

LETTERS TO THE EDITOR

The Editor welcomes submissions for possible publication in the Letters to the Editor section that consist of commentary on an article published in the *Journal* or other relevant issues. Authors should:

- Include no more than 500 words of text, three authors, and five references
- Type with double-spacing
- Submit the letter electronically via the Internet to jtcvs@drexel.edu if possible
- For *nonelectronic* submissions, send a disk and three copies of the disk's content, a copyright transfer letter (see Table of Contents for location) signed by all authors, and a cover letter describing any conflicts of interest related to the contents of the letter

Letters commenting on an article published in the JTCVS will be considered if they are received within 6 weeks of the time the article was published. Authors of the article being commented on will be given an opportunity to offer a timely response (2 weeks) to the letter. Authors of letters will be notified that the letter has been received. Unpublished letters cannot be returned.

Sternal vascularity after harvesting of the internal thoracic artery

To the Editor:

We read with great interest the article titled, "Assessment of Sternal Vascularity With Single Photon Emission Computed Tomography After Harvesting of the Internal Thoracic Artery"¹ and the resulting correspondence.^{2,3}

Although anatomic⁴ and angiographic studies^{5,6} show partial devascularization, studies using bone scans^{3,7} paint a conflicting picture with regard to the degree of devascularization. Korbmacher and associates,⁷ using bone scintigraphy, concluded that use of one or both internal thoracic arteries (ITAs) did not cause an increase in healing disturbances as a result of a postoperatively decreased sternal blood supply. However, a diminution in blood supply may not result in a clinical deficiency in wound healing.

Because ITA branches can originate as common trunks, potential anastomoses can occur across these joint branches (eg, sternal/intercostal) after the ITA is harvested.⁸ Because the mean length of the common trunks is 3.0 mm, careful harvest of the common trunks close to the ITA may preserve their points of division, thereby creating a collateral blood supply after ITA mobilization.⁹ This may be the mechanism that would account for the lack of reduction in sternal blood flow noted by Cohen and coworkers¹ when the ITA is skeletonized as opposed to pedicled. We believe that careful harvest of the ITA will preserve these arterial channels, so that blood flows from the intercostal arteries to the intercostal branches of the ITA and then to the points of division of the common trunks through to the sternal branches of the ITA. Thus, blood flow to the sternum occurs through these collaterals in reverse of the normal anatomic direction. Venous return is helped by preservation of the internal thoracic veins.

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Reply to the Editor:

I agree with Casha and Gauci that the reason for lack of ischemia to the ipsilateral internal thoracic artery (ITA) while harvesting a skeletonized ITA is the avoidance of damage to collateral vessels. I thank them for citing a reference that explains this phenomenon anatomically.¹

Concerning venous return, since our publication, we have harvested the ITA with only the accompanying veins in a separate group of patients and have performed scans before and after the operations. We found no ischemia of the hemisternum in this group, as in the skeletonized group. Therefore, we believe that preservation of the arterial collaterals is the key to avoiding hemisternal ischemia after ITA harvest. Preservation of venous return plays a minimal role, if any at all, in sternal ischemia after ITA harvest.

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Valve-preserving aortic root reconstruction

To the Editor:

We read with interest the article by Zehr and associates¹ on initial clinical experience with a new graft for valve-preserving replacement of the ascending aorta. The authors state that cusp stress "will reduce long-term durability of the valve cusps." However, this hypothesis is based only on experimental work and is not backed up by clinical observations. Yacoub and colleagues² reported that the most common cause of surgical revision after valve-preserving replacement of the ascending aorta is progressive valve regurgitation. It is uncertain whether the new Robiesek-Thubrikar grafts will protect against this. The neo-sinuses with the crimping parallel to the longitudinal axis of the aorta might well dilate even more than usual.³

Furthermore, we believe that case-based, individualized reconstruction of the sinus of Valsalva with single patches is technically easier to accomplish. Sinuses 1 to 3 are resected first (it is not always necessary to resect all three). The individually tailored patches are then sewn in as neo-sinuses. Finally, after reimplantation of the coronary ostia, the new sinotubular junction is created by anastomosis of the reconstructed sinus of Valsalva with the tube graft.

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Reply to the Editor:

We appreciate the interest in our manuscript¹ and the various points raised in the letter to the Editor by Urbanski. Urbanski points out that the statement that cusp stress "will reduce long-term durability of the valve cusps" is a hypothesis based only on experimental work and not backed up by clinical observations. There is little published information concerning the mechanism of clinical failure in patients having undergone a valve-preserving aortic root reconstruction. I would further hypothesize that long-term failure has more to do with the quality of the cusps and the initial accuracy of the geometrical reconstruction concerning cusp coaptation than the method of reconstruction. Indeed, successful short-term and long-term results using various reconstructive methods have been reported.^{2,3} Harringer and associates⁴ showed that patients with poor geometrical coaptation and greater than trace aortic insufficiency had a high rate of reoperation. In our own series using various techniques, reoperation appears to be related to the need for individual cusp adjustment and amount of regurgitation present after repair. However, there is anecdotal evidence that cusp maceration can occur by contact of the cusp on the Dacron tube. Fig 1 shows the cusp of a patient presenting 17 months after a valve-preserving operation using the reimplantation technique. The cusp had several areas of maceration and a torn free margin.

Because of the experimental evidence that the presence of sinuses does result in less cusp stress, there have been several clinical attempts to recreate sinuses.^{2,5,6} Leyh and coworkers⁷ have shown that the presence of pseudosinuses as in the remodeling technique results in nearly normal opening and closing characteristics of the aortic valve. In the evolution of the valve-preserving procedure, it makes sense that the next step is to recreate the exact anatomy of the aortic root. We believe that this sinus graft nearly does so.

Urbanski expresses some concern that the bases of the sinuses may splay out over time in this graft, resulting in progressive aortic insufficiency. Long-term results are necessary to prove or disprove this concern. It is a theoretical possibility. However, the outer purse string of the graft sinuses is incorporated in the proximal scalloped suture line. This serves to fix the anulus with a crown-shaped annuloplasty stitch that will prevent dilatation at the annular and sinus levels. In patients with a dilated anulus, an annuloplasty suture and the addition of an annular fixation strip can be performed.

The concept of individual reconstruction of the sinuses of Valsalva with single patches and the addition of a tube graft to a new sinotubular junction is interesting. We could do the