# Can a foreign body migrate against natural body barriers?

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**Pericardial foreign bodies (FBs) are a rare cause of chest pain in children. They can reach the pericardium through several routes including direct or iatrogenic implantation, transbronchial or transesophageal migration of inhaled or swallowed FBs. We reported a case of a 4-year-old girl presenting with persistent chest pain for 1 month. The child described the pain as 'stitching' in nature localized on the left side of the sternum. The child presented with increased pain intensity and a new onset of fever and cough. No history of chocking or swallowing of FB and no signs of trauma or child abuse were noted. Chest radiography revealed a needle in the left side of the chest. Computed tomography scan and echocardiography were used to precisely localize the needle and exclude intracardiac extension. ECG showed elevated ST segment and cardiac enzymes were normal. Removal of the needle was carried out surgically under fluoroscopic guidance. A small portion of the needle was found intrapericardially complicated by localized purulent pericarditis. The child had uneventful recovery and was discharged from the hospital on postoperative day 3.** ***Ann Pediatr Surg*** **13:157–159 © 2017 Annals of Pediatric Surgery.**

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## Introduction

Pericardial foreign bodies (FBs) are rarely described in children. Despite the direct traumatic or iatrogenic implantation being the most common routes of entry [1], pericardial FB can occur due to migration of tracheobronchial [2,3] or esophageal FB [4]. The condition has no specific symptoms and signs, and without definite history of trauma or FB aspiration, it can simulate any chest disease. Its management is controversial and requires thorough imaging evaluation because of the possibility of FB migration. We reported a case of a pericardial sewing needle in a 4-year-old girl discovered accidently during investigating the child for chest pain.

## Case report

A 4-year-old girl presented to our institution with a history of persistent chest pain for 1 month. The patient presented because of an increased intensity of the pain and recently developed fever and cough. Before the onset of the pain, the child was healthy and had normal development. The child described the pain as stitching in nature and she pointed to the left side of the sternum as the site of maximum pain intensity. Her temperature was 38.2°C and heart rate was 115 bpm. The trachea was central and air entry was equal bilaterally with no adventitious lung sounds. Blood tests revealed leukocytosis and elevated erythrocyte sedimentation rate and C-reactive protein. Cardiac enzymes were normal. Chest radiography showed a needle in the left side of the chest (Fig. 1a). A rigid bronchoscope was deferred because of the unusual location of the needle that required more investigation to localize it. Chest computed tomography scan showed the position of the needle in the pericardial sac (Fig. 1b). Echocardiography confirmed the intrapericardial position of the needle and excluded the intracardiac extension. ECG demonstrated elevation of the ST segment and no arrhythmia. Retrieval of the needle was carried out in the operation room through mini-anterior thoracotomy under fluoroscopic imaging guidance. The needle was partially in the pericardium and most of it was in the lung with associated pneumonitis (Fig. 1c and d). The pericardium was opened before extracting the needle to exclude and handle any associated myocardial injury. The needle was found surrounded by a pocket of pus at its pericardial end with no myocardial injury. The pus was cultured and the pericardium was irrigated and drained. The patient had uneventful postoperative course and was discharged on the postoperative day 3.

A written informed consent was obtained from the parent of the patient for publication of this case report and the accompanying images.

## Discussion

Pericardial FBs are a rare cause of chest pain in children [5]. Most commonly, the FB enters the pericardium by direct chest trauma. Our patient did not have a history of trauma. Physical examination revealed completely normal chest wall, and also no signs of child abuse were observed elsewhere. With operative inspection during the FB extraction, the main part of the needle was found to be within the lung parenchyma and the sharp pointed end of the needle was inside the pericardium, surrounded by pus. These findings suggested migration of the needle within the chest with the possibility of migration to the pericardium from the lung parenchyma.

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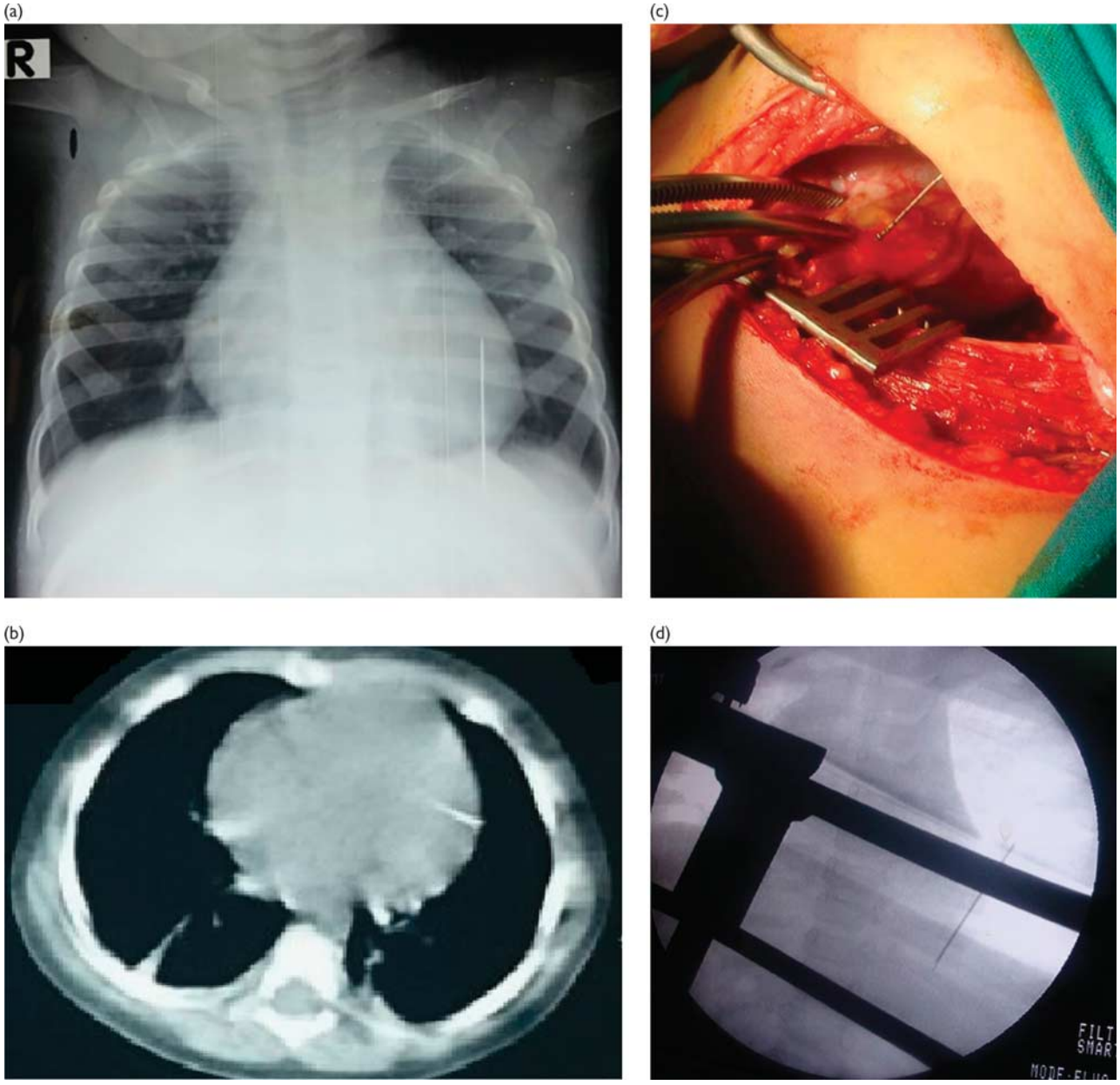
**Fig. 1**




(a) Preoperative chest radiography posteroanterior view showing a 6 cm needle in the left side of the chest. (b) Computed tomography scan of the chest demonstrating foreign body on the left side in the pericardial sac. (c) Operative view showing the needle partially in the pericardium surrounded by a pocket of pus at its pericardial end. (d) Intraoperative fluoroscopic image demonstrating the location of the foreign body.

Other possible routes of entry reported in the literature were transbronchial or transesophageal migration. In our experience with tracheobronchial FB in children, sharp FB migration occurred in six patients out of 177 children with tracheobronchial FB in 1 year (3.4%). All migration occurred into the peripheral lung parenchyma and were on the left side. Reported cases of tracheobronchial FB migration to the pericardium occurred in the left-sided sewing needles [2,3]. Tendency of the left tracheobronchial FB to penetrate into the lung parenchyma could be explained partially by the obtuse angel between the left bronchus and the trachea. Esophageal migration is another possibility but was not supported by the location of the FB and the penetration into lung parenchyma.

Management of pericardial FBs is controversial [1,6]. The purulent pericarditis complicating this patient indicates surgical removal of any pericardial FB in children. The possibility of further migration is another anticipated complication that warrants early surgical intervention.

Several techniques for removing the pericardial FBs have been described including the thoracoscopic approach [7]. In cases with potentially migrating radiopaque FB, we prefer to localize the FB by intraoperative fluoroscopic imaging or intraoperative echocardiography if the FB has intracardiac extension.

This case of pericardial sewing needle accidentally discovered during investigation for chest pain raises the

possibility of migration of neglected sharp FB inside the body. Despite the direct traumatic implantation being a possibility, lack of history of trauma and presence of the main length of the needle outside the pericardium suggested another route of entry.

We recommend surgical removal of all pericardial FB to avoid potential complications including further FB migration and purulent pericarditis, which have been reported in this case.

## Conclusion

Pericardial FB is a very rare cause of chest pain in children. Surgical removal should be carried out early in all patients to avoid infectious complications and migration. Comprehensive preoperative imaging is necessary to precisely localize the FB.

### Conflicts of interest

There are no conflicts of interest.

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