

[Target Lesion]

Left main bifurcation in ACS

[Strategy]

Mechanical circulatory support was established with an intra-aortic balloon pump (IABP) prior to PCI because of the patient's critical clinical condition.

Both the LAD and LCX were wired, as angiography demonstrated a left-dominant coronary circulation with LAD D1 subtotal thrombotic occlusion & an apparent 70–80% thrombotic stenosis at the ostial LCX.

PCI to the LAD was performed using a Penumbra mechanical thrombectomy system, followed by excimer laser coronary atherectomy and sequential balloon pre-dilatation achieving TIMI III flow.

Subsequently, OCT evaluation of the ostial LCX demonstrated a significant fibrotic plaque with superimposed thrombus, confirming true bifurcation involvement.

At this stage, two revascularization strategies were considered:

Complex bifurcation stenting, or

Provisional LM-to-LAD crossover stenting & staged PCI to LCX.

However, considering the patient's young age, left-dominant coronary anatomy, we elected to pursue an imaging-guided Bifurcation PCI with DCB.

The LCX ostium was further treated with excimer laser coronary atherectomy followed by cutting balloon angioplasty. OCT confirmed an adequate minimum lumen area (MLA) without flow-limiting dissection.

Definitive treatment was completed with drug-coated balloon (DCB) angioplasty to both the LAD and LM-LCX, avoiding permanent metallic implantation.

[Final Result]

A final angiogram demonstrated an excellent procedural result with TIMI 3 flow in both the LAD and LCX.

There was no angiographic or OCT evidence of flow-limiting dissection, and an optimal post-procedural MLA was achieved. The procedure resulted in complete stentless revascularization of a complex left main bifurcation STEMI using an OCT-guided leave-nothing-behind strategy, thereby avoiding permanent metallic implantation in a young patient with ACS involving left-main bifurcation.