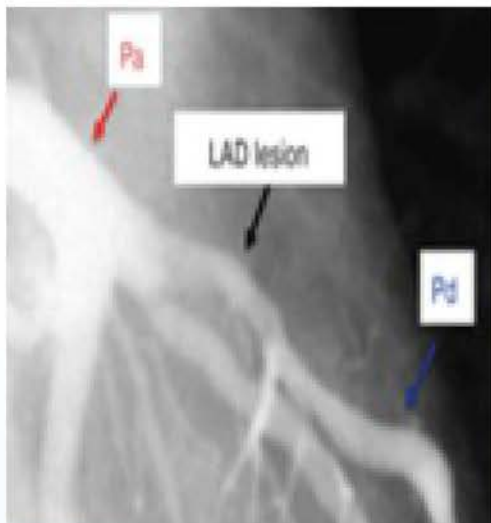




Fractional Flow Reserve (FFR)

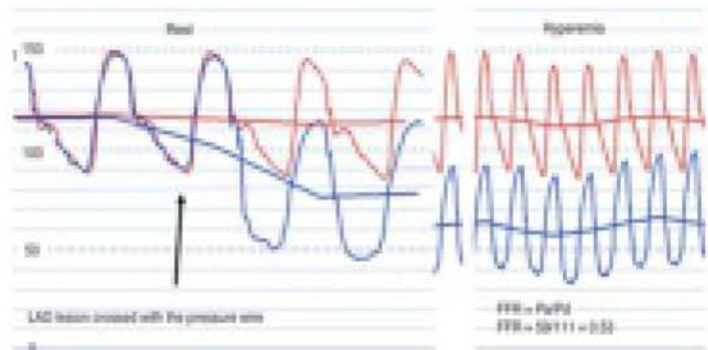
It is a technique used in coronary catheterization to measure pressure differences across a coronary artery stenosis (narrowing, usually due to atherosclerosis) to determine the likelihood that the stenosis impedes oxygen delivery to the heart muscle (myocardial ischemia)

FFR uses a small sensor on the tip of the wire (commonly a transducer) to measure pressure, temperature and flow to determine the exact severity of the lesion



Fractional flow reserve (FFR):

- Ratio of hyperemic flow in the stenotic vessel to hyperemic flow in the same vessel in the absence of coronary stenosis.
- Extent to which the maximal flow is limited by the stenosis
- Ratio of distal coronary pressure (P_d) to aortic pressure (P_a) during maximal hyperemia.



- 1) To determine the physiologic and hemodynamic significance of an angiographically intermediate coronary stenosis.
- 2) To identify appropriate culprit lesion(s) in multivessel coronary artery disease (CAD).
- 3) To measure the functional importance of stenosis in the presence of distal collateral flow.
- 4) To identify the precise location of a coronary lesion when the angiographic image is unclear.



NEWS FROM HEART FIRST CARDIAC AND VASCULAR CENTER

Heart First Cardiac and Vascular Centre will soon relocate to more convenient location at Athawa Circle facilitating easy access, convenience and more time options for your patients.

A workshop called “Preceptorship in Advanced Cardiac Technology” (PACT) was recently organized on 23rd and 24th cardiologist as its convenor. This was a very unique workshop conceptually first of its kind in the entire country. The workshops uniqueness was that it provided the participants with a hands on experience with the new technology in presence of experts and colleagues. The participants came from various parts of the country like Delhi, Chennai, Bangalore, Nagpur, Mumbai, Ahmedabad, Baroda. The participants were not cardiology students or junior cardiologists but experienced interventional cardiologists who came to acquire or sharpen skills in specific advanced technology.



The theme of the conference was “Beyond Angiography”. Coronary angiography is considered as the gold standard but it still has some limitations. Angiography is a two dimensional picture of a three dimensional object. So it creates some decision making problems when the blocks are borderline and are eccentric (located on one side in the artery which is like a round tube). Angiography does not tell the functional importance of a block. It also cannot tell about the type of block (whether the block has more fat or calcium). Sometimes the angiography does not reflect the amount of disease since it only reflects how narrow the inside of the artery looks in a certain angle.

The workshop focussed on three new techniques – Intracoronary Ultrasound (IVUS) , Optical Coherence Tomography(OCT) and Fractional Flow Reserve (FFR)

The first two techniques are two see the artery from inside like a tunnel using either sound waves or light waves. “It is as if you are standing inside the artery and seeing it and it not only shows you the inside but also what is within its walls” explains Dr Abhyankar, it helps to decide if stent should be put in certain blocks when angiography can not decide, it tells you how long is the disease , where to put the stent, if you need to remove calcium from the



artery before putting the stent, if your stent is put perfectly and also if your stent is well covered by body lining after a few months”

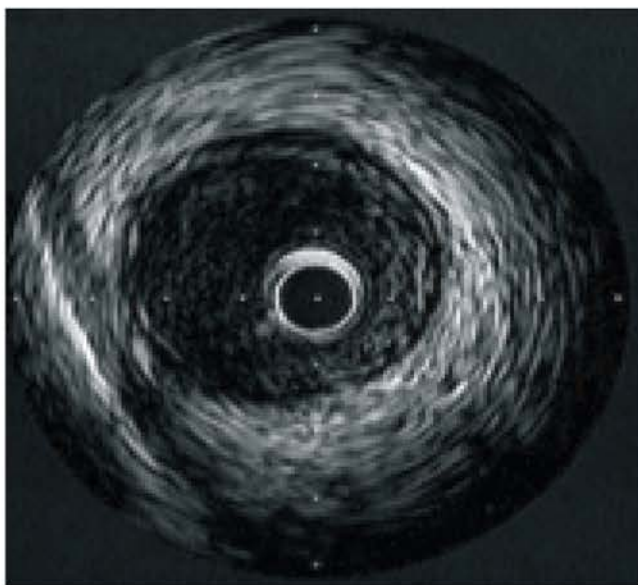
The third technique called Fractional Flow Reserve (FFR) is useful in deciding the importance of the block and to predict if that block is likely to cause heart attack in near future or not.

It is a matter of pride for Surat city that such advanced technology workshop was conducted here with participation of experienced cardiologists from all corners of the country.

Intracoronary Ultrasound (IVUS)

It is a medical imaging methodology using a specially designed catheter with a miniaturized ultrasound probe attached to the distal end of the catheter. The proximal end of the catheter is attached to computerized ultrasound equipment. It allows the application of ultrasound technology to see from inside blood vessels out through the surrounding blood column, visualizing the endothelium (inner wall) of blood vessels in living individuals. The coronary arteries are the most frequent imaging target for IVUS.

- Assessment of Lesion Significance
- Assessment of Angiographically Indeterminate Lesions
- Guidance for Plaque Modification
- Guidance for Stenting
- Thrombosis and Restenosis
- Assessment of Complex Lesions
- Assessment For Complications
- Guidance in Peripheral Interventions
- Picture of artery through IVUS
- Additional Clinical Applications
- Assessment in Disease Progression/Regression



Optical Coherence Tomography (OCT)

It is a novel invasive imaging technique that produces high resolution intracoronary images.

Utilising infra-red light it offers a resolution 10xs greater than ultrasound facilitating new insights into how stents conform within atheromatous coronaries. OCT has highlighted frequent tissue prolapse between stent struts, malapposition, thrombus and vessel trauma, including intra-stent and edge dissection.

The main applications of the OCT are:

- Atherosclerotic plaque assessment
- Stent struts coverage and apposition assessment, and in stent restenosis evaluation
- PCI guide and optimization