



CASE REPORT

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Right brachiocephalic artery reconstruction along with coronary artery bypass grafting

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Abstract

The presence of concomitant coronary artery and supraaortic diseases requires a management strategy for best neurological outcome. A combined operation for both innominate artery reconstruction and coronary artery bypass surgery through a single median sternotomy incision is feasible. We are presenting a concomitant repair for a 63 years old man with coronary artery disease and innominate artery occlusion at aortic arch origin.

Key words: Coronary artery bypass grafting, brachiocephalic artery, occlusion

Introduction

The presence of concomitant coronary artery and brachiocephalic diseases is a rare condition and both diseases may be managed during coronary artery bypass grafting (CABG). Simultaneous surgical reconstruction of both coronary and innominate artery diseases is safe and does not increase the cross clamp and cardiopulmonary bypass (CPB) times if innominate bypass is performed before CPB establishment.

Case Report

We present a 63 years old male patient with multivessel coronary artery disease, right brachiocephalic artery total occlusion and left internal carotid artery stenosis. His initial complaint was left leg claudication with short walk. First he was evaluated for peripheral arterial disease. On physical examination, left femoral pulse was weak and all other distal pulses were absent. Left upper extremity pulses were also absent. Lower limb doppler ultrasonography revealed multiple occlusions and stenosis on both legs. Digital subtraction angiography (DSA) was performed and revealed right common, external iliac and superficial femoral artery occlusion along with left external iliac artery stenosis and left superficial femoral artery occlusion.

While planning for peripheral arterial reconstruction his preoperative ECG was considered suggestive for coronary artery disease. He underwent coronary angiography that demonstrated three-vessel disease with concomitant total occlusion of right brachiocephalic artery (Figure 1). A computerized tomographic angiography was performed to evaluate supraaortic vessels and carotid arteries. This study demonstrated 40-50% stenosis of both left subclavian and left carotid arteries and confirmed right brachiocephalic artery occlusion at the origin.

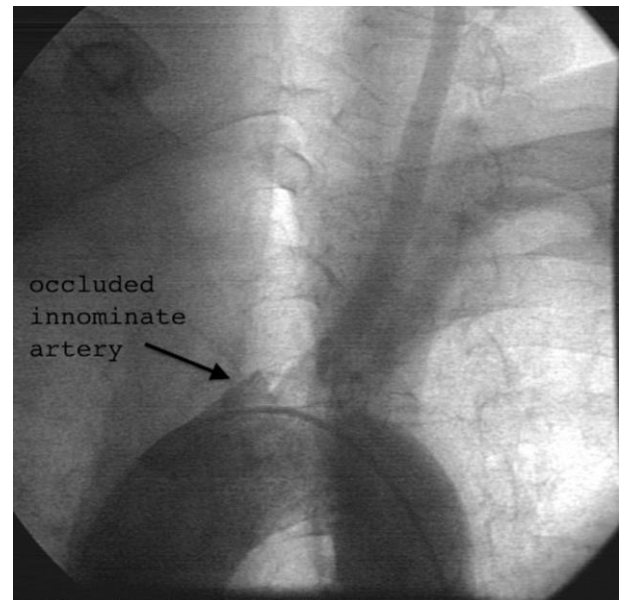


Figure 1. Angiographic image of occluded right brachiocephalic artery.

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A CABG operation along with brachiocephalic artery reconstruction was planned. Standard median sternotomy was performed under general anesthesia, subsequently right brachiocephalic artery was isolated and encircled with vascular tape. We decided that performing aorta- right brachiocephalic bypass first will maintain cerebral perfusion better during cardiopulmonary bypass (CPB). A clamp was set on distal right brachiocephalic artery following 5000 IU heparin administration. This artery was divided just off the level of its occluded origin at the aortic arch, after placing two 2-0 pledgitted polypropylene U stitches on the arch side for security. A 10 mm Dacron graft was anastomosed end-to-end fashion to right brachiocephalic artery and the other end of the graft was anastomosed end-to-side to ascending aorta using a side biting clamp (Figure 2).

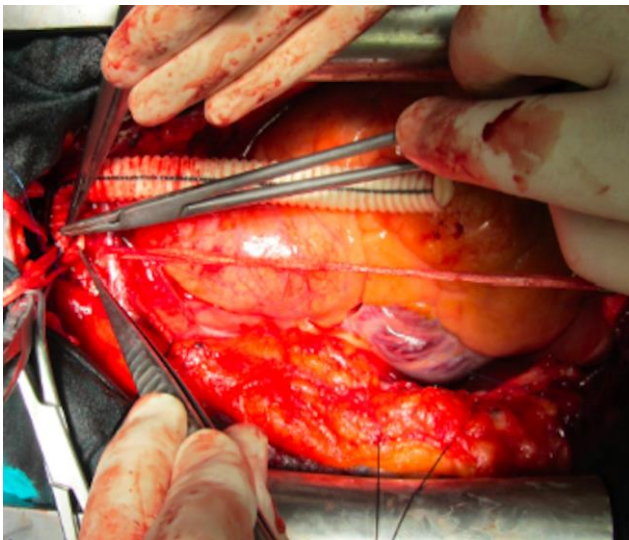


Figure 2. Intraoperative image of Dacron graft anastomosis to distal innominate artery prior to cannulation for CPB.

Following the completion of aorta-brachiocephalic bypass, arterial and venous cannulations are performed as usual. CPB was established and the aortic cross clamp was placed proximal to the Dacron graft anastomosis in order to perfuse the right cerebral hemisphere during CPB. After achieving cardioplegic arrest, left anterior descending, circumflex postero-lateral and right coronary arteries were bypassed with saphenous vein grafts (Figure 3). Left internal mammary artery (LIMA) was not harvested because of the stenotic left subclavian artery. Operation was terminated uneventfully. The postoperative course was also uneventful and the patient was discharged on sixth postoperative. One and three month follow-ups were normal and patient was then scheduled for peripheral arterial reconstruction for claudication.

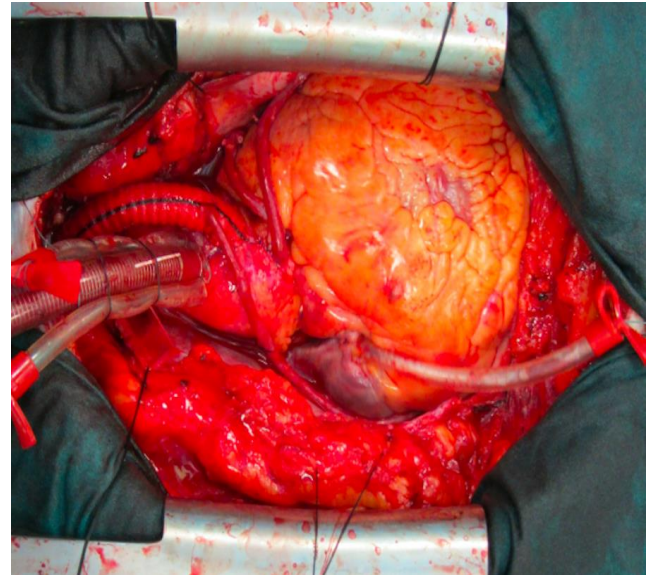


Figure 3. Intraoperative image of interposition and saphenous vein grafts just before decannulation.

Discussion

Extra-thoracic reconstruction techniques like carotid-subclavian bypass or transposition are the standard treatment for symptomatic right brachiocephalic or left subclavian artery occlusive lesions. In the presence of coronary artery disease, following median sternotomy, direct ascending aorta to supraaortic vessel grafts can be used for reconstruction and this strategy may lower the incidence of neurological complications that may occur due to inadequate cerebral perfusion for such patients. An aorta-axillary bypass graft with an additional infraclavicular incision was described by Ochi et al. [1]. Azakie et al. presented good results with right brachiocephalic artery endarterectomy [2]. Reul et al. also reported their experience with intrathoracic and extrathoracic reconstructions for isolated right brachiocephalic artery occlusive disease [3]. They described a variety of bypass graft choices for intrathoracic approach, including our strategy. Our technique consists of the aorta-innominate artery graft interposition and subsequent cardiopulmonary bypass for coronary bypass grafting. Placing the aortic cross clamp proximal to the Dacron graft anastomosis is important for cerebral perfusion via the aorta-innominate artery bypass graft. Failure to do that may jeopardize cerebral perfusion during CPB, especially if the left carotid artery is stenotic as in this case.

Combined innominate artery reconstruction plus CABG operation through a single standard median sternotomy incision is feasible and this approach adds safety, especially if CPB will be used for CABG.

References

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