Commentary: Always do right

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Open aortic arch repair has become safer in the last 3 decades because of the improvement in its strategy and materials, as well as the advent of studies regarding brain protection and temperature setting during the repair. However, the cannulation strategy to establish cardiopulmonary bypass remains a critical issue to safely perform the operation.^{1,2} The presence of atherosclerotic lesions in patients undergoing arch repair is associated with an increased risk of embolisms induced by aortic cannulation.

In this issue of the *Journal*, Kim and colleagues³ report the efficacy of right axillary artery cannulation for arch repair in reducing embolic stroke incidence and mortality rates. I congratulate their fine clinical research and superb surgical results with arch repair. Their report's main point is that the use of right axillary cannulation led to lower embolic stroke incidence and mortality rate.

The data of the enrolled patients were retrospectively collected over decade, and the aortic pathology included both acute type A dissection and atherosclerotic aneurysm. The axillary cannulation group included sole axillary cannulation and some combination with peripheral cannulation, whereas the nonaxillary cannulation group consisted of femoral artery and ascending aortic cannulation. In addition, several different strategies regarding cerebral perfusion were performed during the study period. Therefore, the mortality and morbidity rates, even after propensity score matching, may be influenced by several factors that were not superficially visible. I think that the variable trends of the cannulation strategy and the rate of stroke incidence and mortality in the report revealed the difficulty of the analysis.

Although the axillary artery may be a peripheral artery, the axillary artery cannulation is categorized as a central cannulation. Particularly, it is because this artery connects to the supra-aortic branches. Their report consequently confirmed that the incidence rate of right-hemisphere stroke was significantly lower in the right axillary artery cannulation group. Numata and colleagues⁴ reported that the right subclavian artery cannulation was cerebroprotective with

Shaggy aorta.

Central Message

The right axillary artery showed positive results in open aortic arch repair. However, this cannulation is only one of several options, and not a final solution, to completely prevent stroke.

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the use of computational fluid dynamics simulation. They showed that a retrograde flow of the brachiocephalic artery and an antegrade flow of the right common carotid artery were produced from the blood streamline from the right subclavian artery throughout the cardiac cycle. In addition, they indicated that the blood flow from the right subclavian artery cannula and aortic valve perfused the left-side supra-aortic branches. Accordingly, they concluded that the right subclavian artery cannulation was cerebroprotective, especially on the right hemisphere. In other words, the flow from the right subclavian artery could have the sandblasting effect on the inside of the aortic arch and lead to left-side stroke. To completely prevent stroke due to the arterial cannulation, an isolation technique should be considered.⁵ The severely atherosclerotic aorta, so-called shaggy aorta, should be treated using this technique.⁶ In their report, the right axillary artery showed positive results. However, it is necessary to note that this cannulation is only one of the several options, and not a final solution, to completely prevent stroke.

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