

Case study

Marker wire technique for precise LAD ostium stenting

Abstract

The ostial left anterior descending coronary artery (LAD) lesion is an important target for coronary revascularization because its location subtends a large territory of myocardium¹. Accurate stent placement is, however, mandatory for optimal results, but this is often difficult to achieve with the guidance of traditional angiography. We present a case of precise LAD ostium stenting with simple innovative marker wire technique. .Ostial PCI requires very precise stent positioning to obtain full lesion coverage, yet avoid unnecessary proximal extension which may result in obstruction of major vessels . Excessive stent movement occurs with cardiac contraction. Our case shows that with simple marker wire technique precise LAD ostium stenting can be done with good results as compared to with imaging techniques like IVUS and OCT.

Introduction:

The ostial left anterior descending coronary artery (LAD) lesion is an important target for coronary revascularization because its location subtends a large territory of myocardium¹. Accurate stent placement is, however, mandatory for optimal results, but this is often difficult to achieve with the guidance of traditional angiography. Ostial disease is traditionally defined as a lesion arising within 3 mm of the vessel origin. The precise stent placement in coronary artery ostium is technically difficult and poses special challenges for interventional cardiologists. “Geographic miss” that is leaving a portion of the lesion uncovered by a stent can result in early restenosis². We present a case of precise LAD ostium stenting with simple innovative marker wire technique.

Case presentation

Clinical background:

A 55 year male k/c/o diabetes ,hypertension,smoker presented with ongoing chest pain diagnosed as inferior and posterior wall myocardial infarction ,with left ventricular ejection fraction 40 to 45 percent.Troponin I was elevated ,ecg showed ST segment elevation in inferior leads and V 7,8,9(posterior leads). Patient was planned for a primary PCI.

Procedural description:

Procedure was performed from right femoral access with 6F sheath and angiography demonstrated 90 percent stenosis in mid LCX and 90 percent stenosis in ostial LAD , RCA was normal (fig1).Patient was planned for stent to LCX and LAD in single setting. EBU guide catheter was used for the procedure .Since LCX was the culprit artery in this case was treated first. After EBU was engaged to left main ostium, both LAD and LCX were wired with workhorse Runthrough coronary wires. Mid LCX was predilated with a NC ballon 2.75x12 mm and stented with DES 2.5x24 mm (fig2) .Then LAD ostium stenting was planned since lesion was classified as Medina (0,1,0). The LAD ostium lesion was predilated with NC ballon 2.75x12 mm and a type C dissection(non flow limiting) was noted

from ostium to proximal LAD (fig3). Simple innovative marker wire technique was used for precise LAD ostium stenting and also to cover the dissected segment of proximal LAD. The stent was positioned precisely at LAD ostium using wire in LCX as a marker wire for LAD ostium (fig4). The idea was that with blood flow the portion of wire will stuck with the roof of carina, which acts as marker of ostium. DES 2.75x16 mm was placed at LAD ostium and deployed (fig5). Final check shoots were taken showing precise stent placement and complete coverage of dissected segment (fig6).

Discussion:

In this case one of its biggest challenge is the precise positioning of stent in LAD ostium and to cover the dissected proximal LAD. Ostial lesions have a reputation of being fibrotic, calcified, and relatively rigid³. Ostial disease is felt to be additionally resistant to dilatation and prone to recoil⁴. Ostial PCI requires very precise stent positioning to obtain full lesion coverage, yet avoid unnecessary proximal extension which may result in obstruction of major vessels. Excessive stent movement occurs with cardiac contraction. Oscillation of the LAD stent increases the risk of inaccurate placement. The more acute the angle is, the greater the risk of suboptimal stent positioning. For precise LAD Ostial PCI, it is necessary to reiterate that the stent is within the radio-opaque markers on the stent balloon and thus the proximal marker must be positioned proximal to the ostial LAD⁵. As LM is free of disease, we prefer here precise placement of stent in LAD ostium to prevent undue jailing of LCX as well as metal in Left Main. Our case shows that with simple marker wire technique precise LAD ostium stenting can be done with good results as compared to with imaging techniques like IVUS and OCT. The dissected proximal LAD was also covered by the ostial LAD stent.

Conclusion :

We herein report unique strategy for the management of critical LAD ostial lesion by precise location of stent implantation at ostium by using a marker wire in LCX. Precise LAD ostial stenting can performed with good outcomes even without costly modalities like IVUS and OCT. So it may be concluded that this technique is quick, effective, and technically simple approach for successful treatment of LAD Ostial lesion.

References:

- 1) Park SJ, Lee CW, Hong MK, Kim JJ, Park SW. Stent placement for ostial left anterior descending coronary artery stenosis: acute and long-term (2-year) results. *Cathet Cardiovasc Intervent*. 2000;49:267–271
- 2) Hildick-Smith DJ, Shapiro LM. Ostial left anterior descending coronary artery stent positioning: partial preinflation prevents stent oscillation and facilitates accurate deployment. *J Interv Cardiol* 2001;14:439-442

3) Airolidi F, Di Mario C, Stankovic G, Briguori C, Carlino M, Chieffo A, et al. Clinical and angiographic outcome of directional atherectomy followed by stent implantation in de novo lesions located at the ostium of the left anterior descending coronary artery. *Heart* 2003;89:1050 –1054.

4) Kern M, Ouellette D, Frianeza T. A new technique to anchor stents for exact placement in ostial stenoses: the stent tail wire or Szabo technique. *Catheter Cardiovasc Interv* 2006;68:901-906.

5) Precise Percutaneous Coronary Intervention of LAD Ostial Stenosis by Using Afzal's Technique: An easy but Innovative Procedure Afzalur Rahman, Farhana Ahmed, Mohammad Arifur Rahman, Syed Nasir Uddin, Md. Zillur Rahman, Tariq Ahmed Chowdhury

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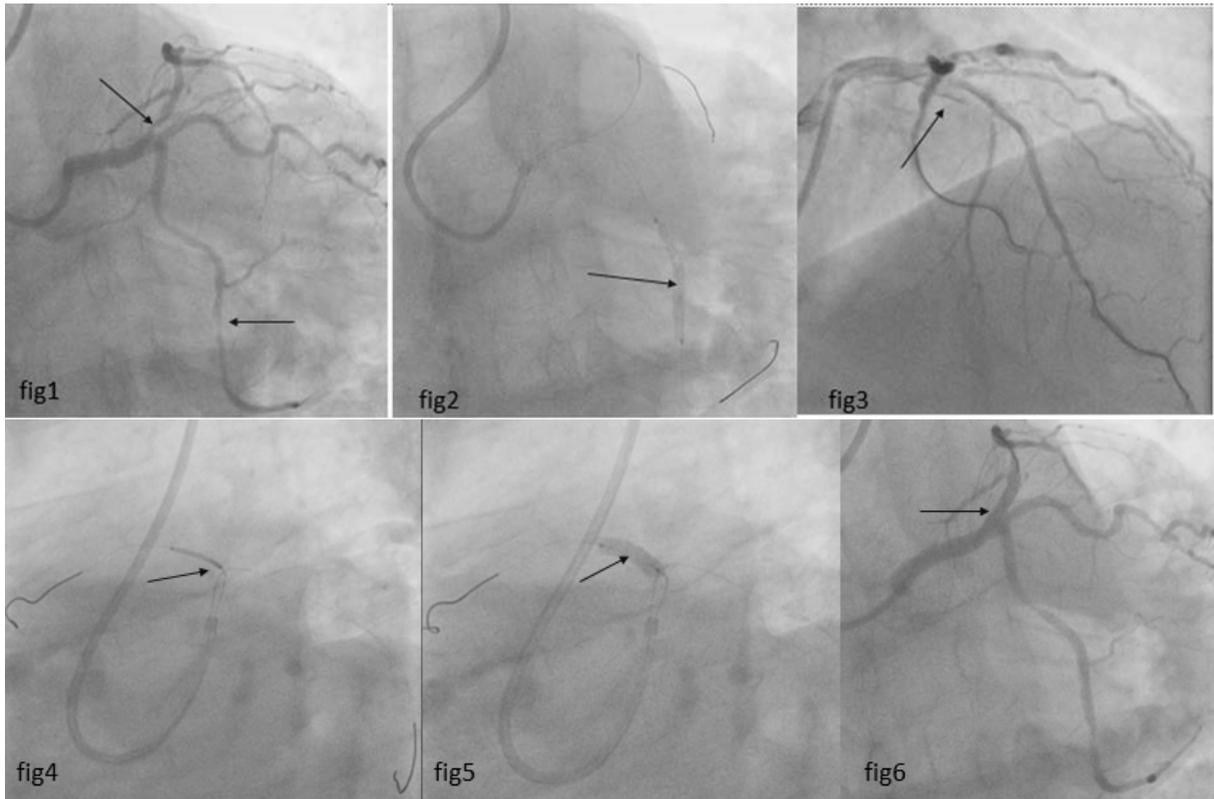


Fig1: 90percent stenosis at LAD ostium and mid LCX. Fig2:stent deployed at mid LCX lesion.Fig3:dissection at proximal LAD.Fig4:precise placement of stent at lad ostium using marker wire technique.Fig5:deployment of stent.Fig6:final results.

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