

## MINI-FOCUS ISSUE: INTERVENTIONAL CARDIOLOGY

ADVANCED

## IMAGING VIGNETTE: CLINICAL VIGNETTE

# Left Main Coronary Artery Stent Misadventure



Stefano Sechi, MD,\* Giovanni Melina, MD, PhD,\* Fabio Capuano, MD, PhD, Romina Pantanella, MD, Riccardo Sinatra, MD

## ABSTRACT

Coronary artery bypass grafting has long been the standard of care for patients with left main coronary artery (LMCA) disease. Lately, percutaneous coronary intervention (PCI) has become a suitable alternative for these patients, but the procedure may be challenging. We describe 2 cases of LMCA PCI failure requiring surgical intervention. (**Level of Difficulty: Advanced.**) (J Am Coll Cardiol Case Rep 2020;2:1905-6) © 2020 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## CASE DESCRIPTIONS

A 69-year-old woman underwent a primary percutaneous coronary intervention (PCI) with left main coronary artery (LMCA) and left anterior descending (LAD) coronary artery stenting. This procedure was followed by staged treatment of the left circumflex artery and further LAD stenting for severe in-stent restenosis with an LMCA stent post-dilatation as a result of suboptimal expansion. After 6 months she presented with unstable angina. Diagnostic imaging showed the coronary stent protruding through the LMCA origin into the aortic root (**Figure 1A**), and a repeat coronary angiogram showed in-stent thrombosis. The patient was then referred for surgery and underwent on-pump coronary artery bypass grafting to the LAD and left circumflex artery. Once the aorta was opened, the LMCA stent was found protruding approximately 1 cm into the left sinus of Valsalva, in direct contact with the aortic valve, which was not damaged (**Figure 1B**). The stent was then cut at the origin of the LMCA, and the operation was completed successfully.

A second patient, a 76-year-old woman, 2 months following a primary PCI with LMCA and LAD stenting for an anterior ST-segment elevation myocardial infarction, presented with exertional angina. Echocardiographic examination showed a stent protruding through the left coronary ostium. At coronary angiography, the protruding stent was unexpanded and fractured (**Figures 1C and 1D**). In this case, open heart surgery was necessary to cut the fractured stent protruding into the aorta with few clots for approximately 7 mm (**Figures 1E and 1F**) and to perform intraoperative balloon dilation through the LMCA, under direct vision, to achieve full stent expansion. The operation was then completed uneventfully.

Both patients were discharged home, and at 6 months follow-up they were both free from angina, with no signs of myocardial ischemia during exercise electrocardiogram testing.

LMCA PCI may be challenging because of certain anatomic and structural factors: the length and angle of bifurcation and its specific histological characteristics could make stent positioning difficult or even

From the Department of Cardiac Surgery, Sant'Andrea Hospital, Sapienza University of Rome, Rome, Italy. \*Drs. Sechi and Melina contributed equally to this work.

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 *JACC: Case Reports* [author instructions page](#).

Manuscript received July 8, 2020; revised manuscript received August 11, 2020, accepted August 14, 2020.

**ABBREVIATIONS  
AND ACRONYMS**

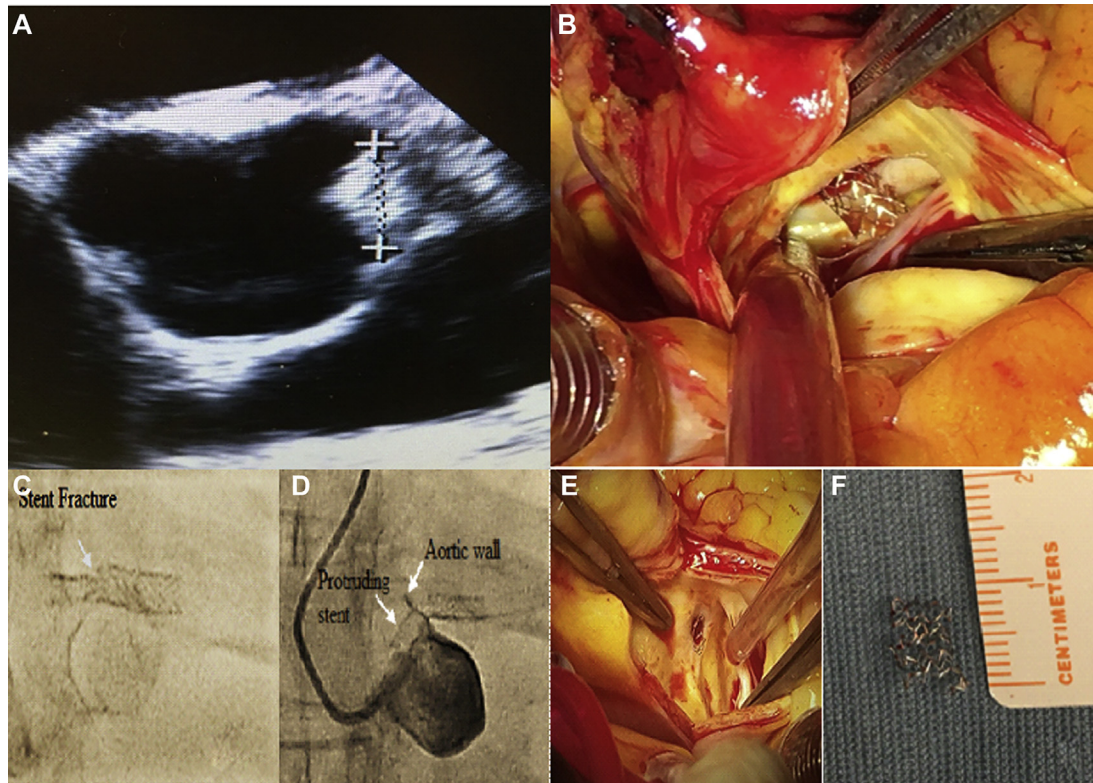
**LAD** = left anterior descending

**LMCA** = left main coronary artery

**PCI** = percutaneous coronary intervention

impossible. The most frequent complications are in-stent restenosis, stent fracture, thrombosis, and malposition, which can increase the risk of early and late coronary events and/or damage to the aortic valve. A malpositioned LMCA stent may be treated surgically (1) or conservatively (2). These 2 patients underwent surgery. The malpositioned stents were cut in both cases to avoid aortic damage and to prevent thromboembolic events and/or endocarditis, in addition to coronary artery bypass grafting and intraoperative balloon stent dilatation, respectively, to treat coronary ischemia.

**FIGURE 1** LMCA PCI Failure and Repair



(A and B) Patient 1. Echocardiographic and surgical views of the stent protruding through the left main coronary ostium in direct contact with the left cusp of the aortic valve. (C and D) Patient 2. Angiographic images of the malpositioned and fractured left main stent. (E) Patient 2. Surgical view after cut of the protruding stent. (F) Patient 2. The trimmed portion of the stent. LMCA = left main coronary artery; PCI = percutaneous coronary intervention.

**AUTHOR RELATIONSHIP WITH INDUSTRY**

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

**ADDRESS FOR CORRESPONDENCE:** Dr. Stefano Sechi, Department of Cardiac Surgery, Ospedale Sant'Andrea, Sapienza Università di Roma, Rome 00189, Italy. E-mail: [s.sechi@uniroma1.it](mailto:s.sechi@uniroma1.it).

**REFERENCES**

1. Nakamura M, Minakata K, Yamazaki K, et al. Aortic valve replacement in patients with protruding coronary artery stents. *J Cardiol Cases* 2014;10:213-5.
2. Kim JH, Kim KW, Choe WJ. Suspected coronary ostium calcification identified as a protruding stent by epiaortic echography. *J Clin Ultrasound* 2015; 43:135-7.

**KEY WORDS** complication, coronary artery bypass, stents