Lumbar disc mimicking tumor

To The Editor: We read with great interest the article by Dr. el Barzouhi and colleagues (el Barzouhi A, Vleggeert-Lankamp CLAM, Lycklama à Nijeholt GJ, et al: Predictive value of MRI in decision making for disc surgery for sciatica. Clinical article. J Neurosurg Spine 19:678–687, December 2013). In a randomized controlled study, they found MRI to be of little value in predicting an eventual discectomy. The authors are to be commended for conducting the trial to provide this Level I evidence. However, we respectfully point out that there are a few scenarios in which MRI could be extremely helpful or necessary when the postponement of a lumbar discectomy is considered.

First, MRI is critical to rule out neurogenic tumors causing sciatica. Nevertheless, some disc herniation may also have enhancement of contrast media in MRI, which is typical for neoplasm. Also, there is occasionally enhanced disc herniation such that its morphology can mimic a schwannoma (Fig. 1). Second, MRI is useful for the evaluation of foraminal stenosis caused by a far-lateral disc herniation. Last, but not least, MRI can provide information about the neighboring facet joints, which could affect the strategy of intervention.

To date, there are still controversies in the management of lumbar disc herniation, including the timing and surgical approach. Since the current report focused on the index level of disc herniation, perhaps a post hoc analysis of the adjacent levels in the same clinical trial could also provide invaluable data.
Neurosurgical forum

Complication avoidance in intradural extradural spinal tumors

To The Editor: We read with great interest the article by Mehta et al.1 in the Journal of Neurosurgery: Spine (Mehta AI, Adogwa O, Karikari IO, et al: Anatomical location dictating major surgical complications for intradural extradural spinal tumors: a 10-year single-institutional experience. Clinical article. J Neurosurg Spine 19:701–707, December 2013). The authors analyzed a series of 96 patients with intradural extramedullary (IDEM) tumors and concluded that postoperative neurological deficits occurred most frequently in cases with anteriorly located tumors between T-1 and T-8. Their article provides valuable insight by correlating tumor location with postoperative complications. However, we respectfully propose several other factors that could be considered by the authors.

The size of the tumor should be taken into consideration.2 Were tumors of variable sizes within the same location group associated with a similar rate of complications? In our practice, a patient recently presented with a tumor in T-2, and the lesion occupied almost all 3 categories proposed in the article (Fig. 1). Gross-total removal of the tumor was achieved from behind, via laminectomy and facetectomy, without neurological complications. Would the authors consider different surgical strategies according to the diameter of the tumor?

Moreover, the interface between the tumor and the spinal cord also affects outcome.2 Usually there is an arachnoid plane between the IDEM tumor and the spinal cord. However, sometimes the tumor can be strongly affixed to the spinal cord, and it is risky and almost impossible to dissect. For example, another patient of ours had a spinal tumor at a very similar anatomical location (Fig. 2). During the operation, the tumor-cord interface was so


RESPONSE: We would like to thank Dr. Kuo et al. for their interesting letter. The authors present 3 interesting scenarios in which MRI could be helpful. First, to rule out neurogenic tumors causing sciatica. Second, for the evaluation of foraminal stenosis caused by a far-lateral disc herniation. Third, MRI can provide information about the neighboring facet joints, which could affect the strategy of intervention.

The presented scenarios are not inconsistent with our conclusions. Our study showed that MRI findings were not predictive for future lumbar disc surgery in patients who suffered from 6–12 weeks of sciatica. We therefore concluded that the role of MRI remains limited to depict the anatomical features and the level of a herniated disc, necessary for the surgical technical approach, and should not be used as a prognosis tool in the shared decision-making discussion for surgery versus wait-and-see. We did not question whether or not MRI should be performed or the optimal timing of MRI in sciatica.

Current guidelines recommend performing MRI after 6 to 12 weeks of sciatica. Magnetic resonance imaging provides information about the cause of sciatica (scenario 1) and what surgical approach is most appropriate (scenarios 2 and 3). However, as our study suggests that MRI is not predictive for future lumbar disc surgery, one should be cautious to base the decision for lumbar disc surgery on MRI findings. In fact, clinical variables, such as the severity of disability and leg pain, proved to be of more discriminatory value.

When assessing the disc levels at adjacent levels (levels outside the index level of disc herniation), we observed that the percentage of impaired discs at these levels was 80% in those who did and 72% in those who did not undergo disc surgery (p = 0.49).

Future studies are needed to assess the optimal timing of performing MRI in the evaluation of patients with sciatica. The optimal timing for lumbar disc surgery also remains to be established.

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Fig. 1. A: Preoperative sagittal T2-weighted MR image revealing a spinal tumor in the segment of T1–3. B: Preoperative axial T2-weighted MR image of the tumor occupying three-quarters of the spinal canal (a clock position from 12 to 9 o'clock). C: Postoperative sagittal section of the indicated level. D: Postoperative axial view of the indicated level, suggesting proper re-expansion of the spinal cord.
strongly attached that, even under the highest magnification and neuromonitoring, a thin layer of tumor was left to keep the spinal cord intact.

Intradural extramedullary spinal tumors consist of a variety of pathologies and can present with heterogeneous manifestations. The authors are commended for sharing their data with the worldwide readers of the Journal of Neurosurgery: Spine and for successfully demonstrating the importance of a tumor’s location. It is intuitive to infer a few other factors (for example, size, interface, and pathology) that could complicate the operation. Therefore, surgical strategies must be tailored individually for an optimal outcome.1,3–5

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Nonexpandable tubular retractors and spinal tumors


The authors’ goal was to answer the question whether a nonexpandable retractor could be feasibly and efficaciously utilized in the resection of tumors in the thoracic and lumbar spine. To this end, they described their experience in 13 cases, including both extradural and intradural-extramedullary tumors. The authors utilized tubular muscle dilation techniques and completed the operations with a final 18-mm working portal. They reported no significant operative or postoperative complications and gross-total resection in all but a single case. The mean blood loss per case was 219 ml and the mean length of stay was just under 3 days.

We applaud the authors’ excellent treatment of these patients and are strong advocates of the use of minimally invasive techniques in the treatment of spinal malignancy. However, we question the conclusion that a nonexpandable retractor provides a substantial advantage over previously described reports. The authors state that nonexpandable retractors may be associated with “even less tissue destruction than mini-open techniques, translating to shorter operative time and hospital stay.” First, this appears to be an overstatement of the currently reported data. Without an open control group with similar pathological conditions treated with open or mini-open approaches or even with minimally invasive expandable retractors, it is difficult to come to this conclusion. Furthermore, it is our belief that an additional 4–6 mm added to the incision for the use of an expandable retractor will not affect outcomes.1,4 This is especially true when an incision is made off midline and the midline tension band is preserved. In addition, built-in mechanisms for angulation and expansion of the retractor blades give the surgeon intraoperative flexibility to adapt to the size of the dural opening as well as exposed soft tissue for fixation of tenting sutures after opening of the dura. These are advantages realized both for surgeons who are early on the learning curve and for operators comfortable with the technique.
Nzokou and colleagues have additionally grouped 6 separate minimally invasive and mini-open reports. In doing so, they have additionally calculated overall fusion rates, perioperative outcome measures, and complication/revision rates. Given the unique surgical challenges of different tumor types—intradural versus extra-dural, foraminal versus extra-foraminal, metastatic versus primary—we feel that this table is inappropriate. These are disparate groups that have unique anatomical and technical demands. To this point, the authors state that their approach does not require a fusion. They cite the report of Lu et al., in which 2 of 3 patients required fusion. On closer inspection, that series does not represent a comparable set of patients. In Case 2 in the series of Lu et al., the patient was intraoperatively found to have a pseudarthrosis requiring fusion (this was not a result of the surgical approach). In Case 1, the tumor was quite large (> 2 cm) and likely had created preoperative instability.

Summarizing our thoughts, we strongly believe the use of minimally invasive techniques will promote better care for patients with spinal malignancies. This holds true, regardless of the use of a retractor type, or even minimally invasive versus mini-open exposure. Further study and evaluation of these techniques should be applauded, and we commend the authors for their contribution.

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Disclosure

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Response: We thank Drs. Smith and Fessler for their interest and insightful comments regarding our paper. Their group has pioneered minimally invasive surgery techniques for the treatment of various pathological conditions of the spine and they have paved the way for minimally invasive spine surgery.

Drs. Smith and Fessler question whether the use of nonexpandable tubular retractors offers a real advantage over expandable retractor systems in patients harboring spinal neoplasms, referring to our statement that nonexpandable retractors “may” result in “less tissue destruction than mini-open techniques, translating to shorter operative time and hospital stay.” We do agree that any difference between nonexpandable retractors, which provide rigid dilatation up to 24 mm, over expandable tubes, which provide adjustable dilatation up to 52 mm, may be clinically negligible. Keeping in mind the inability of a recent randomized trial to show a significant clinical advantage of minimally invasive surgery over standard open discectomy, where the size of incision and bone removal are quite similar, we agree that it may not be likely that nonexpandable tubes actually translate to significant improvement in clinical outcome compared to the expandable tubes used in minimally invasive or mini-open techniques.

We sought to suggest that the smallest feasible incision, with less muscle disruption possible, should always be the goal and that this may potentially improve results. Although this may not be the experience of others, in our hands, when using adjustable tubes, the paraspinal muscle tends to creep into the operative field and must be coagulated and/or excised, potentially resulting in more muscle destruction; this may be avoided with smaller nonexpandable tubes. Although this does come at the cost of a smaller, rigid, nonadjustable exposure, we have been able to resect very large extradural tumors and small intradural tumors using this approach. However, as we stated in our paper, “Further studies are needed to evaluate the relative safety and efficacy of minimally invasive resection of spinal tumors compared with standard open or newer mini-open techniques.” Any conclusion regarding the relative efficacy of different tubes or minimally invasive surgery over mini-open or open techniques is currently based on anecdotal Level 3 evidence, and the only way to adequately show a difference would be a prospective, multicenter randomized controlled trial comparing these techniques.

Regarding Table 3 in our paper, which summarizes the current literature, we completely agree with the authors that the patient populations in the reported series are heterogeneous, rendering comparisons difficult if not impossible. The main take-away point of this table is that multiple groups have shown the feasibility of minimally invasive spine tumor resection prior to our report, suggesting that it is both safe and effective in experienced hands. The authors correctly point out that the 3 cases of lumbar schwannomas resected through a mini-open approach reported by Lu et al. are not comparable to our cases.

Fusion was performed in all 3 cases reported by Lu et al., but it was performed for preoperative instability in 2 cases, as a result of pseudarthrosis following prior L3–S1 fusion in one and lumbar discectomy in another, and instability was likely not related to the approach. In the third case (Case 1), however, there is no mention of prior instability, and we do not think that this can be assumed based on the tumor size alone. Accordingly, 2 of the cases in our series involved large (> 5 cm in one) and moderate-sized (2 cm in another) extradural lumbar schwannomas that were resected through a minimally invasive approach without requiring subsequent fusion surgery. That being said, both the mini-open and minimally invasive surgical approaches have a similar advantage over a standard open...
midline approach to resect tumors, especially very large lumbar extradural foraminal tumors, in that radical facetectomy and any potential deformity or fusion surgery may be avoided. This certainly applies less to smaller, intradural-extramedullary or intramedullary tumors. We greatly appreciate the input and constructive comments provided by Drs. Smith and Fessler.

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