

# Acute Myocardial Infarction Due to Spontaneous Coronary Artery Dissection – A Series of Five Cases

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## ABSTRACT

We report a series of five patients hospitalized due to acute coronary syndrome, from 2008 to 2010, in whom coronary angiography showed spontaneous coronary dissection. Spontaneous coronary artery dissection is a rare cause of acute myocardial infarction, most commonly seen in young individuals with no history of cardiovascular disease. The optimal management is uncertain, especially due to the limited clinical experience with this entity. Intravascular ultrasound is a useful tool to diagnose spontaneous coronary artery dissection as well as to guide percutaneous therapy.

**DESCRIPTORS:** Acute coronary syndrome. Myocardial infarction. Coronary vessels. Angioplasty. Stents.

Spontaneous coronary dissection is a rare entity, usually found in the literature as isolated case reports, which generally affects young and/or female patients.<sup>1</sup> In most cases, classical risk factors for coronary atherosclerotic disease (CAD) are absent. Since it is an infrequently studied disease, its etiology remains largely unknown. It can cause death in up to 40% of cases, usually in the first days of the clinical picture.<sup>2</sup> The prognosis and the therapeutic approach remain uncertain.

Although it usually occurs in arteries without obstructive atherosclerotic disease at the angiography,

## RESUMO

### Infarto Agudo do Miocárdio por Dissecção Espontânea de Artérias Coronárias – Série de Cinco Casos

Relatamos série de 5 pacientes internados por síndrome coronária aguda, entre 2008 e 2010, nos quais a cinecoronariografia evidenciou dissecção coronária espontânea. A dissecção coronária espontânea é uma causa rara de infarto do miocárdio, mais comumente observada em indivíduos jovens e sem histórico de doenças cardiovasculares. O manejo ideal é incerto, principalmente pela limitada experiência clínica com essa entidade. A ultrassonografia intracoronária é uma ferramenta útil tanto para o diagnóstico da dissecção coronária espontânea como para guiar o tratamento percutâneo.

**DESCRITORES:** Síndrome coronariana aguda. Infarto do miocárdio. Vasos coronários. Angioplastia. Stents.

spontaneous coronary dissection may be related with the inflammatory reaction in the medial layer of vessels, mainly initiated by autoantibodies produced during pregnancy or in the first weeks after childbirth,<sup>3</sup> as a result of antiphospholipid antibody syndrome or changes in the extracellular matrix metabolism.<sup>4</sup> Thus, an endothelial dysfunction appears to be the pathophysiological basis of spontaneous coronary dissection.

The present study reports on a series of five cases of acute myocardial infarction (AMI) with or without ST-segment elevation (STEMI and NSTEMI patients, respectively), treated at the Instituto Dante Pazzanese

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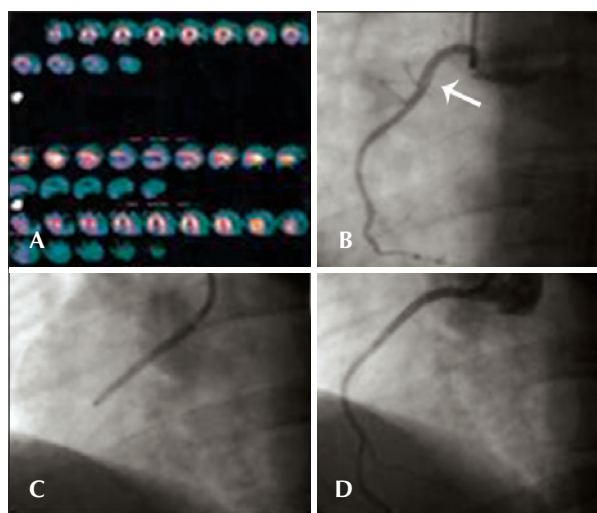
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de Cardiologia between January of 2008 and February of 2011, in whom the coronary angiography showed or was suggestive of spontaneous coronary dissection.

## CASE REPORTS

### Case 1

Male patient, 41 years old, with no CAD risk factors, sought medical care due to typical angina chest pain at rest. Electrocardiogram (ECG) at admission showed ST elevation < 1 mm in the inferior wall. Subsequent ECGs did not evidence of alterations in relation to the admission ECG. There was mild elevation of myocardial necrosis markers. Myocardial perfusion scintigraphy was performed in the presence of chest pain and evidenced hypoperfusion, suggesting inferior wall ischemia (Figure 1A). The patient was submitted to invasive stratification six hours after hospital admission. Coronary angiography showed spontaneous dissection in the proximal third of the right coronary artery, with 70% stenosis at its most critical point (Figure 1B). The other coronary arteries showed no lesions. After contrast injection and image acquisition for the right coronary artery, the patient went into cardiorespiratory arrest in ventricular fibrillation, which was promptly reversed with biphasic defibrillation at 200 J. There was slowing of the right coronary artery flow. It was decided to perform a percutaneous coronary intervention (PCI) with a bare-metal stent to the right coronary artery (Figure 1C), which was successful (Figure 1D). Follow-up of 34 months showed clinical evolution without adverse cardiac events. The



**Figure 1** – In A, myocardial perfusion scintigraphy, performed in the presence of chest pain, shows hypoperfusion in the inferior wall. In B, coronary angiography shows spontaneous dissection in the proximal third of the right coronary artery (arrow). In C, performance of percutaneous coronary intervention in the right coronary artery. In D, optimal angiographic result after percutaneous coronary intervention with stenting.

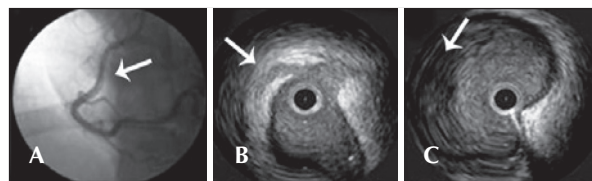
patient is currently using acetylsalicylic acid (ASA) and simvastatin.

### Case 2

Female patient, 37 years old, in postpartum period, without CAD risk factors, sought medical care presenting with typical chest pain, mild, which persisted hours after an episode of severe pain. Optimized clinical treatment was established, with complete pain relief. She was transferred to the Instituto Dante Pazzanese de Cardiologia with a diagnostic hypothesis of NSTEMI. She remained hemodynamically stable. The ECG showed a pathological Q wave in the inferior wall, with no ST elevation (30 hours after the episode of severe chest pain). A coronary angiography was performed three days later and showed an image suggestive of spontaneous dissection in the middle third of the right coronary artery, without significant obstructive lesion, with normal distal flow (Figure 2A). The other coronaries showed no lesions; left ventriculography showed inferior-mid-basal wall akinesia. An intravascular ultrasound (IVUS) of the right coronary artery was performed, which confirmed the coronary dissection, showing an intimal flap (Figure 2B) and vessel wall hematoma (Figure 2C). Due to the patient's clinical stability, the prolonged evolution of the event (STEMI), and akinesia of the ventricular segment involved with no signs of viability, it was decided not to perform the PCI, maintaining the clinical treatment. Follow-up of 29 months has shown evolution with no adverse cardiac events. The patient is currently using ASA, atenolol, and atorvastatin.

### Case 3

Male patient, 34 years of age, with no risk factors for CAD, was admitted to another service presenting mild dyspnoea, approximately 24 hours after an episode of poorly characterized chest pain. He was transferred to the Instituto Dante Pazzanese de Cardiologia with a diagnosis of STEMI in anterior wall, with late presentation. He remained hemodynamically stable, without chest pain. ECG showed pathological Q wave in the extensive anterior wall, with ST elevation of 2 mm (six days after the episode of chest pain). Coronary angiography was performed eight days after the start of the clinical picture and presented image suggestive of



**Figure 2** – In A, coronary angiography shows image suggestive of spontaneous dissection in the middle third of the right coronary artery (arrow), with normal distal flow. In B, intravascular ultrasound demonstrates intima flap (arrow). In C, intravascular ultrasound shows evidence of vessel wall hematoma (arrow).

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