BACKGROUND CONTEXT: Lumbar interbody fusion from a posterior approach affords the advantage of adding interbody fusion to a posterolateral fusion while avoiding the added morbidity of an anterior spinal approach. Transforminal lumbar interbody fusion (TLIF) provides anterior column support through a single posterolateral approach to the disc space with minimal neural retraction and disruption of only one facet joint. TLIF has been shown to be safe with relatively few complications. While the cross-sectional area of bone required to obtain an adequate arthrodensis remains unclear, case series consistently report high fusion rates for TLIF. However, prior studies have demonstrated difficulty in removing sufficient disc material through a unilateral approach.

PURPOSE: The purpose of this study was to quantitatively and qualitatively analyze the cross-sectional area of vertebral end plate prepared for fusion using a unilateral TLIF approach.


PATIENT SAMPLE: 10 human cadaver torsos.

OUTCOME MEASURES: Mean percentage of end plate cross-sectional area exposed for fusion.

METHODS: The lumbar disc levels of 10 cadavers were exposed and prepared using a standard unilateral TLIF approach by 4 spine surgeons experienced with TLIF. The spines were harvested and transected through each disc level. The opposing end plates were digitally photographed and three blinded, independent examiners determined the percent surface area exposed for fusion by calculating the amount of end plate prepared over the total end plate within the annulus using Scion Image, an image processing and analysis program.

RESULTS: 44 intervertebral discs were excised and 88 vertebral end plates were prepared. The overall mean percent of end plate surface area exposed through the TLIF approach was 60.42% (range: 48.8%–72.6%) of the total available end plate surface area. The contralateral posterior quadrant of the disc space was the area with the most residual disc material after preparation. The lateral and anterolateral disc space on the ipsilateral side also had available end plate surface area. The contralateral posterior quadrant of the disc space was the area with the most residual disc material after preparation. The contralateral posterior quadrant of the disc space was the area with the most residual disc material after preparation. Moreover, the lateral and anterolateral disc space on the ipsilateral side also had available end plate surface area. The contralateral posterior quadrant of the disc space was the area with the most residual disc material after preparation.

CONCLUSIONS: It is believed that a larger area of bony contact between the grafts and the vertebral bodies heightens the chances of successful interbody fusion. Cowlord advocated removal of almost the entire disc, leaving the adjacent surfaces of the vertebrae completely clean of all soft tissue. The current study shows a substantial amount of end plate can be prepared through a TLIF approach. However, specific regions of the disc space, such as the contralateral posterior quadrant, remain difficult to access with conventional instruments and techniques.

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CONFLICT OF INTEREST: No conflicts.

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