Intrathoracic migration of an unbent Steinmann pin

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ABSTRACT
Steinmann pins are known to be used as a shoulder stabilisation device in recurrent dislocation. Although rare, their potential to migrate within the thorax has been reported. We present the case of an 87-year-old man who was treated for recurrent left shoulder dislocation with pinning using a Steinmann pin. He presented eight days postoperatively with the pin impaling the aortic adventitia. To our knowledge, this is only the fifth case report of such an event. Awareness of this complication and attempts to prevent its occurrence are critical as the outcome can be fatal.

KEYWORDS
Steinmann pin/wire – Recurrent shoulder dislocation – Intrathoracic migration

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Case History
An 87-year-old man was referred to the orthopaedic department with a dislocated left shoulder (Fig 1). As well as recurrent atraumatic dislocation of the left shoulder, he had multiple co-morbidities including ischaemic heart disease, atrial fibrillation, a previous stroke and dementia. However, he had developed persistent pain in the joint and an operation was therefore deemed suitable. He underwent manipulation under anaesthesia and stabilisation of the glenohumeral joint in January 2013. Although we would typically use a thin Steinmann pin for shoulder fixation, none were available and so a larger (6mm) Steinmann pin was used. Figure 2 shows the intraoperative radiography of the reduced shoulder and Steinmann pin in situ. It was not possible to bend the exposed end of the larger pin. As a result, the pin was left straight.

The patient presented to the emergency department three days later following a fall. Figure 5 shows the radiography at this time. The shoulder joint was dislocated and the Steinmann pin had retracted out of the glenoid. He was discharged from the emergency department and an orthopaedic opinion was not sought at this point.

Five days later, the patient re-presented to the fracture clinic for a follow-up appointment complaining of chest pain and shortness of breath. Figure 4 shows the radiography revealing a left-sided pneumothorax with the pin reaching the mediastinal space. Such an injury would probably have developed into a life threatening tension pneumothorax. Further computed tomography showed the pin to be resting in the aortic adventitia, at the level of the arch between the arch and the pulmonary artery branch (Fig 5).

The patient was tachycardic (heart rate 110bpm) but normotensive with an oxygen saturation of 90% on air. A chest drain was immediately inserted and he was resuscitated with high flow oxygen. He was transferred to a cardiothoracic unit where the pin was found to be impaling but not penetrating the aortic adventitia. It was removed via video assisted thoracic surgery (VATS) and he was further managed with a chest drain. A left-sided pneumothorax was the only complication and he made a swift recovery. He now has a chronically dislocated left shoulder with no movement at the joint. He is, however, pain free and no further surgery is planned.

Discussion
Migration of orthopaedic wires has been reported previously with a handful of case reports of intrathoracic Steinmann pin migration. Published cases report migrations to have occurred from three weeks to six years following fixation.1 Presentations included chest pain, back pain2 and haemoptysis.3 Piercing of the innominate vein, the ascending aorta and the superior vena cava as well as pneumothorax are recorded complications. All cases were treated successfully with VATS or thoracotomy/sternotomy.

We believe the migration in our case was secondary to a fall leading to shoulder dislocation and retraction of the pin from the glenoid, with further advancement of the pin due to poor bone quality.

Options for surgical management of recurrent shoulder dislocation include soft tissue stabilisation, arthroscopic stabilisation and pinning. Nevertheless, in elderly patients

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with dementia and poor compliance, it is wise to consider conservative management with analgesics. Surgical management should emphasise rotator cuff repair as the likeliest pathology in this age group, with transarticular pinning as a last resort. Our case highlights the importance of making careful choices, keeping the patient’s age and co-morbidities in mind when considering the use of wires in upper limb surgery, and ensuring pins are well secured.
Conclusions

Despite being rare, transthoracic migration of Steinmann pins has been reported in the literature,\(^1\) sometimes with fatal effect.\(^2\) The learning point from this case is that irrespective of the fixation device used, it must be secured at the skin, by bending or with a collar lock. Although this reduces the risk of migration, there still remains a risk of breakage and migration of the medial segment, which is why pinning is not recommended in the upper limb. We therefore conclude that transarticular pinning of the shoulder is a risky procedure that should only be used with careful consideration, as a last resort. We write this report as a lesson against deviating from best practice.

References