

Spontaneous Coronary Dissection in Late Puerperium: Now What? A Case Report

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Abstract: Spontaneous coronary dissection is an infrequent cause of non-atherosclerotic or iatrogenic acute coronary syndrome, predominantly diagnosed in women under 50 years old during their reproductive phase, usually without associated cardiovascular risk factors. Various factors underlie its occurrence, ranging from connective tissue diseases to intense emotional stress, with fibromuscular dysplasia being a commonly associated nosological entity. Coronary angiography is the preferred diagnostic examination, and a conservative strategy is frequently recommended, especially in stable contexts. Invasive strategies, such as surgical revascularization or percutaneous coronary intervention, are reserved for more complex clinical situations involving severe arrhythmias or dissections involving the left coronary artery trunk, among others. We present the case of a postpartum woman with no known cardiovascular risk factors, diagnosed with spontaneous coronary dissection in the late puerperium of a twin pregnancy, resulting in a fatal outcome.

Keywords: Arterial dissection; Puerperium; Acute Coronary Syndrome.



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1. Introduction

Spontaneous coronary dissection (SCD) is an infrequent condition and the most common cause of non-atherosclerotic acute coronary syndrome (ACS) (43%) during the pregnancy-puerperium period, with a frequency five times higher compared to non-pregnant women under 50 years old. It is defined as the non-traumatic or iatrogenic separation of the intimal/medial layers of the coronary arteries with or without rupture, explained based on two pathophysiological mechanisms: hemorrhage caused by rupture of the vasa vasorum in these layers, favoring the creation of a false lumen and formation of intramural hematoma that compresses the true arterial lumen, impacting the reduction of coronary blood flow, a fact that culminates in ischemia and/or myocardial injury, being associated with a higher fatal potential described during pregnancy.

It is estimated that the occurrence of this nosological entity is approximately 1/3, with a mortality rate of about 8% in ten years. Among the various factors supporting its pathogenesis, connective tissue diseases stand out, where fibromuscular dysplasia has been related to a greater predisposition in this group of patients, predominantly affecting puerperal women (69.6%), especially those with chronic hypertension, a history of migraines, and postpartum depression. Its clinical presentation is variable (ranging from mild chest pain to sudden cardiac death), and its understanding to this day has gone through numerous post-mortem diagnoses, a fact that has resulted in better records so far.

Greater awareness and advancements in diagnostic means have satisfactorily impacted the early invasive approach through coronary angiography in patients with suggestive clinical presentation. Studies on this topic increasingly suggest a conservative strategy as preferable, reserving percutaneous and surgical myocardial revascularization for patients at high imminent risk of death.

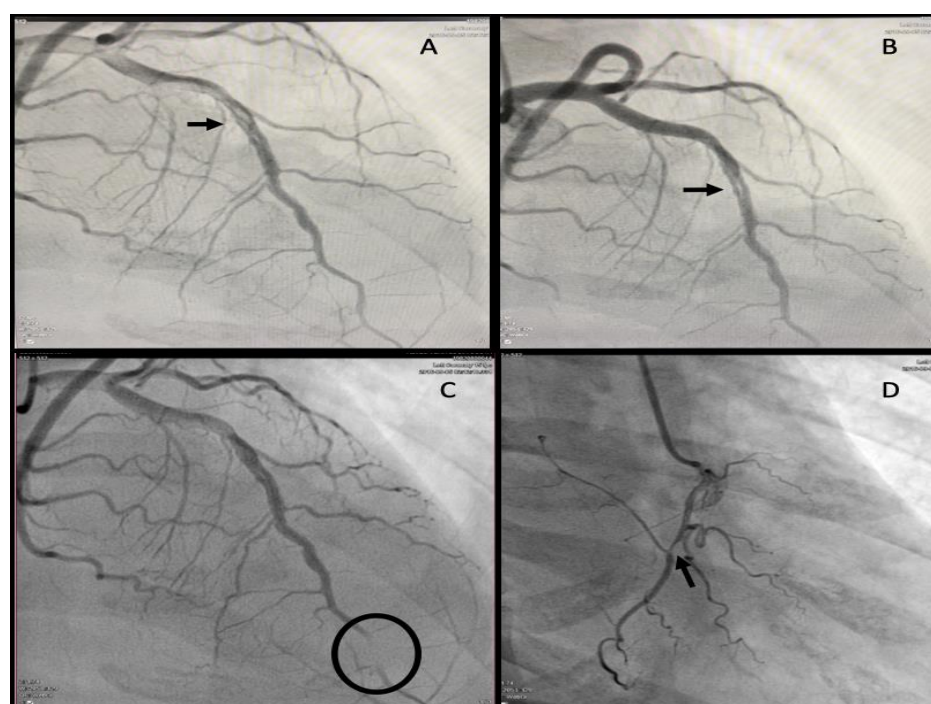
The authors describe the case of a 42-year-old woman, in the late puerperium of a twin pregnancy complicated by cesarean delivery, diagnosed with spontaneous coronary dissection and successfully treated conservatively.

2. Case Report

A 42-year-old woman, with no known cardiovascular risk factors, denies a history of previous chest pain, connective tissue disease, or systemic inflammation. In the late puerperium of a twin pregnancy complicated by fetal death in utero and early neonatal death on the 3rd day after cesarean delivery in 2019, the patient sought the Emergency Service for oppressive chest pain with 2 hours of evolution, radiating to the left shoulder, accompanied by intense sweating and general malaise. She was anxious, with a blood pressure of 116/68 mmHg, heart rate of 86 bpm, and oxygen saturation of 95%. Normal lung and heart auscultation.

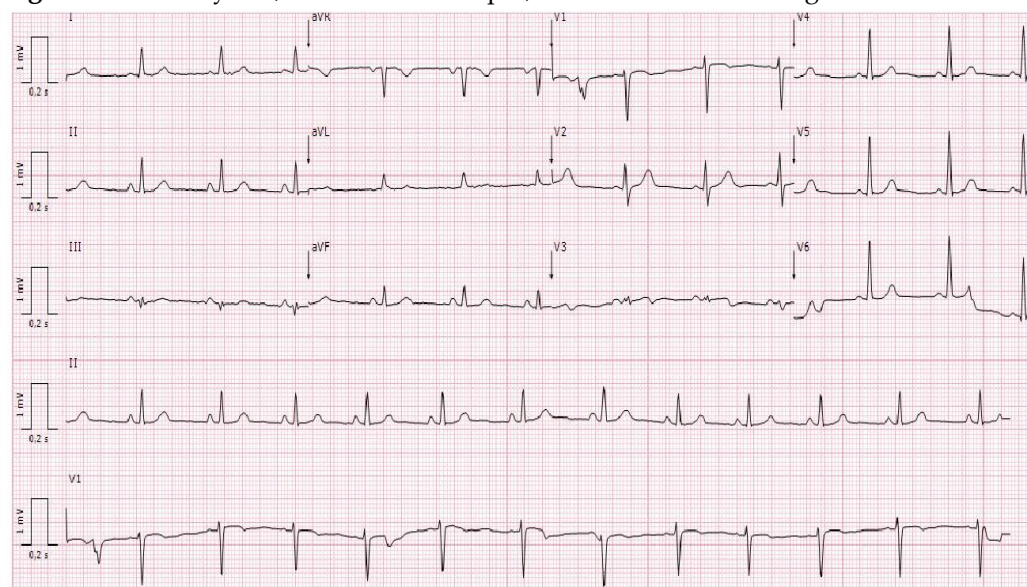
The electrocardiogram revealed ST-segment elevation in the anterior wall, but due to a failure in the computer system, the record was unavailable, remaining only the written note. Troponin I was at 187.9 ng/mL (reference value: 0.0-0.056). The patient was referred to the hemodynamics laboratory, where she underwent coronary angiography via the right radial artery with a 6F introducer, an Rx dose (uGy/m²) of 2122.7, and fluoroscopy time of 2.21 minutes, revealing a luminal filling defect in the middle segment of the left coronary artery and an intramyocardial course in the distal segment (Figures 1A to 1C). The right coronary artery type B1 showed a small-caliber vessel, 90% lesion in the middle segment, TIMI 3 (Figure 1D, arrow), non-complex coronary anatomy, confirming left coronary dissection. Given the clinical stability of the puerperal woman and the low risk of complication, a conservative approach was chosen, and she was medicated with Acetylsalicylic Acid (ASA) 100 mg and Bisoprolol 2.5 mg.

Figure 1. Coronary angiography. A and B. Coronary dissection. C. Intramyocardial course in the distal segment. D. Right coronary artery with 90% lesion in the mid-segment (arrow).



During hospitalization, without complications, laboratory tests were requested to investigate the causes of the diagnosis: anti-C-ANCA, anti-P-ANCA, anti-xANCA antibodies, measurement of anticardiolipin antibodies IgG and IgM, anti-B2-GPI antibodies IgG and IgM, lupus screening test, and rheumatoid factor, all negative. Total cholesterol was 153 mg/dL, LDL-c 74.6 mg/dL, and triglycerides 97 mg/dL. The patient was discharged on the 5th day. During the follow-up for coronary artery disease, annual echocardiograms initially showed variations in ejection fraction (2020: 59%; 2021: 50%; 2022: 49%) without clinical signs of heart failure. A radionuclide angiography was requested, revealing an ejection fraction of 61% in 2024, with an electrocardiogram showing sinus rhythm, heart rate of 75 bpm, without suggestive signs of ischemia (Figure 2). Since then, the patient has remained asymptomatic and was discharged due to improvement, with no need to repeat coronary angiography. She was advised to avoid situations of intense emotional or physical stress.

Figure 2. Sinus rhythm, heart rate of 75 bpm, without ischemic changes.



3. Discussion

The first case of SCD was described *post-mortem* by Harold Pretty almost a century ago [9]. Despite several cases having already been published, the diagnosis, invasive or conservative treatment, and follow-up of this condition have long represented a real challenge for general practitioners and even for experienced cardiologists [2, 4]. Fibromuscular dysplasia is commonly reported to have a strong association with SCD in this group of patients [7]. Other conditions that predispose to lesions of the coronary arterial bed include multiple pregnancies, systemic inflammatory diseases, connective tissue diseases, use of sympathomimetic drugs, intense physical exercise and Valsalva maneuver, coronary spasms, hormonal factors, intense cardiocirculatory and emotional stress associated or not with postpartum depressive state, and weakening of the vessel wall, which leads to the rupture of vasa vasorum, favoring dissections [4].

In the present case, there was a high probability that SCD was precipitated by a moment of intense emotional stress, considering the patient's history and depressive puerperal state, as there were no reports of other risk factors predisposing to such non-atherosclerotic acute coronary syndrome. Early diagnosis and appropriate intervention have notable impacts on the survival of both patients and the fetus. This case serves as an alert for less experienced healthcare professionals to suspect SCD in women of childbearing age with chest pain, as the favorable or unfavorable outcome will depend on the degree of suspicion and individualized treatment [4, 8].

Coronary angiography is the recommended invasive method for the initial diagnosis of SCD, allowing classification of the different types of dissections according to the National Heart, Lung, and Blood Institute (NHLBI) system into types A to F, where: A: Small radiolucency in the coronary lumen, without contrast persistence; B: Parallel tracks or double lumen separated by a radiolucent area during angiography, without contrast persistence; C: Extraluminal cap with contrast persistence; D: Spiral luminal filling defects; E: New and persistent filling defects; F: Dissection with total occlusion [10].

The patient in this case presented SCD of the anterior descending artery, commonly reported in several cases [2, 4], fitting the type D classification, which was managed conservatively. This strategy is frequently recommended (provided the patients are low-risk and hemodynamically stable) by several studies, as there is evidence of spontaneous resolution of the dissection in about 95% of cases after 30 days of the coronary event, with favorable outcomes [10]. Percutaneous coronary intervention and surgical myocardial revascularization are reserved for patients with significant hemodynamic complications such as cardiogenic shock, ventricular arrhythmias, signs of persistent ischemia, acute coronary occlusion involving the trunk [8], as well as for patients with high-risk complex coronary anatomy, recurrent and limiting chest pain, or ischemia in non-invasive tests during outpatient follow-up [7, 10].

There are no randomized clinical trials addressing the management of SCD in both the acute and maintenance phases, leaving the drug approach based on expert opinions [6, 7, 11]. However, considering the low risk of side effects and bleeding, in addition to its evident scope in secondary prevention, Aspirin is frequently used in the treatment of SCD, although its association with Clopidogrel has uncertain benefits [6], being indicated in cases of angioplasty with stent [11]. From the few existing studies, it is suggested that the routine use of anticoagulants and antithrombotics increases the risk of extension of the coronary dissection, rupture, and cardiac tamponade, being associated in most cases with clinical deterioration and need for intervention [6]. Beta-blockers are recommended for helping to reduce the shear stress of the coronary arterial intimal wall, theoretically reducing the dissection area [7]. The addition of angiotensin-converting enzyme inhibitors and aldosterone antagonists is recommended in cases of post-SCD systolic dysfunction [11]. Statins are recommended only if there is dyslipidemia [6, 7]. The patient was hospitalized for treatment and study of possible etiology, as well as assessment of the early risk of extension and/or recurrence of the dissection.

This case allows us to rethink the approach and post-discharge follow-up strategy for SCD without the need to resort to invasive exams to confirm the resolution of the dissection, since more than 95% of cases have spontaneous cure after 30 days of the event. The patient remained stable and without cardiovascular complaints during follow-up in the outpatient coronary artery disease clinic, motivating her discharge due to improvement.

4. Conclusion

It is important for doctors to have a high degree of suspicion regarding chest pain in women during the pregnancy-puerperium period, as early diagnosis and appropriate individualized treatment have positive impacts on this patient group, where conservative follow-up is recommended as long as they are hemodynamically stable.

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Conflicts of Interest: None.

Supplementary Materials: None.**References**

1. Vera Regitz-Zagrosek, Jolien W Roos-Hesselink, Johann Bauersachs, Carina Blomström-Lundqvist, Renata Cífková, Michele De Bonis, Bernard Iung, Mark Richard Johnson, Ulrich Kintscher, Peter Kranke, Irene Marthe Lang, Joao Morais, Petronella G Pieper, Patrizia Presbitero, Susanna Price, Giuseppe M C Rosano, Ute Seeland, Tommaso Simoncini, Lorna Swan, Carole A Warnes, ESC Scientific Document Group. 2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy: The Task Force for the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC). *Eur Heart J*. 2018 Sep 7;39(34):3165-3241. doi: 10.1093/eurheartj/ehy340.
2. Antunes Vicente MB, Luis Mariano de Lima Domingos, Roger Ravelo Dopico, Gelson Rodrigues Pereira, Tomás Mendés Carlos Peralta. Spontaneous coronary dissection and acute myocardial infarction in the puerperium: a real challenge for the interventional cardiologist. *Braz J Case Rep*. 2021;1(3):95-102. doi: 10.52600/2763-583X.bjcr.2021.1.3.95-102.
3. Alvarado T, García-Guimaraes M, Nogales JM, Jimenez-Kockar M, Macaya F, Alfonso F. Spontaneous Coronary Artery Dissection: Are There Differences between Men and Women? *Arq Bras Cardiol*. 2023 Jan 9;120(1). doi: 10.36660/abc.20210550. PMID: 36629596; PMCID: PMC9833275.
4. de Barros Manhaes E, Gomes WF, Bezerra CG, Horta PE, da Gama MN, Cesar LA, Neto PA. Spontaneous coronary artery dissection: therapeutic approach and outcomes of a consecutive series of cases. *Rev Bras Cardiol Invasiva*. 2014;22(1):32-35.
5. Faden MS, Bottega N, Benjamin A, Brown R. A nationwide evaluation of spontaneous coronary artery dissection in pregnancy and the puerperium. *Heart*. 2016;102:1974-1979. Available at: <https://heart.bmj.com/content/102/24/1974>.
6. Yip A, Saw J. Spontaneous coronary artery dissection-A review. *Cardiovasc Diagn Ther*. 2015 Feb;5(1):37-48. doi: 10.3978/j.issn.2223-3652.2015.01.08. PMID: 25774346; PMCID: PMC4329168.
7. Aziz S. Dissecção espontânea da artéria coronária. *E-Journal Cardiol Pract*. 2017;14(38). Available at: <https://www.escardio.org/Journals/E-Journal-of-Cardiology-Practice/Volume-14/spontaneous-coronary-artery-dissection>.
8. Hassan S, Prakash R, Starovoytov A, Saw J. Natural History of Spontaneous Coronary Artery Dissection With Spontaneous Angiographic Healing. *JACC Cardiovasc Interv*. 2019 Mar 25;12(6):518-527. doi: 10.1016/j.jcin.2018.12.011. Epub 2019 Feb 27. PMID: 30826233.
9. Pretty HC. Dissecting aneurysm of coronary artery in a woman aged 42: rupture. *BMJ*. 1931;1:667.
10. Dash D, Mody R, Ahmed N, Thejus J, Malan SR, Mody B. Tratamento de complicações durante intervenção coronariana percutânea: avaliação da situação atual. *J Transcat Intervent*. 2022;30. doi: 10.31160/JOTCI202230A202202.
11. Parekh JD, Chauhan S, Porter JL. Coronary Artery Dissection. 2023 Jun 19. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. PMID: 29083832.