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Case Report

An unusual foreign body into the pericardium after a penetrating thoracic injury: a case report

Dalal S. Alshammari*, Maisa F. Alhelali, Nizam A. Amana, Basem S. Girgis

Department of Thoracic Surgery, King Khalid Hospital, Hail, KSA, Saudi Arabia

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***Correspondence:**
Dr. Dalal S. Alshammari,
E-mail: dalal.1989.alshammari@gmail.com

ABSTRACT

Thoracic trauma remains a major contributor to global morbidity and mortality, particularly through penetrating injuries. This case report discusses a 16-year-old female patient who presented with a penetrating injury following a fall involving a heavy object, resulting in three sewing needles embedded in her chest. Two needles were removed in the emergency department, while a third needle was retained and found to be in contact with the pericardium. Imaging, including chest X-ray and CT scans, facilitated the diagnosis and localization of the foreign body. Surgical intervention was performed successfully under local anesthesia, resulting in the complete removal of the needle without complications. The patient recovered well and was discharged two days post- surgery. This case underscores the importance of prompt imaging and surgical management in cases of penetrating thoracic trauma.

Keywords: Penetrating injury, Thoracic trauma, Foreign body, Pericardium, Surgical intervention

INTRODUCTION

Thoracic trauma is a significant leading cause of morbidity and mortality worldwide and is subdivided by the mechanism of injury into blunt or penetrating trauma. While penetrating thoracic injury is less common than blunt thoracic injury but is considered a more life-threatening injury. Penetrating thoracic injury refers to damage that occurs within a specific region between the lower neck and the lower edge of the rib cage, where the injury breaches the skin barrier, putting all mediastinal structures at risk.[1,2]

Gunshot and stab wounds account for the largest proportion of penetrating trauma, while sewing needles are an uncommon source. Deeper penetrating objects can target the heart, resulting in fatal complications such as cardiac tamponade, hemopneumothorax, pulmonary embolism, and arrhythmias. Patients may exhibit symptoms like chest pain, shortness of breath, or cough, but some people remain completely asymptomatic.[3,4] Early localization of the foreign body through imaging such as a chest X-ray, which is typically straightforward and effective for visualizing the foreign body, and a computed tomography (CT) scan, which is essential for achieving an accurate localization of the foreign object, is necessary, in addition to the removal of the foreign body for life-saving intervention.[5] Here, we present a case of a patient with a needle that penetrated the pericardium after chest trauma.

CASE REPORT

A 16-year-old Saudi Female Medically Free arrived early in the morning at the king Khalid Hospital Emergency Department in Hail City. She had history of fall down heavy object on her chest three days ago with three needles inserted on her anterior chest wall, two of them removed in Emergency department. And one of them missed in her chest. She had been experiencing moderately severe left side chest pain and Shortness of breath. Vital signs were normal. A simple chest X-ray displayed a needle in the chest (Figure 1). CT chest showing mild left sided pneumothorax with hyperdense structures seen in the subcutaneous layers of left upper chest with its tip seen in

the left upper lung parenchyma causing left upper lobe contusion Figure 2. On end of the needle was seen embedded into left upper chest touching pericardium causing pain for the patient during the physical examination.

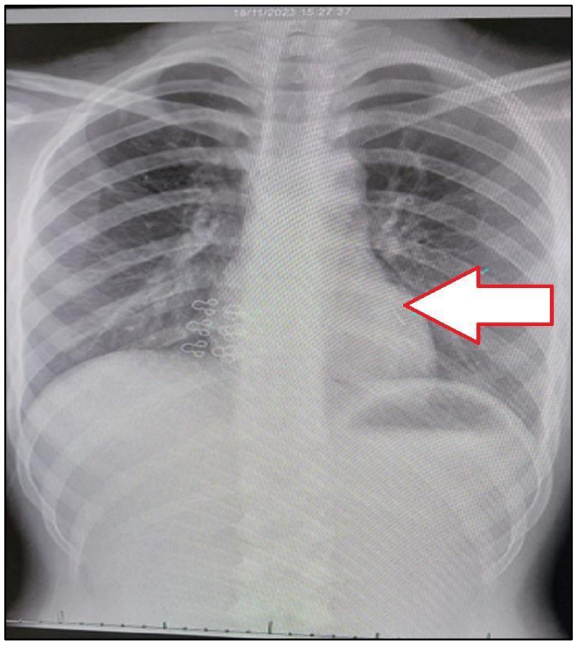

Figure 1: A simple chest x-ray displayed a needle in the chest.

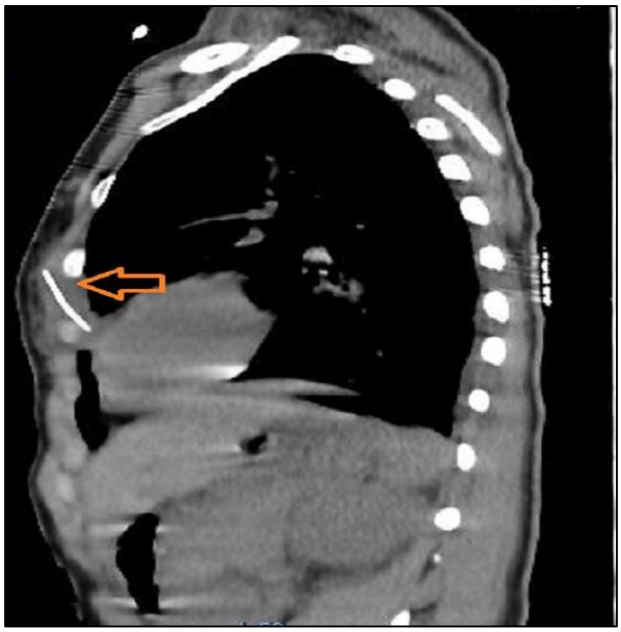

Figure 2: CT chest showing mild left sided pneumothorax with hyperdense structures seen in the subcutaneous layers of left upper chest.

The surgery done under local anesthesia with sedation. Left transverse incision about 3 cm at left third space about 3 cm from the sternum. Exploration of the subcutaneous and muscle and removal of the foreign body. In two parts with the guide of C-arm (Figure 3). Postoperative chest X-ray showed no abnormality and the patient was discharged from the hospital 2 days after the surgery.

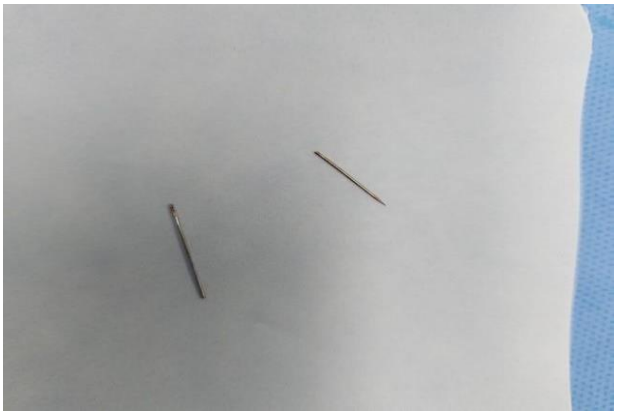

Figure 3: The foreign body (needles).

DISCUSSION

Chest trauma is one of the leading causes of morbidity and mortality worldwide, especially among younger populations. Next to the head and limbs, it is the third most frequent injury in the world. Thoracic injuries have the second highest mortality rate after head injuries, necessitating both a rapid and effective initial treatment in this case. Interestingly, chest trauma (as part of blunt and penetrating thoracic trauma) constitutes 25% of global mortality related to all types of traumas.[6] Penetrating trauma to the thorax necessitates urgent life-saving measure, immediate transfer to a tertiary center for extensive evaluation and optimal intensive care with prompt diagnosis and surgical management by multidisciplinary teams.[7] Gunshot and stab wounds account for the largest proportion of penetrating trauma, and rarely involve retained foreign bodies, such as needles, which account for approximately 1 to 13 percent of all thoracic trauma cases. These injuries present management challenges due to diverse aetiologias from iatrogenic, or accidental causes and potential complications, including tension pneumothorax, cardiac tamponade, and major haemorrhage. Cardiac penetration can result in arrhythmias, ischemia, valvular and septal defects. Such patients can remain asymptomatic or may exhibit symptoms like chest pain, shortness of breath, or cough.[3,4,8]

Our patient arrived with three needles inadvertently embedded in her chest following the impact of a heavy object. She reported experiencing moderate to severe pain on the left side of her chest and difficulty breathing. While two of the needles were successfully extracted in the emergency department, one needle was missed in her chest. Imaging plays a vital role in diagnosing and managing thoracic injuries. Chest X-ray is the first line investigation applied in thoracic trauma cases. Chest X-rays are capable of detecting rib fractures, foreign objects or ballistic fragments, contusions, pneumothorax,

hemothorax, and mediastinal injuries, which can then be further examined using CT imaging. Although radiography is beneficial for early critical management and triage, computed tomography (CT) offers greater accuracy in assessing the severity of injuries and identifying additional findings that could influence treatment decisions.[9] In our case, a simple chest X-ray was done, which identified a needle located in the chest. Additionally, a chest CT revealed a mild left-sided pneumothorax, along with hyperdense structures observed in the subcutaneous layers of the left upper chest. The tip of the needle was noted to be positioned within the left upper lung parenchyma, resulting in a contusion of the left upper lobe.

In case of retained foreign body associated with penetrating chest trauma, surgical intervention is mandatory. For decades, thoracotomy has been the gold standard modality for exploration in the setting of thoracic injuries because it is felt to provide the most adequate exposure to assess injuries, remove foreign bodies, control hemorrhage, and resect injured tissue. This is particularly useful when the final position of the needle in relation to potentials mediastinal structures is known in advance, in terms of recent image studies such as X-ray or thoracic CT.[10,11]

A surgical exploration was performed through a left transverse incision (approximately 3 cm) in the left third space and about 3 cm from the sternum to explore the subcutaneous tissue and muscle. The needle, which consisted of two segments, was successfully removed without any complications using C-arm guidance under local anesthesia. Postoperative chest X-ray showed no abnormalities and the patient was discharged two days following the surgery.

CONCLUSION

This case highlights the critical need for prompt recognition and management of penetrating thoracic injuries, particularly those involving retained foreign bodies. The successful extraction of a sewing needle from the pericardium underscores the importance of thorough imaging and effective surgical intervention. The patient's positive outcome demonstrates that with timely diagnosis and appropriate surgical techniques, even unusual and seemingly benign foreign body injuries can be safely managed.

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