



CORONARY ARTERY BYPASS GRAFTING IN PREMATURE CORONARY ARTERY DISEASE, A REVIEW OF TOTAL ARTERIAL REVASCULARIZATION

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ABSTRACT:

Familial hypercholesterolemia is the most common cause of premature coronary artery disease in south Asian population. Here we present a case of premature coronary artery disease in a 21 years old male. He had critical ostial stenosis of left main coronary artery and triple vessel coronary artery disease. He underwent coronary artery bypass grafting with total arterial revascularization. The postoperative course was uneventful and he was discharged on 6th post-operative day.

Key words: premature coronary artery disease, coronary artery bypass grafting, total arterial revascularization

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INTRODUCTION:

Coronary artery disease (CAD) is a major cause of mortality and morbidity all over the world. According to a report of World Health Organization (WHO) in 2005, cardiovascular disease (CVD) caused 17.5 million (30%) of the 58 million deaths that occurred worldwide.¹ There has been a 4-fold rise of CAD prevalence in Indian subcontinent during the past 40 years. Current estimates from epidemiologic studies from various parts of the subcontinent indicate a prevalence of CAD to be between 7% and 13% in urban and 2% and 7% in rural populations.² It is estimated that about 10% of individuals presenting with documented CAD are <45 years of age.³ Premature coronary artery disease is defined as presence of coronary artery disease in a person under the age of 40 years.⁴

We present a case of premature coronary artery disease in a 21 years old male, having left main coronary artery critical ostial stenosis and triple vessel coronary artery disease. He underwent coronary artery bypass grafting with total arterial revascularization.

CASE REPORT:

21 years old male admitted through outpatient department with the complaints of recurrent chest pain worsening over last few days. He had Cana-

dian Cardiac Society Class-IV anginal symptoms. He was a known case of hypercholesterolemia and was on Statins for last 10 years. He had a family history of hypercholesterolemia and coronary artery disease. He had no history of transient ischemic attack or stroke and no other conventional risk factors for IHD.

On examination, there were tendon xanthomas on fingers, elbow and knee joints. (Figure 1 and 2) His LDL-C was 379, total cholesterol 429 HDL 22 and triglyceride 139 mg/dl. ECG was normal and ECHO showed mild aortic regurgitation. Patients ejection fraction was 45%. Coronary Angiogram showed (Figure 3) critical ostial stenosis of left main coronary artery. Severe proximal disease of LAD. Total proximal occlusion of LCX. Right Coronary artery had tight proximal stenosis.

On Carotid Duplex Scan he also had bilateral carotid artery disease with 60% stenosis of right internal carotid artery and 50% stenosis of left internal carotid artery.

Myocardial revascularization was indicated with coronary artery bypass grafting (CABG). Surgery was performed via median sternotomy under general anesthesia and standard invasive monitoring. Skeletonized bilateral internal mammary arteries (BIMA) along with Left Radial Artery (RA) were harvested. The right Internal mammary artery (RIMA) was taken as free graft and anastomosed to Left Internal mammary artery (LIMA) at the level of left atrial appendage and created a composite "Y" graft. (Fig.4) Standard cardiopulmonary bypass (CPB) was established and myocardial protection was achieved by antegrade cold blood cardioplegic arrest. RCA was revascularised with

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Fig. 1: Tendon xanthomas over elbow



Fig. 2: Tendon xanthomas over hand



Fig. 3: Left Main Coronary artery ostial stenosis



RA whose proximal end was anastomosed directly over aorta.(Fig. 5) The Obtuse Marginal Coronary artery was revascularised with RIMA and LAD with LIMA. Patient was successfully weaned off from CPB and shifted to Intensive Care Unit (ICU) on minimal inotropic support. The postoperative course was uneventful, and the patient was extubated six hours after the surgery. He then stayed in the ICU for one day and spent a total of six days in the hospital. The postoperative echocardiographic findings and enzyme levels were normal, and the patient was prescribed atorvastatin as well as dual antiplatelet drugs on discharge. The postoperative follow-up continues till today. He is still under followup to ensure strict control of his cholesterol levels, and he also undergoes periodic physical examinations

Fig. 4: Composite "Y" Graft

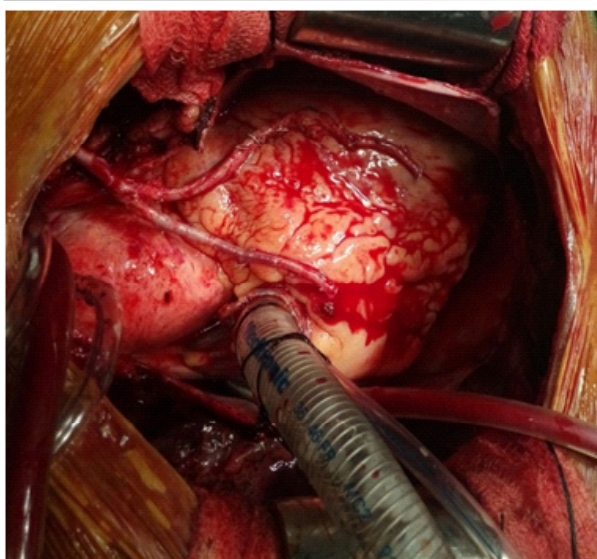
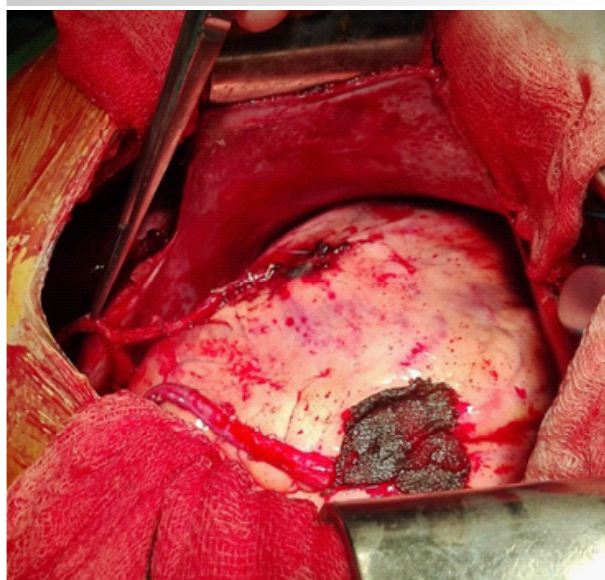


Fig. 5: Arterial Grafts



LIMA: Left Internal Mammary Artery
RIMA: Right Internal Mammary Artery

RA: Radial Artery



including echocardiography. Currently, the patient is free of angina.

DISCUSSION:

Coronary artery disease is no longer confined by geographical area, age, sex or socioeconomic status. Familial hypercholesterolemia is the most common cause of premature coronary artery disease. Although the common age of presentation is late in the second and third decade, earlier presentation with severe obstructive coronary artery disease is well documented.⁵ In these cases, coronary revascularization is required. Which type of graft to be used whether arterial or venous, the arterial graft is a better choice according to some surgeons.⁶ venous grafts have acceptable results

but arterial grafts have better patency rates LIMA to LAD is an acceptable and excellent graft worldwide and higher patency rate and lesser failure rates.⁷ According to ESC/EACTS Guidelines for Coronary Artery Revascularisation, the use of a LIMA to the LAD and arterial grafts to these vessel showed reasonable results.⁸ Tector et al. have showed multiple composite arterial grafts (T-graft) for the vessels.⁹ Radial artery grafts have better result than saphenous vein grafts.⁷ Arterial grafts have the advantage of durability and may have a protective effect by reducing the progression of native CAD in grafted vessels.¹⁰ Multiple arterial grafting may thereby improve survival in patients receiving total arterial revascularization.

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