Incidental single coronary artery in an octogenarian with acute type A aortic dissection

Hironobu Morimoto*, Shogo Mukai, Shogo Obata and Toshifumi Hiraoka

Department of Cardiovascular Surgery, Fukuyama Cardiovascular Hospital, Hiroshima, Japan

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Abstract

Single coronary artery (SCA) in the absence of other major congenital cardiovascular anomalies is rare. We report an extremely rare case of acute aortic dissection in an octogenarian who had a single left coronary artery with the right coronary artery originating from the distal circumflex. A single ostium was incidentally detected by visual inspection during an operation. We diagnosed the anomaly in detail by postoperative 64-slice multi-detector computed tomography. As we performed an emergency operation, it was difficult to recognize SCA preoperatively. In this situation, it is very important to establish adequate myocardial protection and careful dissection is necessary to avoid iatrogenic injury.

Keywords: Single coronary artery • Coronary anomaly • Three-dimensional computed tomography • Acute aortic dissection

INTRODUCTION

Single coronary artery (SCA) is a rare condition in which the entire coronary system arises from a solitary ostium in the absence of other major congenital cardiovascular anomalies [1–5]. SCA is generally diagnosed incidentally during conventional angiography. If not recognized preoperatively, it can result in serious complications during aortic surgery because of inadequate myocardial protection and iatrogenic injury. We report an extremely rare case of acute aortic dissection in an octogenarian who had a single left coronary artery with the right coronary artery originating from the distal circumflex. We diagnosed the anomaly in detail by postoperative 64-slice multi-detector computed tomography (MDCT). To our knowledge, acute aortic dissection in an elderly patient with SCA has not yet been reported.

CASE REPORT

An 89-year old woman with a history of hypertension was admitted to another hospital for chest pain. Enhanced CT revealed acute type A aortic dissection and she was referred to our hospital for surgery. Preoperative echocardiography demonstrated no asynergy of left ventricular wall motion and a small pericardial effusion. We decided to perform an emergency operation. Total cardiopulmonary bypass (CPB) was established by cannulating the left femoral artery and both vena cavae through a median sternotomy. Decompression of the left ventricle was performed using left ventricular venting through the right superior pulmonary vein. After the ascending aorta was clamped, we performed an aortotomy and carefully observed the aortic root from the inside. We recognized a solitary left coronary ostium. Antegrade cold-blood cardioplegia through only the left coronary ostium was administered and cardiac arrest was obtained. In addition, we performed retrograde cardioplegia from the coronary sinus. Although we carefully observed the aortic root and ascending aorta, the right coronary ostium was not detected. We carefully dissected the aortic root for aortic root reconstruction, avoiding iatrogenic injury of the invisible anomalous coronary artery. The aortic root was reconstructed with gelatine resorcin formalin glue and teflon felt strips were secured inside and outside of the aorta. After the patient was cooled down to 28, the aortic cross-clamp was released and antegrade selective cerebral perfusion from the neck vessels was begun. Because we recognized the entry of aortic dissection at the proximal aortic arch, we performed hemiarch replacement using a 24-mm bevelled tube graft with one side arm, and we started systemic perfusion via the side arm of the tube graft. Finally, we sutured the tube graft to the proximal aortic stump. Intraoperative transoesophageal echocardiography revealed preserved biventricular function, and weaning from CPB was uneventful. We diagnosed the anomaly in detail by postoperative MDCT (Fig. 1). The SCA arose from the left sinus of Valsalva and gave off the left anterior descending (LAD) and circumflex (LCx) branches. The LCx continued beyond the crux into the atrioventricular groove and provided branches to the right atrium and atrium (Fig. 2). The right coronary artery ostium was congenitally absent, and the LCx was dominant. This patient was discharged from the hospital without any neurological deficit or other complications on the 21st postoperative day.

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DISCUSSION

SCA is a rare congenital anomaly where only one coronary artery arises from the aortic root from a single coronary ostium and supplies blood to the entire heart [1]. The approximate incidence of a single coronary ostium ranges from 0.014 to 0.066% in the general population undergoing coronary angiography [2–5]. The origin of SCA and its pattern of distribution are variable. The occurrence of the anatomical course of either a right or left SCA is extremely rare. The SCA of an anatomical course generally has a benign clinical course [2]. However, it still has significance for cardiothoracic surgeons and interventionalists because dissection of the ostium or occlusion of the SCA could result in a catastrophic event. Moreover, if not recognized preoperatively, it can lead to serious intraoperative complications because of inadequate myocardial protection and iatrogenic injuries. Although coronary angiography for the patient with acute aortic dissection is controversial, it can identify anomalous coronary arteries. However, it is difficult to determine the relationship between the course of an anomalous artery and surrounding tissue, such as the right ventricular outflow tract and aortic root. MDCT angiography can resolve this problem.

A detailed description of the anomalous artery and surrounding tissue should be given to the cardiothoracic surgeons in order to avoid iatrogenic injury and to ensure adequate myocardial protection. However, when emergency surgery is required, it is difficult to perform MDCT in all patients because of unstable haemodynamics and the time required for the scan. When a single ostium is incidentally detected by visual inspection during an operation on the aortic root or aortic valve, it may reflect the presence of an SCA or high anomalous origin of the right coronary artery from the ascending aorta [6, 7]. For appropriate myocardial protection and avoiding injury to the coronary artery, it is necessary to carefully dissect the ascending aorta and aortic root from the surrounding tissue.

In conclusion, we performed hemiarch replacement for acute aortic dissection in an octogenarian with SCA. As we performed an emergency operation, it was difficult to recognize SCA preoperatively. In this situation, it is very important to establish adequate myocardial protection, and careful dissection is essential to avoid iatrogenic injury.

Conflict of interest: none declared.

REFERENCES