

## VIEWPOINT

### EDUCATIONAL CORNER

# Do One Thing Every Day That Scares You



Khalil Ibrahim, MD, Mladen I. Vidovich, MD

Coronary artery dissection is a rare but potentially life-threatening result of blunt trauma injury. Its description in the literature is almost exclusively through case reports and a few autopsy series. Traumatic coronary artery dissection (TCAD) is presumed to be a consequence of trauma due to a temporal relationship, although incidental spontaneous coronary artery dissection (SCAD) never can be completely ruled out. The left anterior descending artery (LAD) is the most commonly affected artery (76% of cases), presumably because of its anterior course and proximity to the chest wall. The mechanism of injury is felt to be shear stress on the artery causing intimal tear (1).

In the December issue of *JACC: Case Reports*, Rojas et al. (2) describe a case of a 33-year-old man with previous traumatic injury to his descending thoracic aorta and right subclavian artery as a result of a motor vehicle accident. The patient presents 7 months later with chest pain starting 24 h after an all-terrain vehicle accident. An electrocardiogram showed T-wave and ST changes in the anterior precordial leads with a mildly elevated troponin. The patient was transferred for urgent coronary angiography that demonstrated a flush occluded LAD at the ostium with some features suggestive of coronary dissection. Surprisingly, the patient was completely chest pain free and hemodynamically stable.

Rojas et al. (2) made a measured and what some would say a brave decision not to intervene, given the patient was asymptomatic and there existed the

potential to propagate the dissection retrograde into the left main and circumflex arteries. He was monitored for 3 days in the hospital and remained stable. A follow-up echocardiogram demonstrated a mildly reduced left ventricular (LV) ejection fraction of 40% to 45% with anteroseptal wall motion abnormalities. He was discharged on medical therapy that included dual antiplatelet therapy. Interestingly, the patient presented 6 days after discharge with pleuritic chest pain and a coronary computed tomography angiogram (CTA) demonstrated a patent LAD without evidence of dissection. Unfortunately, a repeat echocardiogram showed interval development of an LV apical thrombus and he was discharged on warfarin and aspirin therapy.

This case raises a therapeutic dilemma in terms of revascularization for traumatic coronary dissection. Rojas et al. (2) made a thoughtful decision in not intervening, given the patient was asymptomatic, and followed the mantra to avoid intervention in coronary dissection if at all possible. However, critics could argue an ostially occluded LAD with Thrombolysis In Myocardial Infarction (TIMI) flow grade 0 in a 33-year-old should not be left alone and one wonders had the LAD been revascularized at presentation would the patient's LV ejection fraction have remained depressed with subsequent development of LV thrombus. Traumatic coronary artery dissection is such a rare entity; there is no direct evidence to guide treatment, and rather the best we have is to assume that the disease behaves much the same as SCAD, as they both involve intimal dissections and intramural hematomas. Although there is a much larger body of evidence in the literature for SCAD in terms of epidemiology, pathophysiology, and outcomes, there still remain shortcomings in our understanding of how to manage coronary artery dissection. Compared with atherosclerotic coronary artery disease, percutaneous coronary intervention (PCI) of coronary artery dissection is associated with more complications and suboptimal outcomes, including vessel closure, dissection/hematoma propagation, and unplanned

From the Division of Cardiology, Department of Medicine, University of Illinois at Chicago, Chicago, Illinois, USA.

This Educational Corner addresses the following Clinical Case, which was published in the December 2020 issue of *JACC: Case Reports*: Rojas ER, Gimble LW, Morsy M, Villines TC. Early recanalization of a traumatic coronary artery dissection with medical therapy alone. *J Am Coll Cardiol Case Rep* 2020;2:22992303. <https://www.jacc.org/doi/10.1016/j.jaccas.2020.09.040>

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).

## ABBREVIATIONS AND ACRONYMS

**CTA** = computed tomography angiography

**LAD** = left anterior descending artery

**LV** = left ventricular

**PCI** = percutaneous coronary intervention

**SCAD** = spontaneous coronary artery dissection

**TCAD** = traumatic coronary artery dissection

**TIMI** = Thrombolysis In Myocardial Infarction

PCI (3,4). In addition, there is evidence that most SCADs will heal completely over time (3,4). There is general agreement that if the vessel is patent with TIMI flow grade 3 or the coronary involvement is distal and the patient is stable, then intervention should be avoided; however, in patients who are unstable or with proximal artery occlusions, then intervention is generally pursued. When intervening on coronary dissections, extreme care must be taken to ensure guidewire passage into the true lumen, and this may need to be confirmed with gentle contrast injection distally through a microcatheter. The next challenge is preventing dissection propagation proximally and distally. Steps to mitigate this complication includes using longer stents to reduce the risk of propagation or using short stents proximally and distally to the dissection to seal the dissection (4). More recently, the technique of using cutting balloons to fenestrate the intima and allow back-bleeding or depressurization of the hematoma has become more popular (5). Despite what we know about SCAD, it is a different entity than TCAD, and we do not know if traumatic dissections behave the same way to interventions as SCAD does. Perhaps the intima in TCAD is less delicate than SCAD and therefore less vulnerable to propagation. Although you could find proponents for both sides of the argument on whether to intervene or not in this case, we would argue that intervention, whether PCI or coronary artery bypass grafting, should have been pursued in an LAD with TIMI flow grade 0. An infarcted anterior wall with LV thrombus is a significant morbidity for such a young patient, although we cannot say with certainty that revascularization at the time would have prevented the patient's infarct and LV thrombus.

In addition to the therapeutic dilemma, this case demonstrates how rapidly SCADs can heal. One

observational study found that 95% of SCAD lesions showed spontaneous angiographic healing if repeat angiography was performed >30 days after the index event (6). In this case, it was remarkable how quickly and dramatically the artery healed, progressing from a completely occluded vessel to widely patent within 9 days. Furthermore, this case shows the utility of cardiac CTA. Although cardiac CTA is limited in assessing small vessel dissection due to low spatial resolution and probably should not be used as the initial diagnostic test for diagnosing SCAD, it proves to be excellent as a follow-up modality, as it has 2 distinct advantages. First, it is noninvasive with minimal associated complications and can be easily arranged, and second, it does not carry the risk of iatrogenic dissection that invasive coronary angiography carries in these vulnerable patients (7).

Finally, this case report is an illustration of the utility in case reports for disseminating information and experiences of entities that are too rare to be studied by traditional research, such as randomized controlled trials. With the rise of social media among health care professionals as a platform for sharing and exchanging ideas and experiences, it is now even easier to circulate these valuable case reports and should be encouraged to further the field and provide operators with better context when they encounter rare events.

## FUNDING SUPPORT AND AUTHOR DISCLOSURES

Dr. Vidovich has received a research grant from Boston Scientific; and has received royalty payments from Merit Medical. Dr. Ibrahim has reported that he has no relationships relevant to the contents of this paper to disclose.

**ADDRESS FOR CORRESPONDENCE:** Dr. Khalil Ibrahim, University of Illinois at Chicago, 840 South Wood Street, MC 715, Suite 920S, Chicago, Illinois 60612-7323, USA. E-mail: [khalil8@uic.edu](mailto:khalil8@uic.edu).

## REFERENCES

1. Lobay KW, Macgougan CK. Traumatic coronary artery dissection: a case report and literature review. *J Emerg Med* 2012;43:e239-43.
2. Rojas ER, Gimple LW, Morsy M, Villines TC. Traumatic coronary artery dissection. *J Am Coll Cardiol Case Rep* 2020;2:2299-303.
3. Hayes SN, Tweet MS, Adlam D, et al. Spontaneous coronary artery dissection. *J Am Coll Cardiol* 2020;76:961-84.
4. Adlam D, Alfonso F, Maas A, et al. European Society of Cardiology, acute cardiovascular care association, SCAD study group: a position paper on spontaneous coronary artery dissection. *Eur Heart J* 2018;39:3353-68.
5. Main A, Lombardi WL, Saw J. Cutting balloon angioplasty for treatment of spontaneous coronary artery dissection: case report, literature review, and recommended technical approaches. *Cardiovasc Diagn Ther* 2019;9:50-4.
6. Hassan S, Prakash R, Starovoytov A, Saw J. Natural history of spontaneous coronary artery dissection with spontaneous angiographic healing. *J Am Coll Cardiol Intv* 2019;12:518-27.
7. Roura G, Ariza-Solé A, Rodríguez-Caballero IF, et al. Noninvasive follow-up of patients with spontaneous coronary artery dissection with CT angiography. *J Am Coll Cardiol Img* 2016;9:896-7.

**KEY WORDS** acute coronary syndrome, coronary angiography, dissection, percutaneous coronary intervention