Lumbar fractures involving five vertebrae: a case report

Prithee Jettoo,1 Himanshu Sharma,2 John R Andrews,1 Paul L Sanderson1
1 Royal Victoria Infirmary, Newcastle upon Tyne, United Kingdom
2 Western Infirmary, Glasgow, United Kingdom

ABSTRACT

We report a 20-year-old man who sustained lumbar fractures involving 5 vertebrae following a road traffic accident. He was initially treated non-operatively to allow multiple pedicles to heal. He developed post-traumatic kyphosis for which corrective osteotomy and posterior spinal instrumented fusion was performed. He achieved a good functional outcome. We emphasise the need for careful radiological evaluation in patients with high-energy trauma, and the option of treating such complex injuries by non-operative means. If post-traumatic kyphosis develops, it can be dealt with later and the most mobile segments of the lumbar spine can be preserved.

Key words: lumbar vertebrae; osteotomy; spinal fractures

INTRODUCTION

Multiple-level injuries of the spine tend to occur following more complicated and severe injuries. We report a 20-year-old man who sustained lumbar fractures involving 5 vertebrae following a road traffic accident.
pedicle subtraction osteotomy of L2 to correct the deformity and restore the sagittal alignment, as well as posterior instrumentation and fusion of T12 to L4 using iliac crest bone grafts to achieve a stable construct. A closing wedge was created at the anterior column by removing the posterior aspect of the L2 vertebral body. Short constructs involving fixation anchors 2 above and 2 below the osteotomy site enabled good sagittal alignment and preservation of the L5/S1 mobile segment.

Recovery was uneventful, except for pain in the donor site lasting approximately 6 months. At year 1, spinal correction was well-maintained (Fig. 2). At year 2, the patient reported pain-free spinal mobility and had returned to work.

**DISCUSSION**

Non-contiguous fractures of the spine occur in 4 to 24% of patients involved in traffic accidents or falls from a height. The thoracolumbar spine has a well-defined muscular apparatus and is prone to compression rather than distraction forces. This may account for the large number of lumbar fractures related to high-energy falls.
Radiological evaluation of the entire spine is essential in patients with multiple injuries. Computed tomography and magnetic resonance imaging aid in the diagnosis and assist in surgical planning.\(^7\) Three-dimensional computed tomographic reconstruction or multiplanar reformatting may help predict the occurrence of spinal deformity. Delayed or missed diagnosis of multilevel spinal injuries can lead to instability, neurological compromise, and deformity.

Treatment should aim to achieve mechanical and neurological stability as well as alignment and deformity correction. The viability of non-operative options should be considered when there is extensive injury.

In our patient, fractures of L1 to L5 pedicles posed technical difficulties for a pedicle screw construct, and a bridging construct involving the lower thoracic spine and pelvis was regarded as inappropriate. We decided to treat the patient non-operatively to allow healing of the pedicles, but he developed a post-traumatic kyphosis of 35\(^\circ\).

Pedicle subtraction osteotomy is technically demanding and usually for lumbar spinal sagittal deformities of 35\(^\circ\) to 40\(^\circ\). In 83 such patients, there were 25 intra-operative and 38 postoperative complications.\(^8\) 15\% of such patients had neurological deficits.\(^9\) Posterior stabilisation with a long construct may lead to adjacent level disc disease. We used a short construct and achieved good outcome. Non-operative treatment also enabled healing of the pedicles and avoided such complications.

**REFERENCES**