

Efficacy of Transsacral Instrumentation for High-grade L5-S1 Spondylolisthesis: A Systematic Review of the Literature Rima Sestokas Rindler MD; Brandon Andrew Miller MD PhD; Daniel Refai MD; Faiz U. Ahmad MD, MCh

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Introduction

High-grade L5-S1 spondylolisthesis is challenging to treat, and there is no standard recommended operative technique. We performed a systematic review of the literature evaluating the efficacy and safety of modern transsacral instrumentation techniques for high-grade L5-S1 spondylolisthesis.

Methods

A systematic PubMED search adherent to PRISMA guidelines (1) included relevant clinical studies reporting transsacral instrumentation for high-grade L5-S1 spondylolisthesis in adult humans from 1980 onwards. Available data on clinical and radiographic outcomes for individual patients were abstracted.



Results:

Literature search

Nine of 311 studies were eligible for detailed review (PRISMA flow diagram shown in Fig. 1). Articles reported on 38 patients (mean 33.1 years; range 18-66) treated with transsacral instrumentation.

Operative Technique

Transsacral cages (6 articles, n=23), screws (2 articles, n=12) and rods (1 article, n=3) were used. Posterior (86.8%) and combined anterior -posterior approaches were used, both with (55.2%) and without decompression, partial reduction (23.7%), posterior pedicle screw fixation (94.7%) and adjacent level inter-body fusion (42.1%).

Clinical Outcome

Four patients had a total of 6 perioperative complications (15.8%). Mean follow-up time was 30.1 months (range 2-58; n=37). All patients had adequate fusion on follow-up imaging (n=34) and no progression of slip (n=32). All patients had improvement in pain (n=32) and at least average function postoperatively (94.7%; n=33/35).

Conclusions

Operative techniques for managing high-grade L5-S1 spondylolisthesis are evolving. In this systematic review, modern transsacral instrumentation resulted in good clinical outcome and fusion rates, and acceptably high complication rates. Risks and benefits should be individualized for each patient.



Pre-operative CT of a 31-year-old female treated at authors' institution with Grade IV L5-S1 spondylolisthesis presenting with back pain, right leg pain, saddle anesthesia and urinary incontinence (A). Post-operative CT at 6 weeks status post L5-S2 laminectomies, L4-L5-S1iliac instrumented fusion and 40mm transsacral interbody cage placement at L5-S1 (B). Post-operative CT at 8month follow-up showing adequate fusion and no hardware complications (C). Patient's symptoms improved significantly with continued weaning of narcotic medication. CT- computed tomography

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