

Migration of four Kirschner wires from the humerus to the vertebral column passing through the lung

Dört Kirschner telinin akciğerin içinden geçerek humerustan vertebral kolona ilerlemesi

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ABSTRACT

A 63-year-old female patient with Parkinson's disease who was performed stabilization with Kirschner wires due to right proximal humerus sectional fracture four weeks before was referred to our clinic upon detection of migration of four Kirschner wires to right hemithorax. Immediate thoracotomy was performed and four Kirschner wires were carefully removed from the right hemithorax. Patient was discharged on postoperative day six without any problem. Orthopedic surgeons should avoid the use of such materials with ends remaining outside in patients who are unable to receive adequate home care. Patients should be evaluated as a whole together with their social environment and the most appropriate treatment method should be selected not only for the disease but also for the patients.

Keywords: Emergency; Kirschner wire; penetrating injury; surgery.

Orthopedic pins and wires are often used for the stabilization of bone fractures and dislocations. The intrathoracic translocation of these devices from the shoulder may have very serious consequences like perforation of the pulmonary vasculature, aorta, bronchus, atrium, or ventricle.^[1] Therefore, definitive diagnosis and treatment need to be established urgently to avoid such complications. In this article, we describe a patient with four Kirschner wires (K-wires), which were previously placed into the shoulder, migrating into the thoracic cavity.

CASE REPORT

A 63-year-old female patient with a medical history of Parkinson's disease and shoulder surgery was

ÖZ

Parkinson hastalığı olan ve dört ay önce sağ proksimal humerus parçalı kırığı nedeni ile Kirschner telleri ile stabilizasyon yapılan 63 yaşındaki kadın hasta dört Kirschner telinin sağ hemitoraksa ilerlediğinin tespit edilmesi üzerine kliniğimize sevk edildi. Acil torakotomi yapıldı ve sağ hemitorakstan dört Kirschner teli dikkatlice çıkarıldı. Hasta ameliyat sonrası altıncı günde sorunsuz olarak taburcu edildi. Ortopedik cerrahlar evde yeterli bakımı yapılamayan hastalarda ucu dışarıda kalan bu tür malzemelerin kullanılmasından kaçınmalıdır. Hastalar sosyal çevreleri ile birlikte bir bütün olarak değerlendirilerek sadece hastalık için değil hasta için de en uygun tedavi yöntemi seçilmelidir.

Anahtar sözcükler: Acil; Kirschner teli; penetran yaralanma; cerrahi.

referred for intrathoracic migration of four fixation pins. Patient was operated one month before for right proximal humerus sectional fractures (Figure 1). On postoperative fourth week, she was examined in the orthopedic clinic for removal of the wires and four K-wires were noted to be located in the right hemithorax. Patient's blood pressure was 110/75 mmHg, heart rate was 80 beats per minute, respiratory rate was 25 breaths per minute, and signs of Parkinson's disease were detected on physical examination. Laboratory tests showed a hemoglobin value of 9.8 g/dL, white blood cell count of 6,500/ μ L, and no other notable evidence. Although there was no sign of infection, she had tachypnea due to severe right chest pain. Chest computed tomography (CT)



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Figure 1. Right shoulder X-ray demonstrating Kirschner wires after stabilization of right proximal humerus sectional fractures.

scan confirmed migration of the K-wires through the right upper and lower lobes and distal ends to be located next to the vertebral column (Figure 2). A mild left-sided hemothorax and atelectasis were found. Although patient's vital signs were stable, immediate thoracotomy was performed due to the central position of the wires.

Hematoma was drained, which produced 500 mL of liquid. Adhesiotomy revealed the K-wires between the chest wall and vertebral column, passing through the upper and lower lobes (Figure 3). The four K-wires were removed meticulously not to damage lung and vascular structures. No air leak or bleeding was detected. Decortication was applied to the lower lobe to provide lung expansion. During the same operation, the last remaining K-wire was removed from the humerus. She was extubated in the operating room without difficulty. No complications were observed in the postoperative period. She was discharged on postoperative day six with a normal chest X-ray.

DISCUSSION

Although migration of orthopedic pins from the shoulder area into the chest cavity is rare, it can cause life-threatening consequences due to damage to the trachea, aorta, pulmonary arteries, heart, spleen, and the esophagus. Lyons and Rockwood^[1] reviewed 47 reports documenting the migration of devices used in the fixation of bones or joints around the shoulder area into the chest cavity. Eight cases had fatal outcomes, and all of the deaths were associated with major cardiovascular bleedings and pericardial tamponade. In nine patients, the pin was not removed after migration was recognized, and six of these patients

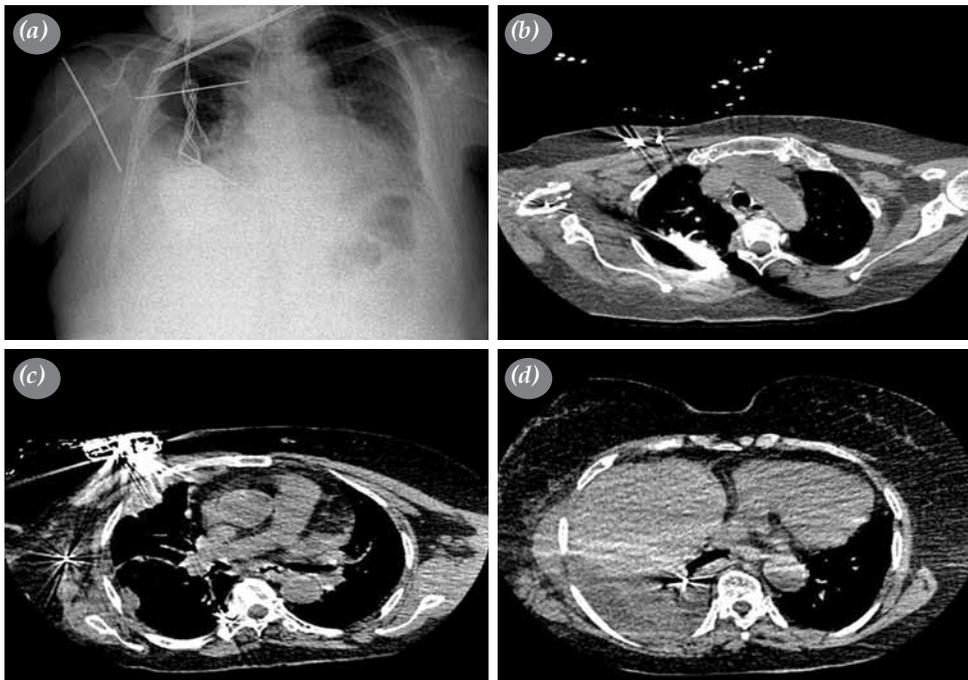


Figure 2. (a) Chest X-ray demonstrating four Kirschner wires and neurostimulator used for Parkinson's disease. (b-d) Computed tomographic scan shows Kirschner wires in lung parenchyma and distal ends close to vertebral column.

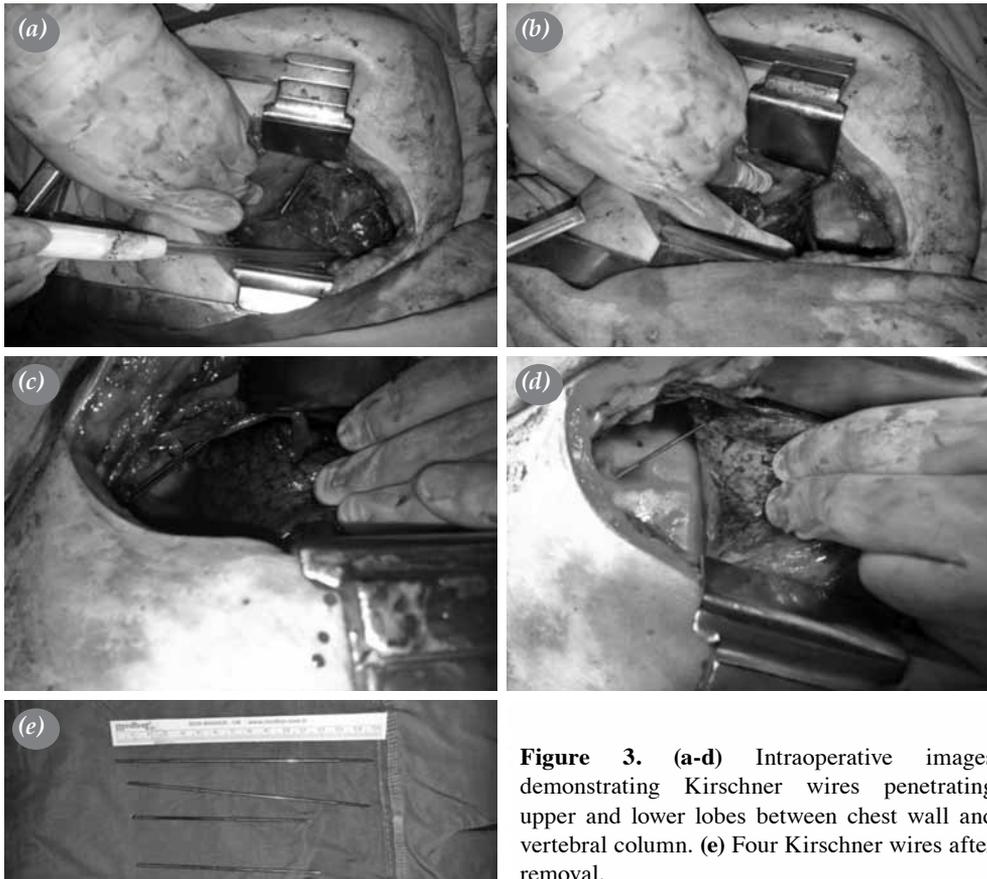


Figure 3. (a-d) Intraoperative images demonstrating Kirschner wires penetrating upper and lower lobes between chest wall and vertebral column. (e) Four Kirschner wires after removal.

died suddenly. Therefore, immediate removal of the pin has been recommended if follow-up roentgenograms show pin migration.^[1] In the present case, although the stability of vital signs and the presence of pleural thickness gave rise to suspicion of a chronic situation, we performed emergency surgery to prevent sudden death due to bleeding.

Thoracotomy, median sternotomy, and video-assisted thoracic surgery (VATS) have been used by different authors to remove intrathoracic migrated wires.^[2,3] In this case, we first intended to remove the wires by VATS. However, the presence of pleural thickening and absence of pneumothorax in CT scan suggested that there might be more adhesions. In addition, four of the wires were passing across the lung from the lateral chest wall to the thoracic vertebrae. If a major bleeding occurred while removing the pins, applying urgent thoracotomy may have been more hazardous for a patient of this age. Therefore, we thought that thoracotomy was more suitable for the patient.

Kirschner wires usually migrate to the opposite side of the input direction. However, in some cases,

they may move towards the entrance direction and cause dangerous results. Although the exact reason is unknown, it is believed that muscle movements, capillary activity, and gravity might be responsible for the migration of K-wires.^[3] In our case, migration of K-wires occurred due to several falls of the patient on her right side.

Most orthopedic surgeons use screwed pins to decrease the rate of dislocation. However, all kinds of wires (smooth, screwed, or bent) have been reported to migrate. In our patient, the pins migrated into the lung parenchyma although they were threaded.

As reported in the literature,^[4,5] if use of such devices is necessary, some preventive measures should be taken such as bending the subcutaneous end of each K-wire sufficiently, using a restraining device in conjunction with it, following-up the patients closely until the wires are removed, pulling out the wires at the end of treatment, and removing the migrated wires immediately to prevent fatal complications.

In addition, our patient had Parkinson's disease and was living with her elderly husband. We discovered

that she had fallen many times in the house because no one was present to look after her.

In conclusion, we suggest that orthopedic surgeons should avoid the use of such wires in patients who are more likely to fall and can not receive adequate home care. Patients should be evaluated as a whole together with their social environment and the most appropriate treatment method should be selected not only for the disease but also for the patients.

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