

“Collared Anastomosis” Technique Used in Arch Replacement Combined with Frozen Elephant Trunk Implantation Procedure for Giant Arch and Thoracic Aorta Dilatation

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To the Editor: We report two cases of arch replacement combined with frozen elephant trunk implantation procedure using the collared anastomosis technique for giant arch and thoracic aorta dilatation.

A 62-year-old hypertensive female patient was admitted because of endoleak after thoracic endovascular aortic repair (TEVAR). The patient underwent TEVAR procedure because of Stanford type B aortic dissection 5 years ago. The proximal diameter of the stent graft was 50 mm. Another patient was a 52-year-old man suffering from arch and thoracic aneurysm. The diameter of the aneurysm was 52 mm.

The ascending aorta and aortic valve of the two patients were normal. Aortic arch replacement and frozen elephant trunk implantation were performed. We developed the one-stage open procedure for arch pathology and obtained satisfactory results.^[1] However, the diameters of the thoracic aorta were larger than the diameter of the frozen elephant trunk, resulting in difficulty in suture placement. As such, frozen elephant trunk procedure with a four-branched hybrid graft is suitable for such implantation case. However, the four-branched hybrid graft is still unavailable in China. As such, we made one using a four-branched graft, a hollow graft patch, and a frozen elephant trunk during cooling. The steps were as follows: (1) Deploying the frozen elephant trunk out of the body; (2) anastomosing the graft and the frozen elephant trunk together (hybrid graft); (3) trimming a hollow graft patch; (4) suturing the graft patch at the joint of the hybrid graft; and (5) binding the frozen elephant trunk as previously mentioned [Figure 1a].

The endoleak can result in the persistent expansion of the aorta and is reported to be an important factor of aortic rupture. Sac enlargement was reported as the key cause of endoleak.^[2] For the first case, the stent graft implanted 5 years ago had a diameter of 50 mm and adhered to the aortic wall rigidly. As such, we left it in the aorta instead of pulling it out. The proximal naked part of the stent graft was trimmed, and then the frozen elephant trunk was deployed inside the previous stent graft. Then, the collar of the hybrid graft, the wall of the proximal aneurysm, and the proximal part of the previously implanted stent graft were anastomosed together as a “sandwich” [Figure 1b]. For the second case, the frozen elephant trunk of the hybrid graft was deployed inside the thoracic aorta, and then the collar of the hybrid graft and the wall of the proximal aneurysm were anastomosed together. No endoleak was detected during postoperative computed tomography at 6 months.

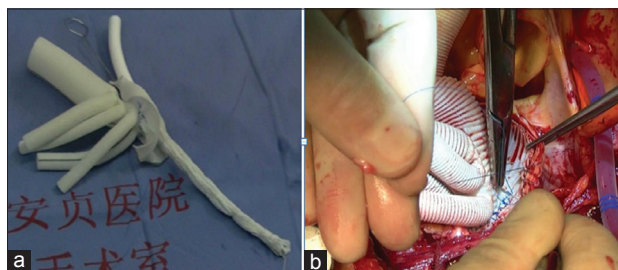


Figure 1: The hybrid graft we made using a four-branched graft, a hollow graft patch, and a frozen elephant trunk (a). The collar of the hybrid graft, the wall of the proximal aneurysm, and the proximal part of the previously implanted stent graft were anastomosed together as a “sandwich” (b).

In aorta surgery, size matching between the graft and the wall of the aneurysm is important. An unmatched size would result in bleeding because of undistributed tension. For our two cases, the size of the graft did match the size of the thoracic aorta well. With this technique, the two patients were discharged from the hospital without any complication. The collared anastomosis technique has several advantages. First, the collared anastomosis technique reduced the tension of the stoma. Second, the collared anastomosis technique decreased the difficulty in suture placement. Finally, the collared anastomosis technique excluded the space between the frozen elephant trunk and previous stent graft or thoracic aorta. The collared anastomosis technique could be an option for patients who have giant arch and thoracic aorta dilatation.

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Quick Response Code:



Website:
www.cmj.org

DOI:
10.4103/0366-6999.160622

Received: 02-12-2014 **Edited by:** Li-Shao Guo

How to cite this article: Ren CW, Liu CL, Lai YQ, Sun LZ, Xu SD. “Collared Anastomosis” Technique Used in Arch Replacement Combined with Frozen Elephant Trunk Implantation Procedure for Giant Arch and Thoracic Aorta Dilatation. *Chin Med J* 2015;128:1982.

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