

# Spontaneous coronary dissection: case report

## *Dissecção coronariana espontânea: relato de caso*

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### *Abstract*

The purpose of this paper is to report on the case of a 62-year-old man with spontaneous coronary dissection of the left circumflex artery, treated surgically by myocardial revascularization. The successfully accomplished surgery demonstrates, in this case, to be the only possible way of a cure.

*Descriptors:* Coronary vessels. Coronary circulation. Coronary arteriosclerosis. Myocardial revascularization.

### *Resumo*

O objetivo do trabalho é demonstrar o caso de um homem de 62 anos, com quadro de dissecção coronariana espontânea, localizada em 1/3 inicial de coronária circunflexa esquerda, tratado cirurgicamente com revascularização miocárdica. A operação realizada com sucesso demonstra, nesse caso, ser o único meio possível de cura.

*Descritores:* Vasos coronários. Circulação coronária. Arteriosclerose coronária. Revascularização miocárdica.

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## INTRODUCTION

Spontaneous coronary dissection is an extremely rare event with only about 150 published reports [1,2] and around 70% being diagnosed postmortem [1]. This condition was first described by Pretty in 1931 during an autopsy of a 42-year-old woman diagnosed as suffering a sudden death [2]. The disease mostly affects young women with approximately two-thirds of cases during childbirth and without any history of atherosclerotic disease [2]. Men with atherosclerotic disease are the most affected.

The left anterior descending coronary artery is the most involved vessel in women (75%) and the right coronary artery in men (20%) [1,3].

## CASE REPORT

A 62-year-old man, without any history of heart disease or family history of atherosclerotic disease, was attended in the emergency department in the early morning suffering from vomiting and tachycardia a state that had started 20 minutes previously. He did not complain of precordialgia or retrosternal pressure as he awoke suddenly with the symptoms.

The physical examination identified: anicteric, acyanotic, pallid (++)/4, afebrile and hydrated. Pulmonary auscultation: vesicular murmur universally audible without adventitious noises. Precordium: irregular heart rhythm with two sounds, hypophonic with systolic murmur (++)/6 at mitral focus, arterial pressure 100 x 60 mmHg and heartbeat 130 bpm. Abdomen: flaccid, without pain to palpation, with fluid-air noises. Lower limbs: without edema, ample and isochronal palpable peripheral pulses.

ECG: atrial fibrillation, negative deflection of the ST segment at V3 and V4, V5 and V6 and DI corresponding to the medial septum, apical and lateral regions respectively. Cardiac enzymes demonstrated myocardial infarction under evolution: CPK – 2692 U/I; CK-MB – 263 U/I; myoglobin – 1000 ng/mL; troponin – 97.60 ng/mL. Blood tests identified slight anemia (Hb = 11.40 g/dL).

Immediately the patient was referred for coronarography with the aim of primary angiography. Hence, dissection of the proximal and medial thirds of the circumflex coronary artery was identified which included the root of the first marginal (Figure 1). The coronarography also revealed 60% obstruction of the ostium and 80% of the medial third of the anterior descending artery.

The patient was hospitalized in the Thoracic Pain Unit for clinical treatment to maintain him hemodynamically stable after chemical reversal of the atrial fibrillation. The use of low molecular weight heparin was very carefully monitored.



Fig. 1 – Dissection in the circumflex coronary artery as seen by coronary angiography

During hospitalization, the levels of enzymes decreased but never reached normal levels. An echocardiogram showed dyskinesia of the inferior-lateral wall of the left ventricle, a mild regurgitating jet through the mitral valve but with overall function preserved.

Percutaneous transluminal coronary angioplasty using drug-eluting stents was counter-indicated as the dissection involved the ostial region of the circumflex artery and might extend to the left coronary artery trunk. In addition, the dissection was extensive and would require more than one stent and so myocardial revascularization was indicated. This consisted of anastomosis of the left internal thoracic artery to the anterior interventricular coronary artery and sequential grafting of a segment of saphenous vein to the first marginal and first diagonal branches. As the left posterior ventricular branch was hypoplastic, we also decided to revascularize it. The sequential anastomosis of the saphenous vein is routine in our service when two or more branches of the same coronary artery require revascularization. On the fifth postoperative day, the patient was released from hospital taking 150 mg/day clopidogrel and other medications routinely prescribed in the postoperative period of myocardial revascularization.

This report was assessed and approved for publication by the Research Ethics Committee of the Hospital São Lucas.

## DISCUSSION

The etiology of coronary dissection remains uncertain and the majority of authors classify patients into three groups: women, patients with atherosclerosis and those without an identifiable cause.

There is an empirical association between coronary dissection and pregnancy. This is due to hormonal variations which influence the composition of the vessel. Together with hemodynamic alterations, coronary arteries become more susceptible [4].

Diagnosed men have different characteristics. They are older (on average 55.7 years old) and have multiple risk factors for atherosclerotic disease. The plaques can rupture causing a continuous flow on the intima. Consequently a hematoma enters below the intimal layer dissecting it [4]. In spite of its seriousness, patients with dissection related to atherosclerosis seem to have a more benign course, as they have a chance to develop a network of collateral circulation [4]. In the case reported here, atherosclerotic disease was not demonstrated in the coronary artery which presented with dissection.

The exhaustive physical examination can also change the hemodynamic parameters leading to a possible dissection, especially in patients with predisposing factors. The patient in question reported practicing moderate physical exercises for many years but had not exercised on the day that the symptoms appeared.

Other conditions that have been associated with dissections are: systemic lupus erythematosus, blunt thoracic trauma, sarcoidosis, fibromuscular dysplasia, cardiopulmonary resuscitation, use of cocaine and hypertension, among others [4,5]. Rogers et al. [6] reported that coronary dissection may occur in up to 30% of angioplasties with lesions classified as gradual. The patient here did not report any comorbidity worthy of concern in his clinical history.

Eosinophilia has been widely reported in publications and its significance remains uncertain. Some authors suggest that eosinophils injure the arterial wall due to lytic substances, however it is more probable that this "inflammation" is a consequence and not cause of dissection.

The clinical manifestation depends on the affected artery, the position and extension of the dissection. However, coronary dissections generally present as sudden death and diagnosis of the majority of cases is during an autopsy. In this case, the patient had a clinical presentation related to tachycardia (atrial fibrillation) although with a final diagnosis of acute myocardial infarction.

Diagnosis antemortem is made by coronarography observing the presence of a double radiopaque lumen separated by a radiolucid intimal line. In this case the dissection was seen along the proximal and medial thirds of the circumflex artery of the left coronary artery. When there is doubt about the diagnosis, intravascular ultrasound is indicated for confirmation [5].

The decision about the best management depends on several factors: clinical presentation, the location and extension of the dissection and the affected area of the heart.

Therapy using medicines, such as aspirin and glycoprotein IIb/IIa antagonists, beta blockers and nitrates, is indicated for asymptomatic and stable patients or those with limited dissections [2,4,5].

Based on findings of inflammation of the coronary artery, favorable results are being seen with the use of immunosuppressants such as prednisone and cyclophosphamide [5].

Intravenous thrombolysis has been demonstrated as beneficial, causing lysis of blood clots in the false lumen and thus reducing compression of the true lumen. However, the majority of studies associate the use of thrombolytic agents to a worsening of the condition, increasing the lesion by expansion of the intramural hematoma [5]. Thrombolytic agents were not used in this case but there was uncertainty in the use of heparin.

When a large area of myocardium is at risk, it is necessary to reperfuse it, and so percutaneous transluminal coronary angioplasty utilizing a stent is the first option with the aim of occluding the false lumen and redirecting flow to the true lumen. The results are excellent with low complication rates.

Myocardial revascularization is indicated when all other options fail or are counter-indicated [6-8], however there is a chance of progression of the dissection to the graft. For this patient, myocardial revascularization was chosen due to the presence of atherosclerotic lesions in the anterior interventricular coronary artery; the ostial region and the medial third (60 and 80% respectively) and because the case presented with a lesion of the left coronary trunk.

## CONCLUSION

Spontaneous coronary dissection is a rare cause of acute myocardial ischemia with a broad clinical presentation. Generally, it occurs in young women during childbirth but it may also affect men. Diagnosis of the dissection in this case was by coronary angiography aiming at treating ischemia. The decision of clinical treatment, percutaneous transluminal intervention or revascularization surgery is based on the primary clinical presentation, extension of the dissection and the area of the heart in danger of myocardial ischemia. This case demonstrates the necessity of a surgical intervention in a situation that, clearly, is the only satisfactory method of treatment.

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