Transthoracic migration of a Kirschner wire from the humerus to the abdomen

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Abstract

Migration of Kirschner wires after fracture fixation is a rare complication. Several cases of intrathoracic migration after humeral or clavicle fixation with this technique have been reported though. We describe an even rarer case where a wire migrated from the proximal humerus to the abdomen perforating the left thoracic cavity and hemidiaphragm. The distal end of the wire was located next to the spleen and its proximal end at the fifth intercostal space. This particular case could be managed with a simple direct removal through an incision at the fifth intercostal space. The postoperative course was uneventful.

Keywords: Trauma • Penetrating • Surgery • Emergency

An 83-year-old woman was admitted at our hospital complaining of left upper abdominal quadrant pain with progressive onset lasting for 2 h.

The most remarkable of her past medical history was that she had undergone an open hiatal hernia repair and antireflux surgery 20 years before and a surgical fixation of a proximal humerus fracture with three Kirschner (K) wires one month earlier at another institution. The patient complained of abdominal pain without any other symptoms such as nausea/vomiting or dyspnoea. On physical examination, the vital signs were normal; she had a discrete right hemithorax hypophonesis and left upper quadrant tenderness but no rebound or guarding. Laboratory investigations disclosed a haemoglobin value of 12 g/dL, White blood cell count of 5700/μl and no other remarkable findings. A chest X-ray showed migration of one of the three K wires through the left hemithorax with its tip located in the left upper abdominal quadrant of the abdomen (Fig. 1).

A computed tomography (CT) scan confirmed migration of the K wire through the left pleural space and left hemidiaphragm with its tip (or distal end) located next to the spleen and its bottom (or proximal end) at the fifth intercostal space (Fig. 2). A mild left haemothorax and atelectasis and a minimum amount of perisplenic fluid were found. There was no evidence of active thoracic or intrabdominal bleeding. There was no pneumoperitoneum or other pathological findings.

Taking into account the haemodynamic state of the patient, her physical examination, the laboratory results and the CT-scan findings discarding ongoing bleeding or hollow viscus perforation, we decided to perform an urgent surgical removal of the K wire under general anaesthesia. This was performed through a transverse incision located at the fifth intercostal space at the level of the anterior axillary line. The cutaneal incision placement was decided with the help of introperative radioscopical location of the bottom of the K wire.

A 6-cm transverse incision was performed to the level of the thoracic wall where the wire was felt by palpation under the plane of the external intercostalis muscle. After opening of the latter, the bottom of the wire was seen and removed without any feeling of resistance. No further opening was carried out beyond that layer. The wound was closed in a standard fashion. The patient was haemodynamically stable throughout the procedure. The postoperative course was uneventful, and the patient was discharged 72 h later after close observation discarding any haemorrhagic or septic complications.

COMMENT

Several reports about thoracic migration of K wires from the humerus or clavicle are found in the literature with specific complications such as tracheal, cardiac or aortic perforation [1–5]. Abdominal migration of wires arising from the hip is well known too [6]. As far as we know, there has been only one previous report of a shoulder-to-abdomen migration of a K wire by Retief and Meintjes [7] more than 30 years ago.

We believe that every thoracic and abdominal surgeon should know the existence of this potential complication and obviously all orthopaedic surgeons should put all their efforts in order to avoid it. Bending of the outer end of the wire has been advocated as the primary measure to prevent migration and is actually performed by the vast majority of orthopaedic surgeons but it is evident that it may not work, especially when the wire breaks. It seems that the most reliable way to avoid this
complication is a close clinical and radiological follow-up and removal of the wire at an appropriate time [8].

What every thoracic and abdominal surgeon should know is that once this entity is diagnosed, surgical removal should be performed the sooner the better as the wire causes a progressive ongoing penetrating trauma. There is no need to say that removal should be performed along with specific repair/hemostasis of structures encountered by the wire through its way if necessary.

We would also like to stress the surgical approach in this particular case. After the first evaluation of the patient, we thought of performing a laparoscopic removal of the tip of the K wire as it was located next to the spleen (although the potential adhesions of the previous surgery may have hindered it). After the CT scan showing no evidence of ongoing bleeding or hollow viscus perforation and the patient showing no peritoneal signs, we felt a direct removal from the thoracic wall without entering it or the abdomen and a close surveillance would be less aggressive and thus better. It should be said that the risk of herniation of abdominal contents to the thorax through the diaphragmatic defect is minimal as the width of the wire is less than 2 mm. We believe that open or closed surgical exploration of the abdomen or thorax (depending on the placement of the wire) is the safer and standard way to go but in selected patients like the one we described, and provided the location of the wire makes it feasible, a more conservative surgical approach may be used.

REFERENCES