Primary spontaneous coronary artery dissection complicated by iatrogenous aortic dissection: from David procedure to full arterial coronary revascularization

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Abstract

Introduction: Primary spontaneous coronary artery dissection (PSCAD) is an uncommon cause of acute myocardial infarction that can lead to fatal course especially because of non-standardized management. We report the case of a 37-year-old woman who presented with a PSCAD of the right coronary artery. Patient: A young woman was addressed to our hospital for a PSCAD of the right coronary artery (RCA). During the coronary angiogram, an iatrogenous type II aortic dissection occurred. She was then scheduled for surgery since ascending aortic diameter after the dissection was measured at 52 mm. Method: A David procedure was made to replace the aortic root. Since weaning from cardiopulmonary bypass (CPB) was easy without ischemic signs in the right territory, we didn’t systematically graft the RCA. Thirty minutes after the end of the procedure, a cardiogenic shock occurred witnessing a complete thrombosis of the RCA. CPB was restarted and the RCA was grafted on-pump using a right internal thoracic artery (RITA). The left network was examined and also showed to be dissected. Using the RITA, a T-graft was constructed and the left anterior descending and a marginal branch were grafted, rendering the weaning from CPB possible. Result: Postoperative troponin at day 1 was 93 μg/l. Weaning from inotropic drugs and from intra-aortic balloon pump was possible after four days. Extubation was postponed because of a pulmonary infection due to hemophilus influenzae. It was done at day 14. Echographic control showed no residual aortic insufficiency. CT-scan showed a patent RITA-to-RCA graft but an involution of the LITA graft, along with a healing of the left network. Conclusion: PSCAD is a severe condition and its management is uncertain. The grafting of the diseased coronaries can be facilitated by an on-pump technique and the use of a coronary shunt to avoid further ischemia.

Keywords: Spontaneous coronary artery dissection; Aortic dissection; David procedure; OPCAB

1. Introduction

Primary spontaneous coronary artery dissection (PSCAD) is an uncommon cause of acute myocardial infarction. It occurs often in young females and concerns in general a single coronary artery. The initial presentation is most likely unstable angina pectoris and must be evoked in the patient without a cardiovascular risk factor [1–4]. The causes of PSCAD remain unknown and the prognosis is very often dark with high risk of death due to the absence of standardized management.

Herein we present the case of a woman with a PSCAD of the right coronary artery (RCA), secondarily complicated by an iatrogenous type A aortic dissection during angiogram. The operative technique and the imaging follow up are discussed.

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circulating false lumen, without pericardial effusion (Fig. 3). Inside the false lumen we could still see a persistence of the radiomarker. The aortic dissection started from the right coronary artery and extended towards the left main stem, without extension into the left network. The patient was then discussed for surgery but postponed for two more days because of the recent thrombolysis, the clopidogrel treatment, and the absence of residual chest pain.

Surgery was performed via full sternotomy. CPB was started between the right atrium and the aortic arch. After opening the aorta, the examination of the root confirmed the extension in between both coronary arteries. The entry site was not found inside the right coronary artery. A David procedure was performed. The aortic root was dissected from the pulmonary artery, the right ventricle, and the right atrium. Six 2/0 U-stitches were passed below the aortic valve and were used to attach a 26-mm valsalva Dacron® tube (Vascutek®). The aortic cusps were suspended inside the tube and the edges of the aortic sinuses that were previously resected were sutured inside the tube using a 4/0 polypropylene. The coronary ostias were repaired using biologic glue, and reimplanted laterally on the valsalva segment of the tube. After distal anastomosis, and declamping, the patient was weaned from CPB without inotropic support. The left network was conse-
Fig. 4. CT-scan of the right internal thoracic artery-to-right coronary artery (RCA) graft. Note the dissection of the first segment of the RCA (arrow).

Fig. 5. CT-scan showing the first segments of the left network. We do not see any residual aspect of dissection.

was clearly risky, the decision to wait two days before surgery was taken to minimize the bleeding risk because of the recent thrombolytic treatment and in the absence of residual chest pain, ECG signs, and heart failure.

The surgical decision is also to be discussed. Iatrogenic aortic dissections can sometimes be treated with conservative therapy. In the present case, we have to face a form of non-circulating aortic wall hematoma. The first CT-scan showed that the aorta was dilated (42 mm). After the occurrence of the dissection, the external diameter was measured at 52 mm. The David procedure was done as a routine technique in aortic dissection. It is our department’s politics in aortic dissections in patients before 70 years old. Since the weaning from CPB was easy without electrical or echocardiographic disorders, we decided not to graft systematically the RCA. The secondary cardiogenic shock was probably due to the thrombosis of the false lumen of the RCA and consecutively the flow stop. This condition led the anesthesiologist to perform a flash of inotropic drugs with a subsequent rise of the arterial blood pressure (250 mmHg over 5 to 6 min). This was probably the reason for the secondary dissection of the left network.

In our approach to resolve the coronary problem, two decisions were of importance. The use of an Octopus™ stabilizer avoided additional ischemia for the heart, and the insertion of a coronary shunt in each suture allowed a more reliable grafting technique. In postoperative, the absence of development of the LITA is probably due to the cicatrisation of the left network, shown by the CT-scan images (Fig. 5).

In conclusion, the management of a PSCAD must be quick to avoid as much as possible myocardial ischemia. The beating heart technique with the use of a systematic coronary shunt must be discussed as often as possible. Yet, one should not forget the help of ventricular assist devices in case of failure of the revascularization.

3. Discussion

Primary spontaneous coronary artery dissection (PSCAD) is a very rare condition. The etiology remains unknown but hypertension, Marfan syndrome, connective tissue disease or immune system disease can be found [5,6]. Sometimes, a recent chest trauma is related [7]. The initial presentation is frequently sudden death, acute coronary syndrome, or congestive heart failure [1,8]. The location of the dissection is usually the proximal portion of a single artery but multiple vessels can be concerned simultaneously [1].

In our case, the coronary angiography showed a right coronary dissection. Unfortunately, the injection of radiomarker was complicated by an aortic dissection. Even if it
References


