

# Posterior lumbar fusion

Cloward <sup>1)</sup> is credited with championing the [posterior lumbar fusion](#) in 1940.

[Posterior lumbar interbody fusion](#)(PLIF)

[Posterolateral Lumbar Fusion](#)

[Transforaminal lumbar interbody fusion](#)(TLIF)

A [systematic review](#) of the [Medline](#), [EMBASE](#), [PubMed](#), [Web of Science](#), and [Cochrane databases](#) was performed. A hand search of reference lists was conducted. Studies were reviewed by 2 independent assessors to identify [randomized controlled trials](#) (RCTs) or comparative [cohort](#) studies including at least 10 patients undergoing [MIS](#) or open [TLIF/PLIF](#) for [degenerative lumbar spine disorders](#) and reporting at least 1 of the following: [clinical outcome measure](#), perioperative clinical or process measure, radiographic outcome, or adverse events. Study quality was assessed using the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) protocol. When appropriate, a meta-analysis of outcomes data was conducted.

The systematic review and reference list search identified 3301 articles, with 26 meeting study inclusion criteria. All studies, including 1 RCT, were of low or very low quality. No significant difference regarding age, sex, surgical levels, or diagnosis was identified between the 2 cohorts (856 patients in the MIS cohort, 806 patients in the open cohort). The meta-analysis revealed changes in the perioperative outcomes of mean estimated blood loss, time to ambulation, and length of stay favoring an MIS approach by 260 ml ( $p < 0.00001$ ), 3.5 days ( $p = 0.0006$ ), and 2.9 days ( $p < 0.00001$ ), respectively. Operative time was not significantly different between the surgical techniques ( $p = 0.78$ ). There was no significant difference in surgical adverse events ( $p = 0.97$ ), but MIS cases were significantly less likely to experience medical adverse events (risk ratio [MIS vs open] = 0.39, 95% confidence interval 0.23-0.69,  $p = 0.001$ ). No difference in nonunion ( $p = 0.97$ ) or reoperation rates ( $p = 0.97$ ) was observed. Mean [Oswestry Disability Index](#) scores were slightly better in the patients undergoing MIS ( $n = 346$ ) versus open TLIF/PLIF ( $n = 346$ ) at a median follow-up time of 24 months (mean difference [MIS - open] = 3.32,  $p = 0.001$ ).

The result of this quantitative systematic review of clinical comparative effectiveness research examining MIS versus open TLIF/PLIF for degenerative lumbar pathology suggests equipoise in patient-reported clinical outcomes. Furthermore, a meta-analysis of adverse event data suggests equivalent rates of surgical complications with lower rates of medical complications in patients undergoing minimally invasive TLIF/PLIF compared with open surgery. The quality of the current comparative evidence is low to very low, with significant inherent bias.

<sup>1)</sup>

Cloward RB. The degenerated lumbar disc: treatment by vertebral body fusion. J Int Coll Surg. 1954;22(4 Sect. 1):375-86.

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Last update: **2024/06/07 02:57**

