Nonpenetrating titanium clips for dural closure during spinal surgery

TO THE EDITOR: We enjoyed the recent article by Ito et al.1 (Ito K, Aoyama T, Horiuchi T, et al: Utility of nonpenetrating titanium clips for dural closure during spinal surgery to prevent postoperative cerebrospinal fluid leakage. J Neurosurg Spine 23:812–819, December 2015). The authors report the results of bench studies and clinical data in 31 patients with the use of nonpenetrating titanium clips to close the dura during spinal surgery. They found that clips have superior leakage pressure when compared to conventional suture material. The leakage incidence was acceptably low when examined using postoperative MRI at 2 weeks (3.2%). The authors conclude that the clips are useful in spinal surgery as they can close the dura without creating any holes, do not create significant MRI artifact, and have a superior leakage pressure when compared with conventional suture material. We agree with all of their conclusions.

However, we were disappointed to see the authors state that “no published experimental or clinical studies have described the usefulness of nonpenetrating titanium clips for the prevention of postoperative CSF leakage.” We published our experience with the same clips in 2010.2 We reviewed our experience in 26 children undergoing 27 operations over a 20-month period. We found similar results: no CSF leakage and no significant artifact on CT or MRI. One patient required reoperation 13 months after the initial surgery; the prior use of clips did not make the subsequent exposure more complicated. Since 2007 we have used these clips routinely in our practice and have continued to have success in approximately 150 cases. We have made the following observations since our original publication: 1) There are different sizes available. We have found that the 2-mm “large” AnastoClip VCS (Le Maitre Vascular Inc.) works best. 2) Thicker dura like that found in the posterior fossa can be difficult to close satisfactorily with the clips. 3) Unlike suture, the clips cannot be used to bring dura together under any significant tension. A completely tension-free closure is required. 4) When applying the clips one can hold the trigger down to continually grab the 2 edges of dura through the deployed clip while using the other hand to move down the line to reapproximate the dural edges at the site of the next clip. By alternately grabbing the dural edges with the clip applier and dural forceps, one can rapidly close the dura. It typically takes less than 30 seconds to close a 2- to 3-cm long durotomy in this manner. 5) The clips are ideal for deep, narrow exposures such as that seen with muscle-sparing split laminotomies. One only requires an approximately 7- to 8-mm width of bony exposure to adequately apply the clips, less than that required for suturing with a TF or C-1 needle (13 mm) typically used with 4-0 or 5-0 suture. We expect the omission of our previous work in this area was a mere oversight. We would like to congratulate Dr. Ito and colleagues on their thoughtful, more thorough investigation on the utility of these clips.

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References

Disclosures
The authors report no conflict of interest.

Response
Thank you for alerting us to the availability of your publication. Please accept our sincere apologies for not including your valuable publication in our paper.

We have now read your paper and understand the important contribution it makes regarding the usefulness of the nonpenetrating titanium clip. In addition, we have learned many important techniques that will prevent postoperative CSF leakage based on your experience with the cases in which you have applied the nonpenetrating titanium clip. We are extremely grateful to you for this.
Our article describes a fundamental study that investigated the leakage pressure and leakage pattern associated with the nonpenetrating titanium clip, and we determined that it helps to prevent postoperative CSF leakage. Compared with the cranial dura mater, the spinal dura mater is very fragile and it tends to tear easily. Based on the findings from your own study and our study, the nonpenetrating titanium clip can be considered very useful for approximating the spinal dura.

We greatly appreciate your ongoing support of our endeavors.

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High-grade spinal cord glioma

TO THE EDITOR: We read with interest the article by Crowley et al.1 (Crowley RW, Burke RM, Lopes MBS, et al: Long-term cure of high-grade spinal cord glioma in a pediatric patient who underwent cordectomy. J Neurosurg Spine 23:635–641, November 2015). We found the article well written and well illustrated, but short on 1 reference. We realize that not all publications on any topic need to be referenced. However, our case, described in Viljoen et al.,2 represented, up until its publication last year, the longest documented survival. Our patient did survive after cordectomy for spinal cord glioblastoma for 12 years and did witness his daughter graduate from physical therapy school. We agree with Crowley and colleagues that cordectomy is indeed an operation that has its indications.

We take this opportunity to thank the authors for bringing this oversight to our attention.

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Steroid use in anterior cervical discectomy and fusion

TO THE EDITOR: I read with interest the article by Jeyamohan et al.3 (Jeyamohan SB, Kenning TJ, Petronis KA, et al: Effect of steroid use in anterior cervical discectomy and fusion: a randomized controlled trial. J Neurosurg Spine 23:137–143, August 2015). The study was well conducted, and the conclusions were of interest to many. However, I am concerned about a protocol that required 3 fine-cut CT scans of the cervical spine at 6, 12, and 24 months after surgery for fusion assessment in a group of patients averaging 54 years of age. Computed tomography scanning has long been considered the gold standard in assessing the results of arthrodesis (see, for example, Siambanes and Mather, 1998); however, recent data on the potential harm from CT-related ionizing radiation has added an element of caution to the routine use of CT imaging, especially in children (see Table 2 and Fig. 2 in Hikino and Yamamoto, 20152,6,7). The Committee to Assess Health Risks from Exposure to Low Levels of Ionizing Radiation promulgated a significant linear, no-threshold dose-response relationship between ionizing radiation dose and the development of cancer in humans, based in part on data from Japanese atomic bomb survivors.8 It has been estimated that 29,000 future cancers might be attributed to CT scans performed in the United States in 2007.2

A cervical spine CT is estimated to expose a patient to 4 mSv of radiation.9 According to one assessment, a routine neck CT in a 40-year-old patient would cause 1 radiation-induced cancer in 4430 female or 6058 male patients (see Table 4 in Smith-Bindman et al., 200910). In those 60 years of age, the estimated risk was reduced to 1 case in 6700 female or 8030 male patients. Accordingly, 3 cervical CT scans would raise the risk for any cancer to 1477 females or 2019 males at 40 years of age. Some have questioned even the routine use of postoperative radiographs in post–anterior cervical fusion patients whose clinical course is unremarkable.1 To spare patients unnecessary radiation exposure, CT or flexion-extension radiographs have been utilized only if clinical symptoms or radiographs were suggestive of pseudarthrosis.

As regards cervical spine CT in children, one report8 described a risk of excess thyroid cancers ranging from 1 to 33 cases per 10,000 CT scans in females or 1 to 6 cases for 10,000 CT scans in males. In another recent report,4 the thyroid cancer estimate was as high as 100 cancer cases in males or 700 cancer cases in females per