

Beyond Conservative Management: A Case of Postpartum Spontaneous Coronary Artery Dissection with Total Occlusion

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1. Introduction

Spontaneous Coronary Artery Dissection (SCAD) is the most common cause of acute coronary syndrome (ACS) in young females, particularly during the postpartum period [1]. Postpartum SCAD(P-SCAD) is characterized by the disruption of the coronary intimal layer and the formation of an intramural hematoma (IMH), which can lead to vessel occlusion and typically results in ACS. Most cases of P-SCAD occur within the first month after childbirth.

On Angiography, lesions characterized by multiple lumens and/or a stained contrast wall are categorized as type 1 SCAD. Lesions exhibiting long, diffuse smooth stenosis, indicative of IMH, were classified as type 2 SCAD. Lastly, lesions showing focal or tubular stenosis, resembling atherosclerosis due to IMH, were classified as type 3 SCAD [2]. Traditionally, most hemodynamically stable cases of P-SCAD are treated with conservative medical therapy due to high risk of complications with Percutaneous Coronary Intervention (PCI). However, in certain high risk patients or in medical therapy failure, early revascularization should be considered. This case report emphasizes the importance of carefully considering indications that may warrant an early invasive strategy.

2. Case

A 37-year-old woman, G2P2, with a history of gestational hypertension was admitted to the hospital 8 days after a spontaneous vaginal delivery, presenting with postpartum preeclampsia. Her condition was treated with nifedipine and magnesium sulfate. Eight hours later, she began experiencing chest pain, and her EKG indicated an anterior STEMI (Figure 1A). She was promptly taken for diagnostic angiography, which revealed extensive dissection of the proximal Left Anterior Descending Artery (LAD) along with diffuse spasm and TIMI Grade 0 distal flow, an Ejection Fraction (EF) of 25% and anteroapical myocardial hypokinesis. (Figure-1B, C). A diagnosis type II SCAD was established.

Given her postpartum status, preeclampsia, and low EF it was decided to manage her on medical therapy. However, a few hours later, the patient went into sustained Ventricular Fibrillation (VFib). She was resuscitated according to ACLS protocol and cardioverted back to sinus rhythm, after which the proximal LAD was successfully opened using two drug eluting stents (2.25*12 and 2.25*30) during an emergency PCI. Following the procedure, she was transferred to the ICU, where she developed aspiration pneumonia, which was treated according to the standard of care. She was extubated the following day and discharged from the hospital two days later. Three days after her discharge, she started experiencing chest pain again. An emergency angiography was arranged, which showed widely patent LAD stents with TIMI grade 3 distal flow (Figure-2). Her ejection fraction was noted to be 30-35%, with moderate Mitral Regurgitation (MR) and a Left Ventricular End-Diastolic Pressure (LVEDP) of 26. At two month follow-up, the patient is clinically stable.

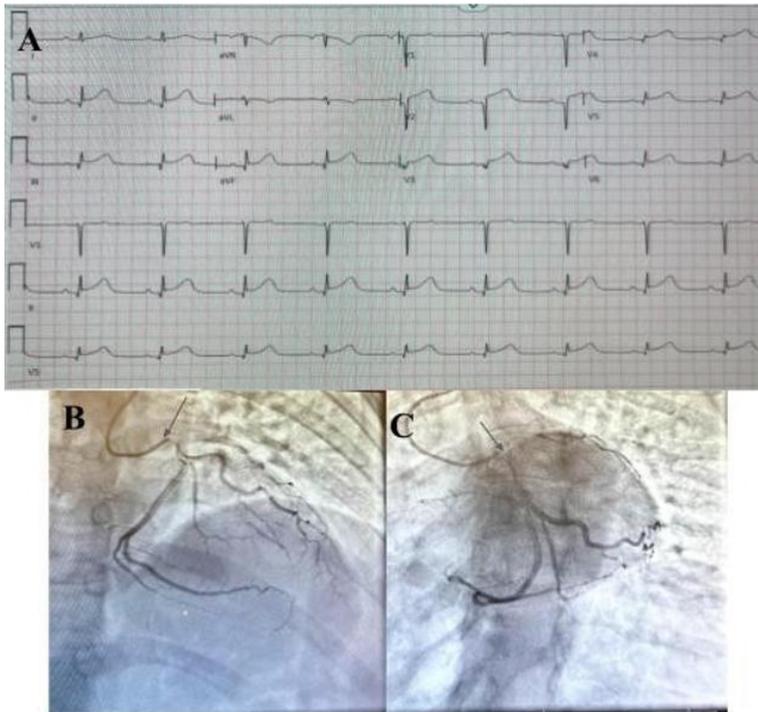


Figure-1: (A) Initial Electrocardiogram Indicating an Anterior STEMI. (B) Spontaneous Coronary Artery Dissection of The Proximal LAD with No Distal Flow in RAO Caudal View (Arrow). (C) Spontaneous LAD Dissection in LAO Caudal View (Arrow).

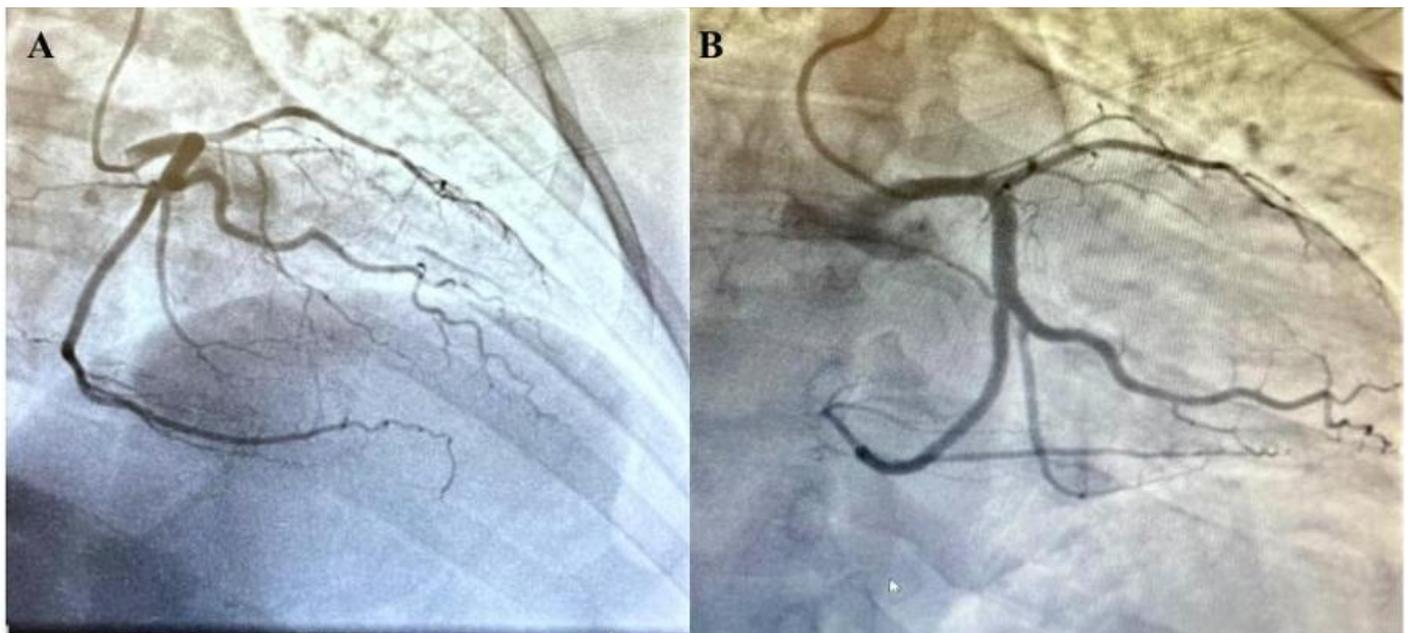


Figure 2: (A) Post Stented RAO Caudal View of the Proximal LAD. (B) LAO Caudal View of the Proximal LAD after PCI

3. Discussion

P-SCAD is the leading cause of pregnancy-associated MI, comprising an alarming 43% of these cases [1]. Medical management is generally preferred because PCI confers additional risks for these patients, and most cases eventually heal over time

Coronary arteries in SCAD have structural weaknesses that heighten complications during PCI, such as dissection extensions and vessel obstruction. Guidewires may enter the false lumen, occluding the true lumen, while balloon dilation and stent placement can extend dissections or propagate IMH, worsening the vessel obstruction. Long coronary stents are often necessary due to extensive

dissections, increasing the risk of in-stent restenosis and stent thrombosis. Additionally, the resolution of IMH over time can lead to stent strut malapposition, further raising stent thrombosis risk [3-5].

Despite these technical challenges involved, immediate revascularization is recommended for patients who are experiencing ongoing ischemia despite medical management, hemodynamic instability, total occlusion of the Left Main Coronary Artery (LMCA) or the proximal LAD (i.e. TIMI flow 0-1), cardiogenic shock, sustained ventricular arrhythmia, or those presenting with STEMI [1]. CABG is reserved for patients with LMCA dissection affecting the LAD ostium or left circumflex artery, extremely diffuse SCAD, or in cases of PCI failure [6].

In the absence of randomized trials, most PCI techniques in SCAD are based on expert opinion. Imaging modalities like IVUS and Optical Coherence Tomography are crucial to confirm entry into true lumen and optimize stent parameters [7]. Most operators consider the use of non-hydrophilic wire preferable to avoid propagation of dissection by entering the false lumen; however, others suggest that starting with a floppy wire and then escalating to a hydrophilic or a stiff wire has a higher PCI success rates [8].

During PCI, undersized balloon angioplasty may be considered to restore flow in focal and distal lesions while fenestration of the IMH by a regular or cutting balloon may be considered to reduce the true lumen's compression in long and diffuse dissections. Some studies suggested that a hybrid approach using cutting balloon angioplasty and stenting may be considered for a compressive IMH to prevent late mal apposition once the hematoma is

Resorbed [9-11].

4. Conclusion

Revascularization in P-SCAD should be considered for patients with hemodynamic instability, total occlusion of the left main coronary artery or the proximal LAD, cardiogenic shock, sustained ventricular arrhythmia, or those with ongoing ischemia despite medical management.

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