

Spontaneous Coronary Artery Dissection Diagnosed By CT Angiography: A Case Report

Disección espontánea de la arteria coronaria diagnosticada por angioTAC: Presentación de un caso



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Palabras clave (DeCS)

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Summary

Spontaneous coronary artery dissection is a rare cause of acute coronary syndrome. Clinical presentation is variable, from acute coronary syndrome to sudden death, depending on the extent of the dissection; case reports and case series shows evidence that most cases present in middle-aged women. We present a case of spontaneous dissection of the left coronary artery extending to the left anterior and circumflex descending branch in a 31 years old woman.

Resumen

La disección espontánea de las arterias coronarias es una rara causa de síndrome coronario agudo, su presentación clínica varía desde un síndrome coronario agudo hasta la muerte súbita, dependiendo de la extensión de la disección. En las publicaciones se evidencia que la mayoría aparecen en mujeres de edad media. A continuación presentamos un caso de disección espontánea de la arteria coronaria izquierda con extensión a la rama descendente anterior y circunfleja, en una mujer de 31 años de edad.

Introduction

Spontaneous coronary artery dissection is a rare cause of acute coronary syndrome, with a low incidence and significant morbidity and mortality related to its clinical presentation, such as acute myocardial infarction. Coronary angiography is the method most used for the diagnosis of this pathology; however, its limitations in diagnostic accuracy make computed tomography (CT) angiography a complementary method for the evaluation of these patients, as in the case presented below.

Case description

This is a 31-year-old female patient with acute inferior myocardial infarction and coronary angiography findings of occlusion of 100% of the first marginal branch of the circumflex artery; Percutaneous coronary intervention was performed and she

received ambulatory management with clopidogrel, acetylsalicylic acid and enoxaparin. Secondary to this coronary event, the patient subsequently had ischemic heart failure with an ejection fraction of 33%.

One month after the initial event, consults again to the emergency department for an interscapular pain of an hour of evolution, sudden onset and irradiated to the precordial region, associated with nausea, diaphoresis, inframandibular dysesthesias, dysphagia and lipotimia. Within the antecedents of importance the patient refers to occasional smoking that she suspended 9 years ago and antecedent of death of the maternal grandfather at 57 years of age due to acute myocardial infarction.

Her entrance physical examination is normal, especially her blood pressure and heart rate.

In the examinations performed, the electrocardiogram showed ST-segment elevation in the anteroseptal (V2-V3) and T-waves in relation to changes

in lateral ischemia, serum markers with elevated troponins, and transthoracic and transesophageal echocardiography demonstrating hypokinesia of the anterolateral wall and an organized apical thrombus image, with a calculated ejection fraction of 30%. With a diagnosis of acute myocardial infarction, and the history of previous myocardial infarction, anti-ischemic management, full anticoagulation, double platelet antiaggregation and percutaneous coronary intervention was initiated.

Angiographic results showed coronary artery disease in two main vessels, a secondary vessel (anterior descending artery with partial occlusion of 70% of its light in the proximal and mid and complete distal third, the first diagonal with severe ectasia, slow flow and total occlusion of its middle third and circumflex artery with an occlusion of 60% of its light) and moderate to severe compromise of left ventricular systolic function (figure 1).

In view of the findings in coronary angiography, we sought to establish whether these new lesions corresponded to new thrombi or to atherosclerotic plaques; A complementary study was performed with angioTAC, which showed the dissection of the left main coronary artery with extension to the anterior descending branch and circumflex branch (figure 2). In the retrospective analysis, the image visualized in the left coronary artery by angiography (figure 1b) appears to correspond to the intimal layer flap by coronary dissection confirmed in the angioTAC.

With this diagnosis the patient received surgical management with coronary bypass and was discharged days later in good general conditions.

Discussion

Spontaneous dissection of the coronary artery is defined as the separation of the coronary artery wall by bleeding that may or may not be associated with intimal tear; there are two proposed patterns, the first one initiates by a tear of the intima that spreads by the median and the second, a dissection of a medial hematoma due to the rupture of vasa vasorum (1), excluding traumatic or iatrogenic etiologies.

This is a rare cause of acute coronary syndrome and death by sudden cardiac arrest; Prospective studies have estimated a prevalence of 0.07-1.1% and an annual incidence of 0.26 cases per 100,000 people (2,3), predominantly affecting young women in 58-79% of cases with an average age of 41 +/- 10.6 years in women and 45.4 +/- 14.4 years in men (4).

Spontaneous coronary artery dissection can be classified according to etiology in atherosclerotic (24-28%), peripartum (27%) that is responsible for infarctions during pregnancy with a clear association between 2-3 weeks postpartum, and idiopathic, including connective tissue diseases, fibromuscular dysplasia, coronary artery spasm, systemic inflammatory diseases, intense exercise, and consumption of antineoplastic, anti-anxiety and anti-migraine drugs.

From the first case described in 1931 (5) to 2014, approximately 1,125 cases have been reported, of which 59.7% correspond to compromise of the left anterior descending artery and its middle segment as a preferential site. In descending order, according to the frequency of compromise, there are the right coronary artery (26.5%), the left circumflex (19.4%) and the left main coronary artery (8.9%).

Regarding the diagnostic methods used, angiography and intravascular ultrasound are the first-line methods when coronary dissection is suspected; However, angiography is less sensitive to extensive thrombosis by masking the luminal material of the dissected segment and is based on the appearance of three patterns: arterial wall contrast delineation with multiple radiolucent filling defects, diffuse stenosis of varying severity, and lesions that mimic atherosclerosis. The endovascular imaging technique has high accuracy in identifying the true lumen, but it does not allow accurate evaluation of the endothelial surface and very small intramural hematomas (6,7).

CT angiography is a non-invasive method that has overcome angiography in the detection of subadventitial hematomas, since it allows differentiating between the light and the arterial wall; it is recommended in stable and asymptomatic patients in whom percutaneous coronary intervention is not necessary (8,9). The pathophysiological explanation is that there is an occlusion of the true light by the false light; if there is a tear of the intima, this decompresses the false light, which will allow the communication with the true light; this explains the variable findings found in coronary angiography. When there is an intimal tear, the typical appearance of a flap with opacification and late washing of the false light is observed; but if, on the other hand, there is no intimal tear, the appearance of an intramural hematoma is less specific and appears as a decrease in vessel lumen that may mimic an intracoronary thrombus or stenosing atherosclerosis, as evidenced in the case described.

Advances in CT technology (multiplanar reconstructions and maximal intensity projections [MIP]) allow this non-invasive and non-operator-dependent method to be effective in evaluating coronary arteries with a high negative predictive value that may exclude obstructive coronary disease with a high confidence level; it is very useful for the diagnosis and follow-up of these patients (8). In addition, the dynamic evaluation with film sequences allows the assessment of the potential compromise, the extension of the intimal flap to adjacent segments and the degree of altered flow or luminal reduction area (10); This information will help the clinician to determine the proper management of these patients; whether it be conservative (aspirin, clopidogrel, beta-blocker, calcium antagonists) or invasive (percutaneous coronary intervention, coronary bypass) (11).

Among the differential diagnoses that must be taken into account in a patient presenting to the emergency department with chest pain of typical characteristics, elevated cardiac enzymes and electrocardiographic abnormalities, as in the case described, are acute myocarditis and tako-tsubo cardiomyopathy, classified within the group of non-ischemic cardiomyopathies. Acute myocarditis is frequently caused by a viral infection and in MRI is characterized by subepicardial and intramyocardial late enhancement with respect to the subendocardial portion (12), tako-tsubo cardiomyopathy is triggered by episodes of physical or emotional stress and is manifested by dyskinesia or akinesia of the middle and distal segments of the left ventricle and hyperkinesia of the basal segments, which are visualized as an apical ballooning of the left ventricle in systole (13). In these two pathologies it is important to emphasize that its myocardial compromise, as opposed to ischemic heart disease due to coronary dissection, is of a transient nature, with complete recovery of its basal state.

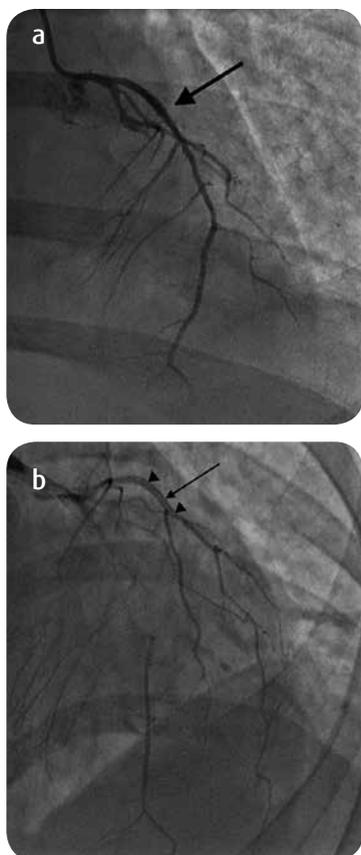


Figure 1. (a) Coronary angiography: morphology of the anterior descending artery a month earlier and (b) during recent acute coronary syndrome. A long occlusion of 70 % of its light in its middle third and proximal (black arrows). Finding that it prospectively appears to correspond to the inner layer flap (arrowheads).

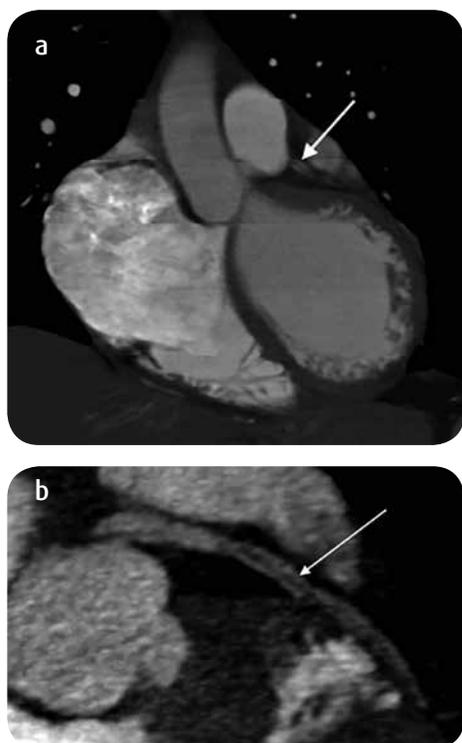


Figure 2. a and b) Coronal and oblique reconstruction of the left coronary artery: Low signal linear filling defect (white arrows), which extends from the main coronary to the anterior descending, findings in relation to the intimal flap.

Conclusions

Spontaneous dissection of the coronary artery is a rare cause of myocardial ischemia, it is more frequent in young women and has a high morbidity and mortality rate, so it should always be considered in young symptomatic patients with no cardiovascular history. In most cases it is diagnosed by coronary angiography; however, the technical limitations explained by the pathophysiology of the disease make CT angiography a complementary, non-invasive exam, ideal in the face of diagnostic doubts and useful in the follow-up of these patients.

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