

Peer Review File

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Reviewer A

Authors described about direct vascular injury & indirect(contralateral) vascular injury based on the location of major vessels and disc via preoperative MRI obtained from supine position.

The authors explained the difference (lateral position) from the actual surgical environment in the limitation. However, the most important point in this study is the correlation between the location of blood vessels and the disc, so the vias due to this limitation are expected to be very large.

According to previously reported studies, it is known that the vessel moves to a significantly dependent position during the lateral approach, so the degree of risk during surgery is thought to be very different.

Nevertheless, since most of the images are taken clinically in the supine position, I agree to evaluate based on the images taken in the supine position in order to establish a surgical plan.

Therefore, this paper is judged to be valuable.

I'd like to give you one opinion.

What is not well understood is the description of the dangers of the aorta or CIAs. In fact, since artery injury extreme rarely occurs during LLIF, it is thought that additional explanation is needed as to why the authors described this information. For most lateral approach surgeons, it is thought to be a risk evaluation that is not clinically necessary.

If artery evaluation is necessary, please describe the reason, and if it is not necessary, it is considered better to omit artery-related content.

Reply: The authors appreciate your comments. We do agree that arterial injuries are a very rare complication reported in the literature. However, it definitely has happened in practice that is unreported in the literature and is an extremely devastating complication. There has been a study by Kueper et al. that reported a case of aortic injury during an LLIF. Thus, although rare, we do believe that acknowledging the potential risk depending on the location of the arterial structures is also critical to be reported within the literature. This paper also provides reassurance based on radiologic data that vascular structures are also at lower risk compared to the venous structure. We have now added this discussion in introduction section for further clarification.

Changes in the text:

- Lines: 121-122 - Kueper et al. reported one case of an abdominal aorta injury during a L3-L5 LLIF [25].
- Added reference #25. All other subsequent references were re-numbered accordingly (26-39).

Reviewer B

The authors perform a nice study regarding the iliac vein at L4-5. There is a good patient sample, nice artist's illustration, and solid data analysis. This is a very important topic, and this paper is of value to spine surgeons.

Reply: The authors appreciate your comments and your time for reviewing our work.
Changes in the text: none

Reviewer C

I applaud the authors for their efforts as reported in "Vascular Injury Risk Stratification for Lateral Lumbar Interbody Fusion (LLIF) at L4-L5: A Morphometric Study using Magnetic Resonance Imaging". Understanding the anatomy in a transpsoas approach is key for a safe procedure; the vascular anatomy is no less important than the lumbar plexus in surgical planning. The authors do a nice job highlighting the variations of anatomy, in particular at the L4-5 level. My only recommendation that I felt would be helpful for readers would be a real world case presentation to highlight how this system will help in the critical pre operative decision making process, or how it might change one's surgical approach. This might highlight the utility of such stratification system.

Reply: The authors appreciate your comments and your time for reviewing our work. The authors agree that additional clinical presentations will help establish external validity of the data. We have now mentioned within the limitations section. However, since the approved study was strictly a retrospective observational imaging study, we were unable to include clinical data. Future clinical studies applying this risk stratification technique will be performed by our group as a separate project that discusses the clinical implication of this methodology.

Changes to the text:

- Lines 329-330: thus, future clinical cohort studies will be valuable for assessing the applicability of this methodology in practice.