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Minimally invasive surgery (MIS) techniques, particularly lateral lumbar interbody fusion (LLIF), have become increasingly popular for adult spinal deformity (ASD) correction. Much discussion has been had regarding theoretical and clinical advantages to addressing coronal curvature from the convex versus concave side of the curve. In a study, Wewel et al. aimed to broadly evaluate the clinical outcomes of addressing ASD with circumferential MIS (cMIS) techniques while accessing the lumbar coronal curvature from the concave side.

A multi-institution, retrospective chart and radiographic review was performed for all ASD patients with at least a 10° curvature, as defined by the Scoliosis Research Society, who underwent cMIS correction. The data collected included convex versus concave access to the coronal curve, durable or sensory femoral nerve injury lasting longer than 6 weeks, vascular injury, visceral injury, and any additional major complication, with at least a 2-year follow-up. Neither health-related quality-of-life metrics nor spinopelvic parameters were included within the scope of this study.

A total of 152 patients with ASD treated with cMIS correction via lateral access were identified and analyzed. Of these, 126 (82.9%) were approached from the concave side and 26 (17.1%) were approached from the convex side. In the concave group, 1 (0.8%) motor and 4 (3.2%) sensory deficit cases remained at 6 weeks after the operation. No vascular, visceral, or catastrophic intraoperative injuries were encountered in the concave group. Of the 26 patients in the convex group, 2 (7.7%) experienced motor deficits lasting longer than 6 weeks and 5 (19.2%) had lower-extremity sensory deficits.

It has been reported that lateral access to the convex side is associated with similar clinical and radiographic outcomes with fewer complications when compared with access to the concave side. Advantages to approaching the lumbar spine from the concave side include using one incision to access multiple levels, breaking the operative table to assist with curvature correction, easier access to the L4-5 disc space, the ability to release the contracted side, and, often, avoidance of the need to access or traverse the thoracic cavity. This study illustrates the largest reported cohort of concave access for cMIS scoliosis correction; few postoperative sensory and motor deficits were found [1)].

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Wewel JT, Ozpinar A, Walker CT, Okonkwo DO, Kanter AS, Uribe JS. Safety of lateral access to the concave side for adult spinal deformity. J Neurosurg Spine. 2021 May 14:1-5. doi: 10.3171/2020.10.SPINE191270. Epub ahead of print. PMID: 33990079.