Rewarming strategy and neuromonitoring are significant details in neurological outcome after surgical repair of type A aortic dissection†

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We with great interest read the article by Haldenwang et al. [1] on the evaluation of the risk factors for transient neurological dysfunction and adverse outcome after repair of acute type A dissection. We recognize the importance of their aim to assess pre- and intraoperative factors that can cause neurological impairment. We do, however, have a few comments and suggestions for more proper clinical management in such complex cases.

One form of transient neurological deficit (TND) was defined by Haldenwang et al. as persistent loss of cognitive function without changes on computed tomography or complete resolution before discharge, which is, in our opinion, closer to the definition of permanent neurological damage. Morphological changes that cause persistent cognitive loss can be detected with more sensitive methods such as MR, but functional changes may regress or disappear before discharge because of brain plasticity [2]. Therefore, the evaluation of cognitive function requires the application of specific functional tests [3]. Axillary cannulation is technically difficult, but is associated with less local and systemic complications. In the case of emergency, an alternative, but safer approach often has to be used [4]. Haldenwang et al. did not specify what type of cannulation modality was used in patients with poor mental status prior to surgery (n = 36), which was found to be a significant predictor of adverse outcome and TND. Although the authors found a statistically significant correlation between femoral cannulation and stroke incidence, analysis of cannulation modality in this subset of patients with poor mental status may cast a different light on the stipulated correlation. Selective cerebral perfusion (SCP) is a widely accepted strategy for cerebral protection during aortic surgery. However, certain technical difficulties can occur during SCP. Therefore, the use of an additional method for neuromonitoring is required. Near-infrared spectroscopy and transcranial Doppler are safe and non-invasive methods that can detect the occurrence of embolization and significant decrease in regional cerebral saturation and blood flow, events that are associated with worse neurological outcome. That information could help the surgical team to act in a timely manner to prevent a neurological deficit [5]. An aggressive rewarming rate after HCA can cause brain hyperthermia. A rapid rewarming rate and large temperature variations during that process may cause imbalance between metabolic needs and inadequate cerebral perfusion as a result of impaired autoregulation of cerebral blood flow. Mismatch between cerebral oxygen supply–demand causes markedly decreased oxygen saturation in the jugular bulb, which receives most of the venous blood from the brain. It is known that oxygen desaturation in the jugular bulb is a risk factor for neurocognitive dysfunction. Also, hyperthermia >37°C 24 h after a surgical procedure is associated with poorer neurocognitive outcome after 6 weeks [6]. It is noteworthy that the authors did not specify the value of oxygen saturation in the jugular bulb, rewarming rate, target rewarming temperature or temperature maintenance in the intraoperative and postoperative periods.

In conclusion, we believe that a proper rewarming strategy and additional neuromonitoring methods could increase the efficacy of routine cerebral protection during surgery. We congratulate the authors on their useful and clinically applicable research.

REFERENCES


†The corresponding author of the original article [1] was invited to reply, but did not respond.