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Case Report

Subclavian-Coronary Artery Bypass Grafting with Extra Prosthetics as an Alternative Method of Imposition of Proximal Anastomosis in Primary and Repeated Myocardial Revascularization Operations

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Received: July 13, 2022; **Published:** July 27, 2022

Abstract

Atherosclerosis of ascending aorta is the most important predictor of stroke after CABG. One of the methods allowing avoiding manipulation of the ascending aorta is S-CABG. This effective alternative method is used when the "no-touch" aorta, optionally connecting the extracorporeal circulation as well as repeated operations.

Keywords: *Subclavian-Coronary Artery Bypass; Atherosclerosis of Ascending Aorta; "No-Touch Aorta"*

Introduction

Despite the obvious progress in coronary surgery, postoperative neurological deficits remain a serious complication in patients after coronary artery bypass grafting (CABG). Serious neurological complications occur in 5 - 6% of cases after CABG with the use of artificial circulation [1]. One of the very safe methods for myocardial revascularization operations is subclavian-coronary artery bypass surgery (S-CABG). For the first time, Coulson A.S. [2] and Knight WL., *et al*. reported cases of S-CABG [3]. The use of the subclavian artery as a place for the imposition of proximal anastomosis is becoming increasingly widespread - ease of access and the possibility of atheroembolization of the brain and kidneys is excluded. The use of long implants from the saphenous vein is problematic, since the vessel is often bent or squeezed, there is an early neointimal hyperplasia due to mechanical trauma. The use of an 8 mm polytetrafluoroethylene graft [4] or a DACRON prosthesis [5] for external protection practically eliminates these complications.

Purpose of the Study

The purpose of our report is to present a clinical case of S-CABG of the posterior descending branch from the right coronary artery, in a patient with coronary artery disease and atheromatous lesion of the ascending aorta.

Case Report

A 63-year-old man was admitted to the clinic with complaints of chest pressing pains with minor physical exertion with radiation into the interscapular space, accompanied by shortness of breath, palpitations. According to coronary angiography, the patient revealed

stenosis of LAD in the proximal third to 70 - 80% and occlusion of PCA in the proximal third, the post-cumulative site of PCA contrasts in intersystem collaterals. The patient underwent LIMA-LAD, autovenous S-CABG PDA in conditions of parallel ECC and normothermia.

Epiaortic ultrasound was performed according to the protocol adopted at the A.N. Bakulev National Center of Agricultural Sciences [6], on which areas of calcium inclusion throughout the ascending aorta were identified - the average degree of damage according to the Wareing T classification [7]. Access to the right subclavian artery was performed, the artery in the first segment was mobilized and parietally squeezed, and a proximal anastomosis of the autovena was formed with the thread 6/0. Through the second intercostal on the right, lateral to the right IMA, a channel is formed into the pericardial cavity, a venous conduit was performed with additional protection by a vascular prosthesis No. 10. The prosthesis is fixed by nodal sutures to the intercostal muscles and pericardium. The length of the prosthesis was about 15 cm. Venous conduit through the canal is conducted into the pericardial cavity, good blood flow is noted. Further, the subclavian artery is cannulated more distal than the proximal anastomosis and parallel artificial circulation is started in conditions of normothermy. Myocardial stabilization was carried out using OCTOPUS. The blood flow along the shunt is assessed and shortened to the proper length after arteriotomy of the PDA. Distal anastomosis of vena with PDA thread 7/0 is applied. Blood flow through the shunt is allowed (Figure 1). After that, a distal anastomosis of the left IMA with permanent residence with LAD of 8/0 is applied. The total ECC time was 62 minutes. Shuntography on the 6th day after the operation revealed the consistency of anastomoses (Figure 2). The patient was discharged from the department on the 10th day after the operation in a satisfactory condition. With the accumulation of experience, this operation can enter the arsenal for cardiac surgeons with atheromatosis of the ascending aorta and repeated operations.

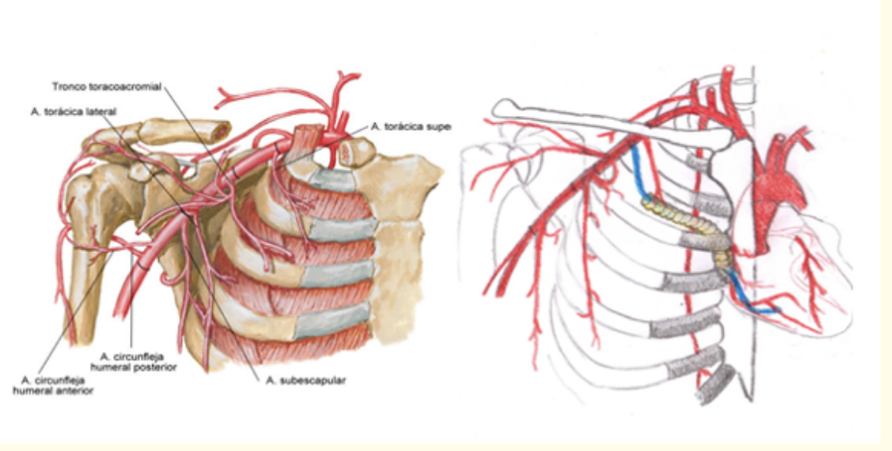

Figure 1: *Anatomy of the right subclavian artery and the scheme of operation.*

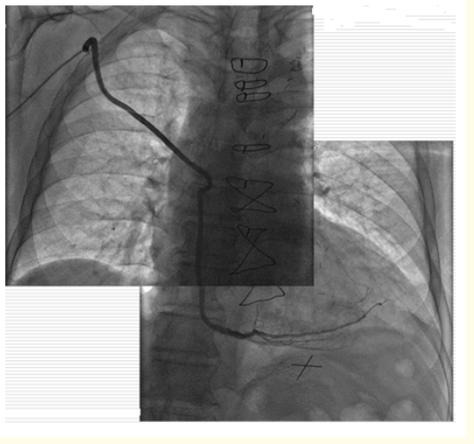

Figure 2: *The subclavian -coronary shunt on the right is passable throughout, the branches of RCA contrasts well.*

Discussion

S-CABG is an effective alternative method, which in practice is used in the "no-touch aorta technique", when it is necessary to connect ECC, as well as for complications during the MIDCAB procedure, repeated operations with a high risk of resternotomy, especially with the participation of previously used LIMA [8]. We believe that, despite significant technical difficulties, the use of S-CABG allows you to successfully perform myocardial revascularization surgery, minimizing the risk of neurological complications.

Conclusion

The proposed technique using a fixed domestic vascular prosthesis allows to optimize the location of the shunt in the chest cavity. Minimizing the injury of the shunt during the respiratory act, long-term patency of the shunt is ensured. A detailed analysis of the anatomy of the coronary and axillary arteries, optimization of the operation plan, the creation of a "prosthetic channel" (or shunt exoprosthesis) can minimize the likelihood of cardiac and neurological complications and achieve a good clinical effect. In this regard, we believe that a new approach to protecting the shunt with a vascular exoprosthesis is a very useful tool in the arsenal of cardiac surgeons.

Conflict of Interest

Conflict of interest is not declared.

Financing Support

The study did not have sponsorship.

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Volume 6 Issue 8 August 2022