the long term compared with other options for these patients.

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OPTIMAL SURGICAL APPROACH FOR REPAIR OF AORTOPULMONARY WINDOW WITH AORTIC ORIGIN OF THE RIGHT PULMONARY ARTERY To the Editor:

We read with great interest the article titled "Single-Stage Repair of Aortopulmonary Window With Interrupted Aortic Arch by Transection of the Aorta and Direct Reconstruction" by Yoshida and associates.¹

The authors describe a repair technique using autologous arterial wall tissue without artificial material for a patient with aortopulmonary window (APW), right pulmonary artery (RPA) originating from the ascending aorta, and interrupted aortic arch. However, the repair technique for APW and RPA originating from the ascending aorta totally coincides with our previously reported technique.² Inasmuch as APW is a relatively uncommon congenital heart defect, to establish the universality of these kinds of procedures expecting the future growth potential of both the pulmonary artery and the aorta, it is necessary to accumulate widespread data related to the applicability and the late follow-up results.

Taking every step into consideration, the reconstruction of the pulmonary bifurcation is the most critical step in the procedure. Where on the ascending aorta of authors' patients did the RPA arise? As more dorsal and unequal partitioning of the aortopulmonary trunk by the conotruncal ridges is the embryogenesis of the APW associated with origin of the

RPA from the ascending aorta,³ the RPA commonly arises from the right posterolateral aspect of the ascending aorta, and the geometry would be better preserved by our technique with an extensive mobilization of both the aortic arch and the pulmonary arteries. Therefore, our technique seems to be impartially applicable to this combination. Consequently, as the authors noted in the article, we also agree that it can allow not only sufficient enlargement but also growth of the reconstructed arteries (Figure 1).²

We appreciate that our technique using only autologous arterial wall tissue was valid for a large APW extending to the proximal site of the pulmonary artery trunk from the pulmonary bifurcation and with the interrupted aortic arch.¹ However, there are a few useful modifications of our technique: appropriately augmenting one of the reconstructed arteries with autologous pericardium is a good practical alternative to avoid a tense anastomosis of the reconstructed arteries in the individual geometry and associated lesions.^{4,5}

We think that our technique using autologous arterial wall tissue is valid for any APW with aortic origin of the RPA, with some practical modifications, and good late results were also certified by this article.

FIGURE 1. Right ventriculography 15 years after complete repair. These findings show sufficient growth and geometry of the reconstructed right pulmonary artery. Simultaneous cardiac catheterization exhibited that main pulmonary artery pressure is 25/7 (12) mm Hg, and peripheral right pulmonary artery pressure 15/8 (10) mm Hg. A, Anteroposterior view. B, Lateral view.

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Reply to the Editor:

We thank Dr Kitagawa for his thoughtful and informative comments

regarding our technique for repair of aortopulmonary window, which is described in the article entitled "Single-Stage Repair of Aortopulmonary Window With Interrupted Aortic Arch by Transection of the Aorta and Direct Reconstruction."¹

With regard to the question concerning the origin of the right pulmonary artery in our last case, this artery arose from just behind the ascending aorta, as demonstrated in the 3-dimensional computed tomography scan (Figure 2 in our article). In the other cases, the right pulmonary artery could have arisen from the right posterolateral aspect of the ascending aorta from the operative findings. However, no computed tomography scan was obtained for these cases for us to show.

As we have described in this article, in our cases there was a large defect extending from the main pulmonary artery trunk to the right pulmonary artery, thus classes I and II by Richardson's classification. That is the greatest difference between our case and that described by Kitagawa and associates.² To avoid right pulmonary arterial stenosis, it was necessary to expose the right pulmonary artery as distally as possible during mobilization. The posterior division line between the aorta and pulmonary trunk was designed to enter the pulmonary arterial wall 2 to 3 mm in width, superiorly and inferiorly, apart from a presumptive borderline intending to reserve sufficient tissue for the reconstruction of posterior aortic wall without tension.

We completely agree with Kitagawa's concept that our techniques allow not only sufficient enlargement but also growth of reconstructed arteries. To achieve this purpose, our technique is similar to his technique. We find Kitagawa's results encouraging that our patients will also have good long-term results.

We believe that our method is one of the best methods to repair aortopulmonary window with a large defect with interrupted aortic arch. We understand

that further follow-up is necessary for comparison to other techniques. Thanks again to Dr Kitagawa for drawing our attention to his article and for his informative comments.

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SAPHENOUS VEIN HARVEST WITH THE MAYO EXTRALUMINAL DISSECTOR: IS ENDOTHELIAL FUNCTION PRESERVED?

To the Editor:

The recent brief communication in this *Journal* by Narayan and associates¹ describes potential benefits of using the Mayo extraluminal dissector to harvest the saphenous vein in patients undergoing coronary artery bypass grafting (CABG). Biochemical studies suggest that endothelial function is preserved. Inasmuch as there is no difference in baseline characteristics or cyclic guanosine monophosphate production between conventional harvesting and veins prepared with the Mayo vein stripper, the authors consider "the use of this underused surgical aid...a very attractive option." In the same issue we provide histologic evidence that saphenous veins harvested using a "no-touch" technique retain a normal structure, an intact endothe-

lium, and preserved endothelial nitric oxide synthase (eNOS) and NOS activity,² factors contributing to improved patency in patients undergoing CABG.³

The Mayo vein stripper, introduced as an alternative means of harvesting the saphenous vein, has been the subject of numerous publications. A recent review describes potential benefits of endoscopic harvesting, including improved wound healing and cosmetic outcome and reduced infection. The authors cite functional studies showing no difference in vasoreactivity between conventional and endoscopically prepared veins, stating macroscopic comparison of these conduits to be only "fair." However, a recently published secondary analysis from the PREVENT IV investigators strongly suggests that vein graft patency is inferior and late cardiac events increased with endoscopic compared with conventionally harvested saphenous veins.⁵

Although many studies focus on the preserved luminal endothelium of endoscopically prepared veins, the effect of the Mayo stripper on the outer layers of the veins is generally neglected. In a recent study on 200 patients, significant endothelial denudation and reduced eNOS immunostaining of medial and adventitial vasa vasorum were reported in conventionally prepared saphenous veins compared with those harvested using the Mayo stripper.⁶ There is evidence that many perivascular structures that are damaged or removed when vein is harvested by conventional techniques affect graft performance (Figure 1). For example, the outermost vessel layer, the adventitia, contains the vasa vasorum, microvessels providing oxygen and nutrients to the vessel wall. In addition, the perivascular fat surrounding various blood vessels is a potential source of vasodilators or anticontractile factors (adipocyte-derived relaxing factors), one of which is nitric oxide.⁷ The main benefits of using the Mayo stripper for saphenous vein harvesting in patients undergoing CABG are reduced