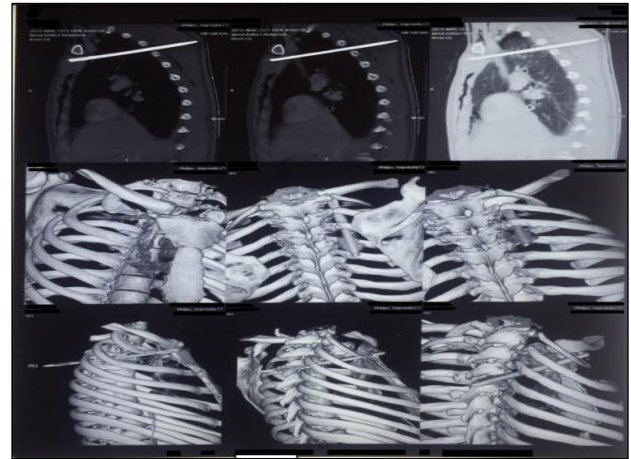


Figure 3: Contrast enhanced computed tomography scan of the patient.

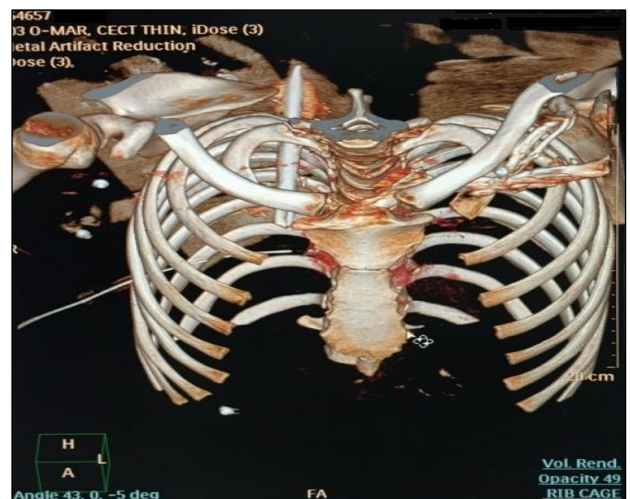


Figure 4: Volume rendered CT scan of the patient showing the location of the foreign body.

The cardiac surgery department was informed and all the investigations and cross match were sent and patient was shifted to the operation theatre. Following routine supportive measures, which included placement of an intercostal catheter in the right chest in triangle of safety.^{4,5} Patient was shifted to cardiac operation theatre within 2 hours after presentation in the emergency, complying with the World Health Organization (WHO) Surgical safety checklist and the condition of the patient remained stable throughout the interim.⁶

A midline sternotomy was made. The pericardium and the pleurae were intact. The right pleura was opened and the exposure was facilitated by using a Rultract sky hook

Retractor (PEMCO, INC USA). There was no collection in the right pleura.

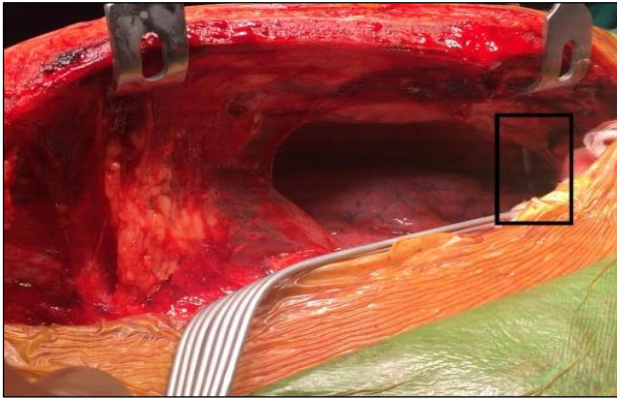


Figure 5: Intra-operative picture; location of the foreign body, piercing the lung apex.

The object had pierced the apical segment of the right lung (Figure 5), missing the superior vena cava, subclavian and internal mammary vessels.

The apex was grasped with a duval lung clamp (Figure 6) and the foreign object, (a large sewing needle) (Figure 7), was removed through the entry site by pulling out with a Berry wire holder. The apex of the lung was wedge resected using an endobronchial stapler (Ethicon/J&J, Echelon 60 mm stapler) (Figure 8).



Figure 6: Intra-operative picture; puncture site of the lung.

Right pleura was closed using no. 1 Vicryl sutures and two drains were placed one to the mediastinum and another to right pleura. Mediastinum was washed with warm saline and antibiotic (cefazolin).

Sternum was closed using modified Robischek method with number 6 steel wires. The pre-sternal layer was

approximated with no. 1 PDS and the skin with 3/0 monocryl.



Figure 7: The removed foreign body.



Figure 8: Wedge resection of the right lung apex, using an endobronchial stapler.



Figure 9: Post-operative chest X-ray of the patient showing sternum sutures and chest drain.

Following extubation, the patient was shifted to the recovery in stable condition (Figure 9). His post-operative recovery was uneventful. He received an ophthalmology assessment for the conjunctival chemical

injury. The patient was discharged on the 5th post-operative day in a stable condition.

During his latest follow up, one-month post operatively, the patient was healthy, with a well healed scar of his mid line sternotomy and sternum was stable. Chest X-ray showed good lung expansion with no collection and congestion. Surgical emphysema had resolved completely.

DISCUSSION

Impalement wounds of the thorax carry tremendous risk of fatal hemorrhage and high mortality. In this case, the patient was extremely lucky, as no major vessels, Brachial plexus or lung hilum were injured. There was no hemothorax or even an air leak or rib fracture despite the lung being transfixated by the object. This needle tried to exit through the intercostal space posteriorly after impaling the lung apex.^{2,3,7-9}

Few cases with successful management of such types of injuries have been reported in the published literature. Management of this type of impalement injury requires great caution, beginning with leaving the foreign object in situ until it can be removed in a controlled environment of the operation theatre, followed by timely transport to a tertiary care hospital and efficient surgical management.

Our patient did not suffer from any neurovascular injuries, the odds of which are very low in this type of impalement with foreign body in the thorax. He proceeded on to have a full recovery, being in the prime of his health on his latest follow up in the department.

CONCLUSION

Impalement thoracic traumas are rare and have high mortality. Selection of line of treatment is necessary. Indication of surgery under high risk is performed for further trauma. In our case sternotomy was planned and under specific vision impaled object which was passing just by subclavian penetrating through lung was removed.

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