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Case Report

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A case of consecutive four-level lumbar spondylolysis and spondylolisthesis

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ABSTRACT

This rare and unusual case is about a 54-year-old female, who has pars fractures involving consecutive four-level bilateral spondylolysis and spondylolisthesis. Due to the increasing intensity with lumbar instability, the patient had severe low back pain. For diagnosis, dynamic X-Ray, magnetic resonance, 3D tomography were performed, and bilateral L2-3-4-5 pars fracture and L3-4 spondylolisthesis were observed. This case was treated surgically byspinal canal decompression at L3-4, L4-5 and L5-S1, posterior lumbar interbody fusion at L4–5 and L5–S1, and pedicle screw fixation at L2–S1. The lower back pain disappeared after the surgery.

Keywords: Spondylolysis, spondylolisthesis, low back pain

INTRODUCTION

The estimated incidence of lumbar spondylolysis is 3%–10% among the general population and the incidence of isthmic spondylolisthesis is circa 2.6%–4.4%.[1] The ratio of spondylolysis occured at the fourth and fifth lumbar vertebrae is approximately more than 95% of the total cases of spondylolysis. Multiple-level lumbar spondylolysis (MLLS) is commonly seen at the three-fourth and fifth lumbar vertebrae. However, spondylolysis involving more than three levels is quite rare.

We report here on a rare case of bilateral four level lumbar spondylolysis.

CASE

Fifty-four years-old female patient had been suffering from lumbago, bilateral leg pain and numbness for 2 years. The pain had been caused by lifting heavy objects and walking the road. After 3 months of conservative treatment including physical therapy, and non-steroidal antiinflammatory drugs, the patient was admitted for surgery because of worsening back pain and leg numbness. Visual Analog Scores (VAS) for low-back pain was evaluated preoperatively. Radiographs, CT scans, and MR images showed bilateral spondylolytic defects at L2, L3, L4, and L5, associated with spondylolisthesis (anterolisthesis at L3-4) and spinal canal stenosis at L4-5 and L5-S1 (Figure 1). The patient underwent spinal canal decompression at L3-4, L4-5 and L5-S1, posterior lumbar interbody fusion at L4–5 and L5–S1, and pedicle screw fixation at L2–S1 (Figure 2). VAS for low-back pain was assessed postoperative 3rd month.

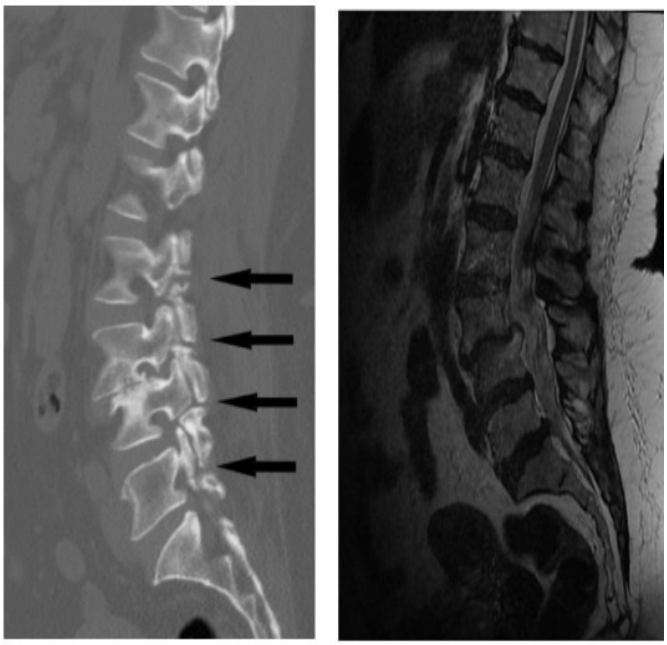

Figure 1. Preop sagittal CT- preop sagittal T2 MRI image. L2-3/L3-4/L4-5/L5-S1 pars fracture, L3-4 listhesis and stenosis are observed.

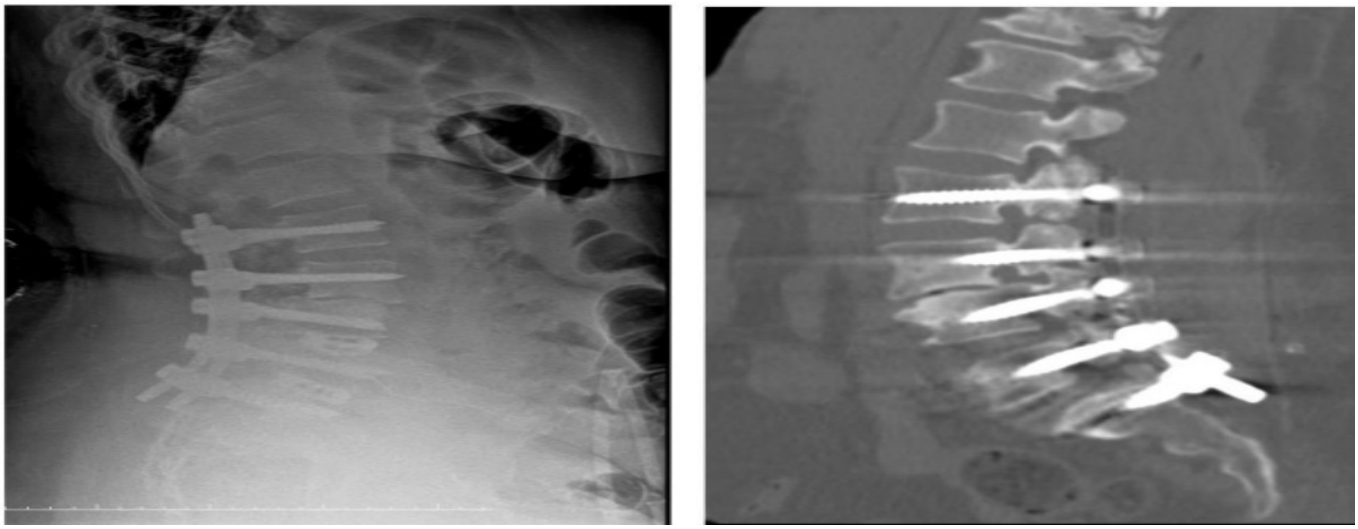

Figure 2. Postoperative lateral x-ray and sagittal CT image. L2-S1 posterior stabilization and fusion with L4-5 and L5-S1 anterior interbody are observed.

DISCUSSION

In the literature, there are very few cases on MLLS and there are no reports about bilateral 4 level spondylolysis. In our case, bilateral spondylolysis at levels L2-3-4-5 and spondylolisthesis at L3-4 are reported.

There are many etiology for single level spondylolysis (SLS) and MLLS.[3] MLLS and spondylolisthesis can be associated with consecutive trauma, heavy labour and contact sports . Since these conditions are generally encountered by men, multiple spondylolysis is more common among men.[3–6] Our patient is female and an agricultural labour, so her complaints increase while she works.

L4 and L5 vertebraes are most common affected levels in lumbar spondylosis. In the upper lumbar vertebrae the spondylolysis has been reported by various authors to be between 0.2% and 1.5%.[7] It has been suggested that two important factors play a role in the pathogenesis of spondylolysis: the genetic factor and the mechanical factor of the lumbar spine. Familial cases of spondylolysis has been signified by Friberg and Willis and Wiltse , and it braces that a genetic factor can be involved with this malady, even so the specific gene that affects spondylolysis isn't named.[8–10]

As our acknowledge, 2 level spondylolysis is more common than 3 or 4 level spondylolysis. Multiple-level lumbar spondylolysis most commonly occurs at L3-5.[1–5] According to literature, sequential bilateral 4-level spondylolysis has not been described. The occurence of 4 level bilateral spondylolysis with L3-4 spondylolisthesis in our female patient is an unique presentation.

X-Ray, 3D computed tomography (CT) and magnetic resonance imaging (MRI) are usefull tool for identification of spondylolysis. X-ray radiograph is diagnostic for pars lesions; however, it cannot differentiate acute lesions from chronic.[3,11] Dynamic flexion/extension radiograph should be used to evaluate spinal instability in symptomatic patients. 3D CT is more reliable and more valuable because it shows the bone anatomy and distinguishes whether the fracture is complete or incomplete.[12] MRI is not very sensitive for evaluation of pars fracture. We use MRI mostly to evaluate foraminal stenosis if spinal stenosis and spondylolisthesis accompany these cases.

In our case, we confirmed the levels of lumbar spondylolysis using three-dimensional CT. We believe that three-dimensional CT is an excellent and convenient tool for diagnosing multiple spondylolysis and for determining the appropriate levels for fusion.

In our case the patient was suffering from lower back pain, bilateral leg pain and numbness for a long time. Surgical or conservative treatments may be considered in MLLS. The standard treatment for spondylolysis and spondylolisthesis is conservative management in cases where the Meyerding grade is less than III.[4] Restrictive sporting activity, lumbosacral orthosis and physiotherapy exercise are recommended during 3 months as conservative treatment. Single level spondylolysis usually responds to conservative treatment. On the contrary, MLLS usually responds poorly to conservative traetment and often requires surgery.[3,13] For pars interarticularis defects seen at multiple-level lumbar spondylolysis without spondylolisthesis, can be directly restored by using segmental wire fixation and bone grafting or using pedicle screw fixation, a laminar hook, and bone grafting.[5,6] Even so, these methods cannot accomplish adequate segmental stability for multiple-level lumbar spondylolysis with spondylolisthesis.

We applied posterior pedicle screw and posterior lumbar interbody fusion to our patient. Following the procedure, spinal instability was significantly improved and the patient experienced a notable reduction in lower back and bilateral leg pain. We present this well-managed case of multiple spondylolysis as the first documented instance in the literature of a four-level bilateral pars fracture.

CONCLUSION

Although multiple-level lumbar spondylolysis is a rare we presented a case of four-level spondylolysis in a female patienti marking the first case in the literature.

ETHICAL DECLARATIONS

Informed Consent

All patients signed the free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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