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Our 11-year experience with axillary artery cannulation in proximal thoracic aortic surgery

Reply to the Editor:

We thank Ohira and colleagues (1) for their comments on our recent paper addressing, inter alia, the risk of stroke with direct versus side-grafted cannulation of the axillary artery during aortic surgery (2). We are very grateful for their insights into some very important issues. We herewith present the relevant replies to the questions they have raised.

Firstly, the current and most frequently used surgical technique of direct right axillary artery cannulation employed at our clinic consists of preparation in the 2nd part with projection to the lateral part of the clavicular bone. After low dose heparinization, we place a purse-string suture using 5/0 Prolene followed by insertion of a 14F-18F arterial cannula in seldinger technique. A suitable soft wire is advanced 20cm into the vessel, and with a short cut using a scalpel the cannula is inserted for 3 cm without using prior dilation. After connection to the arterial line of the cardiopulmonary bypass, a short push with crystalloid volume is applied in order to rule out elevated resistance due to possible malposition.

Cerebral malperfusion as a result of vertebral artery obstruction or subclavian steal phenomenon due to flow reversal in the context of direct cannulation of the right axillary artery has long been recognized. Improved cannulation techniques - based on dissection sites and insertion lengths of the cannula - have indeed been proposed and are in actual use (3). However, it should be noted that our article covers surgical procedures between 2008 and 2019; as such it might be expected that a fairly wide variation of surgical techniques spanning eleven years might

uphold the vertebral malperfusion hypothesis and explain, at least in part, our findings relating to higher stroke rates in the direct cannulation group.

Secondly, as acknowledged in the 'limitations' section of our article, electronic records may not have included all the - possibly - relevant details such as stroke territory, atrial fibrillation status or significant carotid stenosis details that are paramount for stroke development; nor was the type of stroke among our endpoints; in fact, past reports that corroborate our findings (4) do so less by reference to types of stroke and more by comprehensive propensity matching; however, we do acknowledge the point about stroke territoriality and associated technique and would encourage readings of our findings in the historical 11-year perspective outlined above coupled with the relevant caveats in the 'limitations' section. Furthermore, we were not able to address the remark of Ohira and colleagues on the stroke with “ipsilateral vertebral distribution” since strokes in the posterior vessel region might result from one or the other vertebral artery before joining into the basilar artery.

Under the circumstances we look forward to any forthcoming paper that is likely to further illuminate the field by pooling together the experiences of as many surgical centers as necessary for full statistical and clinical relevance.

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