

The Oblique Corridor at L4-L5: A Radiographic-anatomical Study into the Feasibility for Lateral Interbody Fusion

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Objective: Lateral lumbar interbody fusion via the oblique corridor (OC) has the advantage of avoiding injury to the psoas muscle and lumbar plexus. However, the varying anatomy of major vascular structures and the iliopsoas may preclude a safe oblique access to the L4-L5 level. This study aims to analyse the prevalence, size and location of the oblique corridor (OC), and the morphology of the psoas muscle at the L4-L5 disc level.

Methods: 449 axial T2 MRI lumbar spine images of the L4-L5 level were selected. OCs were categorized into 4 grades: Grade 0 = no corridor, Grade 1 = small corridor [≤ 1 cm], Grade 2 = moderate corridor [1-2 cm] and Grade 3 = large corridor [>2 cm]. OC location was labeled as antero-oblique, oblique or oblique-lateral. Psoas morphology was categorized based on a modified Moro's classification, where the anterior section was further subdivided into types AI-AIV. Oblique approach was considered non-viable either when there was no corridor due to vascular obstruction (Grade 0) or when the psoas was high-rising (Types AII - AIV).

Results: 10.5% of the patients had no measurable OC (grade 0) at the L4-L5 level. There were 35% and 25.2% patients with a grade 1 and 2 OC respectively. The location of the OC was anterior oblique, oblique and oblique lateral in 3.7%, 89.6% and 6.7% respectively. According to the modified Moro's classification, 19.4% had a high-rising-psoas. Predominantly, psoas was either in line with the disc (Type I; 30.7%) or low-rising (Type AI; 47.4%).

Conclusion: 25% of the patients did not have an accessible oblique corridor either due to obstruction by vascular structures or due to a high-rising-psoas. Hence, proper evaluation of the relevant anatomy pre-operatively is recommended for early adopters of this technique, as varying anatomy precludes universal suitability of OLIF for the L4-L5 level.