

Alternative Approaches for Redo Aortic Arch Surgery

[Letter regarding “Total Arch Replacement for Distal Enlargement after Ascending Aortic Replacement for Acute type A Aortic Dissection” (Ann Thorac Cardiovasc Surg 2009; 15: 318-23)]

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To the Editor:

I read with interest the recent paper of Yamashiro and co-workers: “Total Arch Replacement for Distal Enlargement after Ascending Aortic Replacement for Acute Type A Aortic Dissection,”¹⁾ and I congratulate the authors for their work.

The combined approach of median sternotomy with left anterolateral thoracotomy provides a good visual field during an approach for both the aortic arch and the proximal portion of the descending aorta. The bilateral axillary and femoral artery cannulations, and the distal aortic clamping used by the authors, provided good cerebral and distal aortic perfusion throughout surgery, which was effective for organ protection and is in line with widely accepted perfusion principles.^{2,3)}

Nevertheless, even if the surgical approach used by the authors was very effective in the reported cases, we should consider that redo open aortic arch surgery is a major procedure. Therefore in the recent era of endovascular surgery, I believe a few more points should be addressed on this subject.

These days, whenever feasible, we should consider other alternatives to traditional surgery. I refer to endovascular procedures on the aortic arch and first portion

of the descending aorta, with supra-aortic vessel transposition or aortic debranching.

An alternative is the use of an endovascular prosthesis covering the entire aortic arch and first portion of the descending aorta. Should the anatomical shape of the arch allow it, then the right brachiocephalic trunk could then be covered by the stented open portion of the endovascular prosthesis, allowing blood to flow through it. An extra-anatomical connection (retropharyngeal or anterior) will then connect the right carotid artery to the left one and to the left subclavian artery. With this approach, open surgery is limited to the neck area, with no need for resternotomy or cardiopulmonary bypass.

On the other hand, when the anatomical condition of the aortic arch does not allow the use of the right brachiocephalic trunk as inflow, a different approach may then be used. In such cases we usually perform a total surgical aortic debranching (from the ascending aorta to the three supra-aortic vessels). There is no need to perform a complete resternotomy. An upper ministernotomy (upper J or inverted T) is sufficient to expose the entire ascending aorta and right brachiocephalic trunk. The incision is then extended in the left cervical area as for carotid surgery, exposing both the left carotid and left subclavian arteries. Surgery is then completed by an endovascular insertion of a prosthesis, occluding all the supra-aortic vessels. Also in this case there is no need of cardiopulmonary bypass.

As mentioned by the authors, a follow-up of patients treated with ascending aorta replacement for type A aortic dissection is very important to monitor the enlargement of the first portion of the descending aorta. Excessive enlargement of this area will not allow an endovascular procedure because of the lack of an aortic “neck” to be used as a landing zone for the endovascular prosthesis.

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I believe that in these days all attempts should be made to reduce invasiveness in redo aortic arch surgery. Hybrid procedures should be considered as a first-line option for these patients. Traditional surgery should be reserved for selected cases where a hybrid procedure is not feasible because of particular anatomical conditions of the descending aorta.

I take this occasion to again congratulate the authors for their paper.

Reply:

Thank you for your attention to our manuscript, entitled “Total arch replacement for distal enlargement after ascending aortic replacement for acute aortic dissection.”¹⁾

I also believe that in these days all attempts should be made to reduce invasiveness in aortic surgery. Recently, several reports of total endovascular treatment of aortic arch with branched stent graft or fenestrated device have demonstrated feasible results.²⁾ Kawaguchi et al.³⁾ described that thoracic endovascular repair (TEVAR) tends to have a lower rate of serious complications than open surgery does, reporting that the cerebral infarction rate in patients who received a fenestrated device was 5.5%. Actually, TEVAR does not require extracorporeal circulation; therefore patients do not have low cerebral perfusion during the procedure. Certainly, we agree that endovascular treatment of pathologies affecting the ascending aorta and aortic arch is feasible in limited patients. Actually, we performed TEVAR for distal arch enlargement after total arch replacement cases.

Although TEVAR cannot be considered a well-established treatment method just yet, especially in aortic arch, technical difficulties with graft design and deployment persist.⁴⁾

We agree that hybrid procedures should be considered as a first-line option for limited patients. However, debanching is not as easy for redo cases because of severe adhesion. Therefore we considered extensive surgery unavoidable in this series, especially in dissection and patients who required concomitant procedures.

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Of course I believe that in the near future TEVAR will become a standard option for aortic arch surgery as advances of the device are accomplished.

Thank you very much. I appreciate your good advice.

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