Partial Root Remodeling on the Two Sinuses for Acute Type A Aortic Dissection with Right Coronary Arterial Dissection

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We reported simple partial root remodeling using a graft trimmed twin “U” shape for extensive dissection into the right/non-coronary sinuses with acute type A aortic dissection with cardiac tamponade, acute myocardial infarction on the right coronary artery and aortic regurgitation. After total arch replacement with frozen elephant trunk technique for distal dissection, partial root remodeling on the non and right coronary sinuses was performed. Postoperative computed tomography (CT) showed well shaped Valsalva sinuses and aortic regurgitation completely disappeared. This technique might become an alternative procedure for aortic dissection severely involving Valsalva sinuses without dilatation on the aortic root.

Keywords: aortic root remodeling, type A aortic dissection, right coronary arterial dissection

INTRODUCTION

Aortic root replacement has been widely performed for aortic dissection with extensive dissection into the Valsalva sinuses.1) Recently valve sparing operation has been sometimes selected instead of root replacement because of avoiding prosthesis valve replacement.2) However they have technical difficulties, in special hemostasis on the anastomosis site. We report simple partial root remodeling using the graft trimmed twin “U” shape for intensive dissection into the right/non-coronary sinuses without dilatation on the aortic root.

CASE REPORT

A 59-year-old woman was emergently admitted to our hospital with chest pain. Her heart rate decreased to 50/min and systolic pressure decreased to 90 mmHg. Cardiac echo in emergent room presented moderate pericardial effusion, moderate aortic regurgitation, and poor wall motion on the inferior left ventricle. Electrocardiogram reported ST-elevation on the II, III, and aVF. Computed tomography revealed De-Bakey type I aortic dissection with severe stenosis on the right coronary artery because of right Valsalva sinus dissection (Fig. 1). Primary entry was located on the distal aortic arch.

We performed emergent operation for acute type A aortic dissection with cardiac tamponade, aortic regurgitation and acute coronary syndrome on the right coronary artery.

We scheduled total arch replacement with frozen elephant trunk for intimal tear on the distal arch and partial root remodeling for the dissection on the right coronary artery. After median sternotomy was performed, cardiopulmonary bypass was established by arterial perfusion from graft anastomosed on the right axillary artery. During moderate hypothermia at a rectal temperature of 28°C, selective cerebral perfusion was established under the monitor by regional cerebral oxygen saturation (rSO2) and bilateral radial arterial pressure, and the aortic arch was transected. After performing the frozen elephant trunk technique using a stent graft to close initial

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Finally a right coronary bypass using the saphenous vein graft was performed after two grafts (inserted proximal graft and distal 4 branched graft) were anastomosed end-to-end with a 4-0 running suture. The anastomosis level of two grafts was 3 cm above STJ.

Surgical, cardiopulmonary, and selective cerebral perfusion times were 370, 195, and 70 minutes, respectively. The postoperative course was considerably good, and the patient was discharged 21 days after the operation without complication. Postoperative CT revealed well shaped Valsalva and complete thrombosis of false lumen on the thoracic aorta (Fig. 4). Aortic regurgitation completely disappeared according to postoperative cardiac echogram.

**DISCUSSION**

Although early operative outcomes of acute type A aortic dissection have recently improved, the incidence of reoperation on the proximal aorta remains high during long-term follow-up. Therefore, there are still controversies concerning the appropriate approach. The valve sparing operation on the proximal site has been proposed as an alternative for the repair of aortic dissections based on the principle of total resection of the aortic root. However, since dilatation of the aortic root is very often absent, total aortic root replacement, regardless of valve preservation, is difficult to justify because of a potentially higher surgical risk for acute aortic dissection;
resorcin formalin (GRF) glue reconstruction resulted in an increased freedom from reoperation on the aortic root compared with suture resuspension (92% vs. 70%). However, the use of GRF glue has been incriminated in a higher incidence of false aneurysms or redissection, particularly in the proximal part of the aorta. Graft insertion to the sinus Valsalva can avoid the pressure load to the dissected sinus wall. Because of dissected Valsalva wall is free from pressure load, there is no need of fixation of dissected lumen and can avoid the side effect of GRF glue. On the basis of these concepts, partial root remodeling on the two sinuses for acute type A aortic dissection with right coronary arterial dissection was performed in the absence of root dilatation greater than 35 mm. This technique can be preserved needless coronary reconstruction of left coronary artery. The aim of graft insertion to the sinus Valsalva is avoid the pressure load to the dissected sinus wall. The proximal anastomosis is at the level of 2–3 cm upper the STJ. Because of no resection of Valsalva sinus wall and no anastomosis at this level, we can reduce the risk of bleeding from aortic root. Post bleeding from the basal aorta has been well controlled and Valsalva sinuses have been well remodeled.

In conclusion, partial root remodeling of two coronary sinuses without left side should be an alternative technique for acute aortic dissection severely involving right coronary artery without dilatation on the aortic root instead of root replacement or valve sparing method.

Fig. 3 Operative finding. Right coronary artery was dissected and torn (white arrow). Partial root remodeling was performed on the right/non sinuses except left coronary sinus. LCC = left coronary cusp; NCC = noncoronary cusp; RCC = right coronary cusp.

Fig. 4 Postoperative computed tomography (CT). Postoperative CT revealed well shaped Valsalva and complete thrombosis of false lumen on the thoracic aorta.

therefore, root replacement is not always performed. The decision to treat only the dissected sinuses and to avoid either a complete root replacement or root remodeling/reimplantation procedure reduces operative complexity, which is an important factor in life-threatening situations. In addition, the need for proximal reoperation is related to both patient pathology as well as operative technique. Niederhäuser, et al., reported that gelatin因此，瓣膜替换并不总是进行的。治疗仅在撕裂的窦旁进行，避免全根替换或根部重塑/再植术，减少手术复杂性，这是一个重要的因素，在生命数命攸关的状况中。此外，需要修复近端再手术与病患病理以及手术技术相关。Niederhäuser，等报告了胶原凝胶
**Disclosure Statement**

The authors have declared that no conflict of interest exists.

**References**
