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doi:10.1016/j.jtcvs.2011.12.066

Reply to the Editor:

We thank Biancari for his comments on and additions to our article. Although the risk of neurologic complications cannot be completely avoided after surgical revascularization and is most likely associated with the underlying risk profile,¹ we agree that atherosclerosis of the ascending aorta is among the most important predictors for the occurrence of stroke. Epiaortic ultrasonography has been demonstrated to be more accurate than digital palpation in the detection of aortic atherosclerosis² and can be considered the standard of care for the detection and characterization of aortic plaques in the ascending aorta. Despite this knowledge, epiaortic ultrasonography is not established for routine use in most centers.³

The potential benefit of combining off-pump and aortic no-touch techniques has been repeatedly shown to be a significantly reduced stroke rate.⁴ Although in situ grafting may be considered the criterion standard whenever possible, for free graft use requiring proximal anastomosis, our series has clearly shown that the use of the HEARTSTRING device (MAQUET Cardiovascular LLC, San Jose, Calif) yields stroke rates comparable to those achieved with no-touch, in situ techniques.³

We acknowledge the most recent meta-analysis, which included 8 studies with a total of 819 patients with

a pooled stroke rate of 1.9% (95% confidence interval, 0.8%–4.5%) with the use of the HEARTSTRING device⁵; however, it appears that in 6 of these studies (accounting for 88% of all included patients; 719/819), the stroke rate was either 0% (5 studies; n = 305 patients) or 0.5% (1 study; n = 412 patients), whereas in only 2 studies, accounting for only 100 patients (12%; n = 19 and n = 81), were stroke rates substantially higher at 3.7% (accounting for 3 events) and 5.2% (accounting for 1 event).⁵ In contrast, the report of Hilker and colleagues,⁶ representing the largest series of the evaluated studies, supports our findings highlighting the potential benefit of the HEARTSTRING device with regard to a reduction in stroke rate.

We agree that a prospective, randomized trial in combination with the standardized application of epiaortic ultrasonography would be ideal to assess the potential clinical value of clampless devices such as the HEARTSTRING device in reducing neurologic complications.

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doi:10.1016/j.jtcvs.2012.01.060

SIMULATION OF THORACOSCOPIC SURGERY USING 3-DIMENSIONAL TAILOR-MADE VIRTUAL LUNG To the Editor:

I read the article titled “Simulating video-assisted thoracoscopic lobectomy: a virtual reality cognitive task simulation” by Solomon and colleagues¹ with amazement, and I applaud their efforts to adopt and improve new technology. Their efforts are not only very important in contributing to the education of young thoracic surgeons but are also of help to senior surgeons educating young surgeons. It is important to practice the steps involved in thoracoscopic surgery on one element that was absent in the work by Solomon and associates¹—that is, the ability to simulate anatomic variability.

Thoracic lobectomy for lung cancer has been gaining widespread popularity, particularly in the treatment of early-stage lung cancer, and thoracoscopic segmentectomy has also been conducted in some institutes. However, anatomic variations in the pulmonary vessels carry a potential risk of uncontrollable intraoperative bleeding; therefore, it is necessary to emphasize this issue while educating young surgeons. The education of young thoracic surgeons is undoubtedly important; however, it is far more difficult to teach thoracoscopic surgery than it is to teach thoracotomy surgery. During thoracotomy surgery, senior surgeons can touch the organ directly with forceps or fingers to indicate the point of division. During thoracoscopic surgery, surgeons do not touch the monitor to prevent bacterial