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A Study on Spondylolisthesis

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Abstract
*There are various types of spondylolisthesis that are commonly encountered in daily routine practice on the basis of Spinal Deformity Study Group **(SDSG)** classification. Each clinical scenario underlines the workup required for such case along with various technical tips.*
Keywords: *TLIF, SDSG, Sacral dome osteotomy, spondylolisthesis.*

Introduction

"Spondylolisthesis" is defined as the translation of one vertebral body over the other. Various etiologies have been described, such as tumour or congenital dysplasia, degenerative, trauma, isthmic, Degenerative dysplasia is the most common variety seen in adults and is usually of a low grade. High grade spondylolisthesis (HGS) is far less common. Clinical presentation ranges from lower back pain to unilateral or bilateral radiculopathy on the basis of severity of the disease. Various classification systems have been used to measure spondylolisthesis and observe its progression. Classification are described as **Type 1:-** Low grade (<50% translation) spondylolisthesis and **Type 2:-** High grade (>50%) spondylolisthesis. The goal of the surgical management of spondylolisthesis is decompression, stabilization, arthrodesis and reduction wherever applicable

Case 1

History

A 62-year-old male represented with a history of severe mechanical back ache and right lower limb radiculopathy. The patient complained of difficulty in walking and inability to climb stairs due to severe right thigh and calf pain especially on the side of the back with a dragging sensation. His pain was relived to some extent on bending forward.

Examination

The patient had associated depressive disorder. He had a bilateral positive straight leg-rise at 50degree in bilateral lower limbs; 5/5 muscle strength in hip, knee, ankle and Extensor Hallucis Longus (EHL) bilaterally. Paraesthesia was present in L5-S1 dermatomal distribution on the right side.

Prior Treatment

Conservative treatment with physiotherapy and activity of daily living modification yielded no relief in symptoms.

Pre-Treatment Images

Flexion and extension dynamic film of the lumbar spine revealed an unstable high-grade spondylolisthesis at L5-S1.

The MRI showed grade 2 spondylolithesis with grade 2 foraminal stenosis with L5 nerve root impingement on right side.

Management

This was case of type 2 SDSG, and surgical options. This patient had back pain along with radicular symptoms with loss of lumbar lordosis, so decompression along with instrumented fusion is required to decrease risk of pseudoarthrosis and prevent further slippage of deformity explaining all the due risks, the consent was taken and a single level TLIF was planned for patient and decompression being done from the right side. The patient showed substantial relief in low back ache at the first follow up visit at 4 weeks, and was symptom free at the latest follow-up of two years.

Case 2-

History

The patient was 35-years-old male who worked as a labour. He was 5'-10" tall and complained of lower back pain and left lower limb radiculopathy, which had got worse with activities for the past two years.

Prior Treatment

All conservative treatment had failed.

Examination

Passive SLR positive (left= 30 degree and right = 60 degree),

Bilateral knees and ankles powers = Normal Palpable step + there was no vascular insufficiency to his legs.

Pre-treatment imaging

1. Spine and pelvis were balanced.

2. Flexion and extension dynamic film of the lumbar spine revealed an unstable high-g*rade spondylolisthesis at L5-S1.

MRI: The MRI grade 3 spondylolisthesis and grade 3 foraminal stenosis with L5 nerve root impingement of the Left side.

Management

Based on the clinical and radiological parameter, the patient was classified under Type 4 SDSG classification. Reduction maneuvers should be attempted when there is sagittal imbalance and the focus should be the correction slip angle rather than the complete correction of the translation. Cantilever is the most common method used to aid in reduction. In situ fusion can be considered in cases with high-grade spondylolisthesis. The spino-pelvic sagittal balance as maintained in this case. Mono-segmental TLIF was planned and executed for the patient. Pedicle screws were inserted in L5 and S1. A contoured rod was placed on the right side after distraction. Decompression was done on the left side after removal of the facet joint, and an inter-body cage was placed to achieve fusion and stability. On follow-up, ten months later the surgery, the patient's back pain and radiation were completely resolved.

Pre-treatment images

X-ray LS Spine: Ap and lateral Grade of lithiasis:> 75% (grade 4) Spine and pelvis was unbalanced MRI-showed grade 4 spondylolisthesis and central disc herniation and grade 4 foraminal stenosis.

Conclusion

All the cases just cited highlight the common clinical scenario seen in the spondylolisthesis group of patients. The planning involved in these is discussed and the technical tips to minimize the chance of complications are mentions.

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