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Functional outcome of spondylolisthesis treated by transforaminal lumbar interbody fusion

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Abstract
Introduction: Spondylolisthesis is defined as the forward displacement of a vertebra in relation to the vertebra below it. It is most common in the lower back.
Aim: The aim of this study is to analyze Functional outcome following Transforaminal Lumbar Interbody Fusion in Spondylolisthesis.
Methods: A total of 20 patients with spondylolistheis was treated in this study from November 2021 to October 2022.
Results: In Our study 11 patients had lesion at L4-L5 and 9 patients at L5-S1. We had 13 female and 7 male patients. Grade II (Myerding grading) of listhesis was common. Isthmic and degenerative spondylolisthesis was common. We had significant improvement in pain, disability, and physical function.
Conclusion: This study was able to show that transforaminal lumbar interbody fusion had good clinical outcome.

Keywords: Lumbar spondylolisthesis, Transforaminal Lumbar, lateral lumbar interbody fusion

Introduction
Lumbar spondylolisthesis is common spine pathology. Spondylolisthesis is displacement of one vertebral body in relation to another. Spondylolisthesis is sagittal plane malalignment of adjacent vertebral bodies, commonly seen at L4-5 and L5-S1. Spondylolisthesis graded by the amount of anterior displacement of the superior body. < 25% - grade 1, < 50 - grade 2, < 75% - grade 3, < 100% - grade 4, > 100% - spondyloptosis. Types are Dysplastic, Isthmic, Degenerative, Traumatic, Pathologic and post-surgical. Most common is isthmic and degenerative. Isthmic spondylolisthesis results from acute or a chronic pars interarticularis stress and leads to elongation or fracture of pars. Degenerative spondylolisthesis is seen with intact pars interarticularis and related to degeneration of apophyseal joints or the intervertebral discs. The surgical management is indicated in cases of neurogenic claudication, radiating pain, severe back pain, failed conservative treatment, instability and progressive worsening of the listhesis. There are many methods of stabilisation and fusion. Transforaminal Lumbar Interbody Fusion is safe and effective procedure.

AIM: The aim of this study is to analyze Functional outcome following Transforaminal Lumbar Interbody Fusion in Spondylolisthesis.

Methodology
The study was done in department of orthopedics, Shri Sathya Sai Medical College and research institute from November 2021 to October 2022. Posterior stabilization, decompression and Transformational Lumbar interbody fusion done in all patients under general anesthesia.

Inclusion criteria
- Age 20 to 65 years.
- Single level spondylolisthesis (Meyerding Grade I or III).
- Failed conservative management.

Exclusion Criteria

- Unfit for Surgery.
- Spondyloptosis.
- Failed back syndrome.

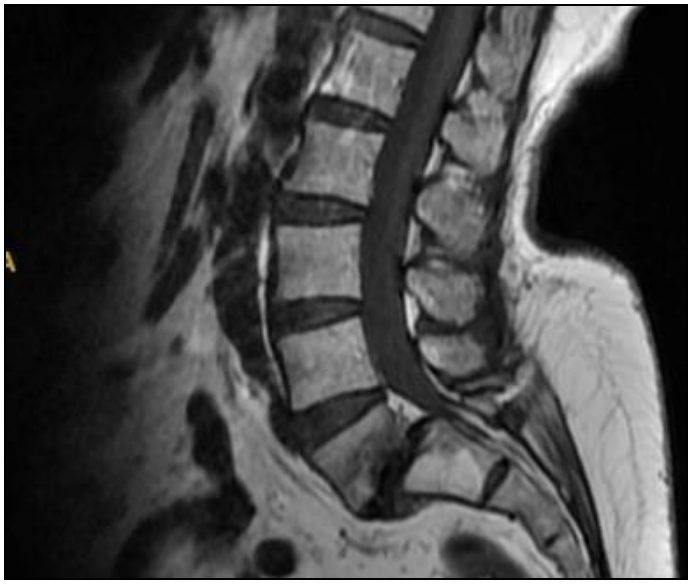
On admission age, presentation, Level and comorbid condition are noted. Severity of pain was evaluated using VAS Pain scoring system

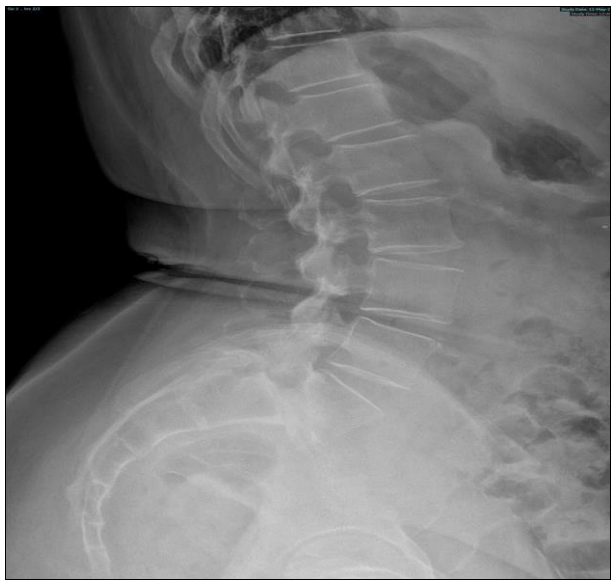
Imaging

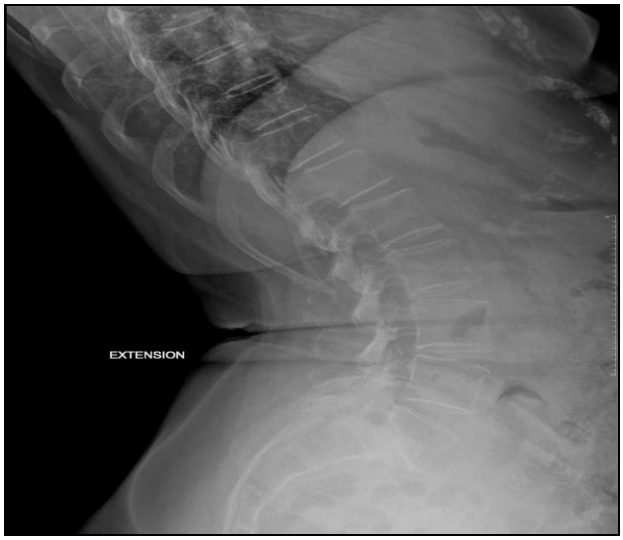
X ray LS Spine – AP, Lateral, Flexion and Extension views-level involved, pars interarticularis defect, degree of slip. MRI LS Spine- cord compression, lumbar canal stenosis, facetal arthrosis, Disc Prolapse. The patients are followed up at 1 month 3 month, 6 month and 1 year. Follow up is done by assessing x-ray, neurological examination, Oswestry disability index score and functional score (VAS).

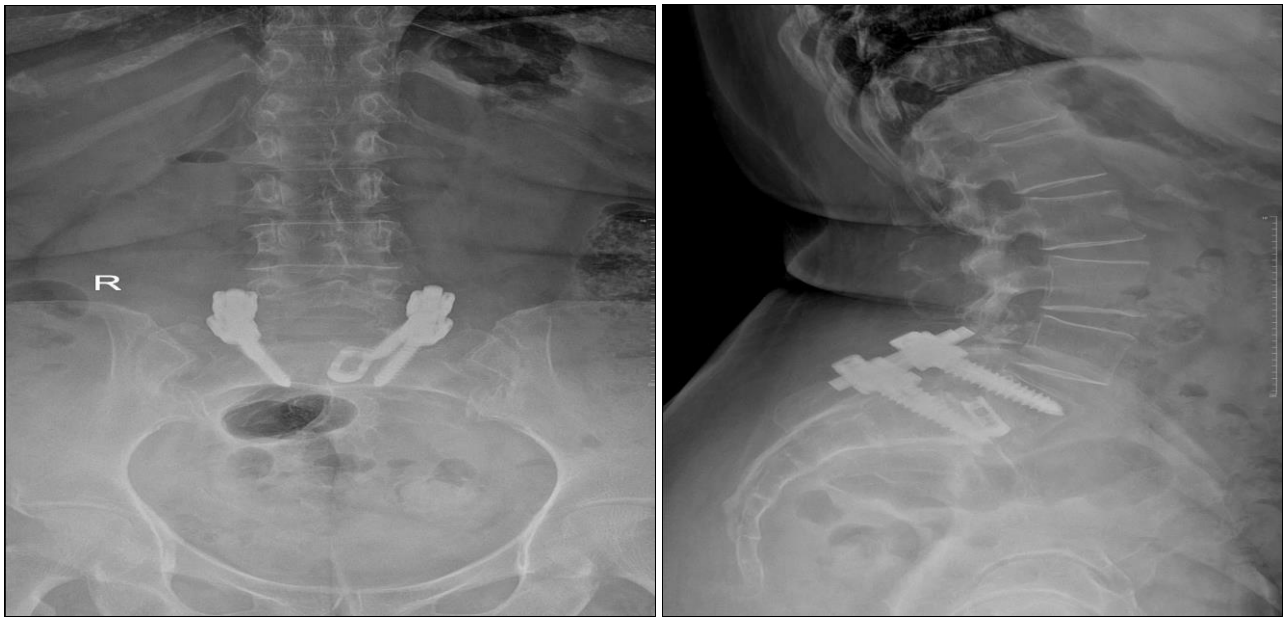
Surgical technique

1. Pedicle Screw Insertion.
2. Facetectomy and Working Zone Preparation.
3. Annulotomy and Initial Disc Dissection.
4. Distraction and Preparation of Disc Space.
5. Endplate Decortication.
6. Placement of Bone Graft.
7. Cage Trialing.
8. Cage Insertion.
9. Implant orientation.
10. Final Compression.
11. Verification of Final Cage placement.

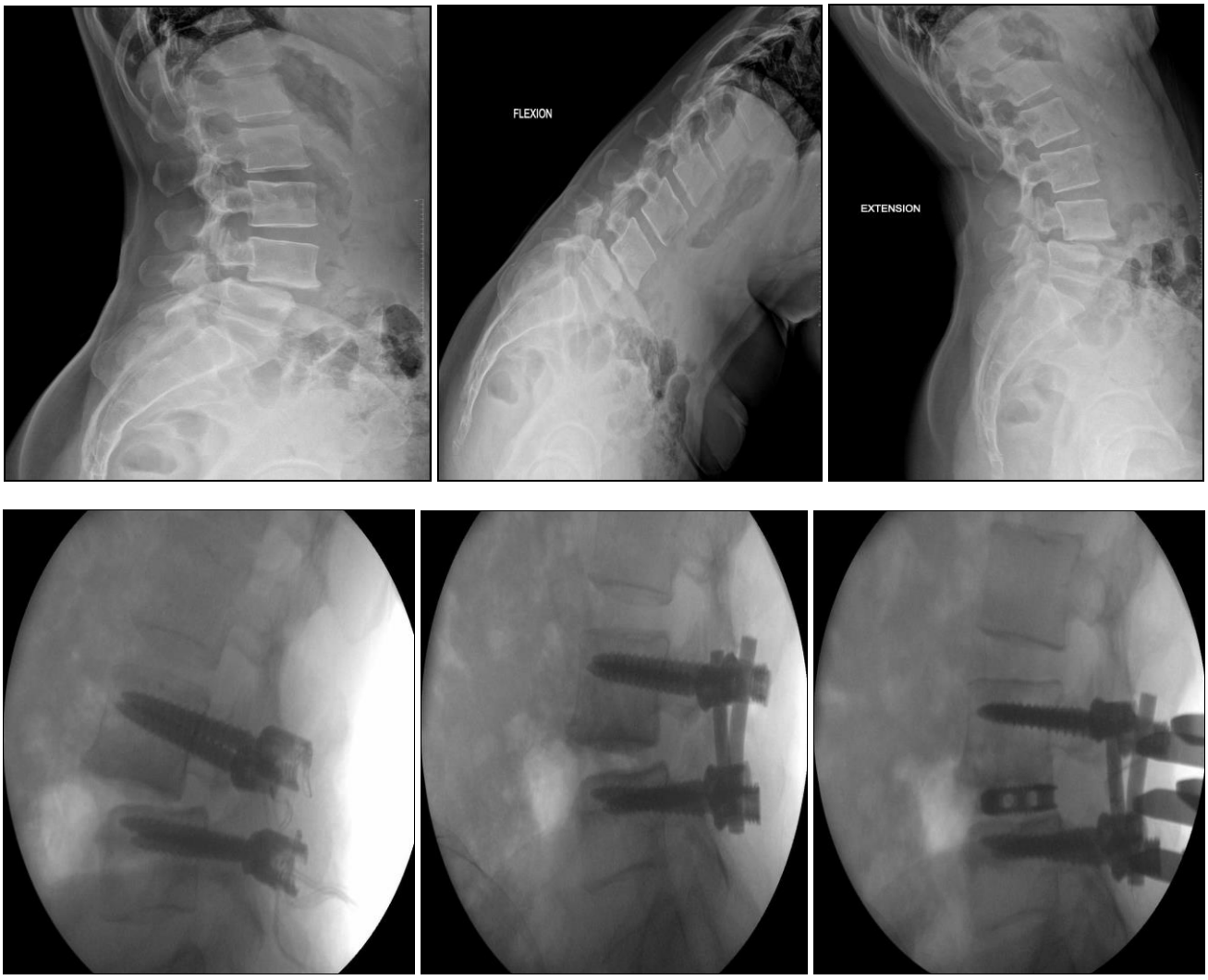


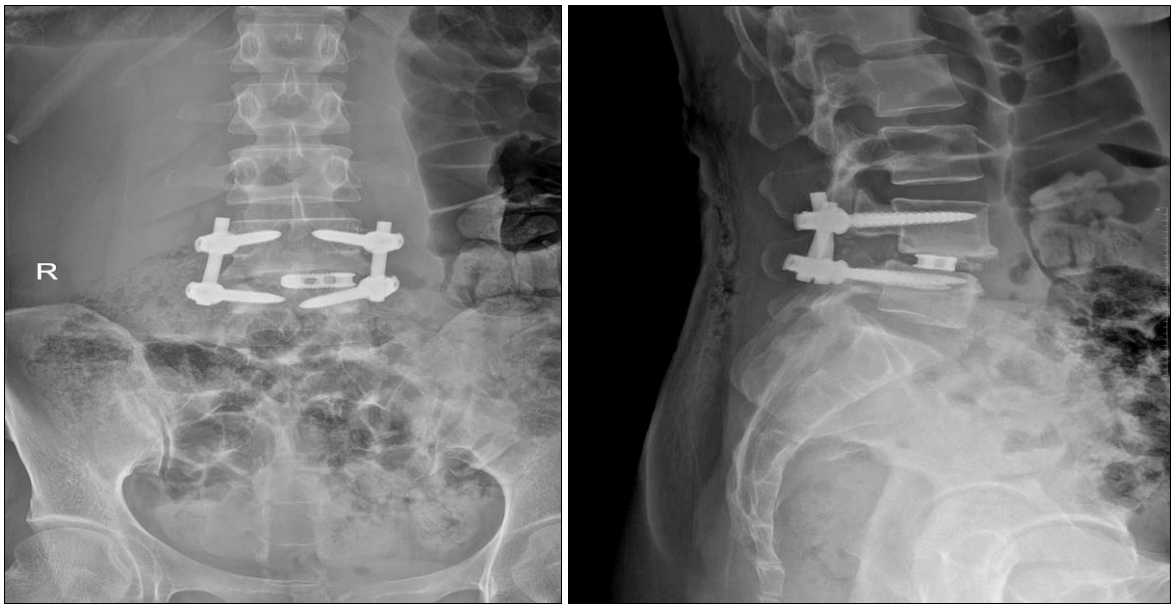




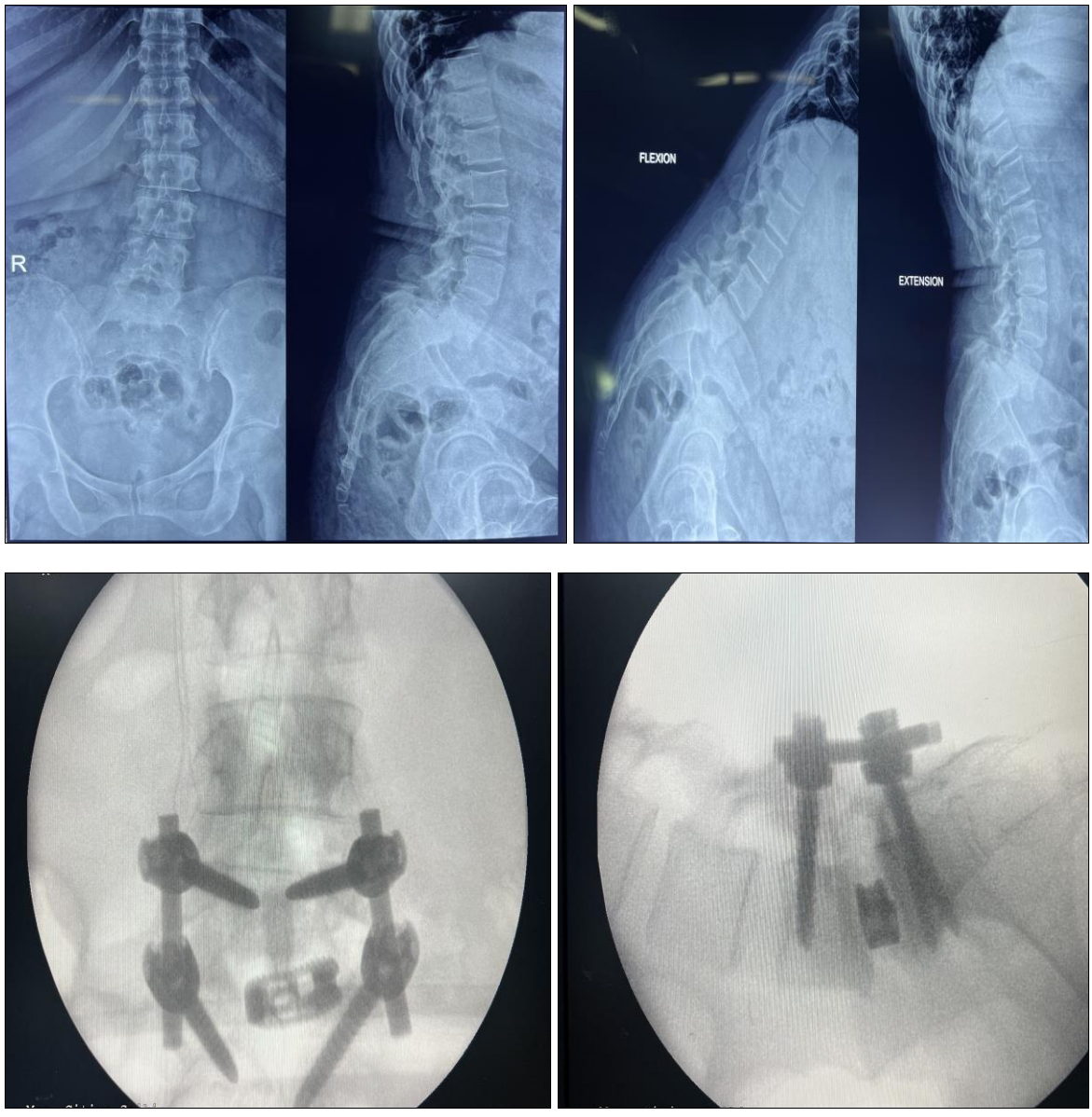


Case 1: 62 yrs. Female – L5 S1 Spondylolisthesis





Case 2: 32 yrs. Male – L4 L5 Spondylolisthesis



Case 3: 55 yrs. Female - L5 S1 Spondylolisthesis

Discussion

Spondylolisthesis presents with low back pain which is localized to paraspinal and gluteal region, restricted range of motion, decrease in lumbar lordosis, and hamstring tightness. Spondylolisthesis can result in nerve root compression and patients present with radicular pain, claudication and sensory / motor deficit. In Our study 11 patients had lesion at L4-L5 and 9 patients at L5-S1. We had 13 female and 7 male patients. Grade II (Myerding grading) of listhesis was common. Isthmic and degenerative spondylolisthesis was common. Surgical alternatives to TLIF include decompression alone (laminectomy), lateral lumbar interbody fusion (LLIF), anterior lumbar interbody fusion (ALIF), posterior lumbar interbody fusion (PLIF), and posterolateral fusion (PLF). TLIF procedure places a single bone graft between the vertebrae from side, rather two bone grafts from rear as in PLIF procedure. Inserting graft from side where facet joint has been removed is an effort to avoid damaging nerve roots during procedure. Main disadvantage of PLF is pseudoarthrosis. TLIF, a modern approach, avoids significant retraction of dura and the nerve roots. By removing one of facet joints, a trajectory is created to take out disc, to insert bone graft and cage into the disc space. This exposes nerves to lower risk of injury, and requires less muscle retraction. The goal is to decompress the spinal cord and nerves, re-stabilize the spine, thus preventing further movement and degeneration.

Conclusion

This study was able to show that TLIF had an excellent clinical outcome in spondylolisthesis patients. TLIF surgery leads to significant improvement in pain, disability, and physical function. Advantages are direct neurologic decompression, Single approach/single position procedure and Foraminal height restoration. TLIF is a safe and effective fusion procedure compared to other fusion surgeries with less complications.

Conflict of Interest

Not available

Financial Support

Not available

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