INPLASY PROTOCOL

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None declared.

Clinical efficacy and safety of biportal endoscopic transforaminal lumbar interbody fusion versus minimally invasive transforaminal lumbar interbody fusion in the treatment of lumbar degenerative diseases: a Meta-analysis

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Review question / Objective: **(1): Patients were diagnosed with including lumbar disc herniation, lumbar spinal stenosis, lumbar degenerative spondylolisthesis, degenerative scoliosis. (2): Patients in the intervention group underwent biportal endoscopic lumbar interbody fusion. (3): Patients in the control group underwent minimally invasive transforaminal lumbar interbody fusion. (4): Outcome: 1 operation time; 2 intraoperative blood loss; 3 postoperative hospital stay; 4 complication rate; 5 VAS(Visual Analogue Scale); 6 ODI(Oswestry Disability Index); 7 Modified Macnab grading criteria; 8 Fusion rate; 9 lumbar lordosis angleat at the last follow-up; 10 postoperative drainage flow. (5)Study design: The study types were prospective or retrospective cohort studies or randomized controlled trials.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 February 2023 and was last updated on 21 February 2023 (registration number INPLASY202320087).

INTRODUCTION

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ODI(Oswestry Disability Index); 7 Modified Macnab grading criteria; 8 Fusion rate; 9 lumbar lordosis angleat at the last follow-up; 10 postoperative drainage flow. (5)Study design: The study types were prospective or retrospective cohort studies or randomized controlled trials.

Condition being studied: Lumbar degenerative disease is a common disease occurring in the elderly population, results in structural instability, sciatica, radiating discomfort to the lower limbs, and low back pain. Lumbar spine fusion is the primary surgical procedure for the treatment of lumbar degenerative diseases. With the continuous development of surgical techniques, many open lumbar decompression fusion techniques were born, from the early posterior lumbar spine lateral fusion to different approaches of lumbar spine interbody fusion. Minimally invasive transforaminal lumbar interbody fusion with channel technology significantly reduces the stripping of posterior muscle tissue and helps reduce complications. It is currently the mainstream minimally invasive surgical approach for lumbar spine fusion. As spinal endoscopic techniques continue to innovate and evolve, they are gaining more and more attention from spine surgeons. Unilateral dual-channel endoscopic techniques have become a new technical focus for spine surgery. The present study was conducted to systematically evaluate the efficacy and safety of UBE and MIS-TLIF in the treatment of degenerative lumbar spine diseases and to provide reference values for clinical application.

METHODS

Search strategy: Database: PubMed, Embase, Web of Science, Cochrane Database, China National Knowledge Infrastructure (CNKI), Wanfang Database, and Chinese Science and Technology Journal Database (VIP) search keywords: unilateral biportal endoscopic lumbar interbody fusion, biportal endoscopic lumbar interbody fusion, BE-TLIF, UBE-TLIF, ULIF, minimally invasive transforaminal lumbar interbody fusion, MIS-TLIF.

Participant or population: Patients were diagnosed with lumbar degenerative spine disease and were treated with UBE-TLIF or MIS-TLIF.

Intervention: Unilateral biportal endoscopic lumbar interbody fusion.

Comparator: Minimally invasive transforaminal lumbar interbody fusion.

Study designs to be included: Prospective or retrospective cohort studies or randomizedcontrolled trials.

Eligibility criteria: Inclusion criteria: (1)contrastive study that compared BE-LIF with MIS-TLIF for the treatment of LDD. (2) Study designs include prospective cohort studies, retrospective studies and randomized controlled trials. (3) The search language was limited to Chinese or English. (4) Postoperative follow-up included at least three of the following reference indicators: operation time, intraoperative blood loss, post-operative drainage flow post-operative hospital stay, complication rate, modified Macnab grading criteria, fusion rate, visual analog scale (VAS) back or leg score, Oswestry Disability Index (ODI). Exclusion criteria : (1) Non-clinical comparison studies. (2) Patients with a history of spine surgery spinal infections, tumors, rheumatic immune diseases. (3) Duplicated studies. (4) Meta analysis, literature review, case-report, conference presentation, degree dissertation, etc. (5) Studies where data could not be extracted.

Information sources: PubMed, Embase, Web of Science, Cochrane Database, China National Knowledge Infrastructure (CNKI), Wanfang Database, and Chinese Science and Technology Journal Database (VIP).

Main outcome(s): 1 operation time; 2 intraoperative blood loss; 3 postoperative hospital stay;4 complication rate; 5 VAS(Visual Analogue Scale); 6 ODI(Oswestry Disability Index); 7 Modified Macnab grading criteria; 8 Fusion rate; 9

lumbar lordosis angleat at the last follow-up; 10 postoperative drainage flow.

Quality assessment / Risk of bias analysis: Newcastle-Ottawa Scale (NOS) was used to test the methodological quality and risk of bias of the included prospective or retrospective cohort studies. This 9-point scale assesses bias in three aspects: selection of study subjects, comparability between groups, and ascertainment of exposure or outcome. Studies with a score of over 6 were considered to be of high quality.

Strategy of data synthesis: RevMan 5.3 software was used for the meta-analysis. Statistics were analysed using odds ratio(OR) and 95% confidence interval (CI) as indicators for dichotomous variables and mean difference (MD) and 95% confidence interval (CI) for continuous variables. The heterogeneity in the results between the studies was analyzed using the Q-test and I2 test. If I2≥50% and P0.1 indicate insignificant heterogeneity, a fixed-effects model was used for Meta-analysis.

Subgroup analysis: We will consider subgroups such as samples.

Sensitivity analysis: We conduct sensitivity analysis by changing the inclusion criteria (especially controversial studies) and excluding low-quality studies.

Language restriction: English, Chinese.

Country(ies) involved: China.

Keywords: unilateral biportal endoscopic, minimally invasive spine surgery, transforaminal lumbar interbody fusion, Meta-analysis.

Contributions of each author:

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