Migrated Kirschner Wires In The Mediastinum: A Case Report And Review Of The Literature

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Citation

Abstract
The use of Kirschner wires for the fixation of fracture dislocations is a common and standard practise. We report here a case of migration of two kirschner wires used for fixation of the sternoclavicular joint. The broken distal ends had migrated into the superior mediastinum and the pericardial cavity. The wires were retrieved via an anterolateral thoracotomy. Migrated kirschner wires into the mediastinum have been reported sporadically in the literature. Early diagnosis and removal of such foreign bodies are important in order to avert potentially fatal major structure involvement.

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CASE REPORT
A twenty-year-old male presented with a history of a fall from a bike 3 months ago. He suffered a left sternoclavicular joint dislocation for which a kirschner wire (k wire) fixation was done at his local hospital. He presented again 1 month later with recurrent pain in the same area extending into the chest. He had no dyspnea, dysphagia, cough or hemoptysis. On a check chest xray it was found that the k wires (2 in number) had broken, with the distal pieces of the two wires lying in the mediastinum, which was confirmed with the lateral view chest x-ray (fig.1).

He was referred to our hospital for further treatment. A CT chest showed the broken k wires lying in the superior mediastinum and middle mediastinum abutting the ascending aorta and main pulmonary artery. (fig.2)
He underwent a left anterior thoracotomy where the 2 distal pieces of the k wire were retrieved. One piece was lying free in the superior mediastinum. However the second piece had pierced into the pericardium which had to be opened and the piece was found lying free in the pericardial cavity and was retrieved (fig.3).

It had remarkably not pierced into any of the adjacent vital structures. He had an uneventful postoperative recovery and was discharged 4 days after surgery.

**DISCUSSION**

Traumatic dislocation of the sternoclavicular joint usually results from indirect force on the anterior shoulder with the arm abducted. The most common type is the anterior dislocation in which the medial end of the clavicle is displaced anteriorly. Posterior dislocations though less common are much more serious because the trachea, oesophagus, thoracic duct, or large vessels in the mediastinum may be damaged by the posteriorly displaced medial end of the clavicle. Occasionally pressure on these structures makes the dislocation a true emergency. Treatment of sternoclavicular dislocations is usually done by closed reduction. Open reduction may be required in case of failure of closed reduction, especially for posterior dislocation because of the danger of leaving the joint dislocated. If open reduction is necessary, an attempt should be made to obtain stable fixation without the use of transarticular pins. The risk of complications due to the proximity of vital structures imply that surgical treatment should be reserved only for irreducible posterior sternoclavicular dislocation and for significantly symptomatic, old, unreduced, recurrent anterior sternoclavicular dislocations.

Various orthopaedic fixation devices like k wires and steinmann pins have been used for fixation of fractures and osteotomies. Migration of these implants is known to occur and usually follow a retrograde path and the wires protrude near the entry point. Occasionally the whole wire will migrate, or the wire will break and parts of it may migrate. Extravascular migration may occur along tissue planes assisted by muscle motion. Penetration of a vessel may occur and has been reported, with migration of the implant to the heart, other solid organs or body cavities.

A review of the literature, searching for the occurrence of migration of k wires to the mediastinum turned up a number of case reports, indicating the possibility albeit rare of such an occurrence. There were reports of migration of k-wires form the sternoclavicular joint, clavicle, and acromioclavicular joint, possibly implicating fractures around the thoracic cavity of having a risk of migration of k wires into the mediastinum. The location of the migrated k wire varied, and included the heart, aorta, pulmonary artery, brachiocephalic artery, oesophagus, trachea, thoracic duct and lungs. There have also been various reports in the literature of migration of k wires from the distal radius, phalanges and the femoral head to the heart. The wires either reached the heart by embolisation through a vessel or by direct migration through tissue planes as in our case. There was even one case report
of migration of a k wire from the acromioclavicular joint to the spleen.[10] The time of migration reported varied from 1 month as in our case to more than 10 years following the implantation of the wire. All reports agreed on the necessity for prompt removal on detection of such migration in view of the possible injury to vital structures. The methods involved for retrieval are basically decided by the position of the foreign body in the mediastinum, and the approaches include, thoracotomy, sternotomy, and video assisted thoracoscopy. Thus even though pins and wires are widely used and efficacious methods of fixation of fracture dislocations, awareness of this rare complication should be kept in mind by clinicians. The important things to be kept in mind to avoid this complication include, bending the free end of the wire where possible, removing the wire or pin as soon as possible, and following up the patient for a long period, and awareness of the possibility of such an occurrence. [1]

References
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