

Intrathoracic Migration of a Broken Safety Pin Which Penetrated the Posterior Thoracic Wall

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Abstract

We report a 2-year old girl who had fallen down on an open safety pin. The safety pin was broken during attempted removal and a 1.5 cm length of pin remained. The fragment migrated into the lower lobe of the left lung. The pin was removed through a mini-thoracotomy, though the patient was asymptomatic.

Potential complications and hazards of metallic foreign bodies which remain in the thoracic cavity are discussed.

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Key words: intrathoracic foreign body, orthopedic fixation devices, migration of metallic foreign bodies

Introduction

A foreign body detected in a chest radiograph needs to be evaluated thoroughly. The clinical history often gives clues about the etiology of the foreign body. In children, the most common route of ingestion of foreign bodies is through being stuck either in the esophagus or in the trachea (1). Penetrating thoracic wounds may also result in metallic foreign bodies in the thorax (2). Migration of metallic objects into the thoracic cavity is rare. Pins and wires commonly used in surgical treatment of fractures and of dislocations around the shoulder joint or clavicle may undergo intrathoracic migration (3,4,5). We describe a patient who had a fragment of safety pin that penetrated the thoracic wall, migrated into the thoracic cavity, got embedded in the lung parenchyma and caused minimal pleural effusion. This is an uncommon route of entry for an intrathoracic foreign body.

Case Report

A 2-year old girl had fallen down on an open safety pin fifteen days before admission to the hospital. The pin penetrated the area just beneath the left scapula. Attempted removal left a broken bit behind. The removal of the fragment was not possible for that time. On admission to Baskent University Pediatric Surgery Department, patient had no complaints and the entry wound was completely healed. Routine laboratory examinations, including CBC and blood chemistry were within normal limits. Physical

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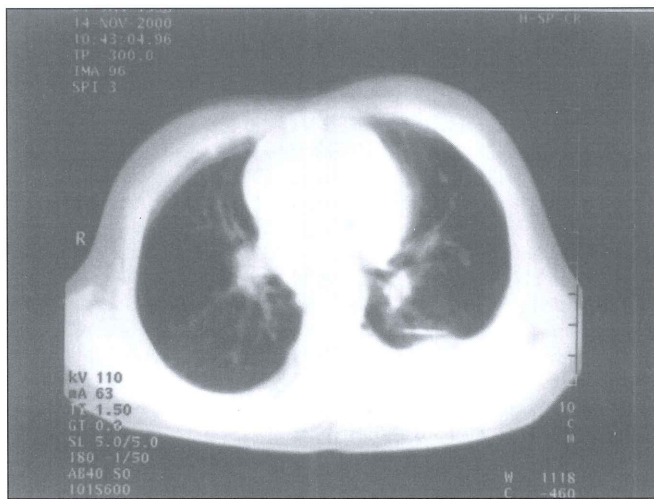


Figure 1. Posteroanterior chest radiograms showing migrated pin in the left hemithorax.

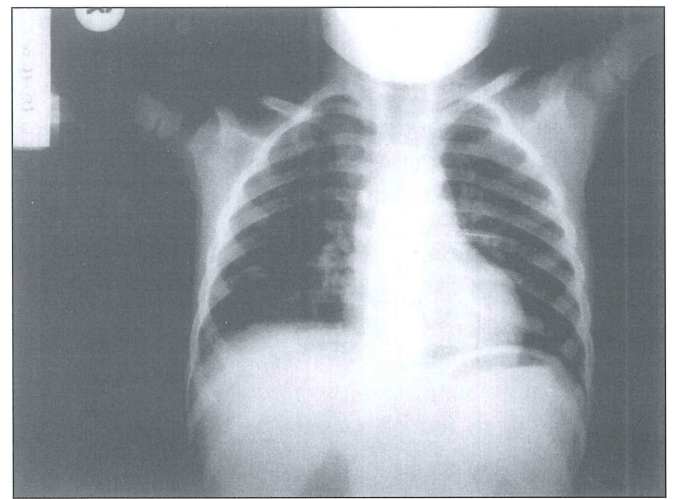


Figure 2. Computed tomography of the thorax showing the migrated pin which had penetrated the lung parenchyma and the resultant left pleural effusion.

examination revealed normal pulmonary sounds. Anteroposterior chest radiographs revealed a straight pin in the left hemithorax (Fig. 1). Computed tomography of the chest demonstrated the exact localization of the pin, which had migrated into the lower lobe of the left lung and caused a small pleural effusion (Fig. 2). The pin, with no intraoperative or postoperative complications, was successfully extracted through a small, left posterolateral thoracotomy incision. There was no air leak or bleeding from the chest tube, which was therefore removed on the 2nd postoperative day. The patient was discharged on the 4th postoperative day.

Discussion

Migration of metallic devices used in joint fixation is a well-described phenomenon (5,6). Recently, intrathoracic migration of all types of orthopedic fixation pins has also been reported. Although the shoulder joint is the most common site from which migration occurs, pins may migrate from other locations as well (3). Various explanations have been suggested for this migration including muscular activity, respiratory exertion, capillary action, gravitational forces, negative intrathoracic pressure and the great freedom of movement of the shoulder joint (3,5).

The pin type has also been suggested as an important factor (6). Most orthopedic surgeons use threaded pins to eliminate this complication, though this might not entirely preclude such events (6). It has been reported that the time it takes for a fixation pin to migrate may vary from 1 day to 21 years (5). Migration may be asymptomatic and discovered on follow-up roentgenographs. Complications of migrated intrathoracic pins range from

minor irritation to death from perforation of vital structures.

Various catastrophic complications of migrated pins have been reported. Damage to almost all cervical and thoracic organs, pericardial tamponade, arrhythmias, pericarditis, false aneurysm, aorta-innominate and aorta-pulmonary fistulas, pneumothorax, hemoptysis, and subclavian steal syndrome have all been reported (3). In two asymptomatic patients pins were reported penetrating the aortic wall and the main pulmonary artery with no bleeding (5,7). All deaths mentioned in the literature were caused by catastrophic cardiovascular events (5). In patients with penetrating chest trauma, foreign bodies can be detected on chest radiographs (8).

In this patient, a broken safety pin was embedded into the lower lobe of the left lung. The elapse of time from penetration of the pin to the posterior chest wall and its detection in the left hemithorax was 15 days. Muscular activity, respiratory exertion and negative intrathoracic pressure were considered as factors leading to migration of the pin into the thoracic cavity. Although the patient was asymptomatic, computed tomography revealed minimal pleural effusion in the affected site. Pleural effusion which develops in a short time indicates either infection or tissue reaction to a foreign body.

The child underwent a left thoracotomy through a small incision for the retrieval of the foreign body with no perioperative or postoperative complications. The pin was removed for the above mentioned potential hazards and possible complications that could develop in time, and to avoid an emergency operation due to these complications.

Recently, there have been reports on the use of thoracoscopy for removal of foreign bodies (6,8). Unfortunately we were not able to perform a thoracoscopy for the lack of necessary equipment. Thoracoscopy is less invasive and could have been our initial choice in the extraction of the pin in this case. However, patients subjected to thoracostomy should also be prepared for a possible thoracotomy in case the foreign body cannot be removed thoracoscopically.

Surgical removal of migrated pins is considered mandatory in both symptomatic and asymptomatic cases. Metallic foreign bodies should be removed as a matter of urgency for complications though rare, can be sudden and fatal (3,5).

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