



Case Report

K-wire migration to unexpected site

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ABSTRACT

Kirschner wire migration is a notorious incident in orthopedic surgery. Efforts to avoid it was carried out by several standard procedures, including bending the wire and reporting the cases all around the world in many journals. Nevertheless, the incident still happens, and some include symptoms that amazed doctors as to how the wire travelled.

We reported a migration of forgotten wire to contra lateral region presented as corpus alienum of the lung in a 34-year-old woman after distal clavicular fracture surgery three years previously. We also reported a migrating wire fragment after a fall accident in sport activity of a 28-year-old male; which travelled from clavicular region to cervical 6–7 region in 4 days. Both cases were successfully managed without extravagant surgery or serious damage, helped by meticulous history taking, physical examination, precise imaging, and prompt management. These cases render lessons and discussion for further understanding of the wire migration and the exact protocol in handling K-wire patient.

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1. Introduction

Kirschner wire, which was introduced in 1909, is a simple orthopedic implant tool to stabilize fracture [1]. It is well accepted, relatively cheap and easy to implant. The first versions of the Kirschner wire were hammered through a predrilled hole into the bone. Since 1943 until recently, there have been reports that the wire could migrate into the thorax cavity, contralateral, and even to abdomen [2–4]. Theories include muscle action, the great freedom of movement of the joint, negative intrathoracic pressures associated with respiration, regional resorption of bone, gravitational force and even capillary action [5–7]. Migration of K-wires have been reported as early as the day after fixation and as late as 21 years [4] (see Figs. 1 and 2).

Albeit all the reports, surgeons and other medical doctors sometimes forget to realise that K-wire could migrate and cause several signs and symptoms mimicking other acute or chronic diseases, and even the patient sometime does not remember the previous K-wire insertion [5,6]. We report two cases of K-wire migration and discuss the applicable theory for several incidents from different case reports from journal reviews. This work has been reported in line with SCARE criteria [8].

2. Case report I: main complaint: chronic coughing and bloody sputum

A female patient with chronic coughing, chest pain during deep inspiration, and bloody sputum was referred to orthopedic department of Dr Soetomo General Hospital, Surabaya when the routine X-ray found a foreign metal object in the right lung region. After checking her medical history, we found out that the patient underwent pinning with Kirschner wire (K-wire) for close fracture of the distal left clavicular bone three years before, in a rural hospital. The patient presumed that the clavicular case has been solved and cannot remember whether she should come for another surgery to remove the implant. The patient lost all the documents and X-ray of the previous surgery.

The patient is a 34-year-old housewife with regular household activity. Since the surgery, the patient has never complained about any serious pain or sickness. The coughing started in the past month without fever, malaise or decreased body weight. Other than pain in the right chest upon deep aspiration, no other pain was felt including in the left shoulder. The laboratory evaluation findings, except the ESR (95mm/hour), were within normal value. X-ray of thorax and further CT scan revealed tension band wiring with two intact K-wire in the distal left clavicular bone and corpus alienum (8 cm metal wire) in the right thorax cavity, attached in the superior lobe of the right lung with reactive reaction surrounding it. A joint surgery with a thorax surgeon to extract the wire in the lung and the clavicle was performed on the third day. Intraoperative

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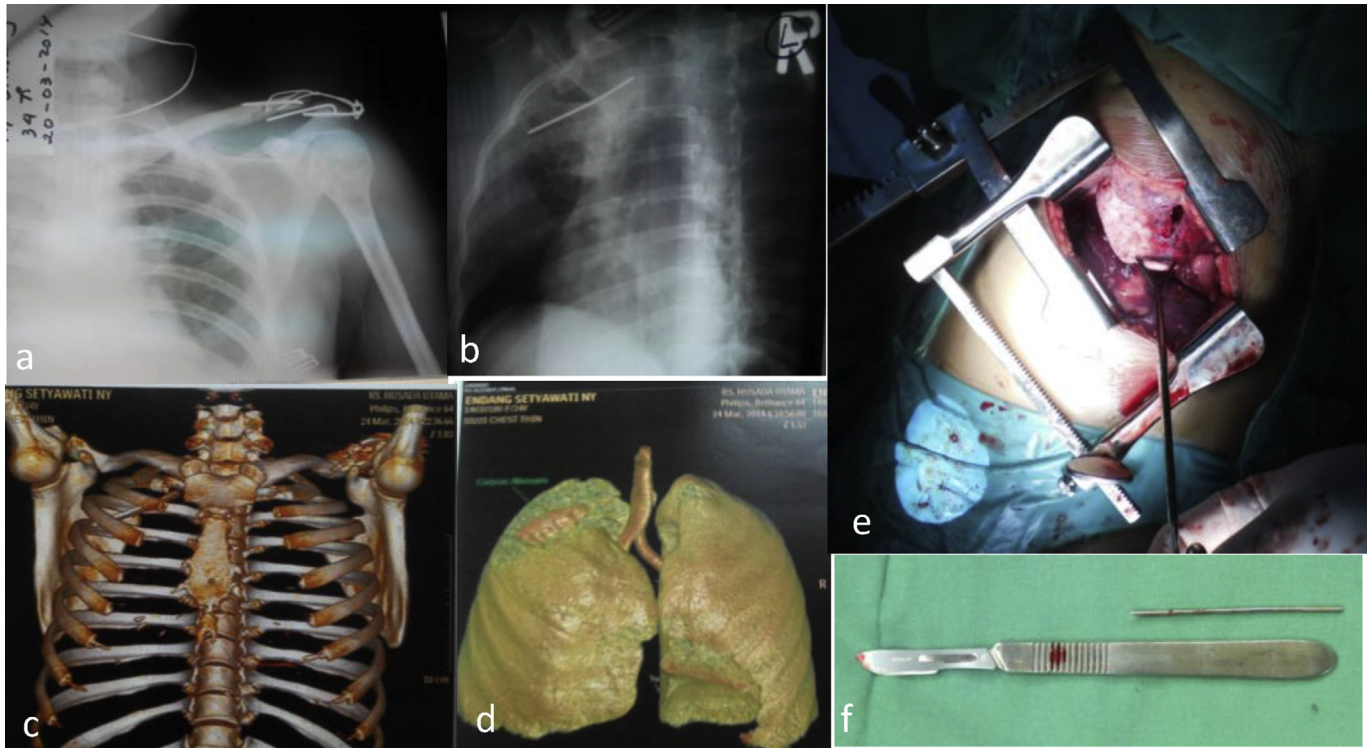


Fig. 1. Trans thoracic migration of K-wire. (a) Tension Band Wire after 1 year (b) X Ray picture one K wire migrate to the right lung (c) CT Scan show location of K wire in right thorax (d) MRI showed K wire in the right lung (e) K-wire in lung parenchym (f). Length of K-wire after removal.

evaluation disclosed that the lung parenchyma does not need to be excised; the wire was easily removed and then debridement was performed to clear the granulation tissue surroundings. Post-operatively patient was well with normal lung function capacity. Patient was discharged on the fifth day.

There were three similar cases where failure of K-wire was reported where it migrated to contralateral site in the thorax cavity [5,6,9]. All cases were from healthy adults and the complaint started after more than 30 months of the insertion; and the migrating wire was found un-bended or bowed/curved. The wire is so sharp that the migration process does not trigger any pain until it stabs a solid plane. After the wire is loosened from the bone, it may be pushed along the muscle bundle by the contraction force; henceforth when stabbing the thoracic wall or mediastinum, it would be sucked up by the negative pressure of respiration, propelled and

then jabbed in the end target, which could be anything inside the cavity. Therefore, it is not unusual for the migration wire to be present in the collateral site of the initial insertion.

3. Case report 2: broken K-wire migrate from right distal clavicle to C6-7 in 4 days

A 28-year-old male came to an orthopedic surgeon after he fell in a badminton session. He fell on his right torso side where a year previously was fractured and treated by surgery. On X-ray evaluation, implant failure of the previous surgery was revealed. Surgery to remove the implant was performed urgently yet only 2 out of 3 K-wire were found and extracted. Patient was told that if nothing happen, then the missing wire would do no harm. Only if some complaints arise, the second surgery would be planned. Patient

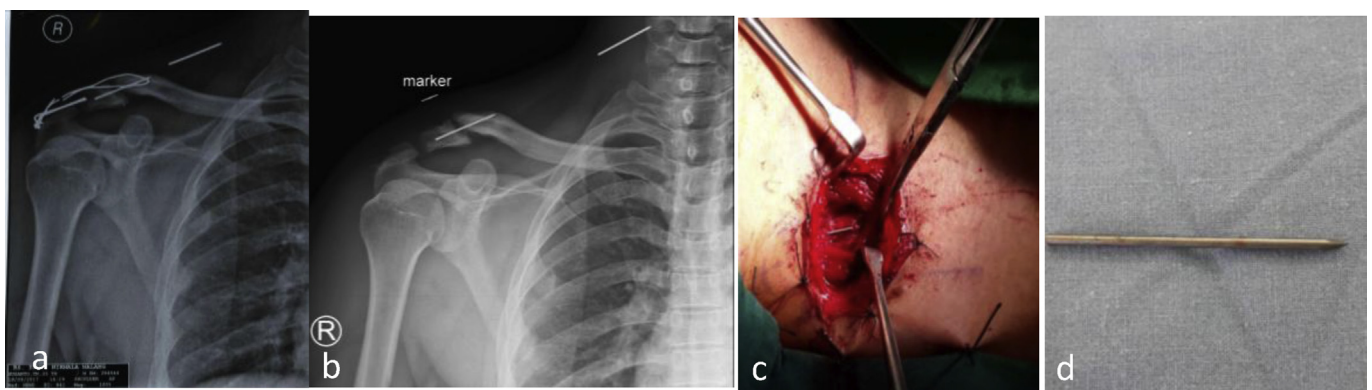


Fig. 2. Cervical migration of K wire. (a) Broken K-wire 1 year after surgery; (b) 4 days after first surgery; (c) K-wire migrate to cervical 6–7; (d) K-wire after removal.

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