On-pump coronary artery bypass in moyamoya disease: A case report

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ABSTRACT

A 54-year-old female with pre-existing idiopathic moyamoya disease developed chest pain with acute myocardial infarction. Coronary angiography detected occluded and stenotic lesions in the coronary arteries. Right coronary artery stenosis was treated by balloon angioplasty and stenting. Because of the restenosis, on-pump cardiopulmonary bypass was performed. The operation was uneventful and no perioperative cerebral ischemic episode occurred. The conclusion is that on-pump cardiopulmonary bypass preserving intraoperative hemodynamic parameters at an optimal level is a safe procedure in a patient with moyamoya disease.

Keywords: Cardiopulmonary Bypass; Coronary Artery Disease; Moyamoya Disease

1. INTRODUCTION

First described in 1957, moyamoya describes a rare cerebral arteriopathy characterized by occlusive disease of the terminal internal carotid or proximal middle cerebral arteries and proliferation of lenticulostriate collaterals [1]. The steno-occlusive changes in moyamoya disease are believed to be confined to the intracranial arteries and rarely occur in the extracranial arteries, including only rare occurrences in the coronary arteries [2]. In the literature, extracranial vascular involvement has been reported mainly in the renal artery [3]. However, coronary artery involvement among patients with moyamoya disease (MMD) is extremely rare [2]. We report an elderly female having ischemic heart disease with MMD who was successfully treated by on-pump coronary artery bypass grafting (ACBG).

2. CASE REPORT

A 54-year-old female was admitted to our clinic with sudden-onset acute inferior myocardial infarction. Urgent coronary angiography, performed at our hospital, revealed triple vessel disease; total occlusion of the right coronary artery (RCA) and left anterior descending artery (LAD); and 70 - 80 percent stenosis of the circumflex obtuse marginal artery (CXOM).

RCA stenosis was treated by balloon angioplasty and stenting.

Upon the resumption of the patient’s angina within one month, coronary angiography was performed. Fifty to sixty percent stenosis within the stent was found. The patient was referred to us for CABG “Figure 1”. Her past medical history included left hemiparesis due to a stroke at age 48 years. She recuperated at another institution following the diagnosis of MMD “Figure 2”.

This patient also suffered from hypertension and diabetes mellitus, though she was being treated successfully

Figure 1. Stenosis within the stent.
occlusion results from a combination of luminal thrombosis and hyperplasia of smooth-muscle cells. Although a combination of moyamoya and renovascular hypertension is well described [3], the association of coronary artery disease and moyamoya is rare [2]. The combination could be a chance occurrence. However, brain protection during CABG for patients with severe cerebrovascular disorder is vital. It is important to optimize physiological parameters, such as hemoglobin, hydration, and blood pressure, particularly around the time of surgery. CPB for patients with MMD is a high-risk procedure because of decreased cerebral perfusion pressure and non-pulsatile flow during CPB [5].

It is commonly believed that preserving autoregulation of CBP is the most important means of preventing brain ischemia in cases of cerebrovascular disorder such as MMD. Some techniques for CBP have been reported, including maintenance of the mean perfusion pressure above 70 mmHg; a-stat blood gas management; and pulsatile flow with systolic pressure above 100 mmHg [6,7]. Off-pump CABG is an alternative, but during distal anastomosis, it might induce unexpected hemodynamic instability and impede cerebral circulation [5,7]. Some authors used an intra-aortic balloon pump as cerebral protection in a patient with moyamoya disease undergoing coronary artery bypass grafting [8,9]. In conclusion, we performed a successful on-pump triple vessel CABG on a patient with MMS. Therefore, it is possible to protect the brain from ischemia during on-pump CABG in a patient with MMS, preserving intraoperative hemodynamic parameters at appropriate levels.

REFERENCES


