

CASE REPORT

Incidentally Diagnosed Sewing Needle in Lung: A Surgical Dilemma Solved Using Simulation

Raja Lahiri¹, Deepak Sharma², R.S. Abisho³, Sawan Dalal⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT

A young adult male in his early 20s was incidentally diagnosed with a sewing needle in the right lung following a routine chest radiograph. This report describes the utilization of thoracic computed tomography (CT) and Anatomage® technology (3D reconstruction) to accurately delineate the needle's position, plan the surgical approach, and facilitate its removal. The patient underwent a routine chest x-ray during evaluation of his dyspepsia, which revealed a needle like opacity in the para-hilar region of right hemi thorax. The patient could not recall any history of accidental penetration, ingestion or aspiration. The patient did not have any history or signs of psychiatric disorder. He also reported no symptoms such as haemoptysis, hematemesis, chronic cough, or dyspnoea. Physical examination revealed no external thoracic abnormalities or signs of past injuries. Following comprehensive radiologic evaluation, the needle was removed through elective right posterolateral thoracotomy. Intraoperative findings suggested a possibility of a remote penetrating thoracic injury. The patient's perioperative and postoperative courses were uneventful.

KEYWORDS

• Foreign Body • Thoracotomy • Penetrating Injury Chest

AUTHOR'S AFFILIATION:

¹ Associate Professor, Department of CTVS, AIIMS, Rishikesh, India.

² Senior Resident, Department of CTVS, AIIMS, Rishikesh, India.

³ Senior Resident, Department of CTVS, AIIMS, Rishikesh, India.

⁴ Senior Resident, Department of CTVS, AIIMS, Rishikesh, India.

CORRESPONDING AUTHOR:

Raja Lahiri, Associate Professor, Department of CTVS, AIIMS, Rishikesh, India.

E-mail: rajalahiri.imsbhu@gmail.com

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INTRODUCTION

Background

Blunt thoracic trauma is more prevalent than penetrating trauma, with latter being graver and can lead to mortality even before patient can reach medical facility. Needles as foreign bodies in thorax have been reported in numerous studies with mechanism varying from suicide attempt being most common, acupuncture, child abuse, drug abuse or accidental.¹ Most patients are symptomatic while few go unnoticed being asymptomatic. Such foreign bodies can migrate and puncture vital organs or blood vessels.

This report describes an asymptomatic patient with a sewing needle lodged in his right hemi thorax, specifically within lung parenchyma in para-hilar region. Its proximity to critical structures, including the superior vena cava, right upper lobe bronchus, azygos vein, right pulmonary vein, pericardium, and its traversal through the lung parenchyma, highlights the potential for severe complication.

The needle was surgically removed via elective right posterolateral thoracotomy.

CASE PRESENTATION

A male patient in his early 20s presented with a self-reported diagnosis of a needle in his chest, initially identified during evaluation for irritable gastric symptoms at another facility. He had no history of psychiatric disorders, thoracic trauma, or respiratory symptoms. He belongs to a family of professional tailors. Physical examination was unremarkable, with no evidence of penetrating chest injury. A chest X-ray revealed a needle in the right hemi thorax [Figure 1]. Computed Tomography Pulmonary Angiography (CTPA) identified a 6.2 cm linear metallic foreign body within the right lung parenchyma, located in the para-hilar region, associated with streak artefacts and a mildly dilated sub segmental bronchus [Figure 2]. No vascular or bronchial invasion was noted. The needle was obliquely oriented with the anterior end pointing downwards and slightly medially.

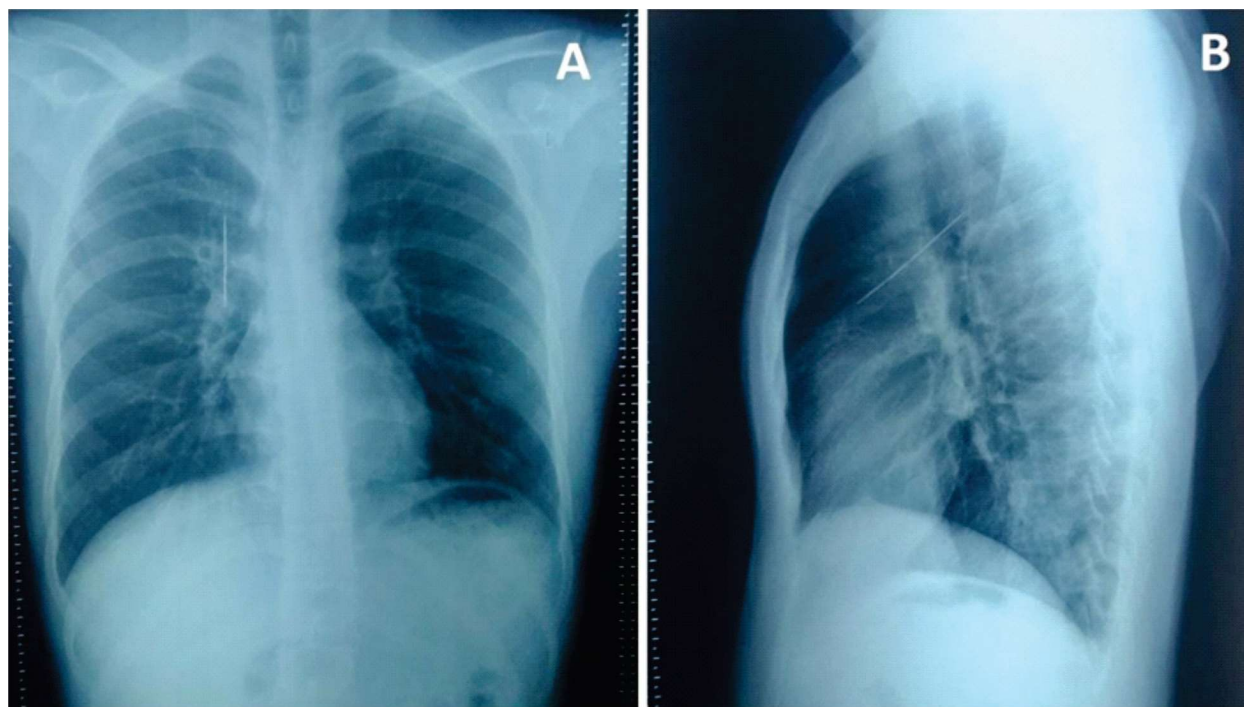


Figure 1: Patient's chest x-ray showing needle inside the right hemi thorax; A: PA view, B: Lateral view

Although silent foreign bodies in the thorax need not always be surgically removed, however, the location of this sharp needle close of pulmonary vasculature prompted surgical removal. Moreover, the patient was anxious since his diagnosis, fearing complications on

account of the needle being left in situ. Hence surgical removal of the needle was planned. We used the Anatomage® workstation to achieve a detailed visualization of the needle's position and its relation to adjacent structures [Figure 3]. It helped us do a thorough surgical

planning by means of virtual dissection and prepared us for any eventuality. An elective right thoracotomy under C-arm guidance was performed to extract the needle. Intraoperative findings revealed a track from the anterior chest wall, indicating the needle's entry path. Right lung ventilation was paused with a double-lumen endotracheal tube, and the needle was carefully removed by pushing it posteriorly. Upon delivery, only anterior half of the needle was found. The posterior

half was located under C-arm guidance and removed using 1.5mm small incision over lung parenchyma at the point closest to the eye of the needle [Figure 4]. Haemostasis was achieved using electrocautery. Saline test revealed no significant air leak at the respective sites. Chest was closed with drain in situ. Patient had an expeditious recovery and was discharged within 48 hours. Post-operative Chest X-ray showed no residual foreign body.



Figure 2: CT showing needle in the right lung para hilar region, A: just superior to right upper lobe bronchus, B: just lateral to superior vena cava, azygos vein and superior to right pulmonary artery

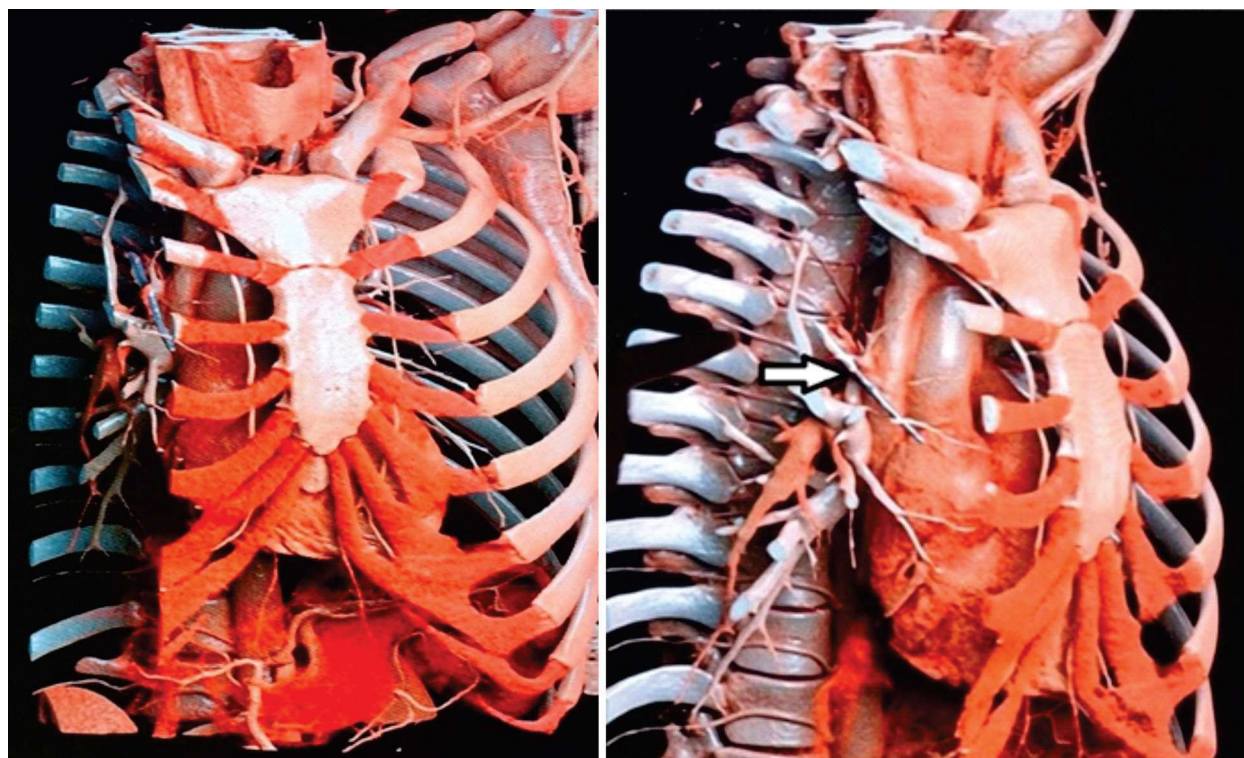


Figure 3: 3D reconstruction done with Anatomage showing obliquely aligned needle and its relation

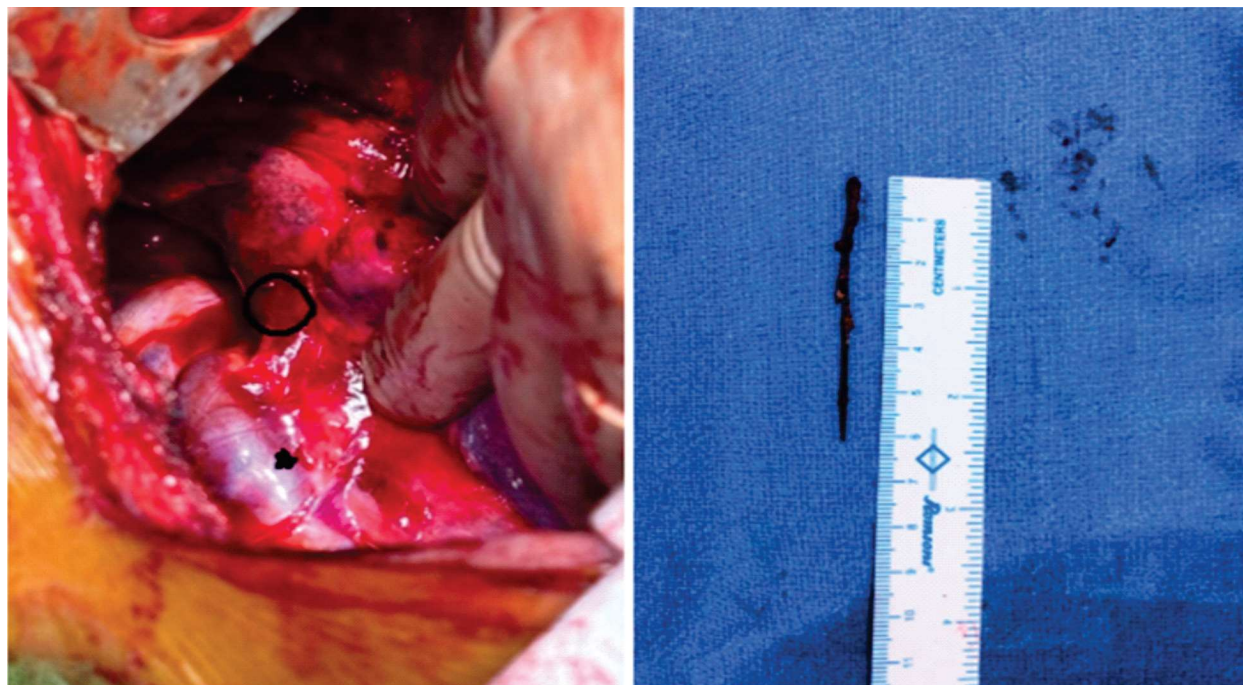


Figure 4: A: needle protruding out from lung parenchyma posteriorly inside circle, * (star) showing location of azygos vein, B: needle post extraction measuring 6.2 cm as seen in CT

DISCUSSION

Incidence of foreign bodies in thoracic cavity is more prevalent among children. Sharp objects like needles may become lodged and remain unnoticed in various anatomical regions, including the head, abdomen, scrotum, and buttocks². However, the presence of needle in the thorax is less likely to go unnoticed due to its slender, pointed, and migratory nature. The dynamic movement of the thoracic organs further exacerbates the risk of vital structure damage, symptom development, and infection due to foreign body degradation. The asymptomatic latency period in such cases is typically attributed to metallic composition of the object and development of fibroconnective tissue around the needle.

Previous studies have reported cases involving sewing needles in thoracic cavity, particularly within the chest wall and lung parenchyma. These reports highlight the importance of early removal of such foreign bodies due to the potential for both immediate and delayed complications.¹⁻³

The pathways through which needles enter the thoracic cavity include transbronchial, transesophageal, transcutaneous, and hematogenous, as described by Hiroyuki Miura *et al.*⁴ For instance, Zeynep Ozkan *et al* documented a case where sewing needle,

ingested accidentally, reached colon and upon waiting for its natural excretion the needle migrated into the lower lobe of left lung, necessitating emergency thoracotomy for removal.⁵ Conversely, a case reported by Graffstadt *et al* demonstrated needle migration from bronchus to the intestine after accidental aspiration, which later got naturally excreted.⁶ The rate of migration is faster in paediatric age group, between radiological workup and surgery, reported by Schultz *et al.*⁷

Given the unpredictable migration trajectory of sewing needles and their potential to cause severe complications, prompt surgical intervention is recommended even in asymptomatic patients.³

Thoracotomy is ideal approach for removal of long sharp objects. Video assisted thoracoscopic surgical removal requires deflation of lung reducing visibility of object and risking further migration of the sharp object.⁷ However, we utilised lung deflation due to deep seated location of the needle. Extensive fibrosis around the needle owing to long standing history prevented further migration during lung deflation in our case.

In our case, the absence of trauma history, symptoms, or external signs of injury, coupled with computed tomography pulmonary angiography findings of adhesions around

the needle with 3D reconstruction and discovery of a decayed needle during surgery, pointed to the chronic presence of the needle. Identification of entry route which was confirmed intraoperatively by presence of localised adhesions in anterior chest wall, suggesting remote penetrating thoracic trauma. The overall picture likely suggests an accidental penetration during childhood through anterior chest wall, which remained unnoticed. This case underscores the critical importance of meticulous history-taking, comprehensive clinical evaluation, and timely surgical management to mitigate the risk associated with foreign body migration in thorax.

LEARNING POINTS/TAKE HOME MESSAGES

- A detailed history and thorough clinical evaluation are crucial for understanding the mechanism of needle entry, which provides not only medicolegal insights but also valuable information about the patient's psychiatric status—both of which are as critical as the surgical treatment itself.
- Given the high risk of needle migration and potential damage to critical structures, prompt surgical removal should be prioritized. While complications may present later, as reported in the literature, even asymptomatic patients benefit from routine chest X-rays, as demonstrated in this case.
- Comprehensive radiologic evaluation, including 3D reconstruction, is essential for accurately assessing the situation and facilitating surgical planning.
- Intraoperative use of a C-arm is invaluable for real-time localization of the needle and for addressing potential migration hazards during the procedure.
- While minimally invasive surgical techniques are preferred, their unavailability should not delay intervention. Open approaches, such as thoracotomy, remain effective and should be prioritized to ensure safe needle removal. Literature suggests that thoracotomy is ideal when maintaining lung inflation, as deflation may increase the risk of needle migration or slippage into adjacent tissues.

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