

Peer Review File

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Reviewer A

The manuscript presents a valuable investigation in an important area of lumbar spine research, particularly maintaining natural movement without exacerbating stress across the joint. I have provided minor suggestions below to improve this manuscript submission.

Case Reports:

- The authors describe significant improvement in VAS and ODI metrics, but do not provide what these numbers are. It would be helpful if to exact changes in scores.

Reply: We have added the VAS pain severity scores and ODI values for both patients preoperatively as well as at 3 months, 1 year and 16 years, postoperatively.

Changes in the text: These values were included on pages 10 (lines 165 & 180) for case #1 and pages 11 (line 209) and 12 (line 230) for case #2.

-Descriptions are given of preoperative images. These images should also be included as figures for their respective cases.

Reply: We have included preoperative images for both patients with new Figure Legends.

Changes in the text: The new Figures have been called out in the text (lines 173 & 211).

-An expanded description of the postoperative course is needed, including PT progress, frequency of medical intervention during the recovery period, medications that were used.

Reply: We have added text describing the standard postoperative management procedures for patients undergoing lumbar total joint replacement.

Changes to the text: New text has been added to page 9 (line 146).

Discussion:

- Enhance the discussion by comparing your findings more extensively with existing literature, including PROs and radiologic findings.

Broader Implications: While the findings are promising, a more in-depth comparison between total joint replacement and arthrodesis would be valuable.

Reply: There is limited direct published comparison between TJR and arthrodesis. We provide reference to the only clinical study of TJR published to date (Sielatycki et al, reference 16). This feasibility trial showed that patients treated with TJR reported significantly better back function by

ODI than patients treated with TLIF. A pivotal, multi-center Investigational Device Exemption (IDE) trial comparing TJR with TLIF is currently fully-recruited and ongoing.

Changes to the text: No additional changes.

Overall this is an interesting study that aids our understanding of outcomes related to TJR.

Thank you very much !

Reviewer B

1. Please check through your article to make sure **all** the abbreviated terms have been defined when they **FIRST** appear in the Abstract and the main text. “CT” “MRI” “VAS” in the main text for example.

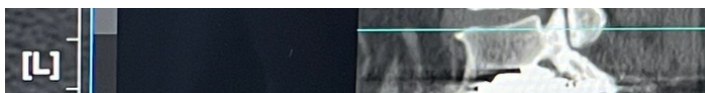
We have made these revisions.

2. Figures

- **All abbreviations** in figures and legends should be explained. “TJR” in Figure 4 for example. Please check all abbreviations and provide the full names in the corresponding legends.
- Please indicate the meaning of the green line in Figure 3 and 5 legend.
- Is there any meaning of the arrow in Figure 4?



- Please indicate the meaning of “L” and the line in Figure 6 legend.



We have spelled out all abbreviations at first appearance in each figure legend.

In all cases, we have identified the lines and the meaning of “L” in the corresponding Figure legends. The arrow in Figure 4 is a random cursor inadvertently left in the image by the radiologist and we have noted it as N/A in the legend.