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CASE REPORT**MANAGEMENT OF PENETRATING INJURY TO THORACIC INLET AND LOWER NECK WITH RETAINED FOREIGN BODY USING VIDEO ASSISTED THORACOSCOPIC SURGERY****Muhammad Adeel Samad, Hamza Abdur Rahim Khan, Faiza Urooj, Usman Ali Hyder, Fazal Wahab Khan*, Saulat Hasnain Fatimi*, Jamal Kabeer Khan***

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Penetrating neck and chest injuries are a common form of occupational injuries. We hereby report a unique case in which a metallic rod had penetrated the left chest and neck of a plastic factory worker. The patient was vitally stable when he presented to Emergency Room. Chest X-ray was performed and the patient was rushed to the operating room. VATS (video assisted thoracoscopic surgery) and neck dissection was done for retrieval of the metallic rod. On table, endoscopy was also done to rule out injury to oesophagus. No injury to vital structures was found and the subsequent recovery was uneventful.

Keywords: VATS; Penetrating injury; Thoracic inlet; Lower neck

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INTRODUCTION

Penetrating neck and chest injuries due to pointed objects are a common form of accidental occupational injuries. Trauma can occur to the major blood vessels, trachea, oesophagus and vital organs such as heart and lungs causing major morbidity and mortality. These injuries occur when rigid objects with sharp or elongated edges pierce the flesh, underlying soft tissue and muscle. This can be the result of occupational hazards, falls and vehicular/ traffic accidents. Trauma associated chest injuries account for 30–40% of hospital admissions and 20–25% of trauma associated deaths, whereas, penetrating chest injuries account for 1–13% of the total number of these injuries.¹ Penetrating neck wounds are present in approximately 10% of all trauma patients.² There is sparse literature on use of VATS for retrieval of foreign body, with majority of it being case reports. The largest available study is a case series consisting of just four cases.³

The current case is the successful management of a penetrating injury to thoracic inlet and lower neck from a large metallic rod. What makes this case unique and worth reporting is that the injurious agent, which was large in size, not only pierced the neck and thoracic inlet through and through, it was also lodged when the patient presented to the Emergency Room. Although cases of penetrating neck injuries due to metal rods have been reported, lodged penetrating injuries of the neck and thoracic inlet combined are very rare, and even rarer is their successful treatment via VATS (Video Assisted Thoracoscopic Surgery).

CASE

A 32 years old plastic factory worker was brought to our institution two hours after a penetrating injury of his left chest and neck. This occurred when a piece of cloth he was using to cover his lower face at work, got stuck in the

mixing machine and pulled him towards itself. The distal end of the mixer machine penetrated his left upper chest and neck and came out through the other end as shown in figure-1. The machine was immediately stopped by his co-workers and the penetrating part of the machine was detached from the above. On arrival in emergency room the patient was hemodynamically stable. Chest X-Ray (Figure-2) shows the nature of injury.

The patient was immediately rushed to the operating room where he was intubated after making sure no secondary injury occurred. VATS followed by neck dissection was planned to see the extent of injuries. A 10 mm camera port and 5 mm working port were inserted to perform VATS. Left sided VATS showed that the metallic rod had just penetrated the apex of the lung, narrowly missing the subclavian vessels. No other injuries were found. The next step was the dissection of the neck just close to where the rod was lodged in the neck. It was found that it had narrowly missed the vital structures in the neck including the carotids and the jugular vein. The metallic rod was then taken out by twisting it anticlockwise and under the guidance of VATS and making sure no injury to neck structures occurred. Figure-3 shows the rod after removal. The endoscopy performed revealed no injury to the oesophagus. Chest tube attached to Pleur-evac was placed after VATS.

The patient was kept under post-operative observation. He remained hemodynamically stable during the length of hospital stay. He was discharged on fourth post-operative day. The recovery following the operation was uneventful and there was no permanent disability. The chest tube was removed after one week in clinic because there was no evidence of air leak or discharge. On next follow-up visit 4 weeks post-surgery, he was doing well and reported no complications during this period.



Figure-1: Foreign body; anterior and posterior view

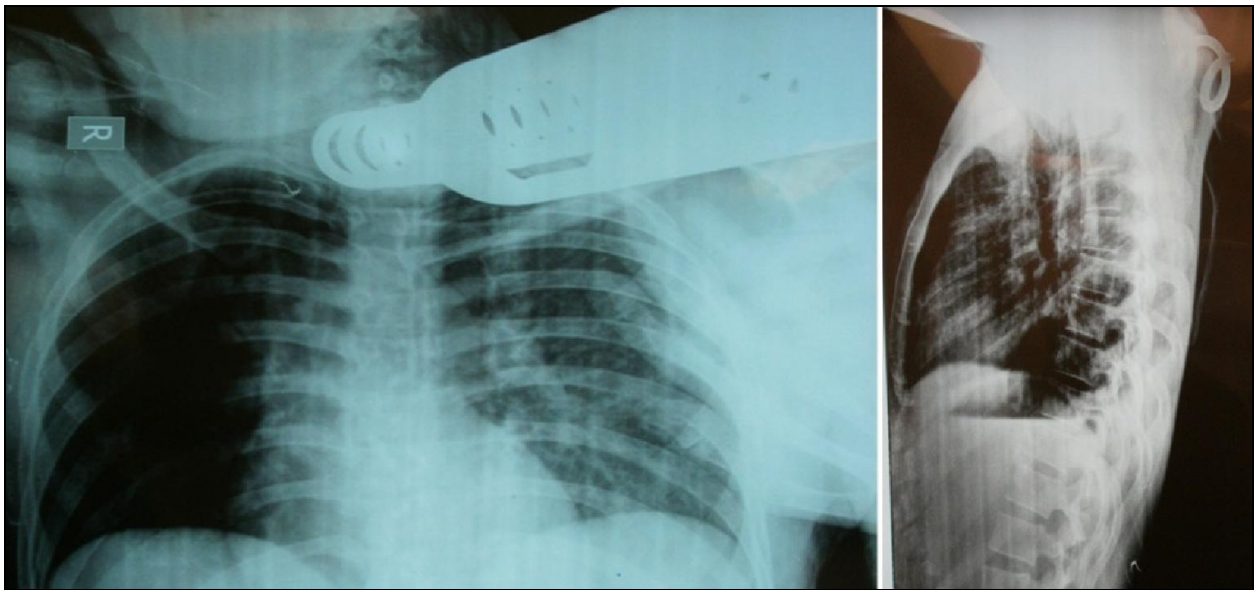


Figure-2: Chest X-ray; AP, lateral view and superior view



Figure-3: Foreign body after removal

DISCUSSION

The neck is one of the most important topographic areas due to the high density of vital organs. Penetrating trauma to the neck causes injury to these structures, resulting in mortality and morbidity.

According to the findings of a study reviewing 192 patients with neck trauma by Mohsen Mahmoodie, Behnam Sanei, Mohammad Moazeni-Bistgani, and Mohammad Namgarin 2012, most common cause of penetrating neck trauma was stab injuries (85.93%) and the most common zone of neck injury was zone II (56.3%). Because of the proximity to the neck and chest, chest trauma was the most common associated trauma.¹

Although the role of VATS in the management of thoracic injuries is expanding, its definitive indications in setting of trauma are not well defined. The Thoracic surgeons are less likely to choose VATS for 2 reasons. First, due to low incidence of penetrating chest trauma not all thoracic surgeons have experience in managing these injuries.⁴ Second, irrespective of preoperative

radiological workup, there is the possibility of major-vessel or cardiac injury.⁵

A few indications described for VATS are diaphragmatic and oesophageal rupture, open pneumothorax with persistent air leak, and progressive hemothorax.⁶ Although there are numerous studies reporting the use of VATS to manage patients with these conditions, there are very few reported cases of VATS being used to manage penetrating chest trauma with retained foreign body. A case series including 3 patients revealed that VATS offers a safe and less invasive alternative to traditional thoracotomy for penetrating thoracic injury with retained foreign bodies in hemodynamically stable patients.⁷ Another case series by William et al., proposed that VATS should be considered more frequently for evaluation and removal of intrathoracic foreign bodies.⁸ Another case reported by Angeline N Radjou and Muthandavan Uthrapathy, describes the successful use of VATS in retrieval of foreign object in a hemodynamically stable patient.³

The major contraindications identified to VATS are: Hemodynamic instability, suspected injuries to the heart or great vessels, inability to tolerate single-lung ventilation or a lateral decubitus position and severe adhesions due to previous thoracic surgeries.⁶

A study including 80 patients with penetrating chest injury showed that the operation time, amount of bleeding and drainage in VATS group were all lower than conventional operation ($p < 0.05$).⁸ Another study that included 23 patients with penetrating chest injuries demonstrated that in hemodynamically stable patients, VATS is safe and effective for managing acute thoracic trauma within the first 24 hours of injury.⁹ Moreover, VATS has an accuracy of almost 100% in diagnosing injuries to the diaphragm¹⁰. This study also showed that the rate of missed diagnosis using VATS for chest trauma is 0.8% and that of procedure-related complications is

2% with the need for conversion to open thoracotomy in 14–31% cases.¹⁰

The use of VATS in penetrating chest trauma is still sparse owing to the lack of experience of surgeons to perform it for retrieval of foreign objects. The case reported by us demonstrates that VATS can be successfully used to manage patients with penetrating chest trauma with retained foreign object. VATS should be used more extensively in setting of penetrating chest trauma in hemodynamically stable patients, who do not have any contraindications to VATS as described above.

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