

Four-branch Prosthetic Graft Used for Stanford Type A Aortic Dissection with Aberrant Right Subclavian Artery

Chang-Wei Ren, Yong-Qiang Lai, Sheng Yang, Shang-Dong Xu, Li-Zhong Sun

Department of Cardiovascular Surgery Center, Beijing Anzhen Hospital, Capital Medical University, Beijing 100029, China

To the Editor: Aberrant right subclavian artery (ARSA) is a congenital vascular anomaly. Stanford-type A aortic dissection with ARSA is rare. We reported a strategy that involved the use of a four-branch prosthetic graft to reconstruct the four supra-arch branch vessels for a Stanford type A aortic dissection with ARSA.

A 46-year-old male was admitted to Beijing Anzhen Hospital because of sudden chest pain. Type A aortic dissection and ARSA were found from the computed tomography (CT) scan. Emergent procedure was planned. The right axillary artery was prepared for aorta cannulation, and subsequently, median sternotomy was performed. The aortic valve was normal. The ascending aorta was replaced during systemic cooling. When the nasal temperature reached 20°C, the left subclavian artery (LSCA) and bilateral common carotid arteries were clamped, and the right axillary artery perfusion was stopped. The aortic arch was cut open, and unilateral antegrade cerebral perfusion was performed through the right common carotid artery with another aorta cannulation. A frozen elephant trunk was deployed to the descending aorta. After the anastomosis of the proximal part of the frozen elephant trunk with the four-branch prosthetic graft was completed, the perfusion of the descending aorta was re-initiated via the perfusion branch of the four-branch prosthetic graft. The bilateral carotid arteries were anastomosed sequentially to two of the branches of the prosthetic graft. Then, the proximal aortic stump was anastomosed to the trunk of the four-branch prosthetic graft and the LSCA to one branch at last [Figure 1]. After weaning off cardiopulmonary bypass, the right subclavian artery was reconstructed with the perfusion branch of the four-branch prosthetic graft.

Aberrant right subclavian artery is a congenital variation of the aortic arch, with a reported incidence of 0.2–1.8%.^[1] There have been reports on Stanford type A aortic dissection with ARSA.^[2-4] Different strategies have been adopted by the authors. In most cases, the ascending aorta or the hemi-arch is replaced.^[2] Frozen elephant trunk is not implanted into the descending aorta. Therefore, reconstruction of the ARSA was not necessary.

For this case, the ARSA was blocked because of the frozen elephant trunk. Right upper limb ischemia and posterior circulation ischemia of the brain would subsequently occur. Thus, it is necessary to reconstruct the right subclavian artery. However, it was too difficult to ligate the starting point of the ARSA because it was located in the posterior part of the aortic arch. Ligating the proximal part

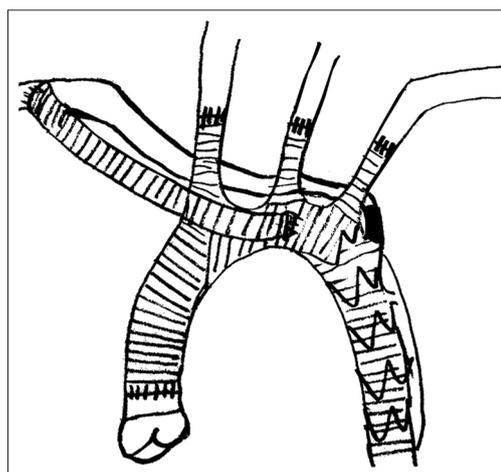


Figure 1: General view of the procedure. The four-branches were anastomosed to left subclavian artery, left and right common carotid artery and right axillary artery separately.

of the axillary artery would block the blood flow to the right vertebral artery. Posterior circulation ischemia of the brain would occur, which in turn would result in cerebral infarction. After reconstruction, the blood flow of the right axillary artery and the right vertebral artery was provided from the bypass graft. By using our strategy, we reconstructed all four supra-arch branch vessels with a four-branch prosthetic graft.

REFERENCES

1. Freed K, Low VH. The aberrant subclavian artery. *AJR Am J Roentgenol* 1997;168:481-4.
2. Battaloglu B, Secici S, Colak C, Disli OM, Erdil N, Kutlu R. Aberrant right subclavian artery and axillary artery cannulation in type A aortic dissection repair. *Ann Thorac Surg* 2013;96:e1-2.
3. Kikuchi K, Makuuchi H, Oono M, Murakami H, Suzuki T, Ando T. Surgery for aortic dissection involving an aberrant right subclavian artery. *Jpn J Thorac Cardiovasc Surg* 2005;53:632-4.
4. Misumi T, Kudo M, Ito T, Cho Y, Kumamaru H. Acute aortic dissection involving an aberrant right subclavian artery. *Jpn J Thorac Cardiovasc Surg* 2002;50:119-21.

Address for correspondence: Dr. Li-Zhong Sun,

Department of Cardiovascular Surgery Center, Beijing Anzhen Hospital, Capital Medical University, Beijing 100029, China

E-Mail: sunlizhongsubmit@126.com

Received: 18-01-2015 **Edited by:** Xin Chen

How to cite this article: Ren CW, Lai YQ, Yang S, Xu SD, Sun LZ. Four-branch Prosthetic Graft Used for Stanford Type A Aortic Dissection with Aberrant Right Subclavian Artery. *Chin Med J* 2015;128:1558.

Source of Support: Nil. **Conflict of Interest:** None declared.

Access this article online

Quick Response Code:



Website:
www.cmj.org

DOI:
10.4103/0366-6999.157701