



A Study on Complications in Spondylolisthesis Surgery

Author

**Dr Rahmat Ali (Ms (ortho), MCh (ortho)) & Fellowship in Spine¹,
Dr Imran Akhtar M.S (Ortho)^{2*}**

¹Professor and H.O.D (Ortho department), Maharishi Vashishtha Autonomous State Medical College,
Basti, UP, India

²Sr. Orthopaedic Surgeon

*Corresponding Author

Dr Imran Akhtar M.S (Ortho)

Sr. Orthopaedic Surgeon

Abstract

Spondylolisthesis is a common pathological condition caused due to various causes in young and old persons. The forward slippage of one vertebra over the other alters the bio –mechanics to an extent that can result in various postoperative complications. The most common complications reported are neurological deficits, pseudoarthrosis. Similarly, neurological complications are a common occurrence postoperatively in the treatment of high grade slips. Percentage of reduction of slips, slips angle. and traction injury to nerve root tend to have a complex interaction leading to neurological injuries. Finally Minimally invasive Spine Surgery (MISS) are now being used to treat Spondylolisthesis.

Keywords: *Transitional syndrome, neurological complications, pseudoarthrosis, Spondylolisthesis, complications.*

Introduction

Spondylolisthesis is a common pathological condition caused due to various causes in young and old persons. It may be due to defects in pars, degenerative, traumatic or pathological issue or a tendency of slippage of one vertebra over other. This may be asymptomatic or symptomatic causing mechanical back pain and/or neurological compression. Surgical intervention with reduction of slip, correction of deformity along with decompression and fusion form the standard of care when conservative treatment fails. The incidence of complications depends upon numerous factors like the pathology of Spondylolisthesis it's grade. Type of fusion and bone graft id used .

Various Complications

1. Transition syndrome

Every technique of spine surgery has its advantages and disadvantages. For example- when a fusion surgery is done, there are chances of pseudolarthrosis. It has been postulated that a solid fusion increase the stresses on adjacent segments which may cause spondylolisthesis acquista or transition syndrome. in young patients with pars defect and no-slip or disc degeneration, pars repair should ideally be performed. This is thought a preserve the motion segment and thus adjacentsegment stresses. Early results showed clinical improvement. Strict care as to not damage the adjacent facet capsule during pedicle instrumentation is recommended as this has been

shown to increase adjacent segment motion. Restoration of mechanical alignment, Lumbar lordosis, slip angle and a reduction might go a long way to reduce stresses across the fused and adjacent segments.

2. Minimally Invasive Spine Surgery (MISS)

Achieving optimum surgical outcome with minimum collateral damage forms the basis of *MISS*. The benefit of *MISS like* early ambulation, reduced blood loss, shorter length of hospital stay. Utility of *MISS* in spondylolisthesis surgery deserve special attention due to altered biomechanics. *MISS* has several advantage like preservation of posterior tension band, contralateral facet joint. A 4-year follow-up study of 3 patients with low-grade spondylolisthesis operated with *MIS TLIF* showed 80% fusion rates and 8% without fusion. Thus, fusion remains the choice in most cases of spondylolisthesis.

3. Pseudoarthrosis

Pseudoarthrosis is one of the commonest complications of spondylolisthesis surgery. The reason for this are numerous, for example- isthmic spondylolisthesis has higher incidence of pseudoarthrosis than its degenerative counterpart. In spondylolisthesis the slip of one vertebra over the other causes a drastic change in mechanics which ultimately affects the biology of the fusion.

4. Neurological complications

One of the most dreaded complications after spine surgery is neurological worsening or paralysis. the incidence of neurological issues after posterior lumbar decompression and instrumented fusion surgery in cases of spondylolisthesis may be as high as 50%, the incidence of neurological deficits over the years increased due to greater attempts at reduction by spine surgeons particularly with lytic spondylolisthesis. The L5 nerve root is also the most commonly affected in clinical practise. The greater slips with larger attempts of reduction might be one of the causes of increased neurological deficits in such cases. Reduction helps in indirect neural decompression restoration of sagittal alignment, facilitates arthrodesis.

Frequently use neuromonitoring in cases of high-grade spondylolisthesis.

5. Unusual and rare complications

As mentioned above, one of the most common complications of spondylolisthesis surgery is pseudoarthrosis. Though most of them are asymptomatic, some may cause gross biochemical failures. Failure of fusion may cause the failure of mechanical constructs with loosening and breakage of screws, loss of reduction and migration of interbody cages with or without neurological compromise.

Conclusion

The biomechanics of spondylolisthesis are different from other lumbar degenerative pathologies. Complications like neurological deterioration, pseudoarthrosis, and transition syndromes may occur. Advances in modern medicine like interbody fusion techniques, neuromonitoring, and osteobiologics help to reduce their incidence.

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