

A Study Of Pedicle Screw Fixation With Postero-Lateral Fusion In Lumbar Spondylolisthesis

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Citation

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Abstract

INTRODUCTION

Degenerative causes of instability like spondylolisthesis occur more commonly in lower lumbar region. L4-L5 level is affected 6 to 8 times more commonly than any other adjacent level. Internal fixation and stabilisation of spinal lesion allows early mobilization of all patients, while protecting the neurological structures from further injury and enhancing their recovery. The goals of surgery are to achieve stability, to correct deformity, early mobilization, to expedite post-operative recovery and to decrease pseudoarthrosis. The pedicle screw and rod construct helps to achieve all these. In this study, we have stabilized cases of spondylolisthesis with pedicular screw and rod fixation and postero-lateral fusion using iliac bone graft. The pedicle screw system has gained much popularity in recent times. We have evaluated all patients for maintenance of spinal correction and neurological improvement after posterior instrumentation of lumbar spinal lesions and clinical outcome in terms of spinal scoring system called as Denis work and pain

MATERIALS AND METHODS

In all, a total of 18 cases were evaluated and assessed during the period from 1st October 2011 to October 2013. The study was conducted in the Department of Orthopaedics, Mamata general & super specialty hospital, Khammam. All the patients were initially evaluated at the time of admission regarding neurological status, general systemic examination, Hemodynamic stability. All the patients underwent dynamic thoracolumbar flexion and extension x-rays. Slip angle and slip percentage measured. In all the patients MRI was done to assess neural canal compromise preoperatively. The pre-operative neurological status was graded on the basis of ASIA (American spinal injury association) grading. It was also used to assess post-operative recovery and follow-up. The indications for the surgery were instability for which

instrumentation was needed to restore spinal stability or to protect neurological elements. All patients underwent posterior instrumentation with short segment pedicle screw fixation with posterolateral fusion with iliac bone graft.

Inclusion criteria :

Patients with spondylolisthesis whose Dynamic x-ray showing anterior slip of 5mm or more in thoracic and lumbar spine.

- 2) Difference in angular motion of two adjacent motion segments more than 11 degrees from T1-L5.
- 3) Persistence of major symptoms for atleast 1yr despite activity modification and physical therapy.
- 4) Progressive neurological deficit.
- 5) Asymptomatic patients with slip beyond 25-50 % (GRADE II).

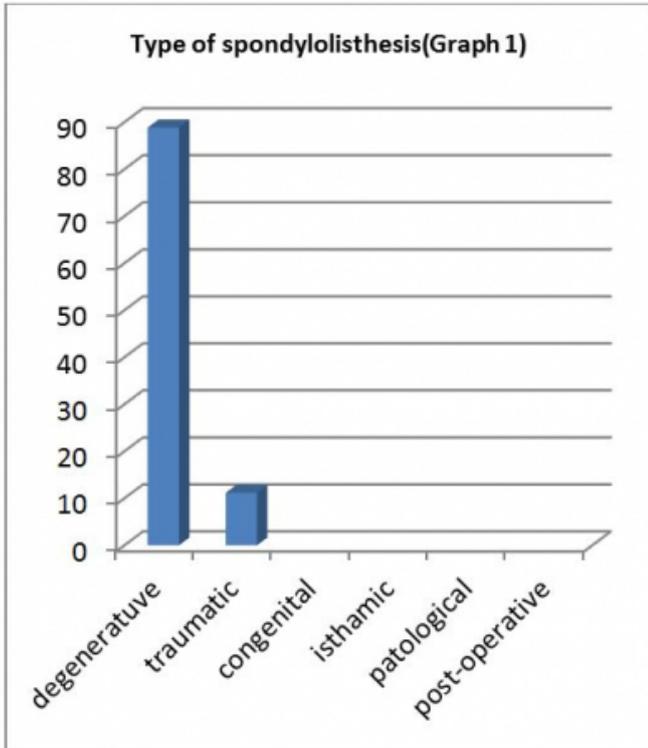
Exclusion criteria: Spinal instability due congenital spinal abnormality

RESULTS

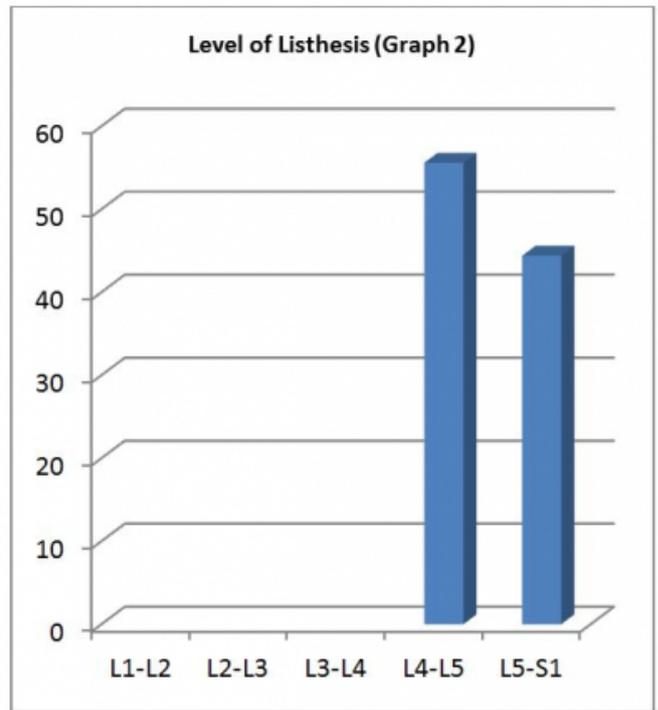
In our study, degenerative type was the most commonest type of spondylolisthesis accounting for 88.8%, 11.2% traumatic (graph 1). Out of 18 patients in our study, commonest level lesion was seen at L4-L5 region, which accounted up to 55.6 %, L5-S1 44.4%, (graph 2). The mean slip percentage pre-operatively was 34.13 % and on post-operative X-rays it was 15.61 % and on follow up the mean slip percentage was 16.72 % (graph 3). There was mean loss of slip percentage by 1.11%. The mean slip angle pre-operatively was 11.11° on post-operative X-rays it was 7.13° (graph 4) on follow up in the mean slip angle 7.13° , there was no mean loss in slip angle. In all patients ASIA grading was used pre-operatively, post-operatively and during the follow up. 16 patients presented with grade D improved to grade E, and 2 patients with grade C improved

to grade E. No patients had neurological deterioration. Thus, from above result, of the 18 patients who had some neurological involvement there is an average improvement of 1 grade.

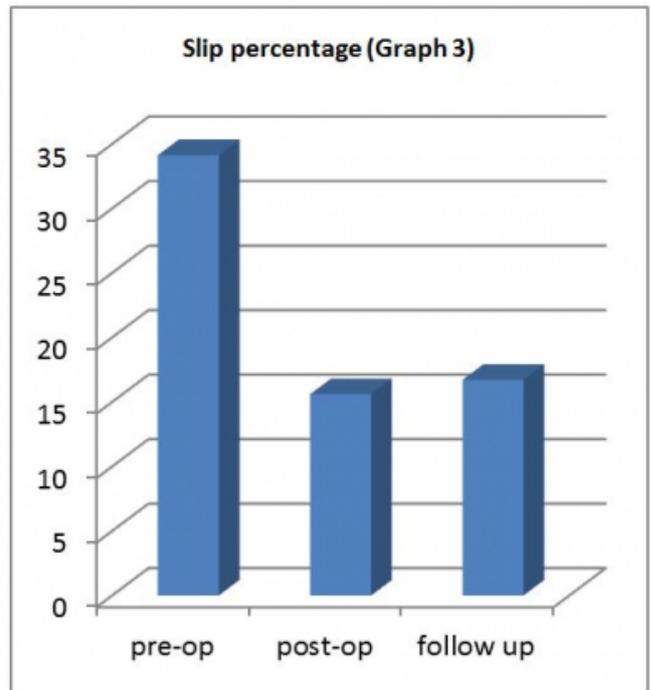
Graph 1



Graph 2



Graph 3



Graph 4

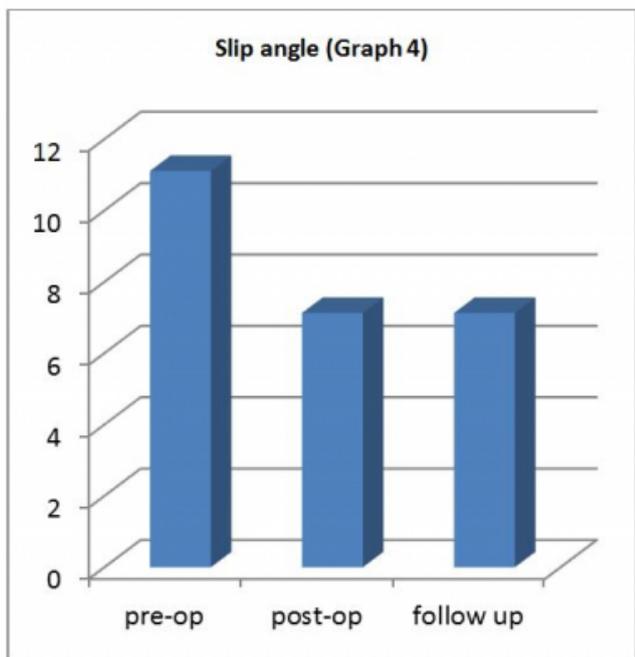


Figure 1



pre operative

Figure 2



post operative

Figure 3



6 months follow up

DISCUSSION

Pedicle screw fixation has been in clinical use for more than 25 years, and the efficacy and safety of these devices have been amply documented. Internal fixation of the spine has proved useful in various conditions of the spine. Pedicle screw and rod fixation technique is one technique that has gained wide acceptance. This technique allows fusion to be achieved while maintaining mobility in healthy segments of the spine. This may be important in maintaining activities of daily living. Another advantage of this technique is that screws are placed into the pedicle, which is the strongest part of the spine.

In our study of 18 patients, 14 were female (77.7%) and 4 were males (22.23%), 11 patients (52.38%) belonged to 41-55 yrs age group. Degenerative lesions of thoraco-lumbar spine are commonly seen among adult population as osteoporosis prevails widely in this age group. The range was between 35 to 55 years, the mean age was 45.94 years. Commonest level lesion was seen at L4-L5 region, which accounted up to 55.6 %,L5-S1 44.4%,.Sagittal orientation of the facet joints and increased pedicle-facet angle have been described as predisposing factors. Also a contributing factor is the coronal orientation of the L5-S1 facet which increases stress at the L4-L5 level. The clinical outcome was judged by using the Denis work and pain scale after 6 months of follow up.13 (72.22%) out of 18 patients were able to return to their previous work remaining 5 able to carry out light work, 15(83.3 %)out of 18 patients were relieved of pain with no medications required,3 patients required medications to eliminate pain. There were no instance of hardware failure. one patient developed discharging sinus post-operatively which healed well with appropriate antibiotics and dressings

CONCLUSION

Posterior stabilization by pedicular screw and rod is an effective method of achieving spinal stabilization in spondylolisthesis for restoring spinal angulation and maintaining the spinal correlation post operatively and at follow up. The pedicular screw and rod fixation is associated with less number of complications. It helps fairly in improving the neurological status, early mobilization and the clinical outcome has been satisfactory in terms of Denis work and pain score.

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