Product review on “intimal re-layering technique” for arch repair

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Aimed to simplify the arch reconstruction like hemiarch repair while providing an elephant-trunk configuration for future interventions, the “intimal re-layering technique” involves (1) insertion of a vascular graft into the lumen of the arch, (2) isolation and fenestration of the arch–vessel island either by continuous sutures or by stapling, and (3) finally the anastomosis of additional proximal aortic graft.¹

When I came across the paper on the intimal relayering technique as a reviewer for the *Journal*, I felt the technique was convincing and worth determining whether it really was feasible. When one hesitates on buying something, there is nothing better than hearing from other users in deciding whether or not to buy. Fortunately, in my own case I had a chance to perform it as soon as I was invited to write this editorial commentary. Here is my product review on this technique.

My case was a 40-year female patient who presented with root aneurysm (5.4 cm) with severe aortic regurgitation and moderately dilated arch and descending aorta (40–45 mm) highly suggestive of genetic aortopathy (Figure 1, left). Although it was not aortic dissection, later distal reintervention was highly projected; therefore, the elephant-trunk technique seemed a reasonable option. In addition, the left

Perioperative CT images.

Central Message

Intimal re-layering technique, which maintains the simplicity of hemiarch repair, while providing an elephant trunk configuration may be a reasonable alternative approach in selected cases with acute type A aortic dissection.

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FIGURE 1. Perioperative CT images.

vertebral artery arising direct from the arch precluded the use of the usual 4-branch arch graft; instead, a skinny arch island technique was regarded as the best fit.

With all these things considered, the arch repair technique suggested by Neri and his colleagues¹ along with valve-sparing root replacement (David I) was planned but with the use of continuous suturing for the island creation rather than using staplers. Even though this was my first attempt using this technique, the insertion of 30-mm Dacron graft into a 42-mm-sized arch was easy, and suturing around the arch was relatively straightforward. The only difficult part was the suturing on the posterior side of the arch vessels, and this was a little bit time-consuming.

After fenestration of the graft in the island, I placed another inverted graft inside the arch graft and began suturing on the proximal aortic end, and then the graft was pulled out. This was to facilitate faster and more hemostatic anastomosis. A circulatory arrest time of 31 minutes was a bit on the longer side for my standard arch procedures,² but when distal anastomosis and reconstructing the arch vessels are all combined, the procedure was surely quicker (I assume a time savings of 30-40 minutes).

Completion of the David procedure followed, and then the surgery was finally completed by graft-to-graft anastomosis. Cardiac ischemic (114 minutes) and cardiopulmonary bypass times (124 minutes) were surprisingly short, as was the entire procedure time (4 hour, 19 minutes), and I am sure this is much attributable to the new arch technique. Postoperative echocardiogram was unremarkable, with trivial central aortic insufficiency, and postoperative

computed tomography showed excellent configuration of the reconstructed arch and elephant trunk (Figure 1, right). The postoperative course was uncomplicated, and the patient was transferred to the general ward the next morning. In summary, this technique is doable, seemingly reproducible, and probably more efficient if performed in well-selected cases. Stapling is believed to facilitate the island creation.

Although the paper showed complete thrombosis in the dissected arch in all patients, the intimal relayering technique may not be feasible in overt arch aneurysm because it is not truly arch exclusion from circulation. A small-sized arch that hinders the insertion of an adequately sized graft will surely preclude the use of this intimal relayering technique as well, which is commonly found in young patients with Marfan syndrome presenting with acute dissection. In addition, using staplers for arch repair is an off-label use, so adequate processes may be anticipated before its use, such as obtaining informed consent and approval from the local ethics committee. Its use also may be affected by regional reimbursement policies. Finally, this new technique needs further validations through more experiences in the future.

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