

Letter To Editor

Comments on the article entitled “indications for fusion with intradural spine tumor resection in adults: a systematic review and meta-analysis”

Lei Liu^{1,2}, Yuanhao Liang³, Haiyan Qiu⁴, Bin Shi⁵, Gongchang Yu⁵, Rui Xu¹

¹Academy of Medical Engineering and Translational Medicine, Tianjin University, Tianjin, China; ²Department of Painology, The First Affiliated Hospital of Shandong First Medical University (Shandong Provincial Qianfoshan Hospital), Jinan, Shandong, China; ³Weifang Medical University, Weifang, Shandong, China; ⁴Shenzhen Pingle Orthopedic Hospital (Shenzhen Pingshan Traditional Chinese Medicine Hospital), Shenzhen, Guangdong, China; ⁵Neck-Shoulder and Lumbococral Pain Hospital of Shandong First Medical University, Shandong First Medical University and Shandong Academy of Medical Sciences, Jinan, Shandong, China

Received October 18, 2025; Accepted November 5, 2025; Epub November 25, 2025; Published November 30, 2025

We read with great interest the article by Quinceno et al. [1], which assessed preferences for spinal fusion during intradural tumor resection in adults. This systematic review and meta-analysis found that concurrent fusion was rarely indicated but could be beneficial in specific cases requiring extensive bony resection.

However, we would like to raise several concerns regarding the methodology and interpretation of the findings.

Firstly, the stated objective of this study was to analyze changes in practice patterns for stabilization and fusion following intradural tumor resection in adults. However, the authors conducted only a proportional meta-analysis [2], which does not align with that objective. A true meta-analysis of interventional measures would be necessary to explore the association between clinical outcomes and fusion procedures. Given the rarity of intradural spinal tumor surgeries, most included studies are retrospective cohorts that do not meet the inclusion criteria for interventional meta-analyses based on randomized controlled trials (RCTs) [3]. Therefore, conclusions-such as the association of fusion with reduced postoperative deformity should be interpreted cautiously.

Secondly, the reported heterogeneity was substantial for the pooled spinal fixation rate ($I^2 = 93.74\%$), laminoplasty rate ($I^2 = 99.82\%$), and postoperative deformity ($I^2 = 78.05\%$). Meta-regression and sensitivity analyses should have been performed to identify possible sources of heterogeneity [4]. In addition, variability in diagnostic criteria and study designs likely decreased the reliability of the pooled results. The authors should have considered key study characteristics-such as sample size, follow-up duration, and surgical techniques-as potential moderators in subgroup analyses [5]. Similar methodological approaches have been successfully applied in meta-analyses of fusion surgery for degenerative spinal disease [6], which could serve as valuable references for addressing heterogeneity.

Thirdly, although this meta-analysis concluded that fusion surgery may be beneficial in certain situations, specific details-such as surgical indications, contraindications, and procedure types were not provided. We suggest that the authors incorporate recent advances in spinal surgery, such as the use of 3D-printed personalized fixation systems [7], as well as updated clinical practice guidelines, including the 2024 Consensus on the Diagnosis and Treatment of Spinal Tumors [8], to offer a more contemporary perspective on fusion indications.

Fourthly, the analysis did not explore whether tumor histology (e.g., schwannomas vs. spinal cord tumors) influenced the effectiveness of fusion. Given that different pathological types may exhibit distinct biomechanical implications, further stratified analyses would enhance the study's clinical relevance.

Finally, the assessment of publication bias should have been conducted using both Egger's and Begg's tests [9], taking into account that these methods have limited power when fewer than 10 studies are included. Alternative approaches, such as qualitative funnel plot assessment or the trim-and-fill method, should also be considered in such cases [10], as they provide better robustness when the number of studies is small (≤ 10).

In conclusion, we commend Quinceno et al. [1] for contributing valuable evidence to the field of intradural spinal tumor surgery. Their findings provide an important reference for clinical decision-making. Nevertheless, further prospective studies with larger sample sizes and rigorous methodological design are warranted to strengthen the evidence base.

Acknowledgements

This study is supported by the Key Research and Development Program of Shandong Province (2022CXGC020510).

Disclosure of conflict of interest

None.

Address correspondence to: Rui Xu, Academy of Medical Engineering and Translational Medicine, Tianjin University, No. 92, Weijin Road, Tianjin 300072, China. Tel: +86-022-83612122; Fax: +86-022-83612122; E-mail: xrblue@tju.edu.cn

References

- [1] Quinceno E, Hussein A, Pico A, Abdulla E, Bauer IL, Nosova K, Moniakos A, Khan MA, Farhadi DS, Prim M and Baaj A. Indications for fusion with intradural spine tumor resection in adults: a systematic review and meta-analysis. *World Neurosurg* 2023; 176: 21-30.
- [2] Barker TH, Migliavaca CB, Stein C, Colpani V, Falavigna M, Aromataris E and Munn Z. Conducting proportional meta-analysis in different types of systematic reviews: a guide for synthesizers of evidence. *BMC Med Res Methodol* 2021; 21: 189.
- [3] Hestbaek E, Kofoed J, Barlow J, Thorup AAE, Sled M, Simonsen S, Georg AK, Vaever MS and Juul S. Protocol for a systematic review with meta-analysis and trial sequential analysis of preventive interventions versus any control intervention for parents with a mental disorder on offspring outcomes. *Syst Rev* 2024; 13: 292.
- [4] Stogiannis D, Siannis F and Androulakis E. Heterogeneity in meta-analysis: a comprehensive overview. *Int J Biostat* 2023; 20: 169-199.
- [5] Lijmer JG, Bossuyt PM and Heisterkamp SH. Exploring sources of heterogeneity in systematic reviews of diagnostic tests. *Stat Med* 2002; 21: 1525-1537.
- [6] Pokorny G, Amaral R, Marcelino F, Moriguchi R, Barreira I, Yozo M and Pimenta L. Minimally invasive versus open surgery for degenerative lumbar pathologies: a systematic review and meta-analysis. *Eur Spine J* 2022; 31: 2502-2526.
- [7] Ren J and Lyu Z. 3D printed personalized lumbar spinal fusion device design and biomechanical performance analysis. *Zhongguo Gu Shang* 2021; 34: 764-769.
- [8] Chhabra AM, Snider JW, Kole AJ, Stock M, Holtzman AL, Press R, Wang CJ, Li H, Lin H, Shi C, McDonald M, Soike M, Zhou J, Sabouri P, Mossahebi S, Colaco R, Albertini F and Simone CB II. Proton therapy for spinal tumors: a consensus statement from the particle therapy cooperative group. *Int J Radiat Oncol Biol Phys* 2024; 120: 1135-1148.
- [9] Phua QS, Lu L, Harding M, Poonnoose SI, Jukes A and To MS. Systematic analysis of publication bias in neurosurgery meta-analyses. *Neurosurgery* 2022; 90: 262-269.
- [10] Beach SR, Kostis WJ, Celano CM, Januzzi JL, Ruskin JN, Noseworthy PA and Huffman JC. Meta-analysis of selective serotonin reuptake inhibitor-associated QTc prolongation. *J Clin Psychiatry* 2014; 75: e441-449.