Case Report

PERCUTANEOUS CORONARY INTERVENTION IN UN-PROTECTED LEFT MAIN CORONARY ARTERY DISEASE - A CASE REPORT

Naeem Asghar
Assistant Professor of cardiology, Madinah Teaching Hospital Faisalabad.

INTRODUCTION:

By convention, significant LMCA stenosis is treated by coronary artery bypass graft (CABG) surgery. However, with the advancement in interventional tools, operators' expertise, pharmaceuticals and supportive measures, outlook regarding left main PCI is changing.

CASE REPORT:

Mrs. FA, a 38-year-old normotensive, nondiabetic but dyslipidaemic female, with a strong family history of coronary artery disease, presented to Khatam-un-nabeeyen heart center with compressive chest pain. She was haemodynamically stable with pulse 80 beats per minute, blood pressure 120/75 mm Hg, lung bases were clear and heart sounds were normal. Her resting ECG showed ST depression in inferior and anterior lead along with ST elevation in aVR. CK-MB and troponin I were normal. Echocardiography showed normal left ventricular (LV) wall motion and function. She was diagnosed as a case of unstable angina and treated accordingly. Coronary angiography revealed about 90% stenosis in the ostial LMCA, and 60% stenosis in the mid segment of left anterior descending coronary artery. Subsequently, elective PTCA with stenting to LMCA was done. Arrangements for emergency CABG surgery were ensured beforehand. The LMCA lesion was negotiated with BMW PTCA guidewire, and a 4 x 13 mm cobalt chromium bare metal stent (Coroflex® Blue Ultra) was deployed at the lesion at 14 atm pressure, preceded by dilatation with a 1.5 x 6 mm balloon at 8 atm. TIMI III flow was established. Post-procedural period was uneventful. Noninvasive surveillance with computed tomography (CT) coronary angiography was performed 3 months after ULM stenting which shows no significant flow-limiting lesions.

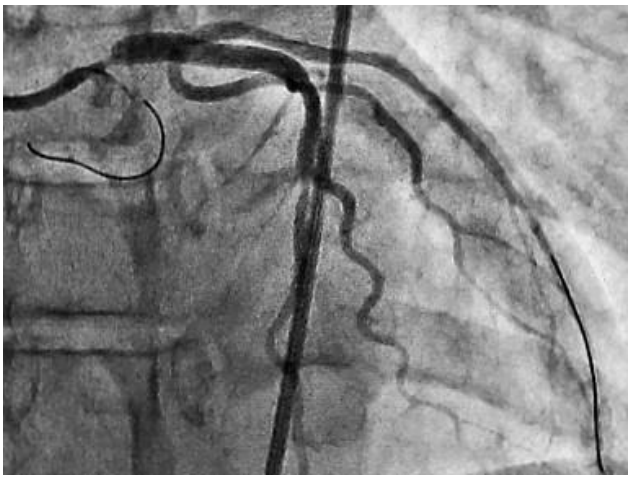

Figure: 1 Angiographic image of ostial LMS disease

Figure: 2 Stenting of LMS

Corresponding Author:
Naeem Asghar
Assistant Professor of cardiology, Madinah Teaching Hospital Faisalabad.

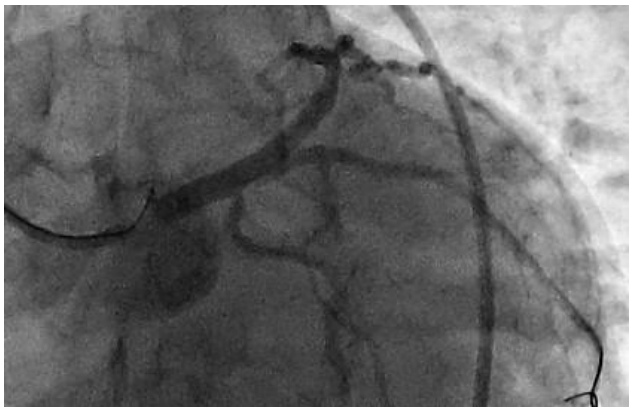

Figure: 3 Post PCI angiographic image of LMS

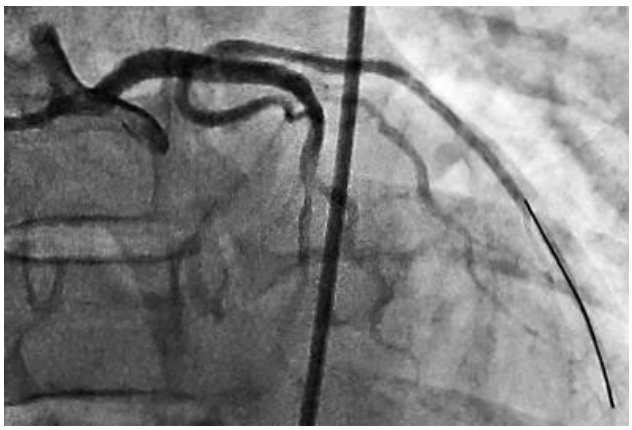

Figure: 4 Post PCI angiographic image of LMS

Figure: 5 CT angiogram after 3 months

DISCUSSION:

LMCA occlusion is potentially fatal due to the large myocardial territory affected.[1] The prevalence of LMCA stenosis with multi-vessel disease is 2.5 to 10% while isolated LMCA disease in 0.07-0.15% cases.[2-6] Significant LMCA stenosis treated medically have a poor prognosis; 3-year survival rate ranges from 60-82% and 15 year survival rate was 27%.[7-9]

The LM trunk lacks adventitia and has greater amount of smooth muscle and elastic tissue which is probably responsible for the excellent 'acute success' of balloon dilatation but more chance of early and late recoil associated with restenosis.[10]

Percutaneous treatment of the LM coronary artery was first performed by Andreas Grüntzig in 1977 and he reported that such procedures were quite difficult to perform and that early mortality was too high to be accepted as a standard treatment.[11] Elective PCI in unprotected LMCA stenosis that can be treated by CABG, is a discouraged.[12] However, this recommendation is based on the clinical trials that are more than 20 years old, so the results of these trials may not be optimally applicable to current practice.[13] Recent observational studies and randomized trials comparing PTCA with stenting to CABG in the management of LMCA lesion are more encouraging and showed no significant difference in rates of death or of the composite end point of death, myocardial infarction (MI), or stroke between patients receiving stents and those undergoing CABG, but stenting was associated with higher rates of target-vessel revascularization than was CABG. [14-23]

The nonrandomized MAIN-COMPARE trial involving 2,240 patients with UPLM disease compared outcomes PCI with CABG and 5-year follow-up, showed similar rates of mortality.[24] The randomized SYNTAX trial comparing CABG with PCI for left main/multivessel disease. For the left main subgroup, there were no differences in 1-year individual outcomes of death or MI, despite significantly higher rates of stroke in the CABG group while repeat revascularization was more common with PCI and was particularly driven by higher rates among

patients with left main disease treated for additional 2-vessel or 3-vessel disease.[8] Angiographic and procedural successes do not differ significantly between Drug-eluting Stent (DES) versus Bare-metal Stent (BMS) in case of LMCA PCI. DES has been associated with reduced incidence of in-stent restenosis[40] at the cost of increased risk of late stent thrombosis. DES use in unprotected LMCA revascularization represents a narrow margin between the need for a potent anti-restenotic effect balanced by the risk of stent thrombosis related to delayed healing.[25]

CONCLUSION:

In Pakistan limited number of PCIs is being performed round the year in Government and private levels and LMCA lesions are treated mainly by CABG surgery. However, operator expertise, pharmacotherapeutics and auxiliary supports are developing in this country day by day. PTCA with stenting specially using DES will hopefully become a viable alternative to CABG in carefully selected patients with left main disease.

REFERENCES:

1. Ochiai M. PCI of the unprotected left main trunk: technical consideration for LMT intervention. Cardiac Interventions Today. September 2007; 40-2.
2. Cohen MV, Cohn PF, Herman MV, Gorlin R. Diagnosis and prognosis of main left coronary artery obstruction. Circulation 1972; 45(Suppl 1): 57–65.
3. Proudfit WL, Shirey EK, Sones FM Jr. Distribution of arterial lesions demonstrated by selective cinecoronary arteriography. Circulation 1967; 36: 54–62.
4. Tommaso CL, Applefeld MM, Singleton RT. Isolated left main coronary artery stenosis and mediastinal radiotherapy as an etiologic factor. Am J Cardiol 1988; 61: 1119–20.
5. Miller GAH, Honey M, El-Sayed H. Isolated coronary ostial stenosis. Cath Cardiovasc Diagn 1986; 12: 30–4.
6. Topaz O, Warner M, Lanter P, Soffer A. Isolated significant left main coronary artery stenosis: angiographic, haemodynamic, and clinical findings in 16 patients. Am Heart J 1991; 122: 1308–14.
7. Chaitman BR, Fisher LD, Bourassa MG, Davis K, Rogers WJ, Maynard C, Tyras DH, Berger RL, Judkins MP, Ringqvist I, Mock MB, Killip T. Effect of coronary bypass surgery on survival patterns in subsets of patients with left main coronary artery disease – Report of the Collaborative Study in Coronary Artery Surgery (CASS). Am J Cardiol 1981; 48: 765–77.
8. European Coronary Surgery Study Group. Prospective randomized study of coronary artery bypass surgery in stable angina pectoris – Second interim report by the European Coronary Surgery Study Group. Lancet 1980; 2: 491–5.
9. Caracciolo EA, Kathryn BD, Sopko G, Kaiser GC, Scott DC, Schaff H, Taylor HA, Chaitman BR, for the CASS investigators. Comparison of surgical and medical group survival in patients with left main coronary artery disease. Circ 1995; 91: 2325–34.
10. Sperker W, Gyongyosi M, Glogar D. Percutaneous treatment of left main coronary artery stenoses. J Clin Basic Cardiol 2002; 5:163-9.
11. Gruntzig AR, Senning A, Siegenthaler WE. Nonoperative dilatation of coronary artery stenosis: Percutaneous transluminal coronary angioplasty. N Engl J Med 1979; 301: 61–8.
12. Smith SC Jr, Feldman H, Hirshfeld JW Jr, et al. ACC/AHA/ SCAI 2005 guideline update for percutaneous coronary intervention: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines (ACC/AHA/SCAI Writing Committee to Update 2001 Guideline for Percutaneous Coronary Intervention). Circulation 2006; 113:e166-286.
13. Park SJ, Kim YK. Left main coronary disease. Current evidence for drug-eluting stent placement in unprotected left main coronary disease. Cardiac Interventions Today. September 2007; 47-51.
14. Silvestri M, Barragan P, Sainsous J, Bayet G, Simeoni JB, Roquebert PO, Macaluso G, Bouvier JL, Comet B. Unprotected left

main coronary artery stenting: immediate and mediumterm outcomes of 140 elective procedures. J Am Coll Cardiol 2000; 35: 1543–50.
15. Park SJ, Kim YH, Lee BK. et al. Sirolimus-eluting stent implantation for unprotected left main coronary artery stenosis: comparison with bare metal stent implantation. J Am Coll Cardiol 2005; 45: 351–6.
16. Valgimigli M, van Mieghem CA, Ong AT, et al. Short- and long-term clinical outcome after drug-eluting stent implantation for the percutaneous treatment of left main coronary artery disease: insights from the Rapamycin-Eluting and Taxus Stent Evaluated At Rotterdam Cardiology Hospital registries (RESEARCH and T-SEARCH). Circulation 2005; 111: 1383–9.
17. Chieffo A, Morici N, Maisano F, et al. Percutaneous treatment with drug-eluting stent implantation versus bypass surgery for unprotected left main stenosis: a single-centre experience. Circulation 2006; 113: 2542–7.
18. Seung KB, Park DW, Kim YH, et al. Stents versus coronary artery bypass grafting for left main coronary artery disease. N Engl J Med 2008;358:1781-92.
19. Taggart DP, Kaul S, Boden WE, et al. Revascularization for unprotected left main stent coronary artery stenosis. Stenting or surgery. J Am Coll Cardiol 2008;51:885–92.
20. Smith CR. Surgery, not percutaneous revascularization, is the preferred strategy for patients with significant left main coronary stenosis. Circulation 2009;119:1013–20.
21. Teirstein PS. Percutaneous revascularization is the preferred strategy for patients with significant left main coronary stenosis. Circulation 2009;119:1021–33.
22. Chieffo A, Park SJ, Valgimigli M, et al. Favorable long-term outcome after drug-eluting stent implantation in nonbifurcation lesions that involve unprotected left main coronary artery: a multicenter registry. Circulation 2007;116:158–62.
23. Park DW, Seung KB, Kim YH et al. long-term safety and efficacy of stenting versus coronary artery bypass grafting for unprotected left main coronary artery disease. 5-year results from the MAINCOMPARE (Revascularization for Unprotected Left Main Coronary Artery Stenosis: Comparison of Percutaneous Coronary Angioplasty versus Surgical Revascularization) Registry. J Am Coll Cardiol 2010;56:117–24.
24. Meliga E, Garcia-Garcia HM, Valgimigli M, et al. Longest available clinical outcomes after drug-eluting stent implantation for unprotected left main coronary artery disease: the DELFT (Drug Eluting stent for LeFT main) registry. J Am Coll Cardiol 2008;51:2212–9.
25. Kandzari DE, Colombo A, Park SJ et al. on behalf of the American College of Cardiology Interventional Scientific Council. Revascularization for unprotected left main disease: Evolution of the evidence basis to redefine treatment standards. J Am Coll Cardiol 2009;54(17):1576-88.

Submitted for publication: 05-11-2016

Accepted for publication: 20-12-2016

SR #	AUTHOR NAME	CONTRIBUTION
1	Dr. Naeem Asghar	Operator