

Postpartum spontaneous coronary artery dissection

Doğum sonrası koroner arter diseksiyonu

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ABSTRACT

Spontaneous coronary artery dissection in the postpartum period is a rare cause of myocardial infarction. Multiparity and twin pregnancies are thought to increase the risk of spontaneous coronary artery dissection due to increased hormonal burden and hemodynamic stress. Although there is no consensus on the optimal treatment currently, conservative management, coronary artery bypass grafting, and percutaneous coronary intervention are used. We present four cases with spontaneous coronary artery dissection in the postpartum period.

Keywords: Coronary artery bypass grafting; coronary artery dissection; coronary artery stenting; pregnancy.

Pregnancy-related spontaneous coronary artery dissection (PSCAD) is an uncommon cause of myocardial ischemia in healthy young pregnant.^[1,2] Multiparity and twin pregnancies, which can result in hemodynamic stress from pregnancy-related volume overloading, and endothelial dysfunction are considered to be the main risk factors associated with PSCAD.^[3,4] In the acute phase, an urgent coronary angiography and an intravascular ultrasound are recommended for the diagnosis and its treatment.^[5] Medical or conservative therapy, percutaneous coronary intervention (PCI), or CABG have been suggested.^[6] We present four cases of PSCAD and treatment methods.

ÖZ

Spontan koroner arter diseksiyonu, doğum sonrası dönemde miyokard infarktüsünün nadir bir nedenidir. Çok doğum yapanlarda ve ikiz gebeliklerde artmış hormonal yük ve hemodinamik strese bağlı olarak spontan koroner arter diseksiyonu riskini artırdığı düşünülmektedir. Günümüzde optimum tedaviye ilişkin bir konsensüs olmamasına rağmen, konservatif tedavi, koroner arter baypas greftleme ve perkütan koroner girişim kullanılmaktadır. Postpartum dönemde spontan koroner arter diseksiyonlu dört olgu sunulmaktadır.

Anahtar sözcükler: Koroner arter baypas greftleme; koroner arter diseksiyonu; koroner arter stentleme; gebelik.

CASE REPORT

Case 1- A 24-year-old patient presented with a history of chest pain and dyspnea, which started 11 days after an uneventful delivery of her first baby. Electrocardiography (ECG) showed ST-segment elevation across the anterolateral leads with reciprocal ST depression. A cardiac enzyme analysis revealed acute myocardial ischemia. The levels of cardiac enzymes were found to increase in the CK-MB and there was a marked elevation in the troponin-I levels. The left ventricular ejection fraction (LVEF) was 38%. An emergent coronary angiography showed a dissection of the left anterior descending (LAD) artery (Figure 1a). The patient, therefore, underwent



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percutaneous coronary intervention (PCI) following pre-dilatation, and a Vision 3.5×28 mm bare metal stent (Boston Scientific Inc, MA, USA) was implanted successfully (Figure 1b). A normal hemodynamic status was restored. The patient was discharged. Clopidogrel, beta-blocker, ACE inhibitor, and frusemide was prescribed.

Case 2- A 33-year-old female patient presented with complaints of unstable angina pectoris, tachycardia, and dyspnea. Her medical history revealed delivery via cesarean section 10 days prior. ECG revealed ST-segment elevation in all leads. Cardiac enzyme levels were significantly elevated. TTE demonstrated left ventricular impairment with a LVEF of 35% and angiography revealed a dissection of the left main stem, including the LAD and circumflex arteries (Figure 2). Nitroglycerin and a low-molecular-weight heparin were started. As the ischemic symptoms were resistant to medical treatment, the patient was transferred for CABG. A midline sternotomy was performed, and a left internal thoracic artery (LITA) and saphenous vein were harvested. The patient was successfully weaned from extracorporeal circulation with the use of inotropic agents. The postoperative period was uneventful. The patient was discharged on Day 7 following surgery. Follow-up echocardiography showed a LVEF of 45% and the patient was in NYHA Class I-II.

Case 3- A 31-year-old female gave birth to a baby following a repeated cesarian section. Two weeks later, she presented with a sudden-onset of chest pain,

palpitation, early fatigue, vomiting, and dyspnea. ECG showed anterolateral ST-segment elevation. Initial cardiac enzyme analysis revealed a high level of cardiac troponin-I and high CK-MB levels. Antiaggregant and an anticoagulant in combination with an oral beta-blocker and an ACE inhibitor did start. An emergent coronary angiography revealed that there was a dissection of the LAD artery (Figure 3). Glycoprotein IIb/IIIa inhibitor infusion was started. Heparin and trinitroglycerin infusion were administered. Her chest pain relieved. During the follow-up, she was prescribed clopidogrel and a low-molecular-weight heparin. Angiographic resolution with the return of prompt TIMI-III flow was restored. At one year, the patient still remained asymptomatic and angiography revealed a healed dissection flap (Figure 4).

Case 4- A 35-year-old multiparous patient was referred to our hospital because of unstable angina pectoris. Her medical history revealed delivery via cesarean section 30 days prior at another center. Electrocardiography showed ST-segment elevation at the anteroseptal lead. Cardiac enzyme levels were high. Angiography revealed a dissection of the LAD artery. We started beta-blocker, nitroglycerin, and a low-molecular-weight heparin. The ischemic symptoms were resistant to medical treatment. A surgical revascularization to the LAD artery was performed. The patient was discharged on Day 7. At one year of follow-up, the patient was still asymptomatic.

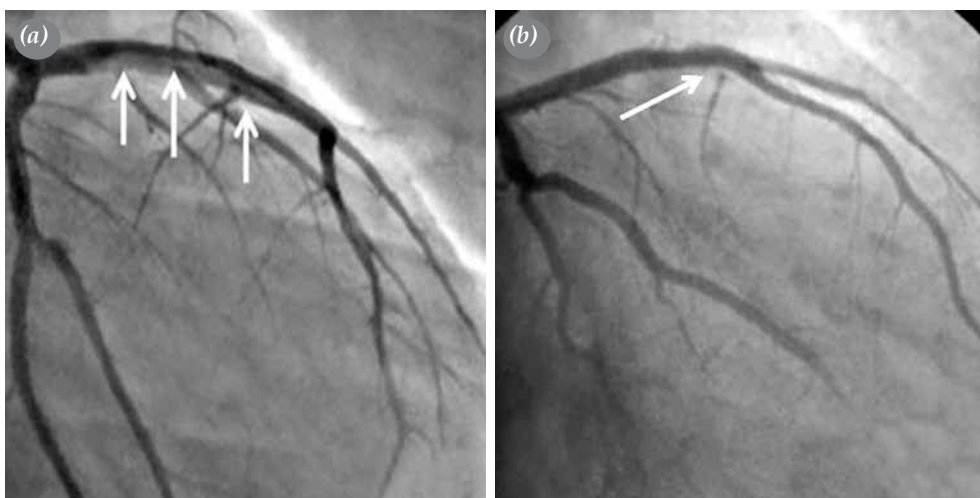


Figure 1. (a) A right anterior oblique projection of left anterior descending artery demonstrating coronary artery dissection of proximal left anterior descending artery (arrows). (b) A view of anteroposterior projection of angiography following deployment of a bare-metal stent in proximal left anterior descending artery (arrow). The TIMI-III coronary flow supplied from left anterior descending artery (arrow).

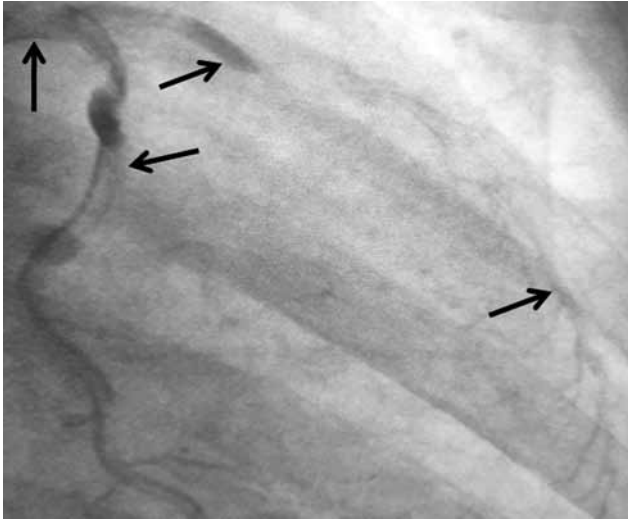


Figure 2. Angiography of left main stem, anterior descending, and circumflex artery (a right anterior oblique projection) showing coronary dissection starting from left main stem. Dissection involves the left circumflex artery (arrows on the left side). This image shows total occlusion of left anterior descending artery (arrow on the right side).

DISCUSSION

Peripartum SCAD is a rare condition in postpartum period. There is no common consensus on the optimal treatment strategy. The mortality rate for patients with SCAD in the peripartum period has been estimated as 38%.^[7] Herein, we present four PSCAD cases and discuss varying treatment strategies. We believe that our findings generated some important information on how best to approach PSCAD cases. First, coronary artery dissection must be considered,



Figure 3. Initial angiogram (left anterior oblique caudal projection) showing dissection of anterior descending artery (small arrow). There is no sign of dissection of circumflex artery (long arrow).

when a pregnant woman presents with unstable angina pectoris accompanied by elevated cardiac troponin-I and CK-MB levels. Second, prompt diagnosis and implementation of appropriate treatment options are the main life-saving measures in these patients. Exercising and volume overloading may increase the shear forces against the coronary arterial wall as a result of cardiovascular or emotional stress. Coronary angiography is considered the gold standard for the diagnosis of SCAD. Since coronary arteriography is only a two-dimensional luminogram, some authors have suggested that intravascular ultrasonography (IVUS) should be performed to assess the arterial wall precisely, as it allows the visualization of the arterial wall structure and composition.^[8] The precise etiology of SCAD, which is the cause of maternal mortality in 3 to 10% of the cases, still remains unclear. Medial eosinophilic angiitis, pregnancy-induced degeneration of collagen, and rupture of the vasa vasorum are accepted as risk factors.^[9] Previous studies on SCAD have suggested different management approaches, including conservative management, PCI, and CABG.^[9,10]

According to the ACC/AHA guideline, if the coronary artery dissection involves the left main coronary artery, CABG should be the initial treatment strategy.^[10] A surgical approach has been also considered the first-line treatment modality, when multiple vessels are involved. In case of PCI failure,

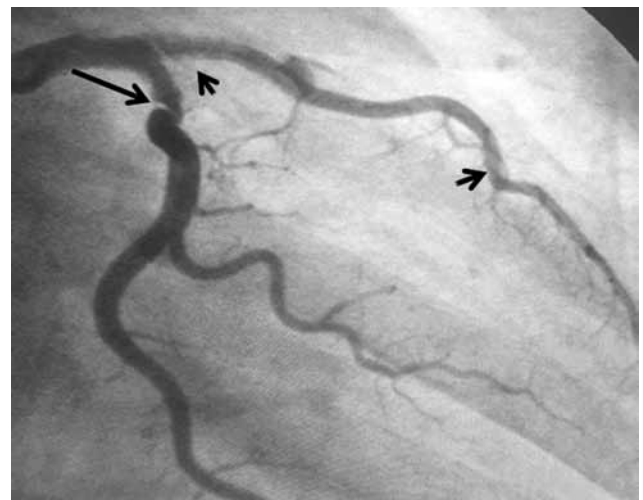


Figure 4. Follow-up angiogram showing a TIMI-III flow provides (an anterior oblique caudal projection) (two small arrows) (on Day 9). Repeated angiogram showing healing of an intracoronary thrombus. At six months and one year, respectively, angiogram showing a healed intracoronary flap. The arrows show a TIMI-III flow from patent circumflex (long arrow) and left anterior descending coronary artery (small arrows).

CABG should be strongly considered for patients with SCAD.^[11] PCI can be used to treat proximal LAD dissection, the left circumflex artery, and the right coronary artery. For distal lesions, a conservative treatment management approach can be applied in symptomatic or asymptomatic SCAD patients. The conservative management may include the use of antiaggregants and anticoagulants, beta-blockers, nitrates, and diuretics.^[11] Karahmet et al.^[12] reported that thrombolytic therapy resulted in the regression of the left main coronary artery dissection. In a review of 123 SCAD cases, death was reported in 67% of the patients who were treated with either a conservative treatment or surgery.^[13] Jorgensen et al.,^[14] reported 100% survival in 10 patients with SCAD.

In conclusion, pregnancy-related spontaneous coronary artery dissection should be considered in patients with unexplained chest pain, respiratory distress, and elevated cardiac enzymes in the peripartum period. An urgent coronary angiography and/or intravascular ultrasonography should be performed for prompt diagnosis and an appropriate treatment to achieve successful outcomes. Furthermore, coronary artery bypass grafting remains one of the optimal strategies in postpartum patients in whom the disease involves the left main stem or leads to multivessel coronary artery disease.

Declaration of conflicting interests

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