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Broken pedicle screw thread extraction from within the pedicle

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BACKGROUND

Following spinal fracture dislocation with neurological deficit (Fig 1), it is usual to perform emergent realignment, decompression and

Figure 1 Sagittal computed tomography showing fracture dislocation at L3/L4 with spinal canal retropulsion of the L4 vertebral body in a patient with an American Spinal Injury Association grade B neurological deficit at L3

Figure 2 Lateral radiography immediately following surgery showing satisfactory fracture reduction with single level monoblock screw posterior stabilisation and no anterior column support

Figure 3 Lateral radiography at seven weeks showing broken screw threads in the pedicles of L3 and L5

Figure 4 Intraoperative photograph demonstrating thoracic pedicle finder insertion into the cannulated part of the monoblock screw and its use in 'screwdriver' mode to remove the broken thread from the pedicle

Figure 5 Intraoperative photograph showing complete broken screw thread extraction using the pedicle finder

posterior instrumented stabilisation (Fig 2). However, when the anterior vertebral body is non-supportive, construct failure may occur. This manifests most commonly as rod fracture or screw cut-out from within the pedicle. On rare occasions, screws may fracture within the pedicles, leaving broken screw threads in the pedicle wall (Fig 3). Removing these without damaging the surrounding pedicle wall, so that it may be re-instrumented, can be challenging. It is

Figure 6 Lateral radiography following revision L4 corpectomy with an expandable cage and posterior stabilisation

advantageous to re-instrument the same pedicle as this may avoid the need to involve adjacent levels in the revision stabilisation.

TECHNIQUE

A standard thoracic pedicle finder (DePuy Synthes Spine, Raynham, MA, US) can be inserted into the cannulated part of the broken screw threads (Fig 4). The pedicle finder may then be used in 'screwdriver' mode to remove the broken screw thread in one piece without damaging the surrounding pedicle wall (Fig 5).

DISCUSSION

The same pedicle can then be re-instrumented without the need to involve adjacent levels in the revision stabilisation (Fig 6). This technique is only applicable if cannulated, minimally invasive screws have been used.