

Simultaneous intravascular ultrasound for precise ostial stent placement

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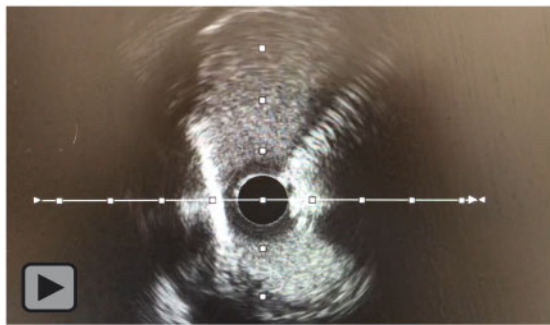
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Ostial lesions remain challenging in percutaneous coronary intervention (PCI) due to complex coronary geometry.¹ The angle of division of coronary arteries from the aorta is often acute or obtuse and the ostia are usually funnelling. Several techniques have been proposed; flash balloon, floating guidewire, stent draw-back, and Szabo,² but all have limitations. Intravascular ultrasound (IVUS) detects incomplete ostial coverage in almost half imaged lesions.³ The ideal technique should not rely solely on angiography. We propose a new technique and present an illustrative case.

A 61-year-old woman was hospitalized with non-ST-elevation myocardial infarction. Coronary angiography was inconclusive due to abnormal origin of left main artery (LM) with suspicion of severe ostial lesion that was confirmed on computed tomography coronary angiography (Supplementary material online, Figure S1). Following heart team discussion, she was accepted for PCI.

Severe angulation led to poor appreciation of aorto-ostial location on multiple orthogonal projections (Video 1). IVUS (OptiCross™, Boston Scientific, MA, USA) demonstrated non-calcified plaques with ostial LM minimum lumen area (MLA) of 5.0 mm², and ostial left anterior descending artery MLA of 6.0 mm². A 4.0 × 23 mm Xience Sierra™ stent (Abbott, CHI, USA) was precisely placed at the aorto-ostial junction with simultaneous IVUS-guidance, with the IVUS catheter passed over circumflex artery guidewire (Figures 1 and 2, Video 2). Once the stent was positioned at the ostium, the IVUS catheter was pulled back and the stent deployed with optimal result (Supplementary material online, Figure S2, Video 3).



Video 1 Coronary angiography showing full coverage of the ambiguous ostial left main origin after stent deployment.

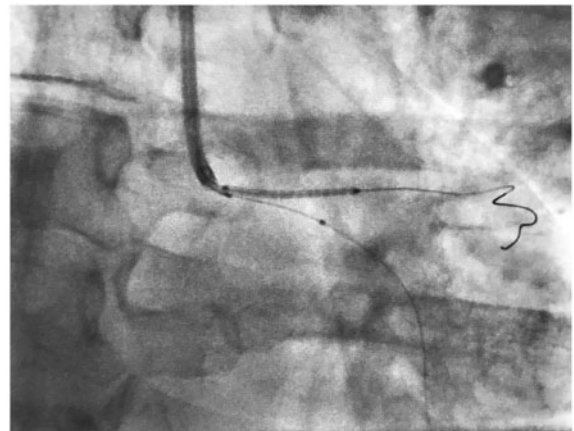


Figure 1 A 4.0 × 23 mm Xience Sierra™ stent was placed with simultaneous live intravascular ultrasound-guidance achieved by passing the intravascular ultrasound catheter over the circumflex artery guidewire.

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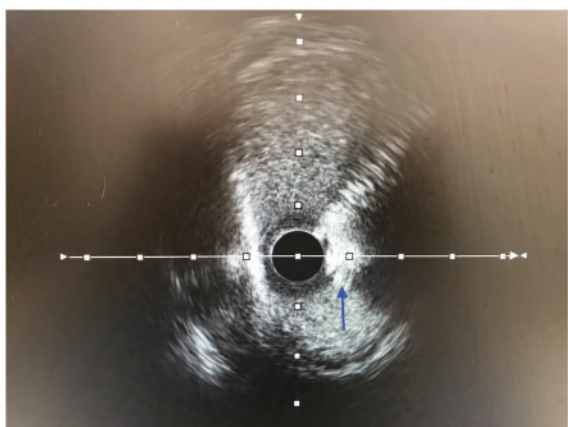
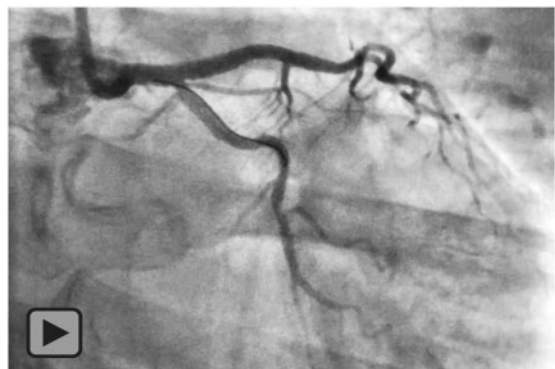


Figure 2 Intravascular ultrasound showing undeployed stent (blue arrow) placed right at the aorto-ostial junction.



Video 2 Coronary angiography showing abnormal origin of left main artery arising high at the level of sinotubular junction with severe ostial lesion.

We use this technique regularly for ostial LM, occasionally right coronary artery, and in T-stent technique in bifurcation-PCI. This technique requires some important considerations; (i) good IVUS interpretation, (ii) meticulous control of the undeployed stent upon



Video 3 Intravascular ultrasound showing undeployed stent placed right at the aorto-ostial junction.

removal of the IVUS catheter, and (iii) suitable guide catheters to accommodate the stent and IVUS catheter simultaneously.

IVUS-guided ostial stent placement is useful in angiographically ambiguous ostia to ensure full ostial coverage and to prevent excessive stent protrusion into the aorta. With increased application, limitations may be recognized.

Supplementary material

Supplementary material is available at *European Heart Journal - Case Reports* online.

Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patient in line with COPE guidance.

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