

Finally, and of particular relevance to our article, without knowing when our patients have experienced complications, we cannot appreciate our potential failings, and lack the necessary information to guide quality of care improvements. Thus, it is entirely appropriate and important for all clinicians, including anesthesiologists and surgeons, to track postoperative outcomes. On many occasions, information on complications can only be gleaned from patients' reports. Based on our experience, our patients are pleased when we follow up with them to track their positive and negative outcomes, and increasingly they expect us to do this.

### Competing Interests

The authors declare no competing interests.

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## Complexities of Bleeding During Spine Surgery: It'll Take Your (Mechanical) Breath Away

To the Editor:

We read with great interest the article by Kang *et al.*<sup>1</sup> wherein the authors report the effect of mechanical ventilation mode on perioperative blood loss in patients undergoing posterior lumbar interbody fusion surgery. The authors report that pressure control ventilation, by limiting peak inspiratory airway pressure, reduced median intraoperative blood by 130 ml.

We would like to highlight several limitations of this study, which may confound interpretation of the results:

1. The authors' description of the surgical procedures performed in the study is vague. The surgical procedure is described as "posterior lumbar interbody fusion (two or three levels)" in subjects with no previous surgery. It is important that more granular information about the surgical procedures performed in each group be provided. The exact number of intervertebral cage constructs (necessitating a discectomy), extent of Smith-Peterson osteotomies, and the number of laminectomies performed during multilevel spine surgery have a linear correlation with perioperative blood loss.

One tool the authors could have used to quantify the extent of surgery and the associated risks of bleeding is the Spine Surgery Invasiveness Index, first reported by Mirza *et al.*<sup>2</sup> This scoring system assigns each operated level a score between 0 and 6 based on whether an anterior or posterior decompression, instrumentation, and/or fusion was performed and explains at least 44% of the variation in blood loss. By not reporting more detailed information regarding the surgery, it is difficult to establish whether the two groups underwent surgical procedures with an equivalent risk of blood loss. The group size (28 patients per group) is too small to assure that randomization would equalize these factors.

2. The authors describe preoperative coagulation parameters; however, no intraoperative coagulation results or allogeneic blood product administration is reported. Several studies have reported the hemostatic abnormalities encountered during spine surgery. Furthermore, hypofibrinogenemia is increasingly recognized as an important cause of intraoperative bleeding.<sup>3</sup> It is critical to exclude the impact of any underlying intraoperative coagulopathy as the cause of difference in patient blood loss reported by the authors.

In conclusion, this article suggests that the mode of mechanical ventilation, by altering airway pressure and inferior vena cava compression, will ultimately affect surgical-site bleeding. However, the authors have not provided sufficient surgical and coagulation data to demonstrate conclusively that mode of mechanical ventilation was the only factor responsible for the observed difference in blood loss.

### Competing Interests

The authors declare no competing interests.

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