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In-hospital recurrent spontaneous coronary artery dissection affecting multiple arteries

Dissecção coronária espontânea recorrente intra-hospitalar afetando diversas artérias

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DOI: 10.31160/JOTCI202028A20190022

ABSTRACT – Spontaneous coronary artery dissection is an uncommon cause of myocardial ischemia. Although the first description dates from 1931, its diagnosis is sometimes made late and/or erroneously due to the lack of knowledge of its non-pathognomonic angiographic variations. Additionally, the proper management of this condition is not yet well established. Here we present a rare case of in-hospital recurrence of spontaneous dissection affecting both the left anterior descending and circumflex coronary arteries, with distinct clinical presentations.

Keywords: Coronary angiography; Myocardial ischemia; Coronary artery disease; Dissection

RESUMO – A disseção espontânea da artéria coronária é uma causa rara de isquemia miocárdica. Apesar de a primeira descrição ter sido em 1931, o diagnóstico é feito, algumas vezes, tardiamente e/ou erroneamente, devido à falta de conhecimento de suas variações angiográficas não patognômicas. Além disso, a conduta adequada para esta doença ainda não foi bem estabelecida. Apresentamos um caso raro de recorrência intra-hospitalar de disseção espontânea envolvendo duas artérias coronárias – descendente anterior e circunflexa –, com distintas apresentações clínicas.

Descritores: Angiografia coronária; Isquemia miocárdica; Doença da artéria coronariana; Disseção

INTRODUCTION

Spontaneous coronary artery dissection (SCAD) is defined as a spontaneous separation of the coronary artery wall not related to trauma or iatrogenesis. The pathogenesis has not been fully understood, but two potential primary mechanisms have been proposed: the first one suggests that an intimal tear may create an entry point for intramural hematoma accumulation inside the false lumen, leading to separation of the arterial wall; the second one is related to a disruption with bleeding of vasa vasorum and intramedial hemorrhage. Both hypotheses invariably result in blood accumulation within the false lumen, which may compress the true lumen to varying degrees resulting in myocardial ischemia and infarction.¹⁻³

Although the first description dates from 1931, its diagnosis is sometimes made late and/or erroneously due to the lack of knowledge of its non-pathognomonic angiographic variations. Additionally, the proper management of this condition is not yet well established.

We present a rare case of a very short-term recurrent in-hospital SCAD affecting distinct arteries with different clinical presentations. The Research Ethics Committee evaluated and approved this study (CAAE: 79780417.5.0000.0071).

CASE REPORT

A 53-year-old woman with no risk factors for coronary artery disease presented to the emergency department with two episodes of chest pain during physical exertion

How to cite this article:

Almeida NK, Souza MT, Caixeta A. In-hospital recurrent spontaneous coronary artery dissection affecting multiple arteries. J Transcat Interv. 2020;28:eA20190022. <https://doi.org/10.31160/JOTCI202028A20190022>

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Received on:

Nov 11, 2019

Accepted on:

Feb 21, 2020

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of moderate intensity and at rest, respectively. Electrocardiogram (ECG) showed anterior T wave inversion and the patient received loading dose of 300mg of aspirin and 300mg of clopidogrel orally. Following her serum troponin level result of 6,625pg/mL, a coronary angiography revealed a tubular and severe narrowing in left anterior descending (LAD) artery, extending from the proximal to mid-distal segment, followed by a distal sub-occlusion, suggesting a type 2 SCAD (Figure 1A). Other coronary arteries had no abnormalities (Figure 1B). Due to the ongoing chest pain associated with a suboptimal *Thrombolysis in Myocardial Infarction* (TIMI) flow grade 2, percutaneous coronary intervention was successfully performed. A 0.014" PT² Moderate Support (Boston Scientific) guidewire was positioned on LAD. Predilation with 2.5×20mm Pantera balloon catheter (Biotronik) was performed at 12atm. Three bare metal PRO-Kinetic (Biotronik) stents were implanted (3.5×09mm, 3.5×35mm and 3.0×30mm) in overlap from the ostium to the distal third of the LAD. After evidence of first diagonal involvement, a successful bare metal 3.5×09mm was implanted at 14atm (V stenting technique). Control angiography showed type C dissection in left main

(LM) (Figure 2). A PRO-Kinetic 3.5×26mm bare metal was implanted in LM directed to LAD with 20atm. Figures 3A and 3B present the final angiographic result. The patient remained stable and asymptomatic and her left ventricular ejection fraction was 45%.

Figure 2. Iatrogenic dissection of the left main coronary artery.

Figure 1. Spontaneous type 2 dissection involving the proximal and middle segment of the left anterior descending artery (A). Other arteries without obstructive lesions (B).

Figure 3. Final angiographic result after percutaneous coronary intervention (A and B).

Approximately 24 hours after the index procedure, the patient experienced a new acute onset of chest pain associated with nausea and sweating. A new ECG revealed inferior ST-elevation myocardial infarction (STEMI) and an emergency coronary angiography revealed circumflex artery occlusion as type IV SCAD (Figure 4). A conservative approach was preferred due to unsuccessful percutaneous intervention (no guidewire crossing). The patient was discharged 8 days after hospitalization taking aspirin and clopidogrel. She remains asymptomatic after 4 months of follow-up.

Figure 4. Spontaneous type 4 dissection involving the left circumflex artery.

DISCUSSION

Several series have reported a wide spectrum of clinical presentations and severity of SCAD. In a cohort of 87 patients from Mayo Clinic, 43% presented with STEMI, 38% with non-ST-segment elevation myocardial infarction (NSTEMI), 14% with malignant arrhythmias and 7% with unstable angina.³

Considering the management and treatment of SCAD differ from those occurring in an acute coronary syndrome (ACS), an accurate and early diagnosis is of paramount importance. In this context, coronary angiography remains

the standard imaging study for patients presenting with SCAD;^{1,2,4} however, due to its two-dimensional luminogram poor accuracy in imaging the entire arterial wall, the diagnosis of SCAD can be underestimated in up to 70% when performed by physicians unfamiliar with the angiographic variants of the disease, and who expect to find only evidence of multiple radiolucent lumens.^{2,3,5}

Although the conservative approach is the first choice in managing SCAD, the optimal strategy remains undetermined and no randomized controlled trials have compared medical therapies with revascularization strategies. Besides that, in-hospital outcomes are reasonably acceptable with a recurrent infarction rate of approximately 5% to 10%, and a recurrent SCAD rate lower than 15%.²

In observational studies, SCAD recurrence rate is approximately 15% in the first 2 years after initial presentation, and 27% in the next 5 years; and multiple SCAD occurs in 11% of cases.^{1,2} To the best of our knowledge, the present case is the first describing very short term in-hospital SCDA recurrence involving distinct coronary arteries, emphasizing its critical and difficult management.

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