Case Report

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Migration of a Broken Kirschner Wire from Lateral End of Clavicle to the Cervical Spine

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ABSTRACT

Kirschner wire (K-wire) is commonly used in orthopaedics to treat various fractures. Migration of K-wire from the shoulder to different vital organs have been documented in many case reports. The possible explanations for such migration have been mentioned in the various literatures with the recommendations to prevent such complication. We report a case of migration of a broken K-wire to the cervical spine, which was used for the treatment of displaced lateral end fracture of right clavicle

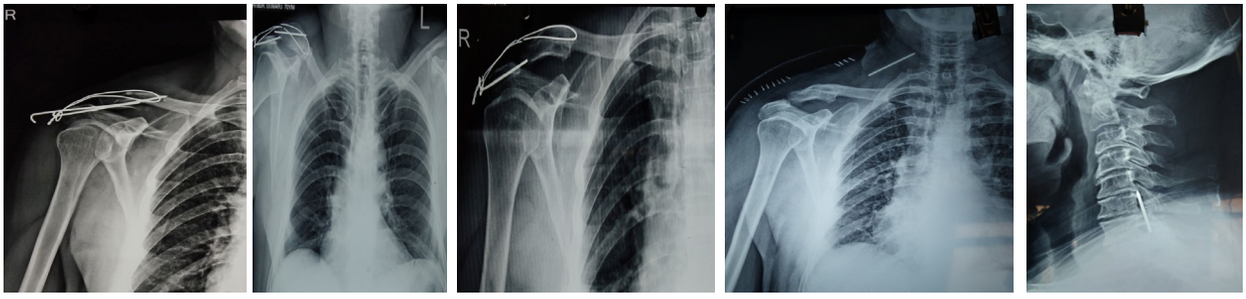
Keywords: Cervical spine; kirschner wire; migration,

INTRODUCTION

Kirschner wire (K-wire) is one of the most commonly used orthopaedic implant, which is a smooth, stainless steel wire with various tips. It has got certain complications like loosening, migration, pin tract infection, osteomyelitis, tendon injury, neurovascular injuries. Migration of K-wire has been reported to different sites of the body from its original site, e.g., migration to spine, lungs, mediastinum, heart, aorta and pelvis.[1-6] These migrations to the various sites can leads to the catastrophic complications. We report a case of migration of a broken K-wire to the cervical spine which was used to fix the displaced lateral end right clavicle fracture in a 60 years' man.

CASE REPORT

A 60 years' man underwent open reduction and internal fixation with tension band wiring [using two K-wires and stainless steel (SS) wire] for a right lateral end displaced clavicle fracture four years back at the another hospital (Figure 1 a). He was on regular follow-ups till the union of the fracture, after which he did not continue to visit the operating surgeon and became busy with his regular job. After three and half years of surgery, he noted one of the two K-wires used for the tension band wiring had protruding out causing the pressure sore at the surgical site, which was removed at the same hospital. Two months ago, he was scheduled for the removal of the remaining part of the tension band wiring at the same hospital when they noticed the breakage of SS wire and K-wire with its migration to the neck (Figure 1 b and c). They removed the remaining part of the tension band wiring and did best to remove the migrated K-wire from the neck, but could not be succeeded. Then, he was referred to our hospital for the removal of the migrated K-wire (Figure 1 d and e). The patient had complaint of the right sided neck pain. He did not have any features of neurovascular deficits.



(a) (b) (c) (d) (e)

Figure 1. (a) Open reduction and tension band wiring was done for right lateral end clavicle fracture; (b) Breakage of K-wire and SS wire; (c) migration of the distal part of K-wire after breakage; (d) and (e) Antero-posterior view and lateral of neck and chest showing migration of the K-wire after breakage.

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(a) (b) (c)

Figure 2. (a) Intra-operative picture of migrated K-wire to the neck; (b) K-wire after removal; (c) X-rays cervical spine – antero-posterior and lateral views after removal of K-wire.

An open surgical method was used to remove the migrated K-wire from the right side of the neck. We made longitudinal incision over the right side of the neck and used intra-operative ultrasound to locate the broken K-wire. Care was taken during the dissection to protect the neurovascular structures around. The migrated K-wire was removed (Figure 2). The post-operative period was uneventful.

DISCUSSION

Tension band wiring is one of the different surgical methods described for the treatment of displaced lateral end clavicle fractures. Other options mentioned are K-wire fixation, hook plate, Knowles pin, coraco-clavicular screw etc.[7] In our patient, tension band wiring was done at the another hospital.

Migration of K-wire was first reported in 1943, from the clavicle to the lungs.[8] Since then, various case reports of K-wires migration from the shoulder to lungs, heart, aorta, trachea, mediastinum, neck, spleen and spinal canal have been documented.[1-6,8] K-wire migration to these vital organs can result in non-fatal to the catastrophic complications and even mortality of the patient. There are different explanations mentioned for the migration of the K-wire from the shoulder in the literatures. Some of the mentioned explanations are negative intrathoracic pressure associated with respiration, wide range of motion of shoulder joint, muscular activities and gravitational force.[1-5] It has also been mentioned that the insertion of K-wire by drilling can generate heat that cause bone necrosis which could be the reason for loosening and migration of wire.[8] In elderly patients with osteoporotic bone, the wire is easily loosened. The target of the migrating wire could be anywhere depending on the angle of the wire position.[9]

To prevent the migration of K-wire, it has been recommended to bend the external end of the wire. But, even bent K-wire can migrate after breakage as we have noticed in our case. So regular follow-up radiographs were recommended until the K-wires are removed.[1,8] Patient must be informed about the potential complications associated with the use of K-wires. It has been recommended that the immediate surgery should be conducted to remove the K-wire even if the patient is asymptomatic.[9]

In our patient, we found the K-wire at the lower cervical vertebral level, behind the carotid vessels and did not migrate into the spinal canal. The patient was lucky enough for not having any serious complication of K-wire migration to the neck. In this case, we have noticed that the patient was lost to regular follow up. So, we would like to emphasize that the patient must be well counselled regarding the importance of regular follow up and timely removal of the tension band wiring (K-wires and SS wire) used for the clavicle fracture.

CONCLUSIONS

K-wires are the commonly used implants in treating different types of fractures. Migration of K-wire to the vital organs can be dangerous to the life. So, K-wires should be used judiciously and the patients must be advised for the regular follow up and timely removal once the fracture becomes consolidated.

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