Peer Review File

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Reviewer A

Comment: This is a retrospective single center study on the use of modular pedicle screws for thoracolumbar fusion surgeries. 1,872 screws were inserted in 285 patients over a 3-year period from 2017 to 2019. Hardware failure and other preoperative complications were investigated and described using simple descriptive statistics. No screw head dissociation was observed (primary outcome), and other hardware failure and complications were comparable to the pertinent literature.

Of note, this is a retrospective, single center, single surgeon series trying to highlight the non-inferiority of modular pedicle screws, but no control group was included to compare outcomes in different subcategories of surgeries and nothing is said about truly meaningful indications for modular screws, such as MIS-TLIF or MIS-CBT screws that give the surgeon space for decompression between the screw shanks and a better field of vision.

Reply: This is clearly not a case-control study. All the reported comparisons in this work were made with other published studies in the literature. While the main goal of this study was to investigate the complications, we have elaborated about the usage of this system in the introduction section. Though there might be potential use of modular screws in MIS procedures, all the surgeries studied here were done by open techniques.

Comment: What would be the rationale for using modular screws in a midline open T10 to pelvis fixation without any bony work?

Reply: As mentioned in the results section and graphically displayed in figure 2, the majority of cases were short-segment fusions. However, many long posterior fusions with or without direct decompression can benefit from the new technology. In addition to make a better field of vision for bony work, decortication under screw head and improving access to the lateral gutter for bone graft, modular screws allow the configuration of the construct to be changed very easily (especially in long constructs) by providing more options in rod connectors. The authors have added these advantages of modular screws to the introduction section.

Comment: It's simply a surgical bias in selecting one product over the other. One could bluntly argue that modular screws fulfill what they were built for, namely being strong pedicle screws that do not break at their junction. This finding itself is not convincing enough to warrant publication, since the material properties of modular pedicle screws with cobalt chromium are the same as for non-modular polyaxial pedicle screws.

Reply: The literature abounds with articles focusing on complications of new surgical products. The study was designed specifically to determine the rate of complications associated with the modular screws. Although “material properties” of the screws are important and affect the hardware-related complications, the main concern here was the “modularity” of the screws that

might cause extra complications. The authors conducted the study to simply address a clinical question regarding the potential risk using these modular screws.

Comment: I disagree with the last sentence of the conclusion in the abstract (page 3, lines 53-54). The modular screw technology itself has nothing to do with safe screw placement, since screw placement accuracy was not investigated in this study.

Reply: Agreed. The technology has nothing to do with accuracy of screw placement. However, the authors didn't mean that. Here, we meant the use of modular screws was not associated with increased rate of complications, and was safe from extra complications. To clarify the issue, we rephrased the sentence in the text as follows," Modular pedicle screws present an excellent option to allow surgeons to place pedicle screws without the risk of extra complications."

Reviewer B

Comment: This paper was clearly presented despite the great heterogenicity of the cases, demonstrating the habitual complications given by the use of the pedicular screws but mainly it demonstrates the safety of the 1,872 modular head/screw junction observed?

Reply: That is the whole point of this study. To show that in a heterogenous group of cases with various stresses on the modular screws at different constructs, the rate of complications is not higher than conventional pedicle screws. The main concern surrounding the modular screws was the potential risk of head/screw junction dissociation. The authors showed that despite the heterogeneity of diagnoses, no incident of this potential complication was noted.