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### Arch-first technique through left antero-axillary thoracotomy or bilateral anterior thoracotomy

#### *To the Editor:*

We read with great interest the article by Rokkas and Kouchoukos titled "Single-Stage Extensive Replacement of the Thoracic Aorta: The Arch-First Technique." They report that a bilateral thoracotomy enabled an arch-first reconstruction preceding proximal or distal aortic anastomosis, as well as retrograde cerebral perfusion through the superior vena cava (SVC) for cerebral protection during deep hypothermic circulatory arrest in an extensive replacement of the thoracic aorta.<sup>1</sup> We totally agree with their strategy for reconstruction of the aortic arch.

However, we do not believe that these techniques are original with them. We have already advocated the use of a left antero-axillary thoracotomy, which is less invasive than a bilateral thoracotomy, as an alternative approach for aortic arch reconstruction.<sup>2,3</sup> This type of thoracotomy combines the advantages of each approach, while filling a gap between a median sternotomy and posterolateral thoracotomy, by providing a wide view of the aortic arch from the ascending aorta to the mid-descending aorta and allowing access to the SVC for a retrograde cerebral perfusion during deep hypothermic circulatory arrest. Furthermore, the possibility for the precedence of reconstruction of arch vessels through the left antero-axillary thoracotomy, and then the reperfusion to the arch vessels through a side branch of the graft before anastomosing the graft to the ascending aorta or descending aorta (which may shorten the period of cerebral ischemia), has already been explained in our article.

A bilateral thoracotomy that requires a transverse sternotomy, ligation of both internal thoracic arteries, and entrance to both sides of the pleural cavities seems to be more invasive than a left antero-axillary thoracotomy. The pericardial stitch, which is placed at the corner of the pericardial reflection on

the SVC, can raise the SVC and pull out the ascending aorta toward the operative field, thus facilitating aortic and SVC cannulations even through a left antero-axillary thoracotomy.<sup>4</sup>

Thus the arch-first technique through a bilateral thoracotomy seems to achieve excellent results albeit with a far more extensive incision.

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#### *Reply to the Editor:*

We appreciate the comments of Sasaguri and Fukuda. We did not claim in our publication that the techniques we used were original. In fact, we referred to previous use of the bilateral thoracotomy approach,<sup>1-3</sup> early antegrade cerebral perfusion to minimize the period of circulatory arrest,<sup>4</sup> as well as total replacement of the thoracic aorta in a single stage.<sup>2,3</sup> We incorporated these techniques into a procedure that was used in patients who required extensive thoracic aortic resections, as well as aortic valve or root replacement and coronary artery bypass grafting.

We are familiar with the reports of Sasaguri and his colleagues<sup>5,6</sup> on the use of the left antero-axillary thoracotomy for aortic arch reconstruction. In their 1997 publication,<sup>6</sup> they described and illustrated perfusion of the aortic arch after attachment of separate grafts to the 3 brachiocephalic arteries and to the aortic graft, but before completion of the proximal and distal aortic anastomoses. Our technique uses a single anastomosis to a cuff of aorta surrounding the brachiocephalic arteries to minimize the duration of brain ischemia. They also indicated that disease requiring resection of the aorta below the level of the eighth thoracic vertebra should be approached through a posterolateral thoracotomy.<sup>5,6</sup>

In our series, which now includes 13 patients with 1 hospital death and no late deaths, the distal anastomosis of the aortic graft to the thoracic aorta was performed at or below the junction of the middle and distal thirds of the descending thoracic aorta in 7 patients. In addition, 7 patients required aortic valve or aortic root replacement or repair, and 6 required

coronary artery bypass grafting (5 to the right coronary system). Eight patients had previous operations for acute ascending aortic dissection, and the ascending aorta was enlarged or adherent to the sternum in all. It is highly improbable, in our opinion, that these extensive procedures could have been adequately or safely accomplished through an antero-axillary thoracotomy. We fully agree with Sasaguri and Fukuda that the bilateral anterior thoracotomy is more invasive than a left antero-axillary thoracotomy. However, we believe that operations in patients with aortic disease that is not confined to the distal aortic arch and the proximal descending thoracic aorta, particularly those with chronic type A dissections who have had previous operations on the ascending aorta, will require a more extensive approach for optimal treatment.

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