CASE REPORT

Pregnancy-associated spontaneous coronary artery dissection: A challenging scenario in limited-resource setting

Hassan Abdullah[1], Ayesha Rafique[2], Asad Jamil Awan[3], Muhammad Muzaffar Mahmood[4]

Abstract

Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome (ACS). We report a case of SCAD in a patient who had her Caesarean section three weeks earlier. This report describes the management, emphasising the need to keep a high index of suspicion to avoid mismanagement, such as inadvertent thrombolysis which may prove disastrous in such situations. The practical aspects of performing percutaneous coronary intervention in patients with SCAD are also discussed.

Keyword: Acute Coronary Syndrome, Coronary Vessels, Percutaneous Coronary Intervention, Thrombolytic Therapy, Caesarean Section.

DOI: https://doi.org/10.47391/JPMA.11299

Introduction

Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome (ACS); however, it is an important cause of non-atherosclerotic ACS, particularly in middle-aged women. According to a retrospective cohort study done in the United States, its prevalence rate was only 0.78% out of 26,598 ACS cases seen between 2006 to 2016.[1] Notably, no research data on the same exists in any registry in Pakistan. Acute Myocardial Infarction (AMI) due to SCAD has been observed in females of all ages, but peak prevalence (87% to 95% of cases) occurs between the ages of 44 and 53 years.[2] SCAD is postulated to arise from the development of a false lumen in the coronary arteries, either due to an intimal tear or intrinsic tunica media haemorrhage.[3] However, in most cases, both the mechanisms are simultaneously at play.

Conventional risk factors for CAD are not seen in SCAD, signifying its non-atherosclerotic nature. Its most common risk factors are connective tissue disorders, fibromuscular dysplasia, physical or emotional stress, and pregnancy.[2] Angiographic classification of SCAD denotes "classical" type 1 (evident contrast stain with double or multiple lumen appearance), type 2 (diffuse stenosis, may mimic coronary spasm), and type 3 (focal stenosis, may mimic atherosclerosis).[3] While type 1 SCAD can often be reliably diagnosed on coronary angiography alone, type 2 and type 3 usually require intracoronary imaging. On coronary angiogram a TIMI flow grade II-III is also considered to be an indication for conservative therapy. In unstable patients with ongoing myocardial ischaemia and/or TIMI flow grade 0-I, myocardial revascularisation is indicated. This report also highlights that TIMI flow grade can change rapidly and in patients initially assigned to the medical therapy a close observation is mandatory.

SCAD is an under-studied condition, as evidenced by the fact that there is a severe lack of information about the prognosis or recommendations for management, primary prevention or secondary prevention in literature.

Here, a case of SCAD in a patient three weeks after her caesarean section is presented. Keeping a high index of suspicion for these cases is vital to avoid mismanagement such as inadvertent thrombolysis which may prove disastrous in such situations. The practical aspects of performing percutaneous coronary intervention in patients with SCAD are also discussed.

Case Report

A 33-year-old woman presented with a history of central chest pain for six hours on November 17, 2022. She had a caesarean section performed three weeks earlier. She previously had three uneventful pregnancies with the youngest child being four years old. During the recent pregnancy there had been no health concerns. She had no history of diabetes, hypertension, or significant family history of ischaemic heart disease.

She had initially presented to another hospital, where in view of the ongoing pain and ECG changes, thrombolysis with Streptokinase was considered but decided against it in view of the recent caesarean section. At presentation to Ittefaq Hospital Trust Lahore her heart rate was 84 beats per minute, blood pressure was 110/70 mmHg, heart sounds were normal, and clinical examination was unremarkable. Her ECG showed normal sinus rhythm, ST-segment elevation in anterior leads with hyperacute T waves, and occasional ventricular extrasystole. The chest X-ray and

[1,2]Department of Internal Medicine, Ittefaq Hospital, Lahore, Pakistan;
[3,4]Department of Cardiology, Ittefaq Hospital, Lahore, Pakistan.
Correspondence: Hassan Abdullah. e-mail: habdulah9@gmail.com
ORCID ID: 0009-0001-2641-846X

Submission completed: 27-01-2024 **1st Revision received:** 04-06-2024
Acceptance: 04-01-2025 **Last Revision received:** 03-01-2025

routine blood counts were unremarkable. A transthoracic echocardiogram showed moderately impaired LV systolic function (ejection fraction 40%) with anterior, anteroseptal and apical hypokinesia.

A coronary angiogram was performed through right radial access. The left anterior descending artery showed an obstructive lesion in mid vessel with Thrombolysis in Myocardial Infarction (TIMI) flow grade II. (Figure 1). The appearances were suggestive of a spontaneous coronary artery dissection (SCAD). The intra-coronary imaging was not available for this case. In view of the ongoing ischaemia, it was decided to proceed to the percutaneous coronary intervention. The scout picture on engaging the guide catheter showed that the flow was already reduced to TIMI flow grade I. After careful wiring of the vessel, a 2.75x32 mm Xience Xpedition (Abbott Vascular Inc. California, USA) coronary stent was implanted with satisfactory expansion, no significant residual stenosis, and restoration of TIMI flow grade III (Figure 2). Pre-dilation and post-dilation of the vessel was not performed.

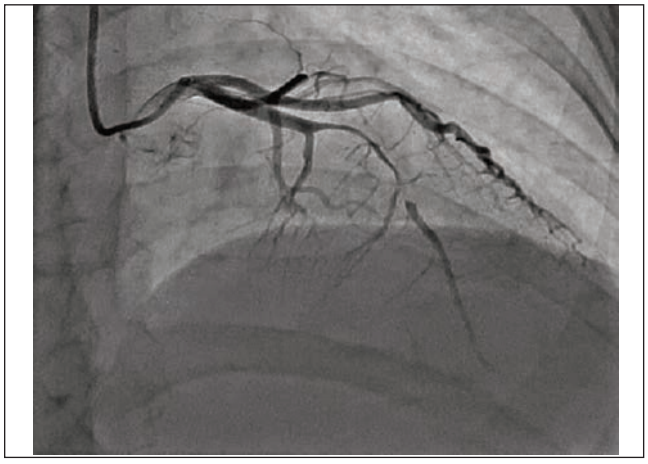

Figure-1: Pre Image showing Coronary angiography (CAG): right anterior oblique (RAO) view demonstrating a severe stenosis in the middle of left anterior descending (LAD) artery with appearance consistent with SCAD.

Figure-2: Post Image CAG: RAO view following implantation of a DES in the middle of LAD artery with complete resolution of stenosis.

Dual antiplatelet therapy, beta blockers and Angiotensin-converting enzyme inhibitor (ACEI) therapy was started. There were no obvious triggering factors for the SCAD apart from recent pregnancy. The patient's subsequent clinical course was uncomplicated and she was well at eight-month follow-up with normalisation of her LV systolic function.

Discussion

SCAD is a rare but well-known cause of ACS, particularly among pregnant women.[1] The diagnosis of SCAD can be easily overlooked and a high-index of suspicion is needed. This is especially important as the treatment strategy may have important consequences. In particular, thrombolysis, the default therapeutic strategy in STEMI in developing countries, may have had catastrophic consequences in this patient. Thrombolytic therapy is relatively contraindicated in patients who have undergone a major surgery within three weeks. However, in patients with SCAD, the contraindication to thrombolysis arises from the risk of catastrophic extension of the dissection rather than the timing of the surgery alone. Considering that SCAD occurs in significantly few patients many months after the pregnancy, thrombolysis in patients with STEMI anytime during the peripartum period should be avoided and timely coronary angiography should be performed.[3] The treatment of SCAD requires careful consideration. As the majority of spontaneous dissections heal without progression, the consensus is to treat haemodynamically stable patients with no ongoing ischaemia with medical therapy alone. Resultantly, most patients (84.3% in one report) with SCAD are treated conservatively.[4]

PCI for SCAD patients is associated with poor procedural outcomes. Wiring the false lumen, extending the haematoma, needing long coronary stents, and suboptimal final TIMI flow grades are recognised problems in patients undergoing PCI. Resultantly PCI often fails to improve TIMI flow grades in patients with SCAD. Various strategies have been suggested to allow improved procedural outcomes with PCI, such as careful wiring with subsequent intra coronary imaging, use of cutting balloons to fenestrate the haematoma,[5] use of longer stents on each side of the lesion to allow for potential extension of haematoma, use of absorbable scaffolds[6] and placing the stents on both ends of the dissection while allowing the rest of the dissection to heal spontaneously. In this patient, deployment of a stent longer by 5-8 mm on each side of the lesion, without pre-dilation or post-dilation was opted for with successful clinical and angiographic outcomes.

CABG is associated with improved procedural outcomes but long-term graft patency is often compromised because of spontaneous healing of the coronary vessels with subsequent competitive flow causing the graft occlusion. SCAD has a tendency to recur in sites different from the original lesion, with hypertension being the most significant risk factor of recurrence.[7]

Conclusions

SCAD is an uncommon yet serious cause of ACS among the peripartum patients. A high index of suspicion is needed. Coronary angiogram and, where possible, intracoronary imaging establish the diagnosis. In haemodynamically unstable patients with ongoing myocardial ischaemia, emergency coronary revascularisation is indicated with particular attention to the mode and procedural aspects of the treatment modality.

Patient consent: A formal consent was obtained from the patient for the publication of this article.

Disclaimer: None.

Conflict of Interest: None.

Funding Source: None.

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Author Contribution:

HA: Data collection, analysis, drafting and agreement to be accountable for all aspects of the work.
AR: Data acquisition, drafting and agreement to be accountable for all aspects of the work.
AJA: Reviewing, acquiring the references and agreement to be accountable for all aspects of the work.
MMM: Concept, design, final approval and agreement to be accountable for all aspects of the work.