

Technique for Using the St. Jude Aortic Connector in Anastomosis with a Composite Graft of Saphenous Vein and Radial Artery

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We presented a technique for using the St. Jude Aortic Connector System in anastomosis with a composite graft of saphenous vein and radial artery. This technique has not been reported in the previous literature. Our technique could improve some disadvantages of the St. Jude Aortic Connector and allow this device to be used in off-pump coronary artery bypass grafting (OPCAB). (Ann Thorac Cardiovasc Surg 2005; 11: 281–3)

Key words: aortic connector system, radial artery, off-pump coronary artery bypass

Introduction

Proximal anastomosis of the radial artery to the ascending aorta in off-pump coronary artery bypass grafting (OPCAB) has been performed using running polypropylene sutures using a side-biter clamp (Fig. 1a). This technique may result in cerebral vascular embolism from the dislodgement of intra-luminal atheromatous plaques and lesions on the ascending aorta. The symmetry bypass system aortic connector (St. Jude Medical, Inc.) is a novel device for the construction of sutureless proximal anastomosis (Fig. 1b). This device allows attachment of saphenous vein grafts only to the aorta without requiring aortic clamping. However, several pitfalls and problems exist during loading or deployment of this device including the issue related to long-term patency of the saphenous vein graft itself. We describe herein a technique for using a composite graft of the radial artery and a short segment of the saphenous vein, which was connected to the ascending aorta with an aortic connector. This composite graft technique improved some problems concerning the aortic connector, and we can expect long patency of the bypass graft.

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Technique

The radial artery and saphenous vein were explanted. As for the saphenous vein, it was sufficient to obtain the graft from the proximal portion 3 cm to 5 cm in length that had a large diameter. Subsequently, the necessary distal anastomoses to the radial artery graft were completed for the coronary arteries, and the aortic connector with a loaded short segment of the saphenous vein graft was deployed. The external diameter of the saphenous vein graft was assessed if it best fitted to the size of the connector system, and a larger aortic connector could be used since the proximal segment of the saphenous vein graft was not required to be very long. Finally, end-to-end anastomosis was performed with 6-0 monofilament sutures between the distal end of the saphenous vein and the proximal end of radial artery without graft kinking (Figs. 2, 3 and 4).

Discussion

Manual suturing remains to be the standard methodology for creation of the proximal anastomosis to the ascending aorta using a side-biter clamp in OPCAB. OPCAB has been promoted by the introduction of new technologies for less-invasive coronary bypass surgery. Conventional suture of a free graft to the ascending aorta with side clamping may increase the possibility of post-operative strokes due to the dislodgement of embolic particles, and attention must be also paid to avoid clamping injury of the ascending aorta itself. The minimization of

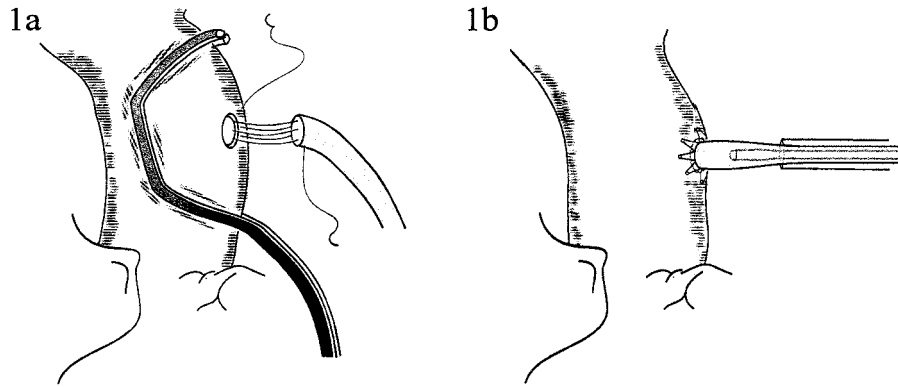


Fig. 1. Conventional proximal anastomosis of the radial artery graft to the ascending aorta using a side-biter clamp (a), and deployment of the saphenous vein graft using the aortic connector system (b).

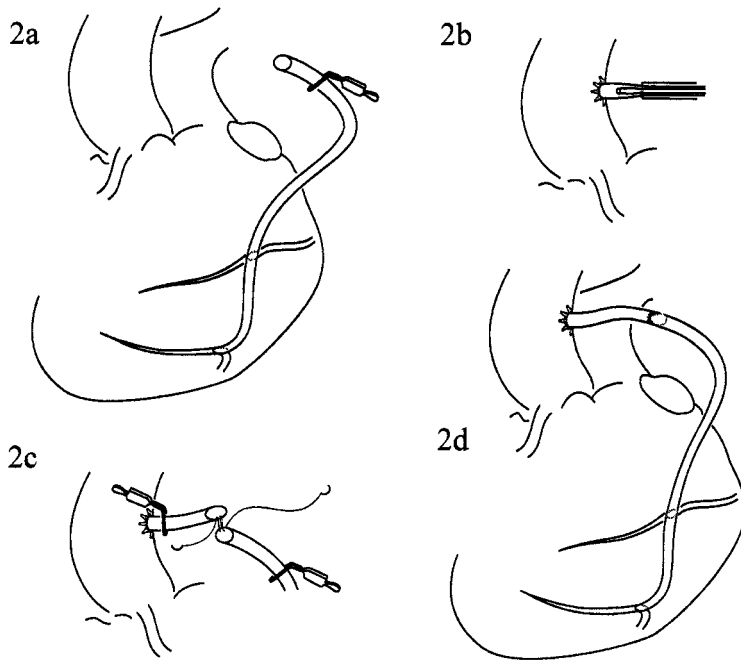


Fig. 2. After the completion of the distal anastomoses of the radial artery graft to the coronary arteries (a), the aortic connector loaded with the saphenous vein graft is deployed (b). End-to-end anastomosis is performed with 6-0 monofilament sutures between the distal end of the saphenous vein and the proximal end of the radial artery graft (c, d).

manipulation to the ascending aorta is required in OPCAB. OPCAB using an in-situ graft in the arteries such as bilateral internal thoracic and right gastroepiploic arteries is also an available procedure for the no-touch method, but flow competition and string conduit affected long patency. A free graft in the arteries such as the radial artery and saphenous vein that attaches to the ascending aorta has a large diameter, and it is an attractive high flow conduit utilized by many surgeons. The radial artery has recently been used as a way of reducing the usage of the saphenous vein, because it has been shown that the radial artery can maintain better outcomes than the saphenous vein.¹⁾ A mechanical anastomotic device, Symmetry aor-

tic connector system, has been developed by St. Jude Medical Anastomotic Technology Group (Minneapolis, MN) for vein graft-to-aorta anastomosis in coronary artery bypass grafting (CABG).²⁾ This connector system is a feasible, quick and reliable device for proximal vein graft anastomosis minimizing aortic manipulation in OPCAB. However, there are several disadvantages in using this connector system as follows; proximal anastomosis is firstly required, graft deployment to emanate at a 90-degree angle from aorta is required, so-called "in connector" stenosis that is typical stenosis at the site of the saphenous vein graft-to-aorta connection may occur, and long-term patency of the saphenous vein graft itself

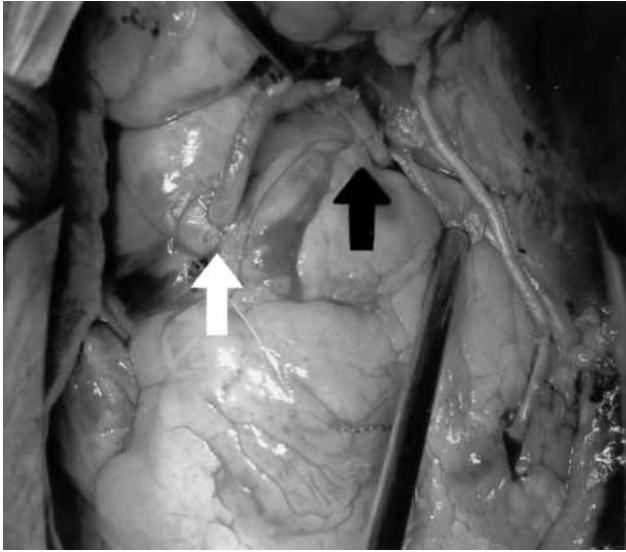


Fig. 3. A photograph showing the view after attachment of the composite graft of the saphenous vein and radial artery (black arrow) to the ascending aorta using the St. Jude Aortic Connector System (white arrow).

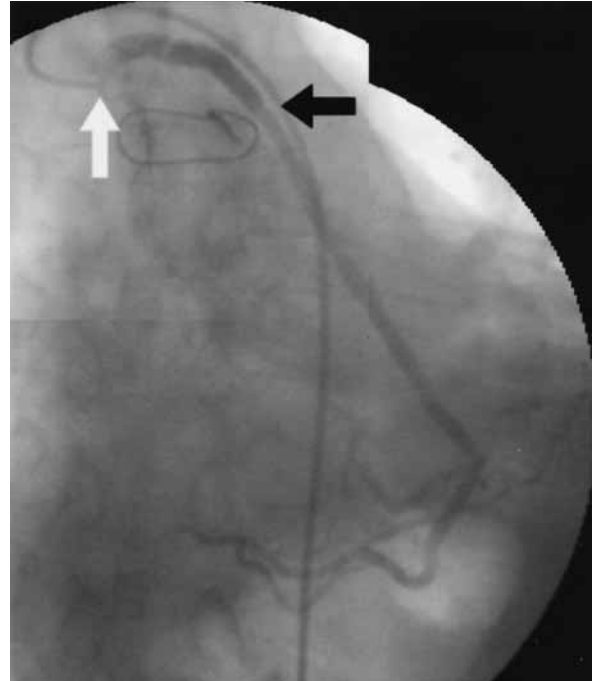


Fig. 4. Postoperative angiogram of the composite graft using our technique. The composite graft was attached to the ascending aorta using the St. Jude aortic connector System (white arrow), and end-to-end anastomosis between the saphenous vein and radial artery graft (black arrow) was performed.

may not be expected.^{3,4)} By using our technique, these disadvantages can mostly be avoided. When a part of the saphenous vein in the composite graft was short, the composite graft almost played a role as a free radial graft. Although the St. Jude Aortic Connector System has been used with the radial artery in some institutions, the use of this device with a radial artery graft, which is not warranted, requires a smaller connector and may result in “in connector” stenosis.⁵⁾ We have used this aortic connector device to 12 saphenous vein grafts with OPCAB and on pump beating CABG, and the postoperative angiography showed all early patency but 50% to 75% connector related proximal stenosis in 5 grafts. This composite graft technique is initial experience for minimizing the disadvantage of the aortic connector system. Longer term clinical and angiographic follow up will be required. But our technique would allow surgeons, who preferred the radial artery graft, to use an Aortic Connector System or PAS-Port™ proximal anastomosis system (Cardia, Inc Redwood City, CA) more feasibly in off-pump coronary bypass surgery.

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