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Case Report

Use of a novel lag screw by technique approach for repair of a severe lumbar fracture associated with ankylosing spondylitis: A technical case report

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ABSTRACT

Background: The lag screw is a common technique and device used in orthopedic surgery for compressing simple fractures. Here, a lag screw was used to treat a traumatic L5-S1 fracture in a 53-year-old patient with ankylosing spondylitis (AS) resulting in 15 mm of anterior subluxation.

Case Description: A 53-year-old patient with AS resulting in 15 mm of anterior subluxation was successfully managed with a lag screw instrumented fusion.

Conclusion: A lag screw successfully stabilized a traumatic L5-S1 lumbar spinal fracture in a patient with AS.

Keywords: Ankylosing spondylitis, Distracted fracture, Lag screw, Lumbar spine fracture

INTRODUCTION

Patients with ankylosing spondylitis (AS) are more prone to spinal fractures.[1] Here, we utilized a lag screw technique to fuse/treat a traumatic (i.e., due to a motor vehicle accident) L5-S1 lumbar spinal fracture in a 53-year-old patient.

CASE DESCRIPTION

A 53-year-old male with AS and gastric sleeve was seen following a motor vehicle crash. The imaging studies demonstrated 15 mm of anterior subluxation in L5 vertebrae compared to S1 with ossification of the posterior ligamentous complex [Figure 1]. The vertically oriented fracture traveled through the L5 and S1 vertebral bodies. Given the degree of subluxation, surgical fixation was required to restore stability. Using navigation, eight pedicle screws were bilaterally placed into L3, L4, L5, and S1 [Table 1]. Postoperative X-rays and computed tomography demonstrated

Table 1: Summary of pedicle screws used.

Screw number	Screw position	Screw length (mm)	Screw diameter (mm)
1-2	L3	45	6.5
3-4	L4	55	6.5
5-6	L5	55	6.5
7	S1 (left)	45	6.5
8	S1 (right)	50	6.5
6	Present case	2 months	M

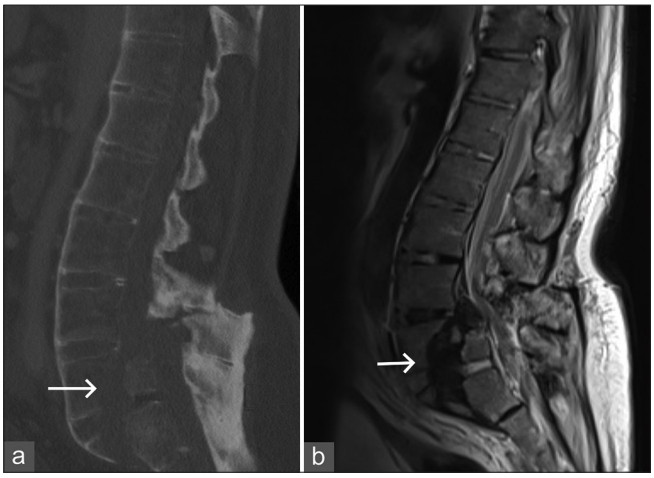

Figure 1: (a and b) Preoperative sagittal slices of the lumbar spine with computed tomography and magnetic resonance imaging demonstrate 15 mm of anterior subluxation in L5 vertebrae compared to S1. White arrows in (a and b) refer to the fracture site. Additionally demonstrated ossification of the posterior ligamentous complex.

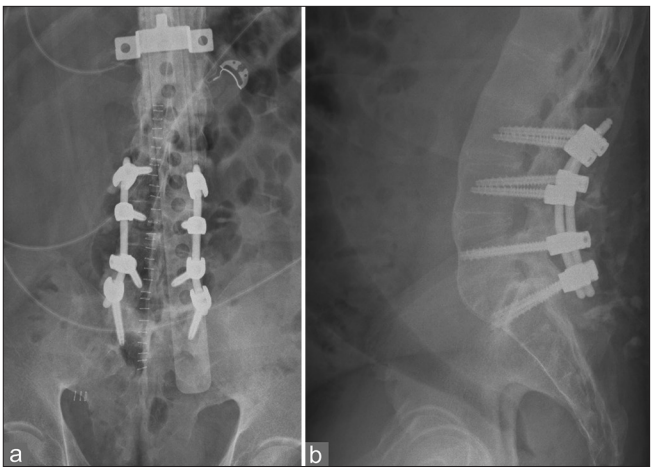

Figure 2: Postoperative X-ray imaging demonstrating reduced lumbar spinal fracture and anatomic alignment of the spinal column from L3 through S1. (a and b) Coronal and sagittal postoperative X-rays showed accurate screw placement and satisfactory reduction of the lumbar spinal fracture.

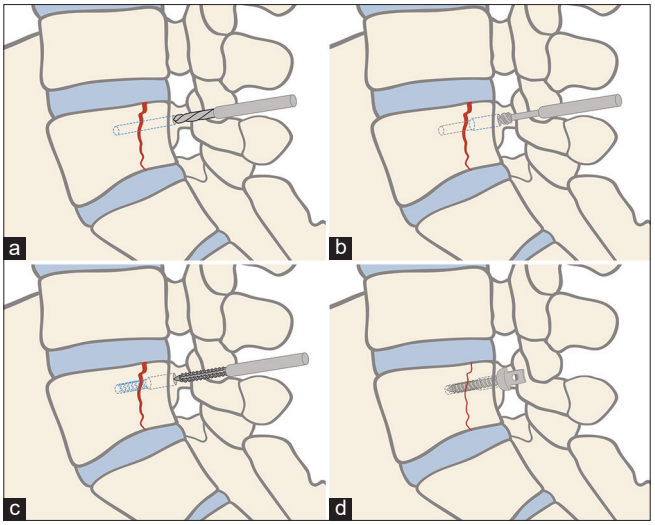

Figure 3: Illustration depicting the lag-screw technique in a lumbar fracture. (a) The fracture is drilled through with the width of the inner diameter of the screw. (b) The near cortex is over drilled to the outer diameter of the screw to create the gliding hole (b). (c and d) Threads are then made, and the screw engages with the far cortex, compressing the fracture.

anatomic alignment of the fracture [Figure 2]. The patient was discharged home, and at the 2 weeks, he was doing well with his pain well controlled.

DISCUSSION

We present a novel surgical technique in which a lag screw was used to treat a lumbar fracture in a patient with AS, resulting in 15 mm of subluxation at the L5-S1 level. Lag screws and the lag screw technique compress the fracture fragments together.[2] With the lag screw technique, the near cortex of the fracture is over-drilled. When the screw is inserted, it glides through this proximal hole, and the threads only engage with the far cortex. As the screw is tightened, the head of the screw engages with the near cortex, and the fracture fragments are compressed together [Figure 3].

CONCLUSION

Here, a 53-year-old male with AS underwent successful repair of a severe lumbar fracture with instrumented fusion using a novel lag screw technique.

Ethical approval

The Institutional Review Board has waived the ethical approval for this study.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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