

Spontaneous coronary artery dissection treated with biovascular scaffolds: Old riddle, novel approach

Chinyere C. Iwuala

ABSTRACT

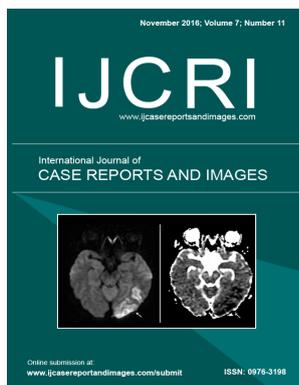
Introduction: Spontaneous coronary artery dissection (SCAD) is a rare, poorly understood disease (incidence 0.1–1.1%). Management modalities vary and are mostly based on consensus from relatively some study results. Percutaneous intervention (PCI) with conventional drug eluting stents (DES), though acceptable treatment for complicated cases, has a widely variable rate of success (65–90%), hence the search for alternative solutions.

Case Report: We present the case of a premenopausal female with no known cardiac risk factor, admitted with a non-ST elevation myocardial infarction (NSTEMI), who, on cardiac angiogram, was found to have had a spontaneous coronary artery dissection (SCAD). Conservative management is the consensus treatment for uncomplicated cases, but failed in this case. Biovascular scaffolds were then deployed and 12 months post procedure, have proven to be a successful treatment option for this rare disease.

Conclusion: This case highlights the difficulties posed by this rare disease and the potential for better results for PCI in complicated cases when biovascular scaffolds are employed. Failure of conservative management necessitated the novel approach with biovascular scaffolds which have been shown to not only restore coronary flow in the interim, but also reduce the risk of restenosis while promoting vascular restoration. Bioresorbable stents should be considered for management of certain complicated cases.



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Keywords: Bioresorbable, Scaffolds, Spontaneous coronary artery dissection, Vascular restoration

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INTRODUCTION

Spontaneous coronary artery dissection (SCAD) is a rare, poorly understood disease (incidence 0.1–1.1%) [1]. Some large studies have been done to give more clarity on this disease, hence some controversy exists as to previous generally accepted ideas. For one, there is a growing sense that SCAD may be more underdiagnosed than rare [2]. Nowadays it is recognized that SCAD is a significant cause of myocardial infarction (MI) in young women, and should be considered in any young woman presenting with chest pain.

Other grey areas exist concerning management modalities. Based on the relatively few studies available, consensus management of SCAD advises conservative management in uncomplicated cases, with percutaneous intervention (PCI) or coronary artery bypass graft (CABG) surgery reserved for complicated cases [3]. As the success rates of PCI done with currently available conventional stents have not been completely satisfactory in SCAD patients [4], consideration of other viable (and likely safer) options such as bioresorbable stents are warranted.

This case reports an uncommon disease which became complicated, and when available traditional methods failed, a novel innovation in interventional cardiology was found to be the answer. The aim is to highlight the occurrence and characteristics of SCAD, the concept of vascular restoration and the new bioresorbable stent technology available to support it, which as in this case, may prove to be a good answer to the riddle.

CASE REPORT

A 45-year-old premenopausal Caucasian female, previously well with no known cardiac risk factors, presented at her local emergency room with severe (8/10) chest pain at rest. The pain was central, “pressure-like”, non-radiating, associated with nausea, dizziness and sweating. It lasted for 1 hr and was partially relieved by nitroglycerin sublingual spray.

The patient was a school teacher with two teenage children. She lived an active healthy lifestyle, never smoked, drank or abused drugs, jogged three times per week and had completed a half marathon the weekend before. She was on an oral contraceptive pill. She was transferred to the New Brunswick Heart Centre (NBHC) as a case of acute coronary syndrome (ACS) in need of urgent revascularization. Her vital signs included heart rate 53 bpm, regular, and blood pressure 94/69 mmHg on arrival. Physical examination was otherwise unremarkable.

ECG showed ST depression in V4-V6 with peaked T waves and poor R wave progression. Troponins were 800 ng/l (had been previously normal on initial ER presentation). Creatinine, electrolytes and other blood tests were within normal limits.

Coronary angiogram (Figure 1A) showed 100% occlusion of left anterior descending (LAD) beyond D2, with spontaneous dissection. Right coronary artery, left main and left circumflex arteries were normal. Percutaneous trans coronary angioplasty (PTCA) was initially done, with return of normal flow. No stent was deployed at the time because of extensive dissection. The patient was managed on enoxaparin, ticagrelor and low dose aspirin. Subsequent echocardiogram showed an ejection fraction of 69%, no segmental wall motion abnormalities or with a small pericardial effusion.

Unfortunately, while recuperating over the next week, the patient had daily episodes of chest pain, a

sign of persistent ischemia and possible progression of dissection. She was therefore booked for a repeat coronary angiogram. Repeat angiogram and optical coherence tomography (OCT) showed dissection extension distally, with mid LAD hematoma.

Three overlapping bioresorbable stents - ABBOT Biovascular Scaffolds (BVS) were deployed in the mid to distal LAD. The OCT immediately after this showed good stent deployment and apposition. There was excellent angiographic result (Figure 1B) and clinical resolution of symptoms, even at 12 months post treatment.

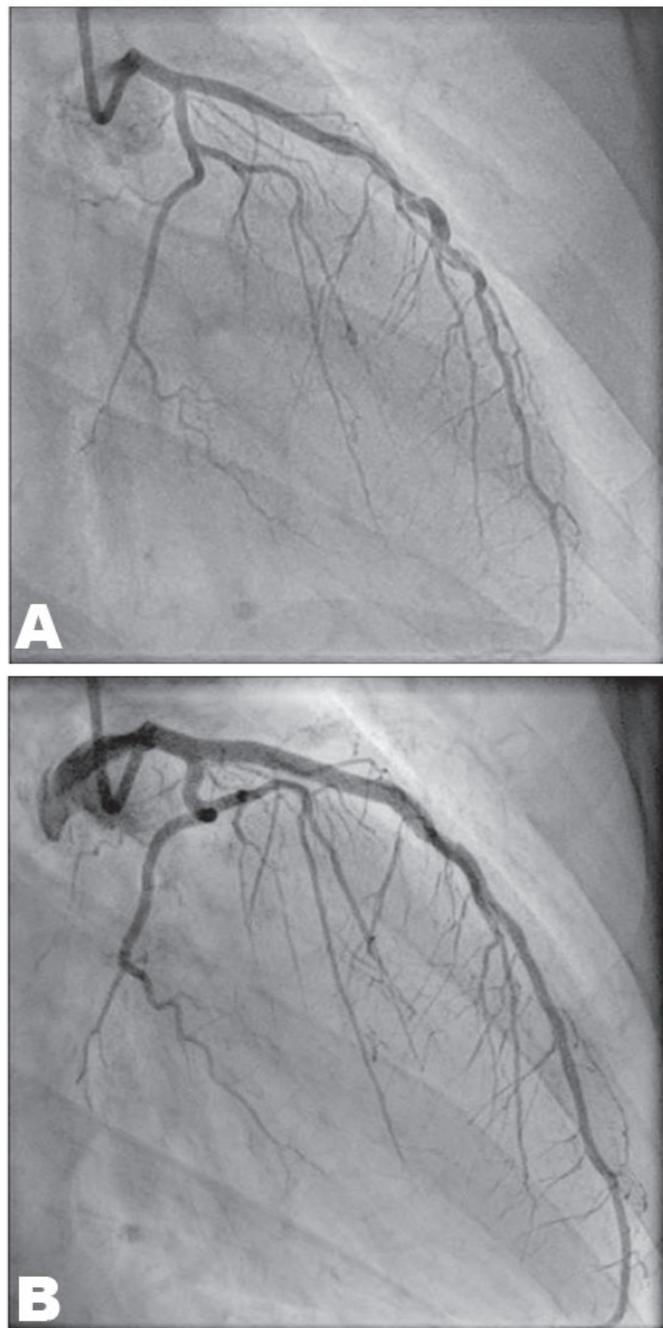


Figure 1: (A) Spontaneous Dissection of the left anterior descending beyond D2 with reduced vascular flow, and (B) Restoration of flow after percutaneous intervention with three ABBOTT biovascular scaffolds.

DISCUSSION

Spontaneous coronary artery dissection (SCAD) describes a separation of the coronary arterial wall by intramural hemorrhage causing a false lumen, with or without an intimal tear. It is typically assumed to be not caused by traumatic or iatrogenic causes. Commonly considered rare (prevalence of 0.1–1.1%), newer studies indicate it may simply be under recognized. It is more common in women (82%), with average age of 42.6 years. Hormonal links exist, with many peripartum or perimenopausal cases reported, and as with the patient, oestrogen contraceptive use. It also linked to fibromuscular dysplasia (FMD), connective tissue disease, and strenuous exercise (as in this case) [5]. Typically, patients have no previous cardiac risk factors. Most presentations involve Chest Pain, electrocardiogram (ECG) changes and elevated cardiac biomarkers. Coronary angiography is currently the cornerstone of diagnosis of SCAD. Newer tests such as intravascular ultrasound (IVUS) and optical coherence tomography (OCT) localize lesions more accurately.

The natural history of SCAD involves eventual spontaneous resolution of the lesion. Most studies report good outcomes with a conservative approach.

Percutaneous intervention or surgery are reserved for single or multi vessel disease (respectively) complicated by persistent ischaemia or severe hemodynamic instability, also in proximal lesions, extensive involvement and failure of conservative management to stop further dissection. Technical success rates for PCI with traditional stents have however been disappointing at about 64% [5].

Bioresorbable stents have been hailed as ‘the fourth revolution in coronary intervention’. BVS like traditional stents, aid revascularization, but uniquely, as poly lactic acid structures, are also resorbable into vessel walls, typically within 2 to 4 years. With this ‘temporary’ presence, reduced rates of late or very late stent thrombosis is an advantage [6].

The ABSORB A and B Cohort trials also showed improved vasomotion and even lumen area gain with these stents. These properties particularly make them a very attractive option compared to traditional stents, considering the natural history of SCAD [7].

Moreover, considering the high risk of recurrent dissection with SCAD, BVS allow better access for future follow up (MRI/CT, IVUS, OCT), or even CABG, compared to metallic stents [8].

Our case is the 1st reported complicated SCAD treated with BVS which has been verified as successful even at 12 months after initial intervention.

CONCLUSION

Spontaneous coronary artery dissection (SCAD) is an uncommon disease which should be strongly considered in young women who present with chest pain. In view of

the unique characteristics of this disease, bioresorbable stents should be considered for management of certain complicated cases. This case report has described a young woman with SCAD complicated by extension of dissection who was ultimately successfully managed with bioresorbable stents.

Author Contributions

Chinyere C. Iwuala – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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REFERENCES

1. Alfonso F, Bastante T, Rivero F, et al. Spontaneous coronary artery dissection. *Circ J* 2014;78(9):2099–110.
2. Saw J, Ricci D, Starovoytov A, Fox R, Buller CE. Spontaneous coronary artery dissection: Prevalence of predisposing conditions including fibromuscular dysplasia in a tertiary center cohort. *JACC Cardiovasc Interv* 2013 Jan;6(1):44–52.
3. Alfonso F, Paulo M, Lennie V, et al. Spontaneous coronary artery dissection: long-term follow-up of a large series of patients prospectively managed with a “conservative” therapeutic strategy. *JACC Cardiovasc Interv* 2012 Oct;5(10):1062–70.
4. Tweet MS, Eleid MF, Best PJ, et al. Spontaneous coronary artery dissection: Revascularization versus conservative therapy. *Circ Cardiovasc Interv* 2014 Dec;7(6):777–86.
5. Yip A, Saw J. Spontaneous coronary artery dissection-A review. *Cardiovasc Diagn Ther* 2015 Feb;5(1):37–48.
6. Onuma Y, Serruys PW. Bioresorbable scaffold: The advent of a new era in percutaneous coronary and peripheral revascularization? *Circulation* 2011 Feb 22;123(7):779–97.
7. Iqbal J, Onuma Y, Ormiston J, Abizaid A, Waksman R, Serruys P. Bioresorbable scaffolds: Rationale,

current status, challenges, and future. *Eur Heart J* 2014 Mar;35(12):765–76.

8. Lesiak M, Araszkiwicz A. “Leaving nothing behind”: Is the bioresorbable vascular scaffold a new hope for patients with coronary artery disease? *Postepy Kardiol Interwencyjnej* 2014;10(4):283–8.

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