130. Sinus Plication Technique for Neo Aorta Dilation and Regurgitation in Patients with Repaired Congenital Heart Diseases

Objective: Neo aortic root dilation and valve regurgitation after congenital heart disease operation has become increasingly recognized. Even though the risk of rupture or dissection is unclear, dilated neo aortic root often compresses the pulmonary artery or bronchus. For adults, aortic valve and root replacement remains the gold standard for aortic root dilation and valve-sparing aortic root replacement has become widely accepted. However, for children, operations should be designed to incorporate growth potential. Because little is known about the optimal management strategy of neo aortic root dilation and valve regurgitation after congenital heart disease operation, the indications for surgical intervention are largely due to associated issues. Therefore, a simple and growth potential technique is required.

Case Video Summary: A 14-year-old, 47kg female with congenital interrupted aortic arch, sub-pulmonary VSD type DORV had undergone arch repair, Damus-Kaye-Stansel procedure, reconstruction of RV-PA continuity using 16 mm polytetrafluoroethylene conduit, and VSD closure at one month old. Her follow-up catheterization showed intra-conduit stenosis with the pressure gradient of 50 mm Hg. Her contrast enhanced computed tomography (CT) revealed neo aortic root dilation with diameter of 39 mm at the level of the sinus of Valsalva (Z value, 4.9). Her echocardiogram showed moderate regurgitation of the neo aortic valve. The patient was taken to the operation room, where sinus plication, subcommissural annuloplasty of the native pulmonary valve, and RV-PA conduit exchange with 20mm polytetrafluoroethylene conduit were performed. Through redo median sternotomy, cardiopulmonary bypass was initiated. Following clamping of the ascending aorta and infusion of cardioplegia, the ascending aorta was transected. The semilunar valve was inspected, and the valve was tricuspid without significant distortion, stress fenestrations, or calcification. Subcommissural annuloplasty was performed. Dilated walls of each sinus of the Valsalva were resected like a wedge shape and re-sutured (Figure 1 a-c). Sinus plication technique has a remodeling effect on the sinus of Valsalva by three commissures bring closer, resulting in increase in the coaptation height (Figure 1e). Additional subcommissural annuloplasty ensures further coaptation zone, if necessary (Figure 1f).

Postoperative CT demonstrated reduced neo aortic root size. Discharge echocardiogram of three patients showed mild valve regurgitation without stenosis.

Conclusions: We have shown early technical success of the root repair. Long term follow-up is essential for potential root re-dilation and aggravation of the regurgitation.

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Sinus plication

Sinus plication + Sub-commissural annuloplasty