

# IVUS: INTRAVASCULAR ULTRASOUND



**Dr. Jay M Shah**

Consultant-Interventional Cardiology  
HCG Hospitals, Ahmedabad



**Dr. Anand Shukla**

Consultant-Interventional Cardiology  
HCG Hospitals, Ahmedabad

IVUS is used as an imaging tool over and above conventional coronary angiography. The conventional angiography reveals only the luminogram of the coronary vessels and doesn't give any information regarding intravascular pathology. IVUS gives information regarding intravascular structures like coronary intima, media and adventitia as well as plaque characteristic, amount of calcified plaques, total plaque volume and atheroma burden.

It also gives information regarding presence of thrombus, dissection, intraluminal hematoma etc.

## **IVUS should be used in following situations:**

- Left main coronary artery lesion ambiguities as diagnostic tool
- Left main interventions should preferably done with IVUS guidance because it allows precise stent size selections and proper apposition after deployment will carry better long term outcome.
- All complex coronary interventions should be ideally done under the guidance of IVUS

If we look at the worldwide scenario, Japanese Interventional Cardiologists use imaging assisted

angioplasty very frequently with favourable cardiovascular outcomes.

IVUS guided interventions also saves contrast load especially in a Renalt compromised patients. IVUS can decide the location and distribution of calcium within the vessels and upfront usages of rotablator device for debulking of the plaque and modifications within the plaques.

## **Summary:**

IVUS is a very useful imaging tool for the coronary angioplasty. It examines the vessels from within and give additional information over and above conventional angiography.

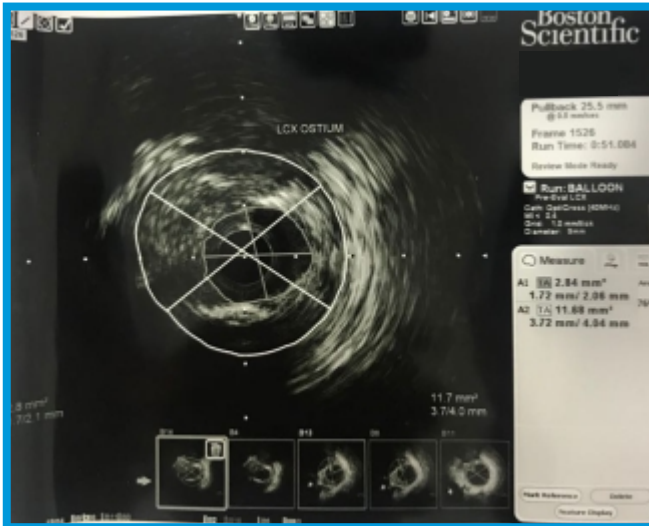
Its usage in complex coronary interventions and left main interventions have improved long term outcome comparable to coronary bypass surgery.

One should always use the technique and the technology to clear diagnostic dilemmas and improve long term clinical outcomes of complex coronary interventions.



# A CASE DISCUSSION

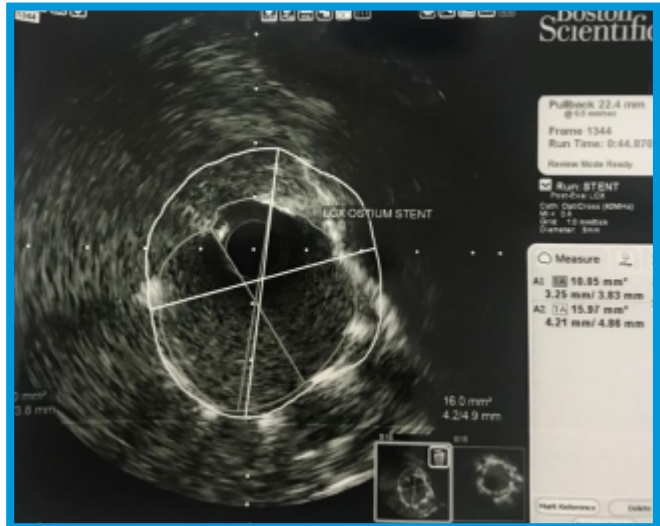
## PRE SURGERY



A female of 68 years of age was presented with typical exertional angina (NYHA II - III) with underlying history of hypertension & dyslipidemia. We advised her routine cardiac blood investigations like cardiac enzymes, ECG, 2 D Echo & colour doppler. All cardiac evaluation tests were within normal limits but her ECG revealed subendocardial patterns in anterior leads. So, she was advised coronary angiography, which revealed 90% critical lesion at ostium of left circumflex artery with very short LMCA segment and ostial plaque at left anterior descending artery. Usually, this type of lesion is being recommended for CABG but apart from that we had given an option of Imaging Assisted Angioplasty in form of IVUS (Intravascular Ultrasound Guided PCI).

On explaining in details, the patient was ready for IVUS guided PCI, which revealed fibrofatty plaque along with calcification at 11 o'clock & 7 o'clock positions.

## POST SURGERY



Immediately, the Minimum Lumen Diameter (MLD - 2.0mm) at LCX ostium was taken with reference diameter of 3.8mm at proximal part of LCX. Then, we decided to take cutting balloon - Flextome catheter to break the ostial lesion at LCX very precisely without any plaque shift.

After this debulking procedure, we choose to deploy 3.5 x 12 mm drug eluting stent at the LCX ostium. Then, the stent was again dilated with 3.5 x 8 mm NC balloon to achieve MLD - 3.8mm as per IVUS guidance. All the newer literature revealed that in such type of complex lesion, IVUS guided PCI always gives good long term cardiovascular outcome for the patients. IVUS guided angioplasty is recommended in all LMCA diseases, bifurcation stenting, chronic total occlusion PCI, graft vessel stenting and in stent restenosis as well; with accurate measurement of lumen area, lumen diameter, plaque morphology & stent apposition.