

Case report

Surgery for Isolated Chronic Total Left Main Coronary Artery Occlusion: A Case Report

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Abstract: Chronic total obstruction of the left main coronary artery is a rare condition, but it is commonly a fatal if not treated. It is defined as the total absence of antegrade coronary blood flow to the left anterior descending and circumflex coronary arteries. It may present acutely or chronically. In the chronic settings, right coronary artery dominance is always present, with significant collaterals from the right to left system. We report a rare case of a young male who presented with stable angina pectoris, and found to have total left main coronary artery occlusion, and discuss some of the surgical considerations in this clinical scenario (*J clin invasive cardiol* 2015;2(1):4-6).

Key Words: left main coronary artery, ischemic heart disease, coronary artery bypass grafting, coronary obstruction

Introduction

Chronic total left main coronary obstruction (TLMCO) is a rare clinical entity, with a reported prevalence by authors of 0.025% - 0.4%.^{1,2} The gold standard therapy for this entity is Coronary artery Bypass Grafting (CABG). Percutaneous Coronary Intervention (PCI) may play a role in the acute settings.¹ We report the successful result of a case that had chronic TLMCO treated by CABG.

Case presentation

A 34 year old male patient presented with stable angina pectoris. His cardiovascular risk factors for coronary artery disease were diabetes, hyperlipidemia and smoking history. Electrocardiogram did show a normal sinus rhythm with no ischemic changes. A transthoracic echocardiogram showed preserved

left ventricular function with normally functioning cardiac valves. Coronary angiography demonstrated a total occlusion of the left main coronary artery (Figure 1) with a retrograde filling of the left system via a diseased right coronary artery (Figure 2).

Surgery was performed via median sternotomy and partial cardiopulmonary bypass. Left internal mammary artery was used as a conduit to the left anterior descending artery, while three pieces of left saphenous vein conduits were used to bypass the posterior descending and left ventricular branches of the right coronary artery and the circumflex coronary artery. Myocardial preservation was performed using antegrade crystalloid solution and a retrograde blood cardioplegic solution. All new grafts documented excellent flow patterns and patient

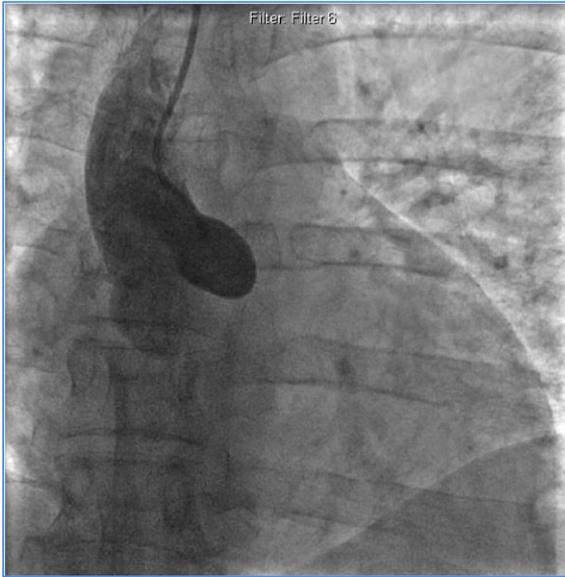


Figure 1: Coronary angiogram showing chronic total occlusion of the left main coronary artery with no antegrade flow in the left anterior descending artery and left circumflex artery.

was weaned from cardiopulmonary bypass successfully. Patient had smooth post-operative recovery period and was dismissed from the hospital in good shape with preserved left ventricular function.

Dismissal medications included clopigerol, since his native coronary arteries in the left system were small in caliber.

Discussion

Chronic total left main coronary artery occlusion is a rare entity, which may be associated with high incidence of sudden cardiac death, and this may explain the rarity of such diagnosis in coronary angiograms. Survival of these patients is determined by the adequacy of the collaterals and the status of the dominant right coronary artery circulation.³

Coronary artery bypass grafting is considered by many authors to be the gold standard therapy for such condition, since there are certain drawbacks for PCI trials in this condition. Aoki and

colleagues reported a wire crossing success rate approaching only 40-81%, and high rates of restenosis.⁴ TLMCO is a progressive disease, with calcification process in the proximal left main is accompanying factor, this fact renders PCI therapy from being a good choice also.¹ Yip and colleagues demonstrated a success rate of 72.2% with PCI in patients with total or subtotal chronic left main occlusion.⁵ The suboptimal results shown by many authors made us choose the surgical revascularization as the first and optimal option to offer for our patient.

Akhtar and colleagues argued the idea of myocardial preservation during on-pump CABG for patients with TLMCO, and showed that antegrade delivery route could be adequate method of myocardial protection.¹ Ipek and colleagues showed good results in using alternating ante and retrograde cardioplegic route in 7 patients operated upon for occluded left main coronary artery.³ Ehrenberg and colleagues showed that retrograde cardioplegic delivery preserves the left ventricular function better than the antegrade route in totally occluded



Figure 2: Collaterals to the left anterior descending artery and left circumflex artery from a dominant right coronary artery.

coronary arteries.⁶ These conclusions made us lean towards using ante and retrograde cardioplegic delivery for better preservation in our case scenario.

Conclusion

CABG is an ideal treatment strategy for patients with total left main coronary artery obstruction. Combined methods of antegrade and retrograde cardioplegic arrest may be helpful.

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