Percutaneous Coronary Intervention of Saphenous Vein Graft in Post CABG Patient- Outcome Experiences at Our Center- SVG to OM are More Likely to Develop Occlusion

Ahm Waliul ISLAM

MBBS, PhD., FACC, FSCAI, FAPSIC,FRCP

Interventional Cardiology

Evercare Hospital Dhaka

Disclosure

- I don't have any potential to declare

Background

- PCI intervention of obstructed & atheromatous venous graft is a real challenge for interventionist to deal with as SVG PCI patients are usually older with significant coronary & non-coronary comorbidities.
- SVG usually present a degenerated pattern of atherosclerosis with complex, friable thrombosis prone lesions.
- Higher risk of Distal embolization, Poorer long-term outcome with Higher ISR rate

- Saphenous vein grafts (SVGs) are commonly used during coronary artery bypass graft surgery (CABG) for severe coronary artery disease.

- Rates of SVGs failure in the first 12-18 months may be as high as 25%

- SVG PCI is associated with worse clinical outcomes compared with native coronary artery PCI.

- The important reason of poorer outcomes in SVGs PCI is the embolization of atherothrombotic debris into native circulation, often resulting in periprocedural MI or reduce antegrade flow

- Full arterial revascularization in coronary artery bypass graft (CABG) procedure, despite related improved clinical outcomes, is still seldom achieved.

- For this reasons , percutaneous coronary intervention of SVGs is being routinely done in daily practice, accounting approximately 6-10% of total PCI volume with optimal clinical outcome compare to native coronary PCI with higher rate of in-stent restenosis (ISR), target vessel revascularization(TVR), death, MI.

- In this scenario, DES vs BMS in SVGs have shown favorable outcome in DES than compared to BMS regarding angiographic and clinical short and midterm restenosis at follow-up

Objectives:

- In the current era, with the advent and availability of different Drug Eluting Stents, PCI of SVG vessel is an alternative to re-do surgery for the occlusion of graft vessel.
- Although, PCI is associated with higher risk of in-stent restenosis, target vessel repeats revascularization, myocardial infarction or death.
- Uses of embolic protection devices is Class I indication by ACC/AHA for SVG PCI.
- Therefore, we have carried out this prospective study, to see the outcomes of SVG vessel PCI at our center.

Methods and materials:

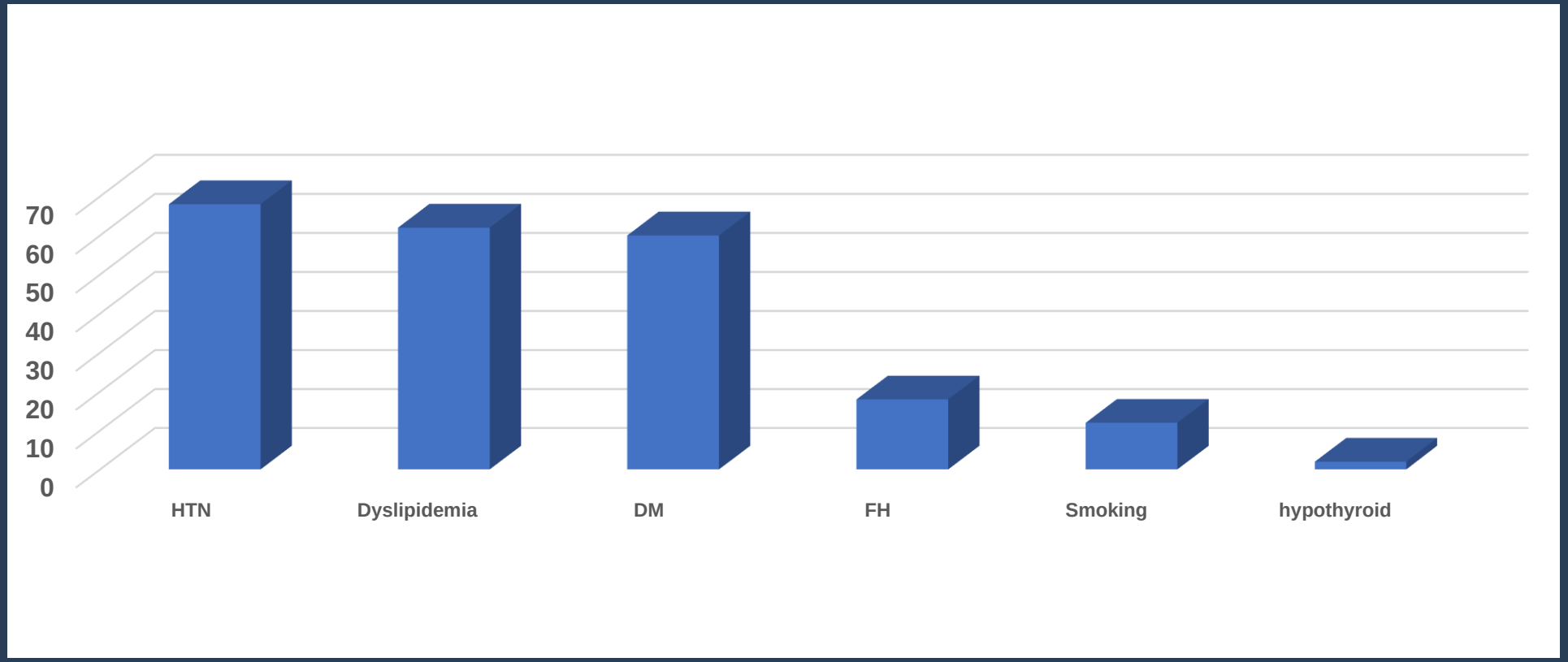
- Patients were enrolled in this observational non-randomized prospective cohort, who underwent routine CAG for the post CABG angina, shortness of breath, dyspnea on minimal exertion or hospital admission with MI, NSTMI, Angina II-III and planned for PCI of occluded graft vessel.
- Total 50 patient were enrolled in this study. Distal protection devices were not used in most of the cases as financial costing is an issue.

Demographic Profile of the patients

Number	(F3/M47)
Age (yrs)	62.1 ± 10.8
BMI(kg/m^2)	24.9 ± 2.9
SBP(mmHg)	128.0 ± 19.0
DBP(mmHg)	76.2 ± 8.3
No. of CAD Risk Factor	2.8 ± 0.9

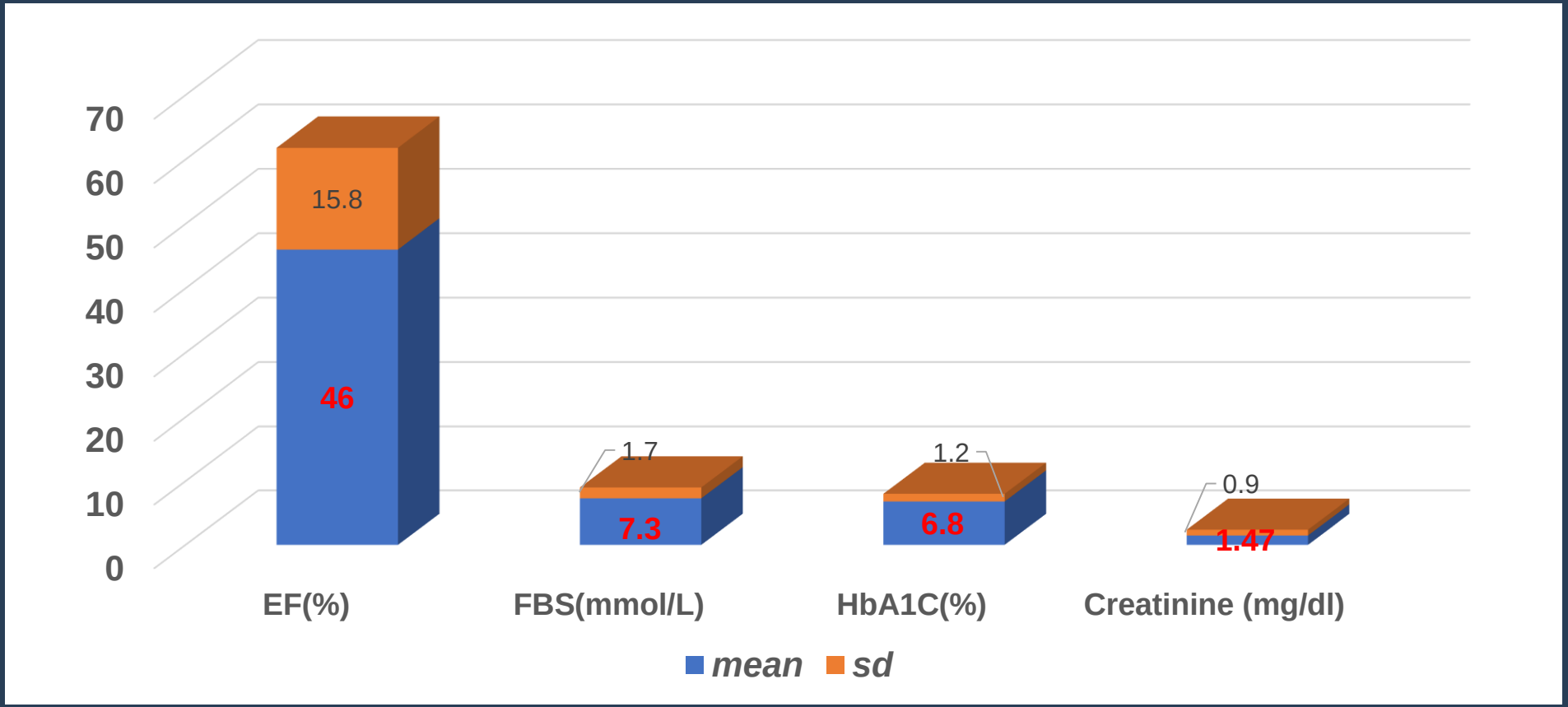
Data were presented as Mean ± SD

Percentage Distribution of CAD Risk Factors

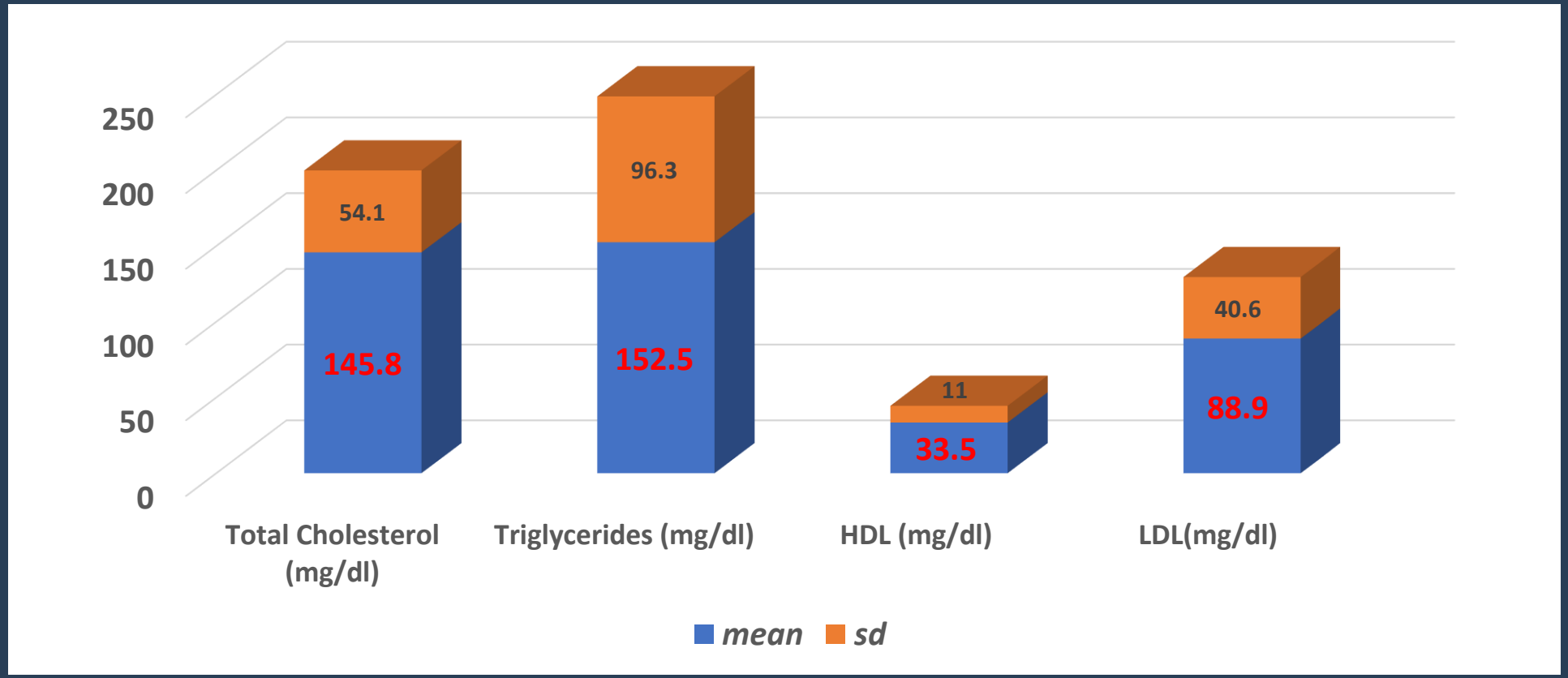


CAD risk factors; DM 30(60%), HTN 34(68%), Dyslipidemia 31(62%), Smoking 12(6%) And FH 9(18%).

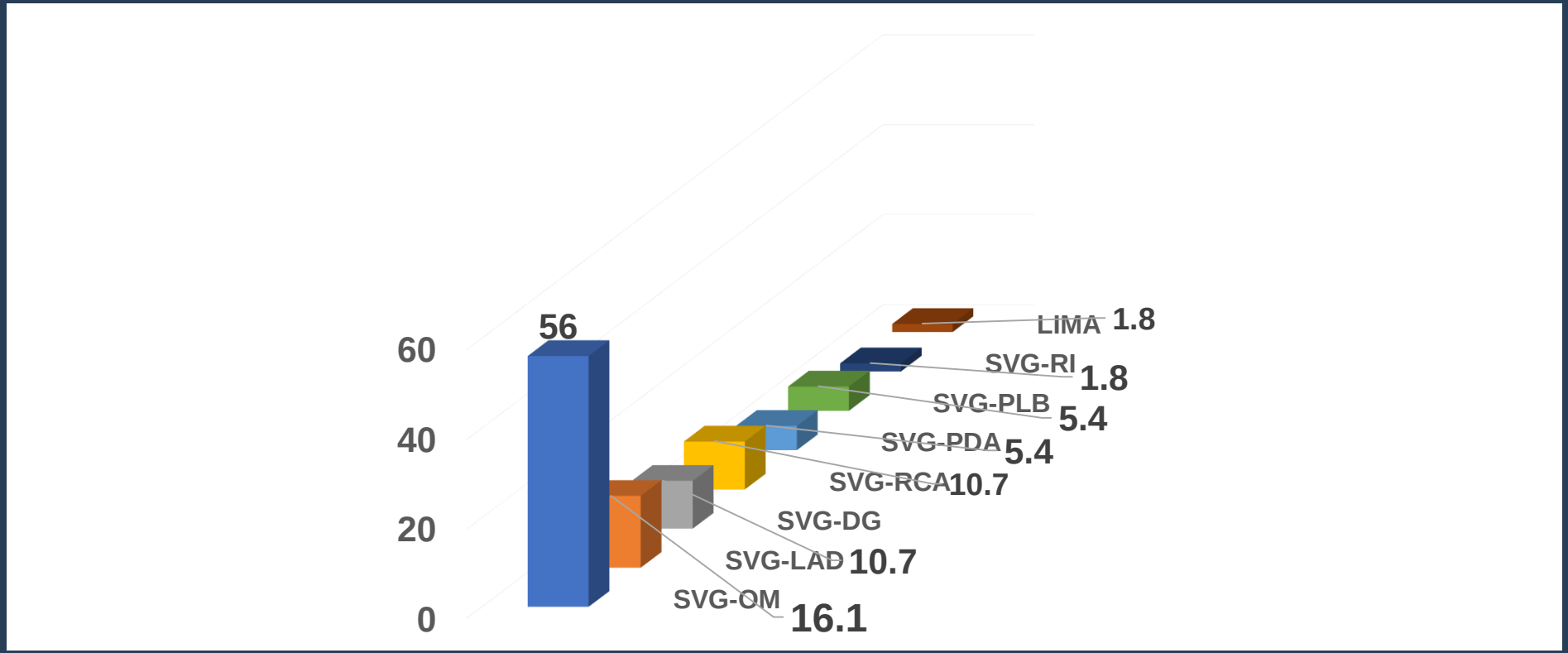
Shows LVEF, FBS, HbA1C and Creatinine level



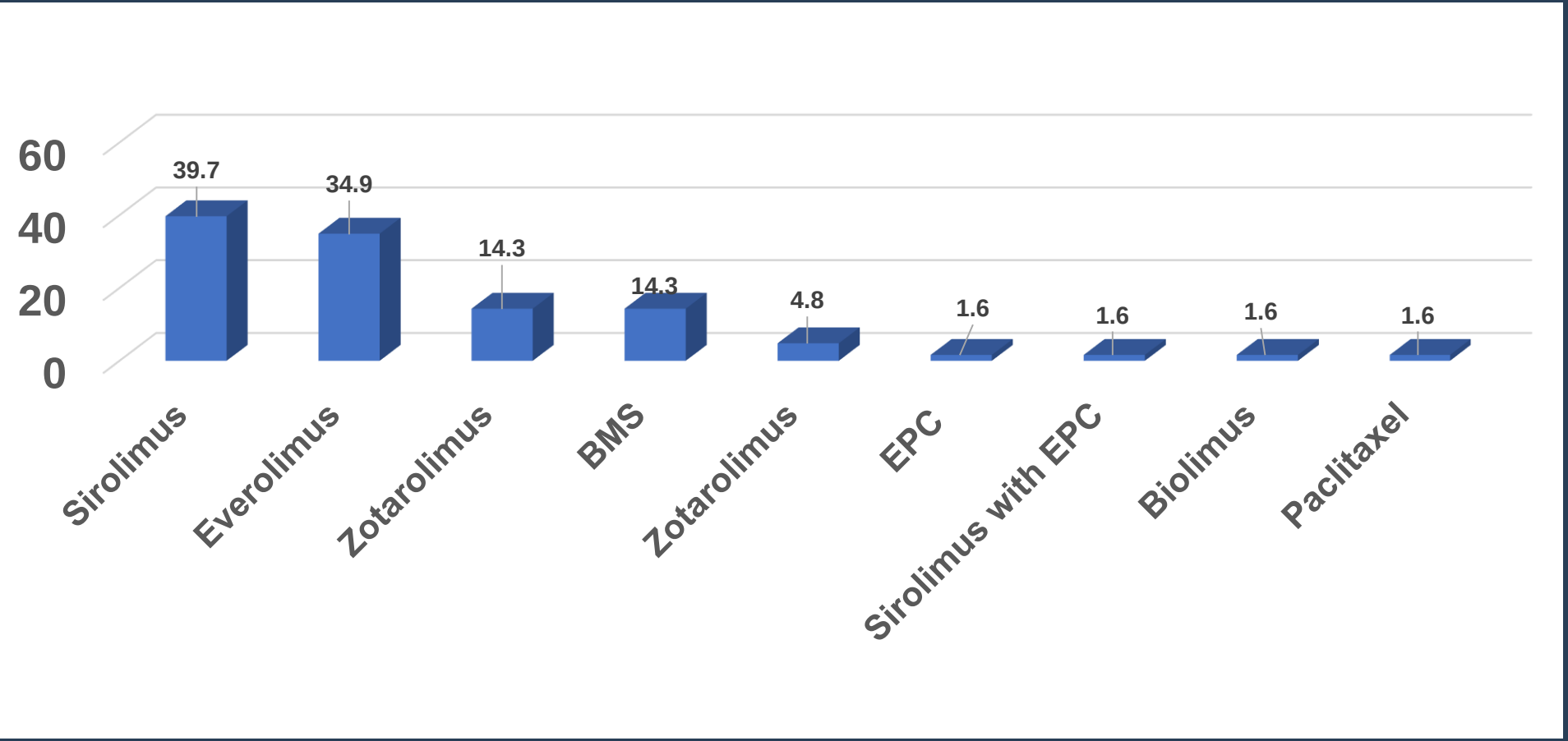
Lipid Profile of studied patient Population



Stented territory of SVG to Native Coronaries



Distribution of different DES



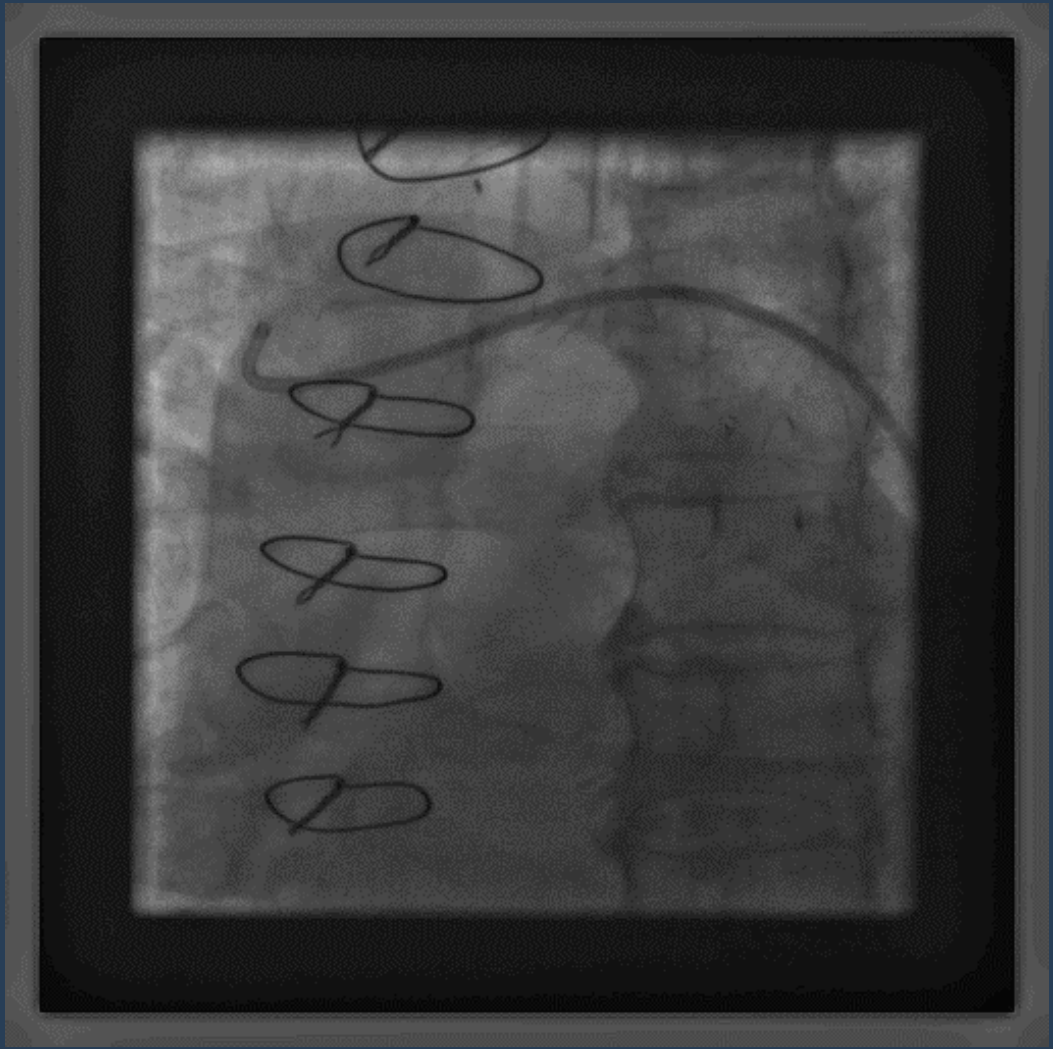
Conclusion / Take-home Message

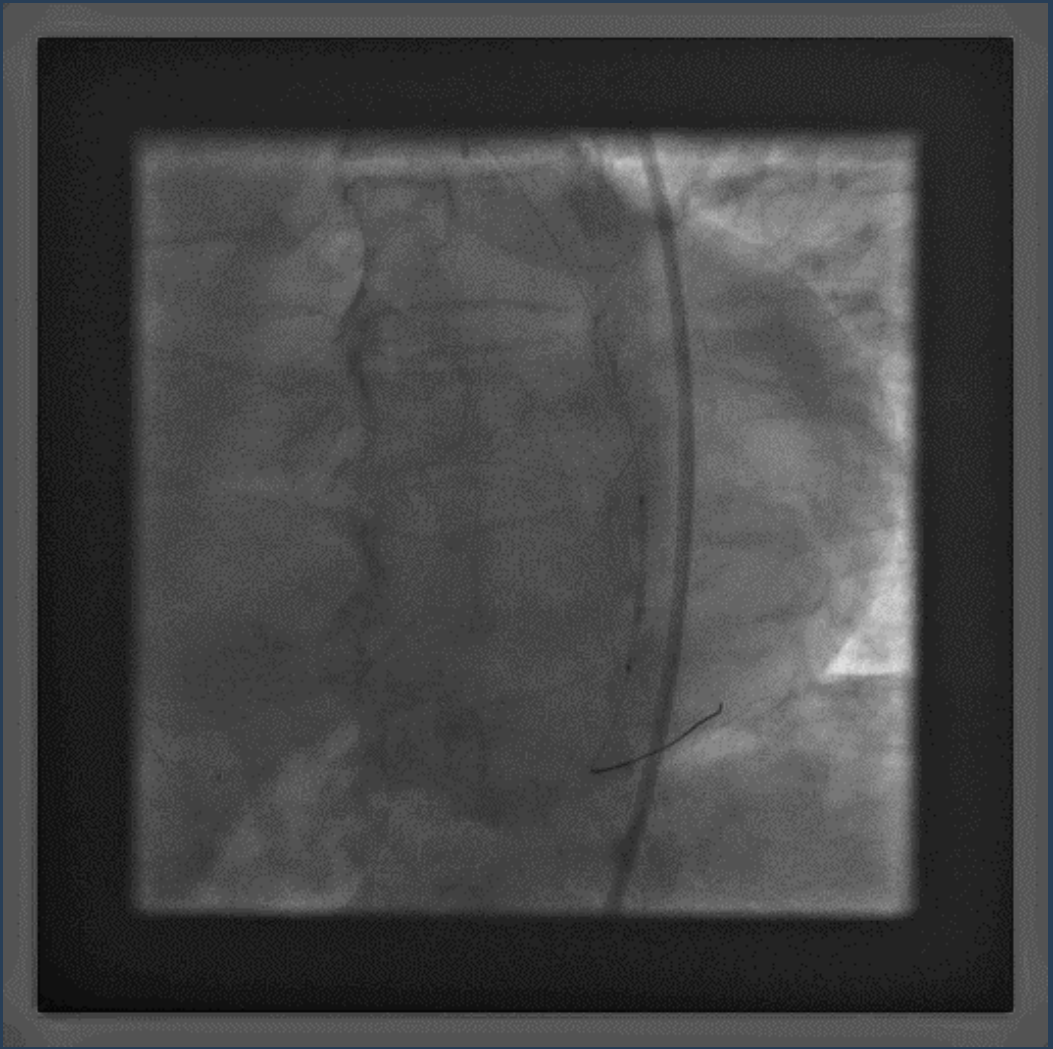
- We found that our patient developed graft vessel occlusion on an average 11yrs, after CABG.
- OM is the commonest territory to developed significant stenosis. PCI of SVG survival outcome was 93.5% (43 patient) patient in this very primitive observational cohort and doing well with OPD follow-up.
- Thus, we recommend percutaneous coronary intervention of occluded or stenosed graft vessel as an alternative to re-do surgery in this part of world.

- SVGs to OM are prone to develop occlusion possibly due to anatomic location of OM is of the predisposing factor.
- Also, stents in SVG to OM is susceptible to develop recurrent ISR.
- One of our patients had several times stenting in SVG to OM for recurrent ISR.
- Thus, PCI to SVG to OM may not be suitable or recommended until it is deemed necessitate to relief ongoing angina or the OM territory is big enough with viable myocardium

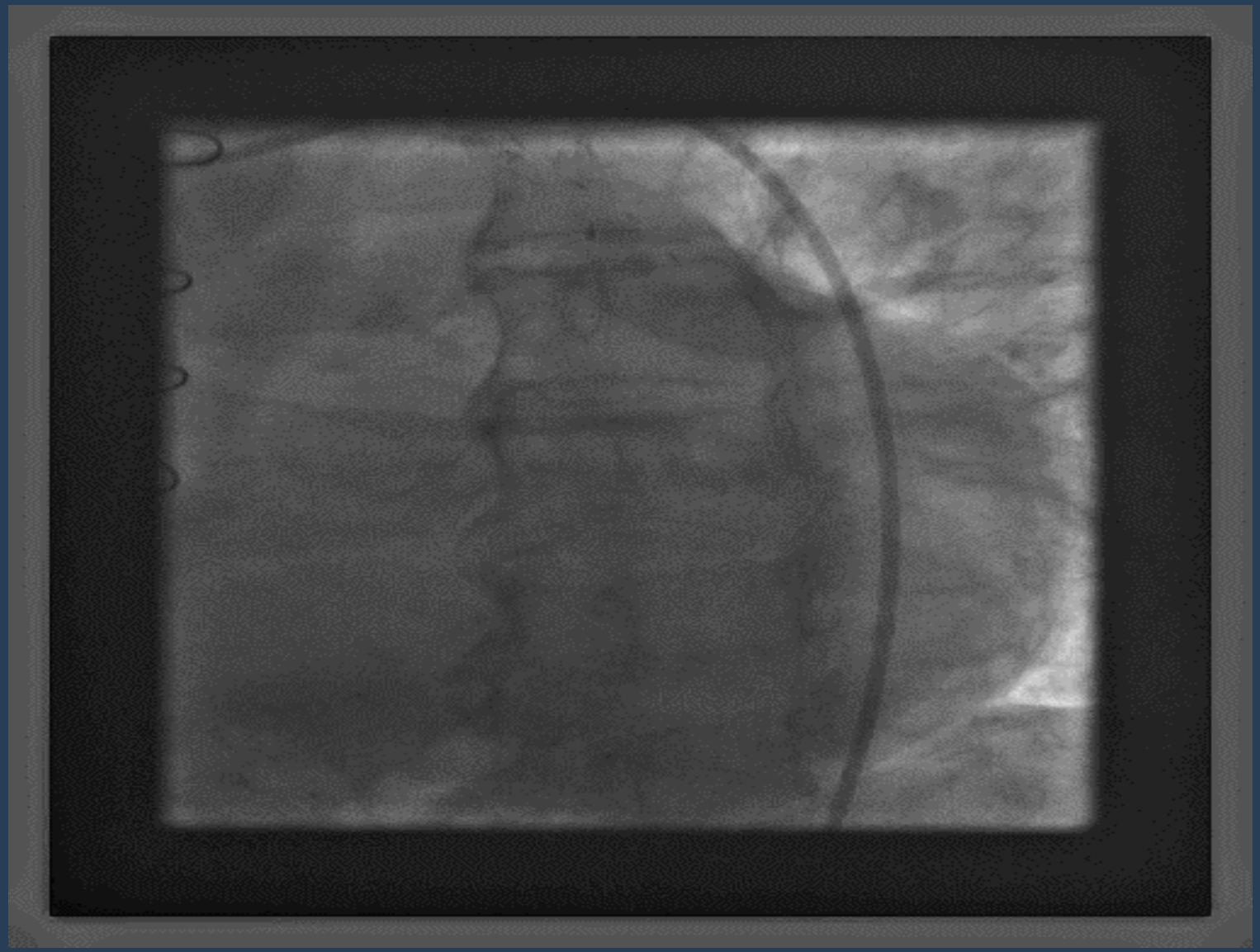
*72yrs Male, H/o **S/P CABG (2004), Post CABG angina, Acute Inf MI***

CAG-SVG-OM 95% at its distal part before anastomosis



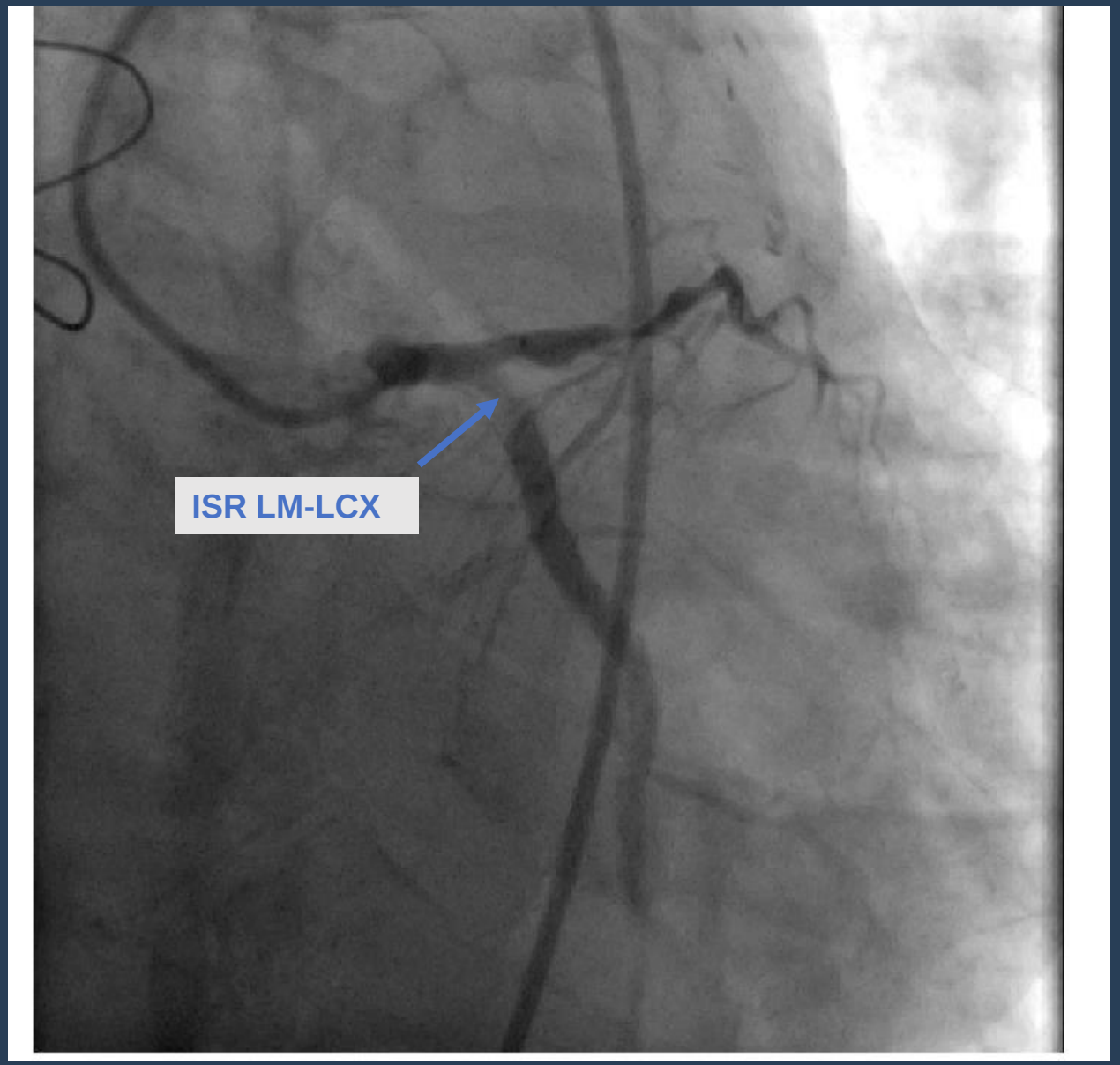


- *3.5 mm x 22 mm stent (Orsiro) at 14-16 ATM directly*

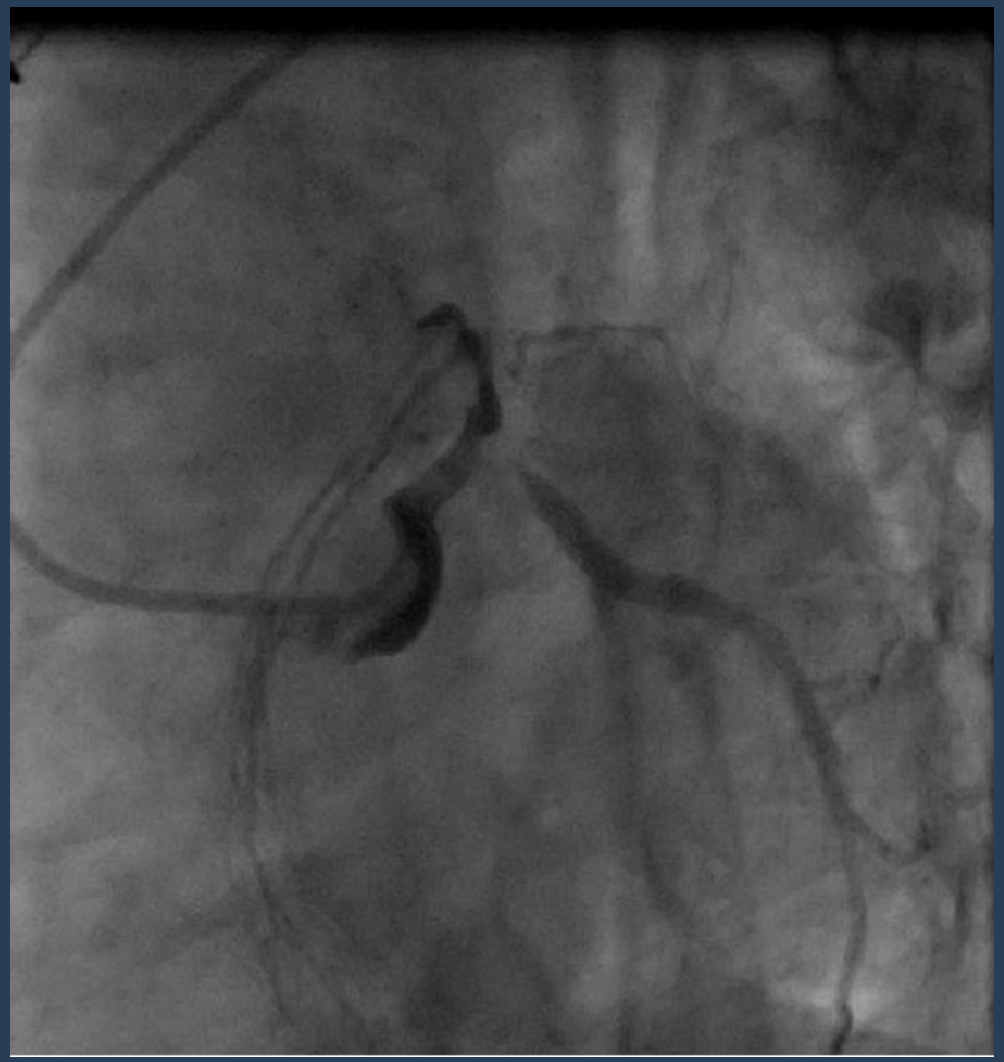


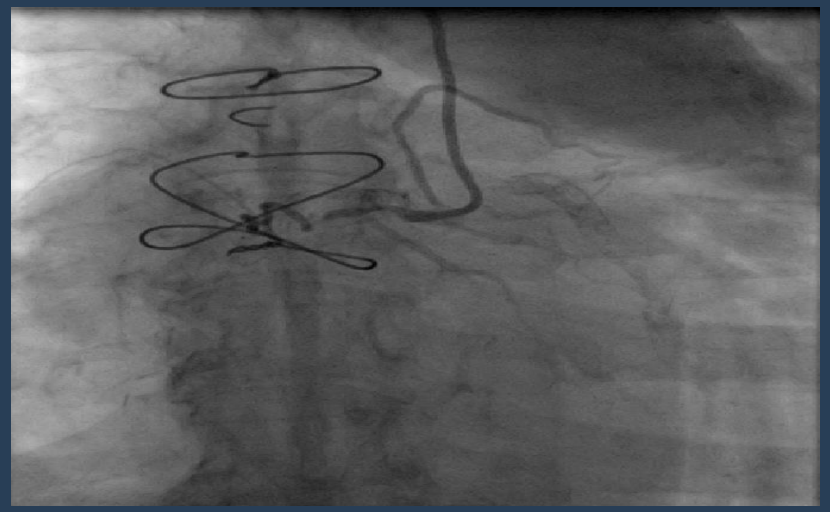
Past history: CABG-1996 and re-do CABG in 2002. PCI to LCX with Rotablation and POBA –OM2 & OM3 in Feb-2010. PCI to ISR at the Circ ostium on July-2010. PCI of LM-LCX due to ISR of LCX stent on Dec-2010. PCI of LM-LCX due to recurrence ISR with ongoing symptom done on July 2011.

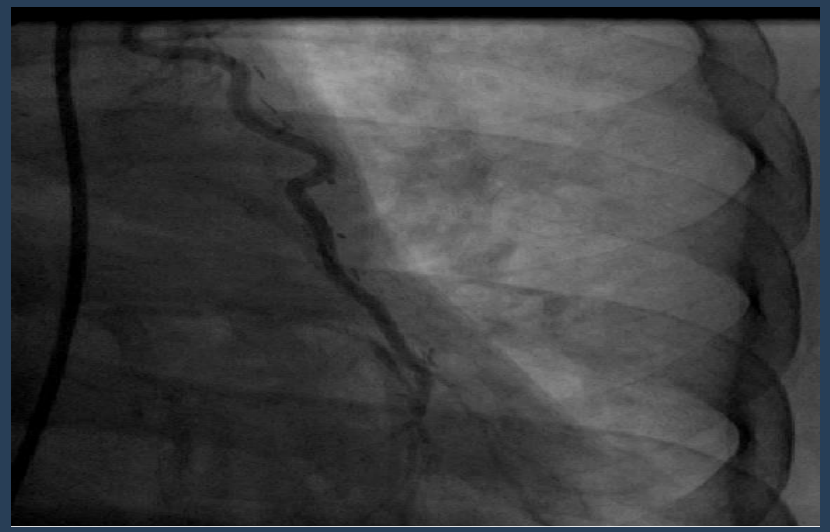
Native RCA occluded, LIMA-patent



CAG: LM-Ok, LAD: occluded after D1. LCX: 95% ISR at the ostium LCX of LM-LCX stent (Roablator+stent deployed in Feb 2010)RCA: occluded at origin , Patent LIMA-LAD

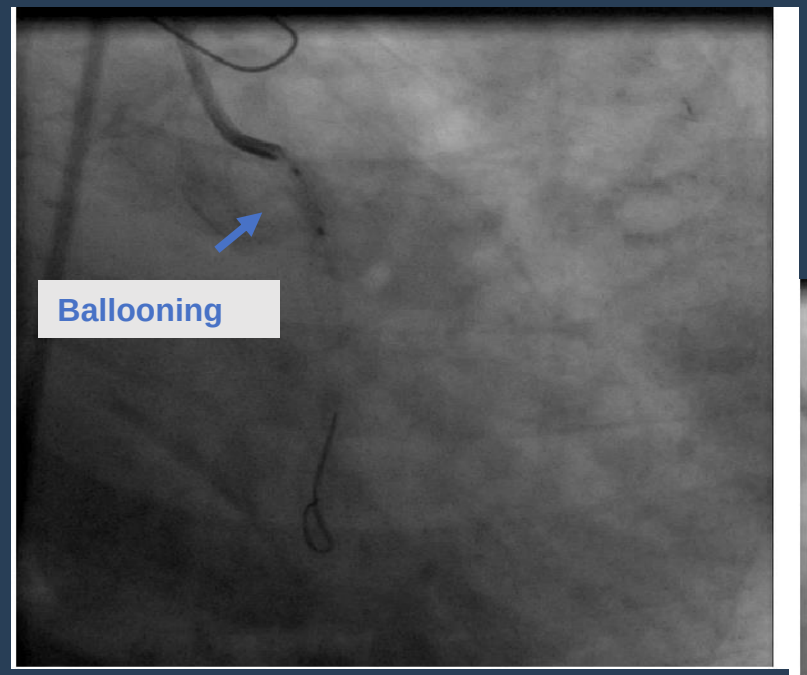


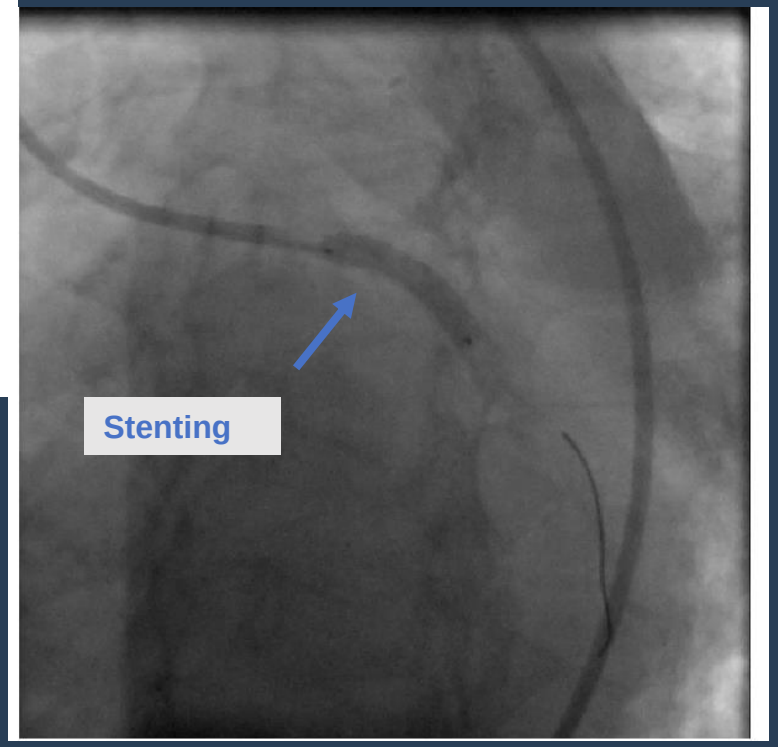


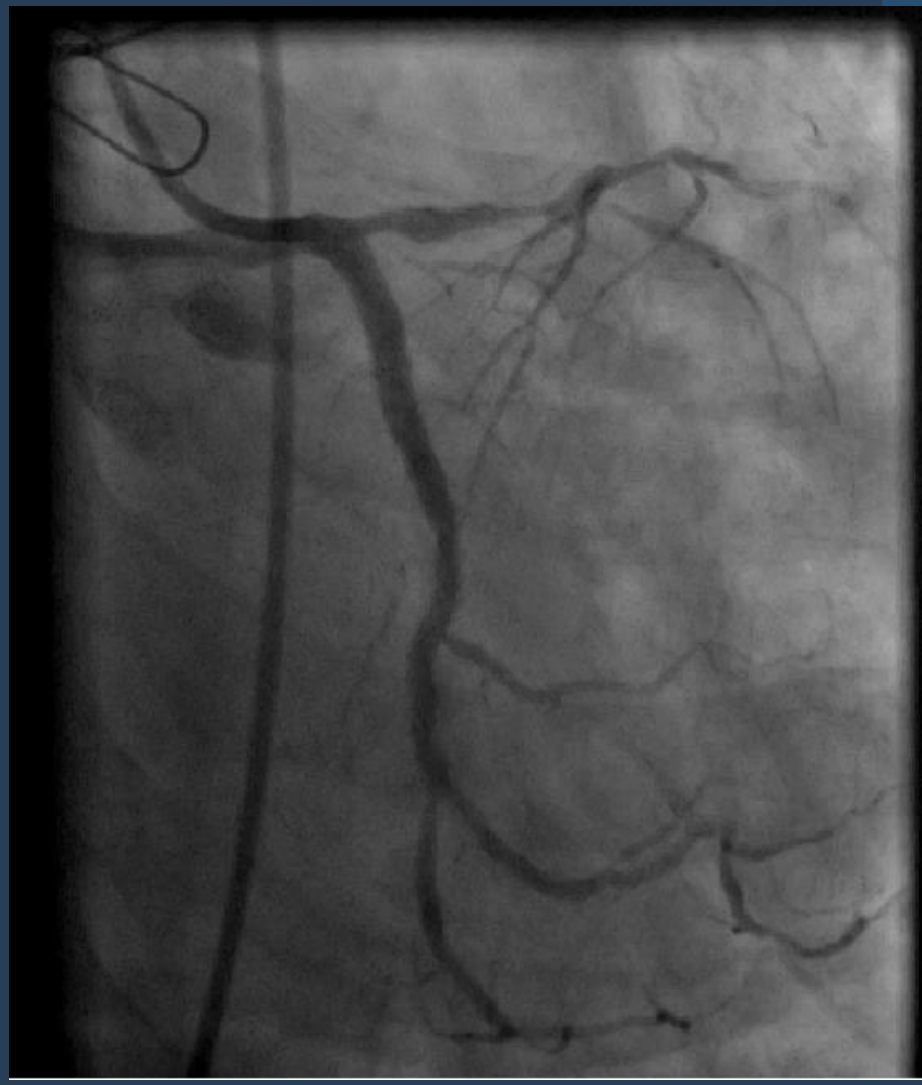


Insert references here

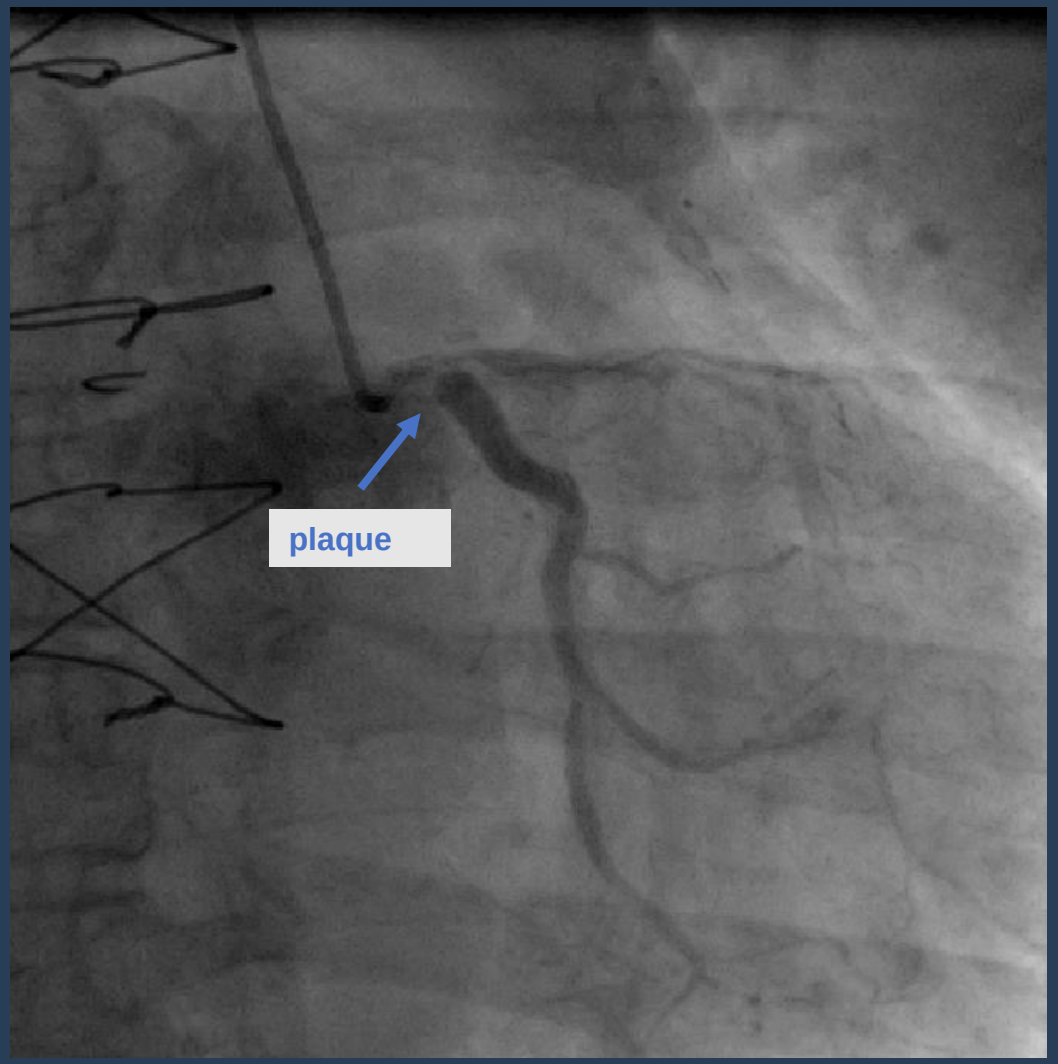
21/07/2010: PCI of LCX Ostium: Pre-dilatation 2.5 x 10 at 12 ATM, 3.5 x 18 mm Cypher -22 ATM, Post-dilatation 4x20 mm Balloon at 26 ATM

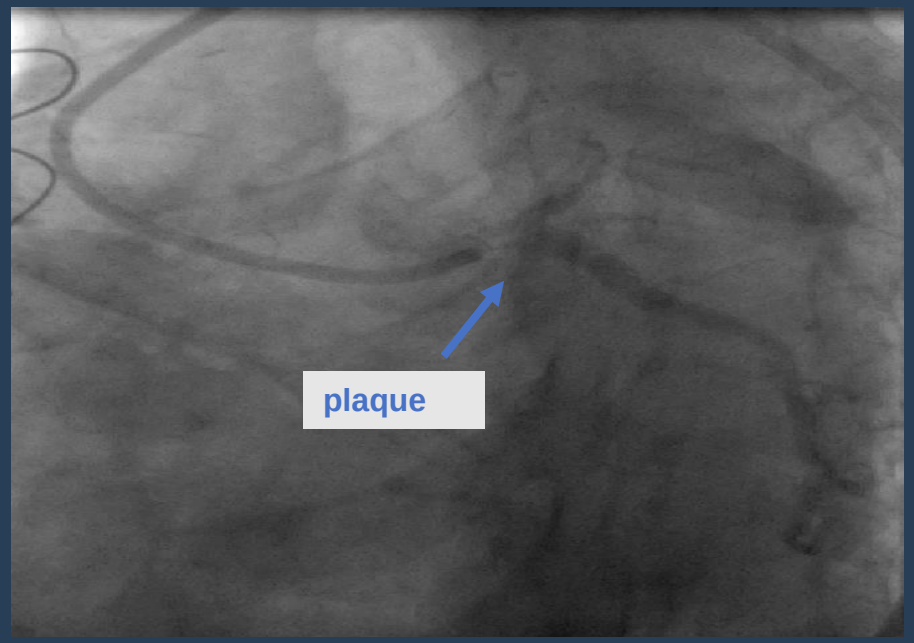


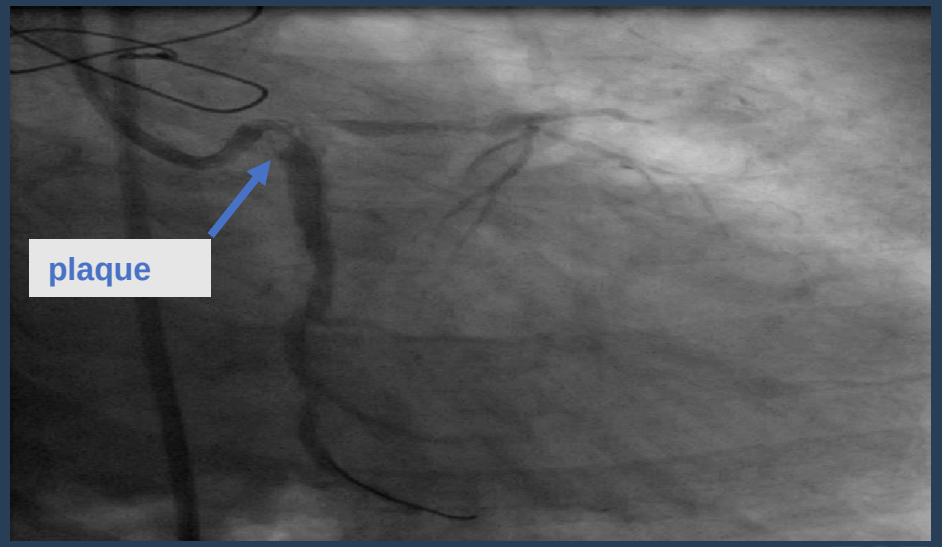




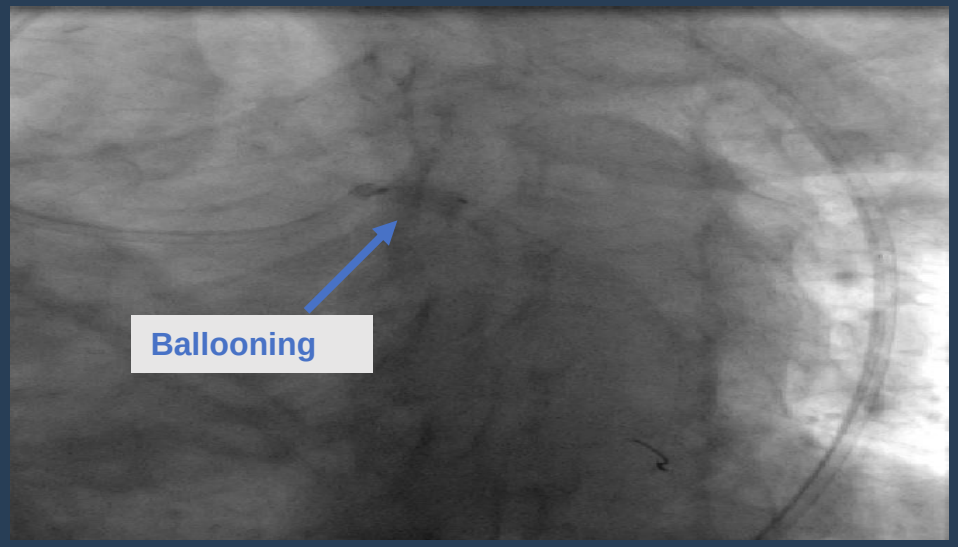
CAG(24/7/2011): ostial 50% plaque. Significant ISR of mid segment extending to Ostial LCx, Osti-proximal plaque. Occluded after origin, LCX: 90-95% ISR of LM-LCx Stent

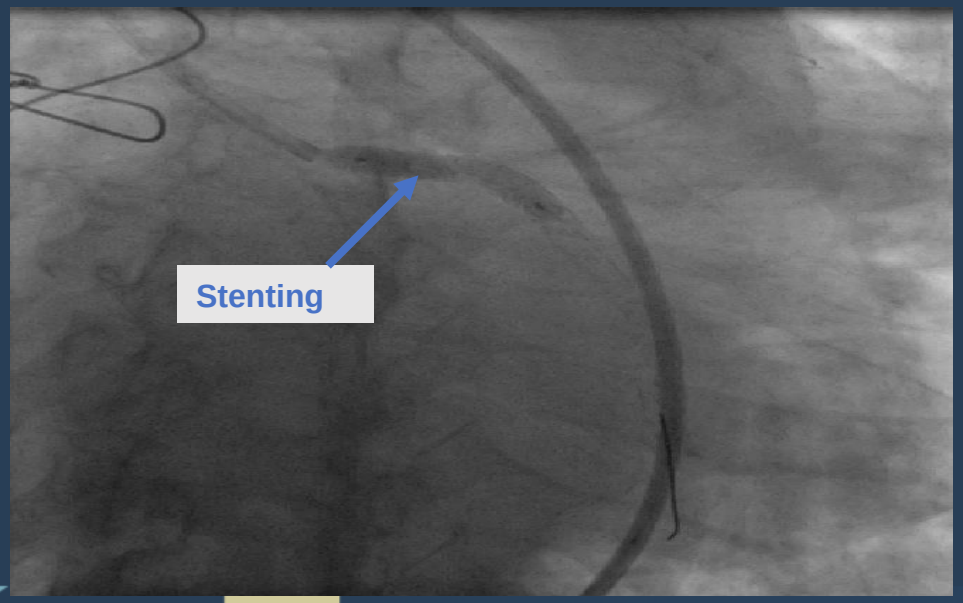


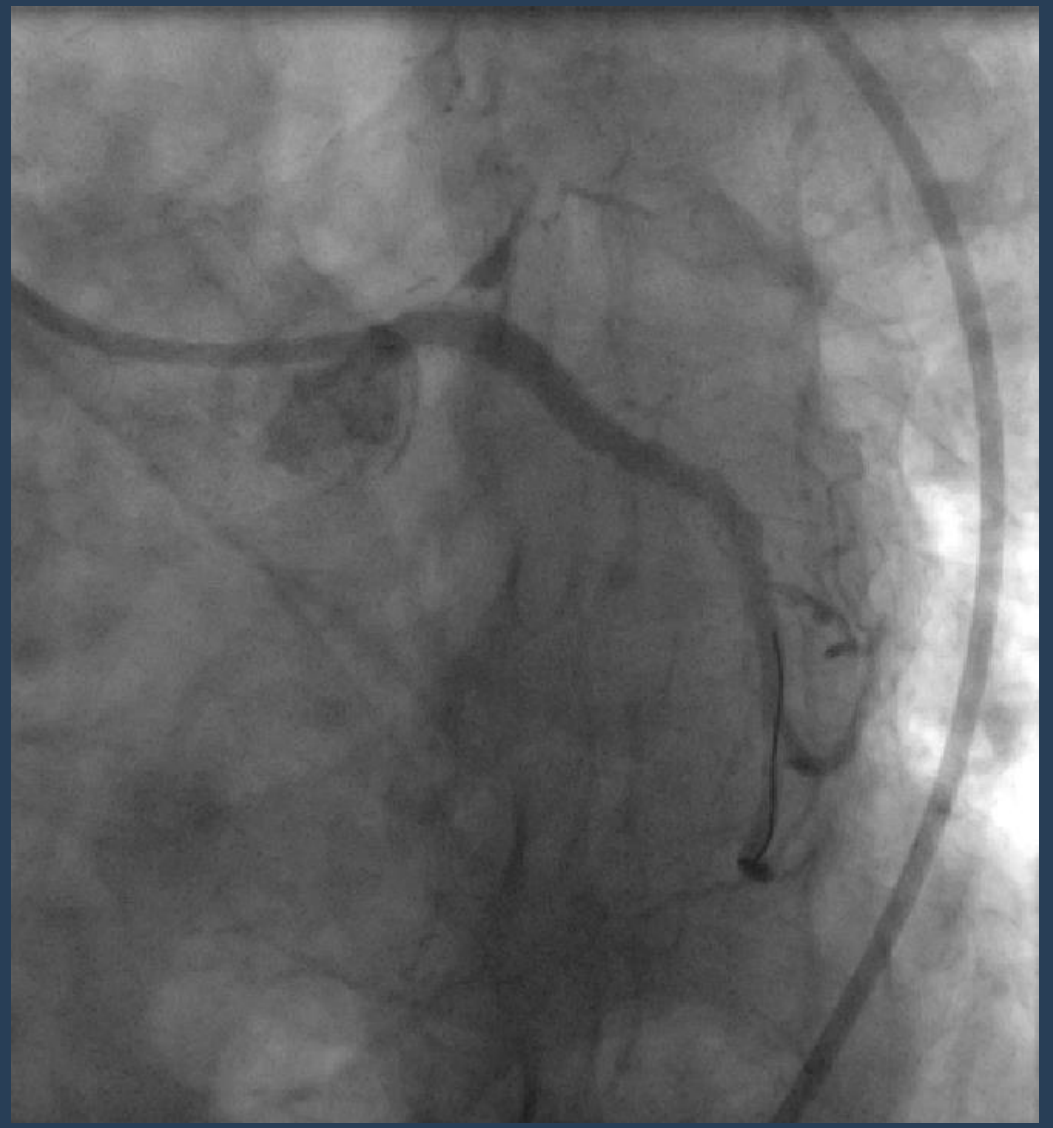




24/07/2011: PCI of LMS-LCX: Pre-dilatation 2.5 x 10 at 12 ATM, 4.0 x 20 mm Taxus Liberte -26 ATM







What Trial Says

- In SAVED (saphenous vein de NOVO) trial reported that compared with balloon angioplasty, BMS were associated with higher peri-procedural success.

- DIVA trial where 88% DES stents were of Second generation DES, at 1-year follow-up the incidence of target vessel failure (Primary endpoint of composite of cardiac death, target vessel MI or TVR) was not different compare to BMS.

- BASKET- SAVAGE trial has lower incidence of target vessel revascularization in the DES group (4.5% vs 19.1% at 3 years

- In RRISC (Reduction of Restenosis in Saphenous vein grafts with Cypher), ISR rate at six months significantly reduced in Cypher, consistently with a drop of TLR and TVR.
- Similarly, SOS (Stent of saphenous Vein Grafts) trial, paclitaxel eluting stent showed lower rate of ISR in paclitaxel with significant reduction of TLR and TVR in Taxus arm than BMS.
- Thus, both RRISC and SOS uses first generation DES with significant advantages of drug eluting stents in treating de-novo SVG

- PCI of SVGs lesion is associated with a uniquely high-risk periprocedural myocardial infarction (MI) and mortality-much higher than routine native coronary.
- Distal embolization manifested as slow-flow and no-reflow (SNFR) in 10- 15% of SVG PCIs.
- SVG plaques are large, soft, friable lipid rich, containing large necrotic debris, cholesterol crystals and foam cell, and are often associated wit overlying thrombus.
- During PCI of SVGs, distal embolization of this particle may lead to platelet and leukocyte activation, release of vasospastic mediators (serotonin, endothelin). And activation of chemotactic mediators (tissue factor, thrombin/anti-thrombin III complex and prothrombin fragments).
- Thus, lead to triad of microvascular embolization, spasm, and thrombosis manifesting as SFNR

- Uses of Embolic protection devices is a class I indication according to the ACC/AHA/SCAI PCI guideline when feasible, to decrease the risk of distal embolization, no-reflow, and periprocedural myocardial infarction.
- This recommendation was based on a single randomized controlled trial, the SAFER study, which showed significant reduction in major adverse cardiac events (MACE) with the use of a distal balloon occlusion device

- *Thank you for patience hearing*