Negative results - Thoracic general  
Transmediastinal migration of Kirschner wire

Evaldo Marchi,*, Marcio P. Reis, Marcus V. Carvalho

*Thoracic Surgery, Jundiaí Medical College, Jundiaí, Sao Paulo, and InCor Pulmonary Division, University of Sao Paulo Medical School, Rua Lucio Bressan Passarin, 590, Ap 42, Vila Rica, Jundiaí 13.216-351 Sao Paulo, Brazil

Abstract

The authors describe a case of transmediastinal migration, and lodging into the right lung, of a Kirschner wire used to fix a fracture of the left clavicle. The medical literature reports cases of intrathoracic migration of Kirschner wire; however, a transmediastinal migration has not been previously described. A small right thoracotomy was performed and the wire was removed without complications. We discuss aspects of this uncommon finding and alert physicians for the potential risks of the migration of metallic pins used to fixate boney structures within the chest.

Keywords:
Bone wires; Chest pain; Foreign-body migration

1. Introduction

Clavicle fractures and sternum-clavicle displacements are frequent after traumatic lesions of the thorax. In selected cases, the orthopedic surgeons need to use metallic wires for fixation and stabilization of these fractures. Reports of migration of these wires are uncommon. However, by virtue of the potential risks of lesions in vital structures inside the chest due to migration of the metallic wires, it is imperative to consider the removal of these foreign bodies once the fracture is considered stable, even if the patients do not present with any symptoms.

2. Case report

A 26-year-old white male patient sought medical attention complaining of a chronic pain in the right chest related to mild efforts and trunk movement. The patient was involved in a motorcycle accident 13 years before that required surgery to fix his left clavicle with a metallic wire. He was followed for one year after the surgery and dismissed without complications. Previous chest radiograms of that period were not available.

The initial clinic evaluation showed a normal physical exam, except for the finding of a 10 cm scar on the left clavicle region related to the previous surgical intervention. Chest radiograms at this time showed the presence of a metallic image approximately 8 cm long, located in the right chest (Fig. 1). Furthermore, the absence of the metallic wire, previously used to fixate the left clavicle, was noticed.

The investigation was complemented by a chest computed tomography that confirmed the presence of a metallic wire inside the lung parenchyma, with no contact to the mediastinum or to the right pleural space (Fig. 1).

The patient was initially subjected to a right thoracoscopy that showed scattered pleural adhesions and no visual identification of the metallic pin, followed by a small thoracotomy. The foreign body was then identified and removed without difficulties by a small pneumotomy and manual traction.

A fibrin layer involving the metallic wire was noticed and microscopically confirmed as a typical foreign body fibrin reaction.

The postoperative outcome was favorable, and the patient was discharged 48 h after the intervention with a normal chest radiogram.

3. Discussion

Cases of Kirschner wire migration inside the thorax have been described since 1943 [1]. A recent review of the literature has shown intra-thoracic migration in 68 patients, but the actual number is certainly larger [2].

The time elapsed between the introduction of the wire in the clavicle and the migration to the thorax varied from one day to 21 years [3]. The mechanism of the displacement is still obscure, but, in theory, factors as the great freedom of shoulder movements, the breathing movements, the intra-thoracic negative pressure, the gravitational force and the regional bony re-absorption are probably involved [3–5]. The bibliography describes dramatic cases in which, during the migration, the metallic wire penetrated the heart and great vessels causing fatal
This report alerts that orthopedic surgeons should take care when fixing clavicle fractures with metallic wires as, for example, bending the extremities of the wires to involve the periosteum, as well as submitting patients to periodic radiograms in order to follow the position of the metallic wires. In addition, if any sign of migration is detected, the surgical procedure should be promptly indicated, because there are reports on displacements of considerable distances in only a few hours after the diagnosis [5]. In general, it has been demonstrated that, in the vast majority of patients, the diagnosis of the migration can be made in the first month after surgery [3].

The operative approaches to retrieve the wires include small thoracotomy, median sternotomy and video assisted thoracoscopy. Median sternotomy should be reserved for situations in which the foreign body is located in the mediastinum or in contact with the heart or great vessels. The thoracoscopic approach can be used in cases in which the pleural cavity offers an easy access and so the wire can be easily identified and removed. When the surgeon cannot assure the safety of the procedure, the thoracotomy approach is preferable.

Acknowledgments

We thank Dr Richard W. Light for his review of this manuscript.

References