

treatment effects with ticagrelor for either the ischemic or bleeding endpoints between those with and without PAD (3). This suggests that there is unlikely a true lack of bleeding risk in such patients, given the known mechanism of action of the drug. Notably, as Lozano and colleagues acknowledge, recent results from the EUCLID (A Study Comparing Cardiovascular Effects of Ticagrelor and Clopidogrel in Patients With Peripheral Artery Disease) trial, where patients with symptomatic PAD, 29% with prior CAD, were randomized to monotherapy with either ticagrelor or clopidogrel, found no difference in ischemic outcomes between therapies (4).

Nonetheless, we agree with Dr. Lozano and colleagues that patients with PAD and concurrent CAD represent a high-risk patient population—for both ischemic and bleeding events—and are worthy of additional investigation into treatment strategies to optimize care, including more individualized assessment of risk and benefit (5).

Eric A. Secemsky, MD, MSc

Robert W. Yeh, MD, MSc

*Laura Mauri, MD, MSc

on behalf of the DAPT Study Investigators

*Division of Cardiology

Brigham and Women's Hospital

75 Francis Street

Boston, Massachusetts 02115

E-mail: lmauri@partners.org

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RESEARCH LETTER:

Pulse on Spontaneous Coronary Artery Dissections

Experience-Based Survey



Spontaneous coronary artery dissection (SCAD) mostly affects young adults (especially women), and clinical manifestations vary from chest pain to sudden cardiac death. It occurs in 0.1% to 1.1% of angiographic series and represents 0.1% to 4% of acute coronary syndromes (ACS) (1,2). However, this condition is underestimated, primarily because its classic angiographic hallmarks are lacking in >70% and may be discovered exclusively with intravascular imaging (3,4). Furthermore, its management remains challenging because of the lack of evidence supporting therapy, and the role of percutaneous or surgical revascularization is still debated.

In this contribution, a group of SCAD experts and the European Society of Cardiology SCAD Working Group developed 20 questions regarding diagnosis, therapy, and follow-up of SCAD (Online Table 1). Surveys were sent out electronically in November 2016 to all the first/corresponding authors (whose e-mail contact was available) of the 609 articles on the topic found on PubMed. These articles were selected with the keyword "Spontaneous coronary artery dissection" or by the acronym "SCAD." Two reminders were sent to nonresponders after 1 and 2 months. The survey was closed in February 2017.

We obtained 402 complete responses to the questionnaire from 609 surveys sent (66%). The responses were from interventional cardiologists in 81%, clinical cardiologists in 14%, cardiac surgeons in 3%, and other physicians in 2%. Fifty-five percent of the responders had seen 1 to 10 SCAD cases in their experience, and only 7% had seen over 50. According to their responses, the most relevant risk factors for SCAD were female sex, pregnancy, or the peripartum period, young age, absence of classical risks factors, heavy physical/psychic stress, and systemic connective tissue disorders, as well as noncoronary vasculopathies (e.g., fibromuscular dysplasia). Considered of minor importance were the use of oral contraceptives or chronic inflammatory diseases. The principal clinical presentation of SCAD was non-ST-segment elevation ACS (56%), followed

by ST-segment elevation myocardial infarction (42%). In case of suspicion of SCAD following angiography, the most frequently performed examination is intravascular ultrasound (33%) followed by optical coherence tomography (OCT) (29%), although OCT is the more useful tool to detect a dissection according to 40% of the sample interviewed. Overall, more than one-third of responders state that intravascular imaging is required in more than one-half of suspected SCAD, but avoid invasive imaging in case of small vessels/distal lesions. [Online Figure 1](#) shows the study's most relevant findings on SCAD diagnosis according to experts' responses. Intriguingly, 78% of those interviewed highlighted how a shared clinical/angiographic score can be useful for a faster diagnosis (5).

Regarding the treatment, 86% of the entire sample of responders prefer medical therapy (MT) as first-line treatment, whereas 10% prefer metallic stents, and only 2%, bioresorbable vascular scaffold (BVS) implantation. However, if dissection occurs in a stable patient, but with the involvement of a vessel >3.0 mm or in its proximal-mid segment, MT was preferred by 59% of physicians versus metallic stent or BVS implantation (26% and 11%, respectively). Otherwise, in case of ACS, only 48% of experts prefer MT alone, against an increasing consensus on an invasive strategy (41%).

BVS use is considered a promising alternative to drug-eluting stents by 48% of the interviewed, but 52% believe that metal stenting is a better choice. Drug-coated balloons are not suitable for SCAD treatment according to 63% of the responders despite some initial clinical evidence of a healing effect of drug-coated balloons in native coronaries left with a dissection (6). Regarding medical treatment, responders give preference to aspirin, P2Y₁₂ inhibitors, beta-blockers, and statins as basic therapy, followed by angiotensin-converting enzyme inhibitors, nitrates, calcium channel blockers, and angiotensin II receptor blockers, respectively. Dual antiplatelet therapy is prescribed mostly in case of stent/BVS strategy, usually for 12 months. [Online Figure 2](#) illustrates the principal findings on how responders manage a SCAD patient.

Follow-up in case of conservative management is scheduled after 3 months for the first year after the index event and then yearly by 57%. In addition, coronary angiography and computed tomography scan are considered if an in-depth assessment is required. As expected, most of the physicians suggest an adequate cardiac rehabilitation cycle for 3 to 6 months, then walking or light physical activity but avoiding heavy lifting or exhausting exercise.

A relevant ethical question involved pregnancy: due to the high frequency of recurrences, the majority of responders (58%) discourage future pregnancy after SCAD in young female patients. The prognosis of SCAD patients is considered better than that for the classical atherosclerotic patient (70%). [Online Table 2](#) reports the entire series of questions and the respective responses and [Online Table 3](#) resumes the study findings.

This is the first survey on SCAD patients that describes the feeling of those who have published on the matter. SCAD has gained solid attention in the last years as shown by the increasing number of publications (39 articles in 2011 vs. 120 in 2016). This fact may reflect the increased availability of intravascular imaging tools in the catheterization laboratories worldwide.

Recently, the European Society of Cardiology, in partnership with the Acute Cardiovascular Care Association, established a European SCAD registry as a platform for collaborative research with the aim of improving the knowledge on the topic to improve its management through a shared strategy.

Accordingly, in our study, 62% of the responders confirmed the prominent role of intravascular imaging in the case of suspected SCAD after angiography. According to the published reports, SCAD occurs in females in more than 80% of the cases and is the cause of 24% of myocardial infarctions in young women (7). Regarding the initial occurrence of the arterial wall separation, 2 hypotheses have been proposed (2). First, the "intimal tear" hypothesis consists in a primary disruption of the intraluminal interface creating an entry door for blood infiltration into the vessel wall causing an intramural hematoma inside the false lumen, thus leading to arterial wall separation and possibly vessel occlusion. The second hypothesis is medial hemorrhage in which the primary mechanism leading to dissection is bleeding into the vessel wall that could be due to primary rupture or thrombosis of the vasa vasorum (2).

A relevant link between SCAD and fibromuscular dysplasia (FMD) was shown by Saw et al. (8) who found FMD in ≥ 1 noncoronary territories in 86.0% of a cohort of SCAD patients. In that study, 58.1% had renal FMD, 48.8% iliac, and 46.5% cerebrovascular, among whom 14.0% had intracranial aneurysm.

Considering the typical recurrence rate of 10% to 20%, MT management with a "wait and see strategy" has been suggested. In fact, myocardial revascularization therapy represents a tricky and particularly challenging strategy in this setting. Moreover, one should consider a higher rate of acute complications,

suboptimal results, and poor long-term outcome. Nevertheless, in symptomatic patients with suitable anatomy and proximal vessel involvement, percutaneous revascularization should be considered (9). If a percutaneous myocardial revascularization strategy is used, several studies seem to show that drug-eluting stents are currently the best device in this setting (10), although some intriguing initial experiences are reported with BVS (11,12).

In conclusion, to the best of our knowledge, this is the first and largest survey on SCAD. Still lacking international guidelines or shared consensus documents, this survey sheds a unique light on the perceived clinical relevance of this still often underestimated entity.

*Dario Buccheri, MD
Giulia Zambelli, MD
Fernando Alfonso, MD
Bernardo Cortese, MD

*Interventional Cardiology
San Giovanni di Dio Hospital
Agrigento 20037
Italy

E-mail: dariobuccheri@gmail.com

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APPENDIX For supplemental tables and figures, please see the online version of this article.

RESEARCH LETTER:

Dual Antiplatelet Therapy After Bioresorbable Vascular Scaffold Implantation



Insights From the Milan Cohort

Bioresorbable vascular scaffolds (BVS) were conceptually introduced to accrue future benefits associated with the lack of a permanent metal cage; however, the enthusiasm for the current generation has been tempered by the results of recent randomized trials reporting a higher rate of scaffold thrombosis (ScT). More recently, concerns regarding very late ScT (VLScT) arose after 4 cases were reported from the ABSORB Japan trial (AVJ-301 Clinical Trial: A Clinical Evaluation of AVJ-301 (Absorb BVS) in Japanese Population) (1). The result suggested that those unexpected late events may be attributed to a suboptimal implantation technique and therefore an optimization of the implantation technique (i.e., lesion preparation, sizing, and post-dilatation) could potentially resolve this problem. However, 6 VLScT cases reported from ABSORB II (ABSORB II Randomized Controlled Trial) (2) raised additional concerns because, in all cases, intravascular imaging at the index procedure showed acceptable final results. Therefore, the implantation technique may not be solely responsible, and because all events occurred after cessation of dual antiplatelet therapy (DAPT), "optimal" DAPT after BVS implantation may be another important factor to mitigate risk. A recent meta-analysis regarding late thrombotic events after BVS implantation also suggested the importance of DAPT to reduce the risk of ScT (3). Accordingly, we reviewed clinical outcomes and DAPT duration after BVS implantation from our centers.

From May 2012 to December 2016, 361 patients (558 lesions) were treated with Absorb BVS (Abbott Vascular, Santa Clara, California) at 2 high-volume