The Safety of Drug-Eluting Stents in High Bleeding-Risk Patients

When anatomically complex meets clinically complex.

BY JOSÉ FRANCISCO DÍAZ FERNÁNDEZ, MD, FESC, AND SANTIAGO CAMACHO FREIRE, MD

This article details an interesting case both anatomic and clinical complexity. The selection of the type of drug-eluting stent (DES) and the length of dual antiplatelet therapy (DAPT) was critical due to the patient’s comorbidities.

CASE REPORT

An 80-year-old man with a history of hypertension, hypercholesterolemia, type 2 diabetes, and colon cancer with anemia (Hb = 9.5 g/dL and abdominal surgery scheduled for 1 month later) was admitted to our institution with a non-ST elevation acute coronary syndrome (electrocardiogram depression on inferior leads). The patient was preloaded with acetylsalicylic acid (ASA) and clopidogrel. An angiogram obtained the next day revealed a left anterior descending artery occluded in its middle segment, with a poor distal vessel (Figure 1). There was also a dominant right coronary artery showing a critical lesion on its middle segment followed by an ectatic segment with a very marked difference in size between the proximal and distal parts of the lesion (Figure 2). Optical coherence tomography (OCT) of the artery anatomy was then performed to determine the optimal landing zones and their size for placement of the stent (Figure 3).

After wiring, predilatation with a 3-mm X 10-mm semicompliant balloon was done and a 4-mm X 23-mm everolimus drug-eluting stent (DES) (XIENCE Sierra™ stent, Abbott) was implanted. A second XIENCE Sierra™ stent (4 mm X 15 mm) was then implanted proximally due to edge dissection. Final postdilation of the whole segment was performed with a 5-mm X 20-mm noncompliant balloon, with good angiographic and OCT results (Figures 4 and 5). We decided to leave the patient on DAPT (ASA and clopidogrel) for 1 month and perform repeat angiography and OCT just before surgery. After 1 month, the repeat angiogram showed a good preserved result in the right coronary artery.

Figure 1. Angiogram of the left coronary artery in right anterior oblique inclination showing an occlusion of the mid-distal left anterior descending artery.

Figure 2. Angiogram of the right coronary artery in left anterior oblique inclination showing a tight lesion at the beginning of the middle segment. Note the great difference in size of the artery at both sides of the lesion.

Figure 3. Three short-view OCT images showing the extreme difference in size distal (A; mean diameter, 6.74 mm) to the lesion (B) and proximal (C; mean diameter, 3.6 mm) to the lesion. Long-view of the whole segment (D) shown in the bottom panel.
(Figure 6) and good endothelialization on the OCT image (Figure 7). Clopidogrel therapy was stopped, and the patient underwent uneventful abdominal surgery and was left only on ASA therapy after release. There were no new cardiac events at 6-month follow-up.

**DISCUSSION**

Dual antiplatelet therapy with ASA and a P2Y12 inhibitor remains the cornerstone treatment in the prevention of recurrent ischemic events after DES implantation. Current European guidelines for DAPT recommend a standard duration of 6 months after next-generation DES implantation for stable coronary artery disease or 12 months for acute coronary syndrome. However, a shorter duration of DAPT may be considered in patients with a high bleeding risk. This case illustrates a not so infrequent clinical scenario in which we are forced to shorten DAPT as much as possible.

After the LEADERS FREE trial, which demonstrated better safety and efficacy of a polymer-free drug-coated stent compared to a bare-metal stent with only 1-month DAPT, there are many ongoing studies focused on short-duration DAPT and different DES. In a recent meta-analysis that included nine randomized controlled trials, short-duration DAPT after DES implantation resulted in a significant reduction of major bleeding events with no apparent increase in all-cause death, myocardial infarction, stent thrombosis, or stroke.

Next-generation DESs present with an improved safety profile and are associated with lower rates of early and late stent thrombosis. Moreover, the XIENCE DES is considered the comparator due to the vast number of patients in trials and registries showing very low stent thrombosis rates at 30-day follow-up (0–0.1%). These results could be explained, at least in part, by the fluoropolymer coating of the stent. The fluoropolymer interacts with proteins in the blood in a way that reduces thrombus formation, a process known as fluoropassivation. In addition, this case highlights the benefits of the XIENCE Sierra™ stent when used in tapered vessels with very different diameters between the proximal and distal segments. Differential postdilatation (ie, dilating the proximal and distal parts of the stent at different sizes) is possible with the XIENCE Sierra™ stent, without foreshortening and ensuring coating integrity.

However, intracoronary imaging techniques can be an inestimable help as a complement for the diagnosis and/or management of patients undergoing PCI. OCT provides, in part due to its better resolution, a series of findings with clinical implications and prognostic value. Different studies have demonstrated the usefulness of OCT in the acute phase after stent placement for being able to identify processes directly related to thrombosis and stent restenosis. In fact, the new European Society
of Cardiology/European Association for Cardio-Thoracic Surgery guidelines on myocardial revascularization recommend OCT for stent optimization with an Ila recommendation. This case showed excellent stent expansion and apposition during the index procedure and we then used OCT at 1-month follow-up to decide on stopping DAPT due to the strut endothelialization, which is supported by small studies though still to be confirmed in larger trials.

CONCLUSION

In cases requiring the need to combine advanced technical features of the DES with maximum safety, the XIENCE Sierra™ DES performs extraordinary well. Additionally, OCT can be an important complement for the diagnosis and/or management of patients undergoing complex PCI.


JOSÉ FRANCISCO DÍAZ FERNÁNDEZ, MD, FESC
Cardiology Department
Juan Ramon Jimenez University Hospital
Huelva, Spain
jfdiazf@yahoo.es
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SANTIAGO CAMACHO FREIRE, MD
Cardiology Department
Juan Ramon Jimenez University Hospital
Huelva, Spain
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