

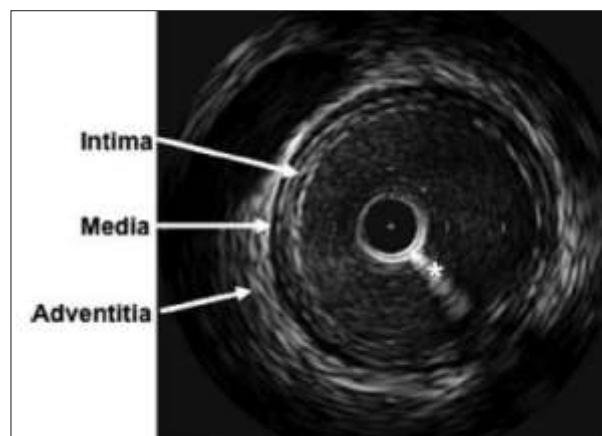
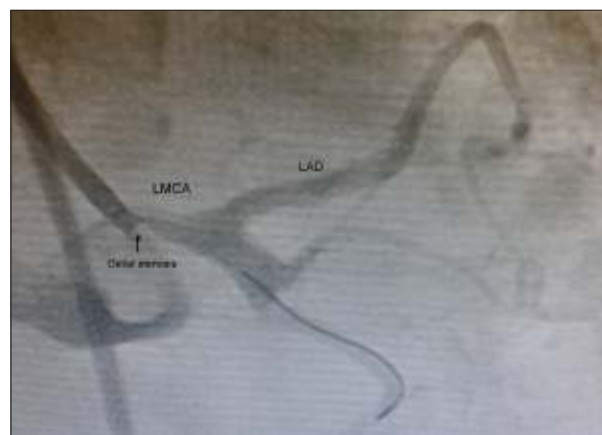
Case Report**Reverse LMCA - A Congenital coronary artery anomalie**Amit Salkar¹, T Sashikanth², Aziz¹**ABSTRACT**

Angiography has a limited value in determining the anatomic severity of coronary artery stenoses. Clinical decision making in patients with symptoms and intermediate lesions remains challenging. Left main coronary artery (LMCA) stenosis is a relatively infrequent but important cause of symptomatic coronary artery disease. Here we present a case which shows that IVUS imaging helps as a guide to stenting and is an acceptable alternative to physiological assessment in such patients where angiography gives erroneous results.

Introduction :

Coronary angiography remains an important modality to assess atherosclerotic coronary artery disease and to guide percutaneous coronary intervention. Intravascular ultrasound (IVUS) is an important adjunct during coronary angiography and has been used increasingly in clinical and research applications. It has vastly enhanced our understanding and has provided us with a thorough perspective of the atherosclerotic process. The advantage of IVUS compared with coronary angiography is its ability to directly image the vessel wall. Coronary angiography has several limitations. Coronary angiogram is a luminogram (images the lumen rather than the vessel wall) and results in significant underestimation or overestimation of lesion severity and extent of atherosclerotic burden. IVUS images the vessel wall and provides a tomographic view of the entire circumference of the vessel wall. It has a higher axial and lateral resolution compared with angiography and is better able to characterize plaque composition, distribution, morphology, and extent. The quantitative measurements with IVUS are precise; hence, IVUS has good intraobserver and interobserver correlations. Moreover, it is helpful in assessing lesion severity at sites difficult to image by

conventional angiography such as the coronary ostia, bifurcations, tortuous vessels, and highly eccentric plaques. (*Fig. 1 : NORMAL IVUS, Trilaminar image of a coronary artery on intravascular ultrasound. Intimal medial and adventitial layers are shown. * Guidewire artifact*)

Fig. 1*Fig. 2*

¹Senior Resident, ²Senior Consultant Interventional Cardiologist
Yashoda Hospital, Secunderabad, Hyderabad

Address for Correspondence -

Dr. Amit Salkar

E-mail : salkaramit@gmail.com

Case Report :

63 yrs old female, was referred to Cardiovascular Thoracic Surgeon (CVTS) for early Coronary Artery Bypass Grafting (CABG) in view of 90% osteoproximal Left Main Coronary Artery (LMCA) stenosis. She presented with complaints of new onset shortness of breath on climbing one flight of stairs and atypical chest pain for which she had undergone coronary angiogram (*Fig. 2*).

She was known case of hypertension and old treated Pulmonary Kochs. On investigation, She was found to have mildly dilated right atrium (RA), right ventricles (RV), pulmonary artery (PA) with moderate tricuspid regurgitation (TR) and severe pulmonary artery hypertension (PAH) (RVSP-90 mm Hg) with no regional wall motion abnormality and Type 1 diastolic dysfunction.

CT pulmonary angiogram was done to rule out pulmonary thromboembolism and mechanical compression of LMCA by dilated pulmonary artery. In view of raised pulmonary artery pressure (PAP), she was referred to us for surgical clearance.

After subjecting to right heart catheterization in view of severe pulmonary artery hypertension (PAH), CABG was deferred and was advised for Intravascular ultrasound (IVUS) guided stent to LMCA.

When patient was taken for IVUS guided stenting, IVUS was suggestive of no plaque in LMCA with minimum lumen area (MLA) of osteo-proximal LMCA of 6.67 mm^2 . So stenting was deferred in view of normal LMCA and patient was discharged on medical therapy.

Now patient is on regular follow-up since 6 months and she is doing well.

Discussion :

Left main coronary artery (LMCA) stenosis is a relatively infrequent but important cause of symptomatic coronary artery disease.¹ Multiple studies have found LMCA stenosis to be an independent indicator of increased morbidity and mortality rates among patients with coronary artery disease.^{2,3}

Although most patients with left main coronary artery stenosis undergo urgent coronary artery bypass grafting, limited information is available regarding the risk factors that might lead to cardiac events between angiographic diagnosis and surgery. In our case after doing angiography we planned for LMCA stenting. But for exact measurement of vessel size, we decided to do IVUS study.

Angiography is not a perfect technique for determining severity of coronary artery stenosis, especially for intermediate lesions.^{4,5,6} Clinical decision making in these patients regarding stenting remains challenging. Symptoms may be typical or atypical, and noninvasive functional testing is often inconclusive. Invasive functional data coronary flow reserve [CFR] or fractional flow reserve (FFR) are helpful for differentiating significant from non-significant stenoses.⁷ In our case angiogram showed significant osteoproximal lesion so FFR was not done and we planned for IVUS-guided LMCA stenting for appropriate sizing of the vessel.

Intravascular ultrasound (IVUS) provides transmural tomographic images of coronary arteries in vivo, which allows the atherosclerotic disease process to be studied in a manner that would otherwise not be possible. Previous studies comparing angiography and IVUS have shown disparities in the presence, location, distribution, composition, and severity of atherosclerosis.^{8,9,10} Some studies also showed that IVUS minimum lumen area correlated strongly with preintervention CFR.¹¹

In our case IVUS showed no plaque burden with osteoproximal minimal luminal area of 6.67 mm^2 . So, stenting was deferred. FFR was not considered in our case as the patient was not willing.

Long-term follow-up after IVUS-guided deferred interventions in patients with de novo intermediate native artery lesions showed a low event rate. In patients with a minimum lumen area $\geq 4.0 \text{ mm}^2$, the event rate was especially low. IVUS imaging is an acceptable alternative to physiological assessment in these patients.¹²

Our patient showed a anomaly in LMCA which could be either a congenital anomaly (a reverse LMCA) or it can be a ecstasia of left main coronary artery. Congenital coronary artery anomalies (CCAAs) are not common, found only in ~1% (range 0.1-2%) of patients¹³. But considering the review of literature and the presentation we concluded our case to be a congenital lesion that is a reverse LMCA.

The patient was thus discharged on medical therapy and is on regular follow-up since 6 months.

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