

# The Migration of Kirschner Wire from Left Distal Clavicle to the Intradural Anterior Thoracic Spine



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## Abstract

We report a 42 year old man who had undergone osteosynthesis to treat left clavicle fracture with a Kirschner wires (K-wire). After 1 month of surgery, began to feel pain in left clavicle region. He was informed that the symptom was expected by the surgical procedure and just analgesics were prescribed. Three months after surgery the pain in left clavicle and upper thoracic spine region continue and an x-ray shows the K-wire had migrated medially. It was attempted to remove with locally anesthetic, but unsuccessfully.

Thoracic spine CT scan showed the wire in the T2-T3 level of the spinal canal. No sensory or motor disability. There was submitted a surgical procedure with a right lateral trans-thoracic approach with elevation of the scapula to remove the wire around 105mm of length successfully. The 6 months of follow-up were neurologically asymptomatic.

**Keywords:** Kirschner wire migration; Clavicular fracture; Thoracic spine

## Introduction

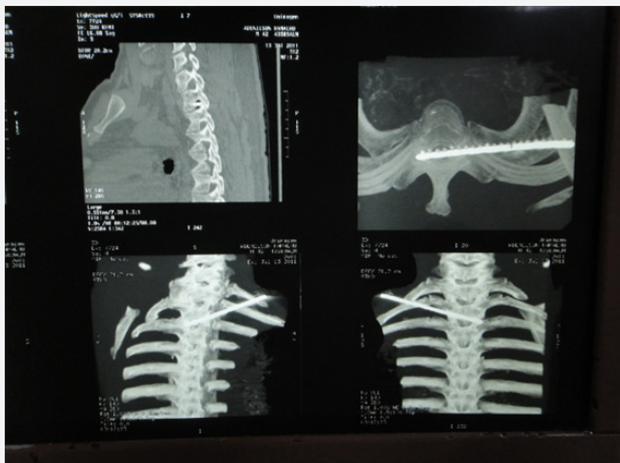
Surgical Procedure to the clavicle fracture is incommon. It just accepted to unstable fracture that can be treated surgically with plates, pins or wires [1]. Kirschner wires (K-wire) are simple tools to manage some fractures. A notable concern is the potential for these devices to migrate to distant anatomic sites. Migration of K-wires used for fixation of the clavicle fracture into the thoracic cavity or thoracic and cervical spine is a rare but serious complication, including lethal cardiovascular events [2-16]. Migration of K-wire to the another cavity (thoracic, mediastinum and spine) is refer with a neurologic symptom. There are a few cases and it has been reported since 1943 [16,17]. It was found just one case report with asymptomatic spinal migration [18]. The symptom are sensitive disability, horner's syndrome, diplopia, headache, subarachnoid hemorrhage, sporadically arachnoiditis [19,20] and Brown-Sequard syndrome [21]. The follow-up of K-wire fixation is recommended and whether observed signal of migration it will be necessary to be remove immediately [22,23].

## Case Report

A 42 year old man has been involved in a motorcycle accident presenting with fractured of his left clavicle, and underwent of k-wire fixation. He came to the emergency department complaining of back pain some days after the procedure. After 1 month of the surgery, began to feel pain in the left clavicle region treated with just an analgesics. Three months after surgery a pain in the left clavicle and upper thoracic spine region continue and an x-ray were obtained showing an osteosynthesis device had migrated medially to the spinal. Simple removing were attempted unsuccessfully. Physical examination shows a surgical scar on the left clavicle region and pain at the palpation of the thoracic spine and with a high mobilization of the trunk. No neurological symptoms were observed.

Thoracic spine CT scan which showed a foreign body in the spinal canal at the T2-T3 level (Figure 1&2). Left lateral trans-thoracic with elevation of the scapula approach with visualization of the heart, spine and lung (Figure 3) were

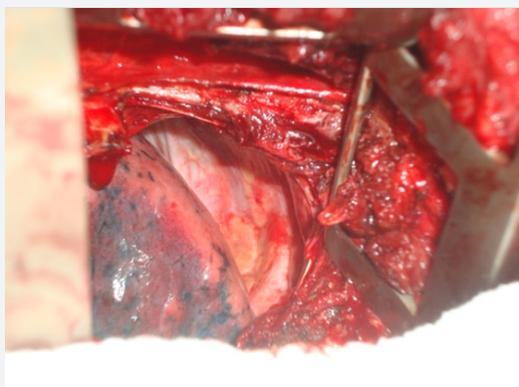
performed to remove the K-wire. Immediate post procedural were in the intensive care unit with a chest drain (Figure 4) with no neurological symptoms. The chest drain were removed in 48 hours. The 6 months follow-up has observed no neurological symptoms.



**Figure 1:** Computed Tomography (CT) of the Thoracic spine shows the wire penetrating in the left T2-T3 vertebral canal.



**Figure 2:** Computed Tomography (CT) of the Thoracic spine shows the wire penetrating into the left intervertebral forame.



**Figure 3:** Intraoperative image showing the intercostal space opened. Visualization of the intrathoracic cavity, lung and the wire.



**Figure 4:** The migrated wire removed of 105 mm.

### Discussion

Migration of the osteosynthetic device with penetration into the spinal canal is rare but it is a well-known complication since the first report in 1943 [17], and the infection is the most common complication. The spinal canal migrating site are more frequently to thoracic, mediastinum, abdome, heart, pelvis, liver [4,24-26] and occur frequently when use the no bending technique. Distant migrations of K-wires have been reported, for example, from the finger to the heart, pelvis to the abdomen, pelvis to the heart, and hip to the liver [25,27-29]. The diagnostic were necessary a good physical examination, complete neurologic examination, and the work-up with x-ray, CT. K-wire migration from the shoulder into the abdomen can compromise the spleen [12] abdominal aortic lumen [30] the neck and spine [14,16].

The most commonly migrating site from the shoulder region are the chest wall with invasion of the thorax, ending up in the pleural space [31], pulmonary parenchyma [8] mediastinum [5], esophagus [3], cavities, pericardial space, subclavian artery, ascending aortic wall or pulmonary artery and this migration can result in serious complications, including lethal cardiovascular events [9,10,32]. Once the correct diagnosis has been made the surgical remove were obligatory. There are no consensus regarding the best surgical technique.

It was decided by left lateral trans-thoracic surgical approach with elevation of the scapula, pulling the rib greatly facilitating the visualization of the entire thoracic cavity and complete access to the K-wire near the T2 vertebra. Several methods to prevent or promptly detect such migration have been devised. Patients undergoing wire osteo synthesis should receive regular plain radiographic follow-up after a complete instruction of the complications possibilities. However, threaded wires cannot completely eliminate the possibility of migration [33] even after years of being firmly in place. It is recommended that patients with K-wires are monitored and that if any sign of moving these wires should be removed mainly before symptoms [22,23].

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