

Mayur Lakhani, Anitha Rajamanickam,
and Annapoorna Kini

Ostial lesions pose distinctive technical challenges. This chapter provides an overview of equipment and interventional techniques used for ostial lesions.

Definition

- Ostial lesions are defined as lesions within 3 mm of the origin of the vessel. It could be at the aorto-ostial or branch-ostial junction.

Anatomic Challenges

- Inability to engage the guide and maintain position
- High degree of elastic recoil
- High restenosis rate
- Different takeoff angles from aorta
- Difficulty in precise placement using conventional fluoroscopic images is critical. In aorto ostial lesion protrusion into the aorta will cause difficulty during recanalisation. In non aorto ostial lesions “pinching” of the second vessel may occur if placement is not performed.

M. Lakhani, MD (✉) • A. Rajamanickam, MD • A. Kini, MD, MRCP, FACC
Department of Interventional Cardiology, Mount Sinai Hospital,
One Gustave Levy Place, Madison Avenue, New York 10029, NY, USA
e-mail: drmayerlakhani@gmail.com; arajamanickam@gmail.com,
Anitha.rajamanickam@mountsinai.org; Annapoorna.kini@mountsinai.org

Equipment

- *Sheath:* 6 Fr
- *Guide selection/position:* Choose a less aggressive guide that will provide coaxial alignment without the tendency of deep engagement; this will also facilitate disengagement of the guide during stent placement.
 - Guide catheter with side holes may be preferred in cases of subtotal aorto-ostial lesion.
 - Guide selection will depend on the vessel takeoff and various other factors.
 - For RCA, IM or FR 4 guide with side holes should be used.
 - For LM, FL guides (due to its short tip) with side holes should be used.
 - For RCA bypass grafts, multipurpose or AR2 with side holes should be used.
 - For OM or diagonal grafts, AR 2 or AL1 with side holes should be used.
 - Position: guide should not be fully engaged or deep seated.
 - For severe ostial disease, pre-load the wire in the guide before vessel intubation. This will facilitate rapid wiring and catheter disengagement after wiring.
 - A buddy wire may also be used to provide additional stability or as a marker in the ascending aorta or side branch to assist in positioning the stent.
 - Once the device (balloon, stent, etc.) is positioned, the guide is gently withdrawn into the aorta. Prior to complete removal of the device from the artery, use the device to “rail in” the guide tip (prevents damage to the deployed stent).
- *Wires:* A standard workhorse 0.014” wire is appropriate for most cases.
- *Balloons:* cutting/scoring balloon – Flextome™ or AngioSculpt™.

Access

- Femoral access is preferred as it provides better guide stability.

Fluoroscopic Views

- LAO-caudal for ostial RCA
- LAO-caudal and AP/LAO-cranial for ostial LM

Steps

- *Lesion preparation:*
 - Ostial lesions tend to have higher calcium and fibrous tissue content with increased elastic recoil. Therefore, we prefer to use cutting /scoring balloons prior to deployment of stent.
 - Rotational atherectomy should be considered for heavily calcified lesions.

Fig. 17.1 Placement of an ostial left main stent in RAO-cranial view. *Arrow* marks the proximal edge of the stent at the ostium

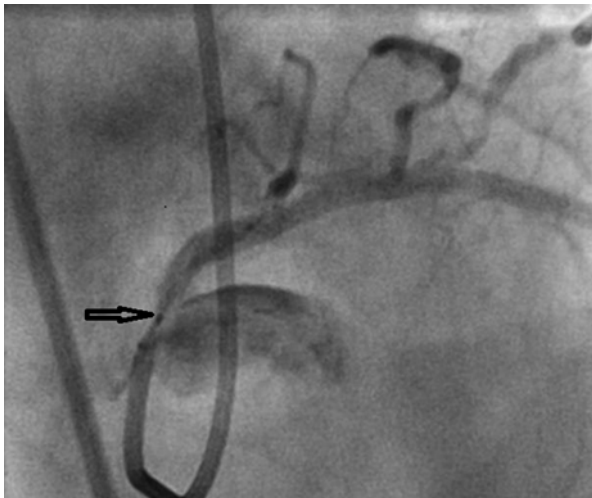
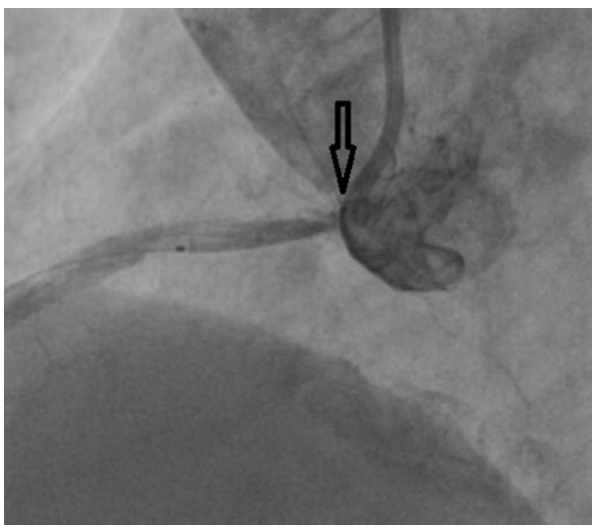
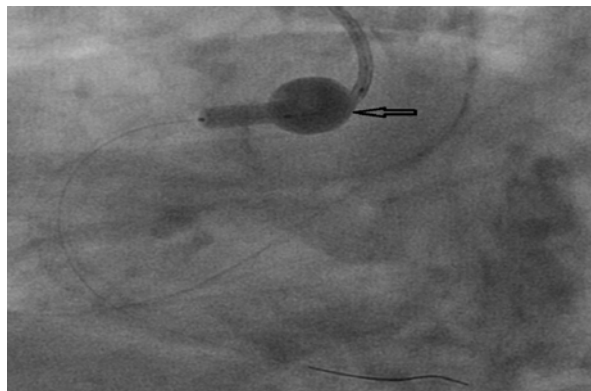


Fig. 17.2 Placement of an ostial RCA stent in LAO-caudal view. *Arrow* marks the proximal edge of the stent at the ostium



- *Stent positioning:*
 - Since the guide is disengaged during stent positioning, it may be difficult to visualize the ostia. If possible, use the presence of ostial calcium to assist with stent positioning (Figs. 17.1 and 17.2)
 - *Szabo technique in aorto-ostial lesions:* load the stent onto the primary guidewire in the usual way, then backload the secondary anchor wire (which is looped in the aorta) through the most proximal stent strut, and then advance the stent into the guide over both the primary guidewire and anchor wire [1]. Partial flaring of the proximal end of the stent is proposed as a modification to facilitate threading of the anchor wire [2].

Fig. 17.3 Use of a Flash Ostial Balloon™ for post-dilatation of an ostial RCA stent. *Arrow* marks the outer compliant anchoring (proximal) portion of the balloon



- *Modified Szabo technique in aorto-ostial lesions*: a second wire is placed and looped in the aorta to outline the sinus of Valsalva. It defines the junction of coronary artery and aorta to assist with stent positioning and also serves to provide further guide stability.
- *Stent pull-back technique in branch-ostial lesions*: inflate a balloon at low pressure in the parent vessel (size balloon 1:1), then pull back the stent to the ostium of the SB to create a dent in the balloon that is positioned in the parent vessel [4].
- *Stent deployment*:
 - The stent should be positioned protruding into the aorta by 1–2 mm to prevent recoil of the lesion at the stent edge.
 - Avoid using very short (<12 mm) stents to ensure adequate anchoring of the stent and to provide adequate lesion coverage distally.
 - Size stent 1:1 ratio and deploy appropriately at high pressures (≥ 12 atm) to ensure optimal apposition.
 - In LM lesions inflation and deflation should be quick (repeat two to three times as needed).
 - After stent deployment, we often perform light “flaring” of the ostium of the stent.
 - Use of Flash Ostial Balloon™ may be used for flaring of ostial stent (Fig. 17.3).

Complications [3]

- Guide catheter-induced dissection.
- Misplacement of the stent
- Inadequate stent expansion
- Side branch closure
- Stent dislodgment

References

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