



Minimal Invasive Transfer of the Anomalous Right Coronary from the Left Sinus of Valsalva

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Abstract

Background: The cases of anomalous origin of the right coronary are rare, but the symptoms of the disease are serious because of the coronary blood flow disturbances.

Case Presentation: A 44-years old man was visited to our department with the signs of coronary ischemia, normal echocardiography (EF: 64%, EDD/ESD: 47/30 mm, IVS: 9 mm, no wall motion disorders). At the ECG gated coronary CTA a right coronary anomaly (the RCA originated from the left sinus of valsalva and run between the aorta and pulmonary trunk) was shown. Open heart surgery was done by upper J mini-sternotomy, and the RCA was replanted to the right sinus of valsalva. No early postoperative complication was observed. No stenosis of the RCA or the orifices of the RCA were found at the late (6 month) ECG gated coronary CTA.

Conclusion: The coronary anomalies in the adulthood are rare, but the anatomical correction (without bypass graft or tunnel) is possible by minimal invasive surgical way.

Keywords: Coronary anomaly; Minimally invasive surgical procedure; Mini-sternotomy

Introduction

The most common congenital coronary anomaly is the coronary arteriovenous fistula [1]. The main signs and symptoms are connected to the sign of myocardial ischemia [2]. This may result the compression of the RCA, because of the courses of the RCA between the aorta and pulmonary trunk. The exact cause of myocardial ischemia is controversial. It is clear that the blood flow of the RCA is limited, this may occur in case of increased cardiac output results in dilatation of the aorta and the pulmonary trunk, which can occur the compression of the RCA. All of these could affect angina, syncope, ventricular fibrillation and sudden death [3-5].

Case Presentation

A 44-years old man visited to our department with chest pain and normal rest ECG. We applied stress ECG, and it was shown non-significant ST segment depression in inferior leads. Normal left ventricular function (EF: 64%), normal left ventricular dimensions (EDD/ESD: 47/30 mm, IVS: 9 mm), no wall motion disorders was shown. Because of the incongruent data, an ECG gated coronary CT angiography where done (GE, 64 slices, dual energy, 95 ml of contrast agent were injected (Iomeron 400), and it shows anomalous origin of the RCA from the left sinus of valsalva, which run between of the aorta and the pulmonary trunk (Figure 1).

The patient underwent minimal invasive anatomical correction of the anomalous RCA without coronary bypass graft or tunelisation. Anesthesia maintenance was with intravenous propofol, fentanyl and rocuronium. Upper J mini-sternotomy was applied. Cross clamp time: 40 min, Total ECC time: 60 min. The proximal part of the Right Coronary Artery (RCA) was dissected under the epicardium. It is run in the media of the aorta (intramural) between the aorta and the pulmonary trunk, and emerged from the aorta before the right sinus of valsalva. The aorta was opened, it was shown only one coronary orifice (Left Main (LM)), at the left sinus of valsalva, and the RCA was originated from the LM straight after the orifice, and run in the wall of the aorta. The RCA was cutting throw (after the emerging point from the aortic wall), and the proximal end was closed by 6/0 Prolene sutures. The right sinus of valsalva was punched and the distal end of the RCA was sutured back (7/0 Prolene) to the right sinus of valsalva. No significant necroenzyme release (High sensitivity Troponin I max: 0.3835 ng/ml, CK-MB max: 3.1 ng/ml) were observed at the first 48 hours. Normal dimensions of left ventricle (EDD/ESD: 53/38 mm), 65% of ejection fraction were observed at the post-operative echocardiography.

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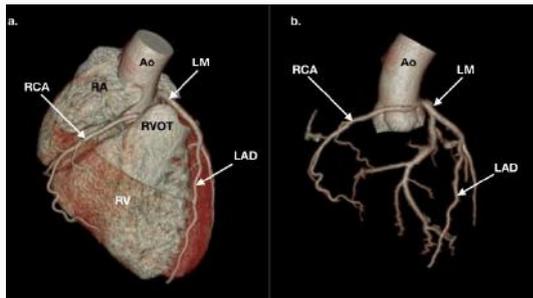


Figure 1: Preoperative CT coronarography: (a) CT coronarography (GE 64 slices dual energy, Volume rendering 3D reconstruction, anterior view and (b) Volume rendering 3D reconstruction without soft tissues, anterior view. RCA: Right Coronary Artery; LM: Left Main; LAD: Left Anterior Descending Artery; RA: Right Atrium; RV: Right Ventricle; RVOT: Right Ventricle Outflow Tract; AA: Ascending Aorta.

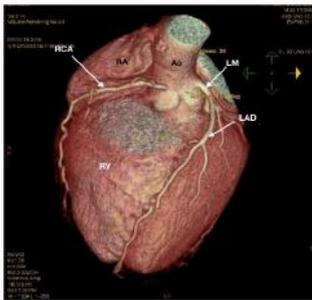


Figure 2: Postoperative CT coronarography after the transfer of the right coronary osmium to the right sinus of Valsalva: CT coronarography (GE 64 slices dual energy, Volume rendering 3D reconstruction, anterior view. RCA: Right Coronary Artery; LM: Left Main; LAD: Left Anterior Descending Artery; RA: Right Atrium; RV: Right Ventricle; AA: Ascending Aorta.

ECG gated coronary CTA was performed 6 month after the operation (Figure 2). It was shown a normal origin of the RCA from the right sinus of Valsalva, no stenosis of the orifice of the RCA, and no significant stenosis of the coronary system, low Calcium score.

Conclusion

The coronary anomalies in the adulthood are rare, but the anatomical correction (without bypass graft or tunnel) is possible by minimal invasive surgical way.

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