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Case report

Kirschner wire migration from subcapital humeral fracture site, causing hydropneumothorax

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ABSTRACT

Migration of wires or pins around the shoulder is a known complication, though their migration within the chest is uncommon. We report an unusual case of hydropneumothorax due to migration of a bent Kirschner wire from the right proximal humerus in a 63 year-old man. We reviewed his clinical history, physical examination, imaging findings, surgical method and outcome. We also reviewed the literature on orthopaedic wire migration and latest technique in removal of the wires. Chest radiographs and chest computerized tomography are useful in detection and diagnosis of this disorder. Regular radiographic follow-up is needed for patients with internal fixation devices; any fractured or migrated pins or wires must be removed immediately to prevent dangerous complications. It is always important to remove the wires at the end of the treatment. Early removal of fixation wires and regular follow-up if wires are retained are essential to prevent serious complications.

Introduction

Pins and wires are widely used in orthopedic practice for fixation of fractures and dislocations around the shoulder girdle. Migration of pins after operations on the shoulder and the resultant complications are well known. Such migration usually follows a retrograde path and the wires protrude near their entry point into the native bone. Occasionally, the migration occurs in an antegrade manner and produces injury.[1] The chest cavity, with its vital organs, is the site where the life-threatening risk of pin migration is highest.[2] To the best of our knowledge, pin migration from proximal humerus presenting as hydropneumothorax has heretofore not been reported in the biomedical literature. Furthermore, there is a notable steady increase in the number of reports about the risk of migration of pins into vital cavities. This necessitates formulation of strict guidelines regarding the use of wires and pins around the shoulder girdle.

Case report

A 63 years old man presented in the emergency department of our hospital with acute onset of right sided chest pain and shortness of breath. History suggested that, three years ago, he had a fracture of the neck of right humerus which was treated from a peripheral hospital by closed reduction and percutaneous fixation with three Kirschner wires (K-wires, Fig. 1). Forty-two days after the operation, two of the K-wires were removed. One K-wire was left in situ probably due to technical difficulty in removing it (Fig. 2). After the surgery, patient did not attend scheduled outpatient appointments.

Chest movement was diminished on the right side with hyper resonance on percussion. Air entry was diminished and chest radiography showed a small volume pneumothorax on the right side with a K-wire on the right apical lobe (Fig. 3A, B).

Computerised tomography (CT) of the chest showed migrated K-wire from proximal humerus, lying obliquely in the posterior segment of right apical lobe (Fig. 4). The cranial end of the wire was touching the inner cortex of lateral aspect of the right second rib in the mid-axillary line and its caudal end near the upper part of right middle lobe. CT demonstrated hydropneumothorax on the right side.

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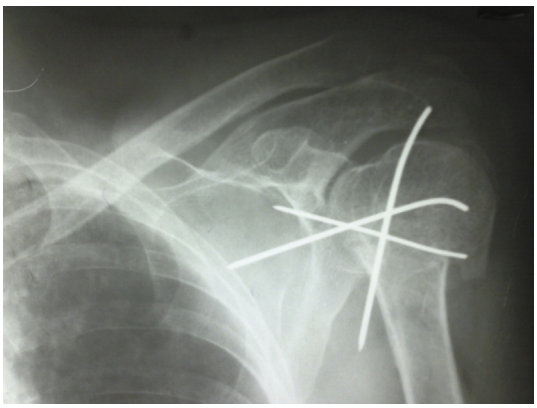

Fig. 1. Fracture of the neck of right humerus with three K-wires penetrating the head of humerus.

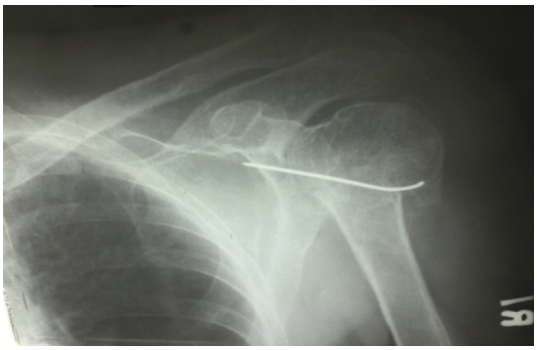

Fig. 2. Radiograph showing united proximal humeral fracture with retained K-wire.

An exploratory video–assisted thoracoscopy was performed via the second intercostal space and the K-wire from the right apical lobe was removed using a ring forceps (Fig. 5A, B). The patient has remained completely asymptomatic at 24 weeks follow-up and chest radiogram was normal (Fig. 5B).

Fig. 4. Computed tomography of the chest showing migrated K-wire extending from the inner cortex of right second rib to the upper part of right middle lobe with a hydropneumothorax.

Discussion

Displaced fractures of the surgical neck of the humerus are usually treated by closed reduction unless the fracture is severely comminuted. If the reduction is unstable, percutaneous pinning needs to be performed.[3]

Percutaneous multiple K-wire fixation is an accepted method for fixation of displaced proximal humerus fractures.[4] Mazet et al[5] first reported the migration of K-wires and other fixation devices from shoulder region into thorax in 1943. Since then, sporadic case reports have recorded remarkable journey of wires from the shoulder region. The location of the migrated pins varied, and it included the heart, aorta, pulmonary artery, brachiocephalic artery, oesophagus, trachea, thoracic duct, lungs, spleen and the spinal canal.[1,6–22] The

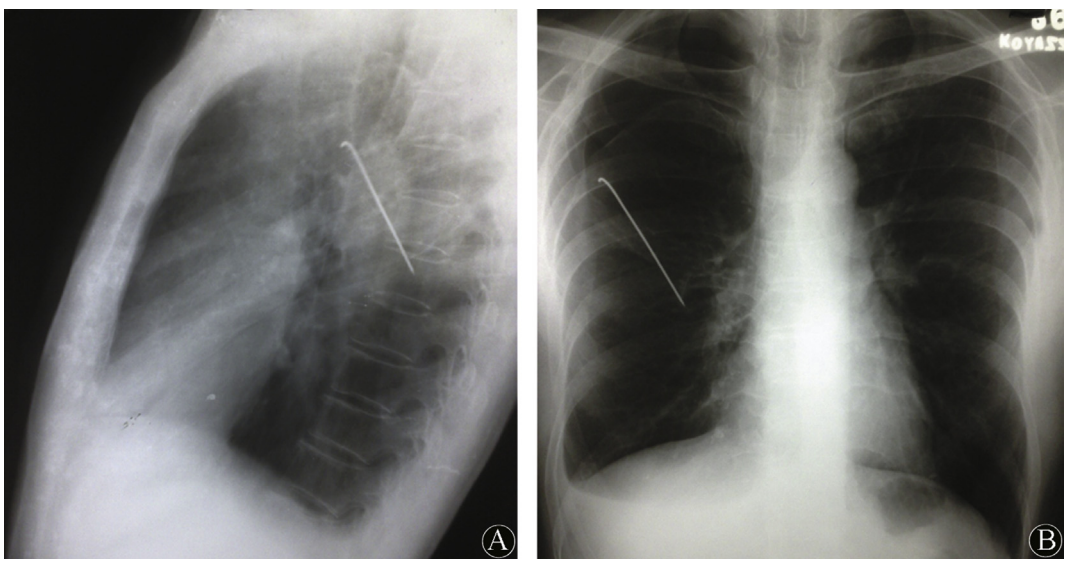

Fig. 3. A and B. Radiograph showing full length of migrated bend K-wire in lateral and anteroposterior views.

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