Letter to editor: Wrong level surgery for intradural thoracic spinal tumour

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Sir,

We read with interest the paper by Dubios LJ and Nissen J: Potential wrong-level surgery for an intradural thoracic spinal tumour: the importance of optimum imaging and consistency in the direction in which the level is determined. (Br J Neurosurg. 2016 Mar 4:1–2 [Epub ahead of print]).

The authors describe a case of a 75-year-old lady with myelopathy who was referred to them for surgery with a magnetic resonance imaging (MRI) diagnosis of a T6-7 intradural meningioma. This level was determined on a cervico-thoracic MRI done at a different hospital. They ordered another whole spine MRI to facilitate intraoperative localization from the lumbo-sacral junction cranially. Counting from the sacrum upward, they realized that the meningioma was at T7-8 and not at T6-7, potentially avoiding wrong level surgery.

They suggest that due to the bony anatomy of the ribcage, intra-operative fluoroscopy may make counting from the cervical spine difficult and advice to count from the lumbosacral junction upwards. We agree with the authors that a combination of factors such as patient size, scapular shadows and decreased bone density makes accurate counting of the spines with fluoroscopy difficult. They also make a passing statement about the pre-operative localization techniques and only mention pre-operative marking using a computed tomography apart from intraoperative fluoroscopy to identify the correct level for these lesions.

We would like to bring to the attention of the authors and readers of your journal, a simple and effective method described by us to address the problem of wrong level surgery for intradural thoraco-lumbar tumors. The technique consists of pre-operative MR localization using cod-liver oil capsules and has been validated in a series of 33 consecutive patients. In brief, the patient undergoes a T2-weighted sagittal and axial MRI in prone position with the placement of these capsules in three rows to cover the length of the lesion. (Figure 1) Upon completion of the MRI, the capsules are removed and the levels are marked with indelible ink.

In the operating room, after intubation, the patient is turned prone with the upper limbs by the side to reproduce the position used in the MRI room. At surgery, a small midline skin incision is made based on the markings made the day before and dissection is carried out to expose the unilateral hemi-lamina or laminae. A perpendicular trajectory is maintained removing bone and ligaments to expose the dura on the side of the lesion and the tumor is excised via a hemi-laminectomy approach. We have now used this method in over 80 patients with excellent results.

Cod-liver oil capsules are inexpensive costing 0.3 USD for 9 capsules, do not produce artifacts on the MRI and the patient is not inconvenienced by the procedure. The disadvantage of this technique is that the patient requires an additional MR imaging the day before surgery. Compared with other techniques, accurate localization with the method documented by us is quick, safe, cost-effective and non-invasive with no exposure to radiation. It also reduces operating time by eliminating the need for intraoperative fluoroscopy.

With the use of our technique there is no need to count the level on radiographs, either from above or below as suggested by the authors, since the level of surgery is marked preoperatively. Most importantly our method provides localization based on visualization of the intradural pathology and not bony anatomy and is therefore, less likely to be erroneous. Use of bony landmarks may lead to the use of longer incisions to ensure that an intradural mass is not missed.

We have tested the efficacy of the localization technique described by us while performing a minimally invasive...
hemilaminectomy approach, an approach that is less forgiving of an error in localization.

Disclosure statement

The author reports no conflict of interest. The authors alone are responsible for the content and writing of this article.

References
