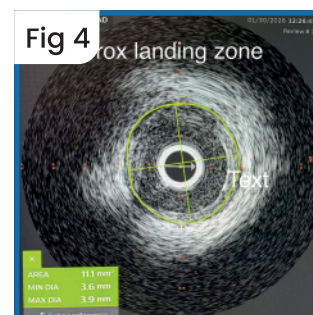
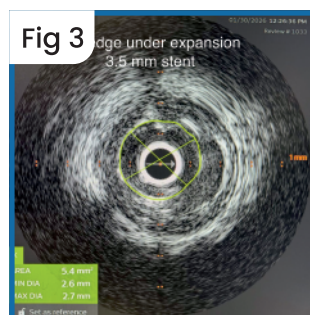
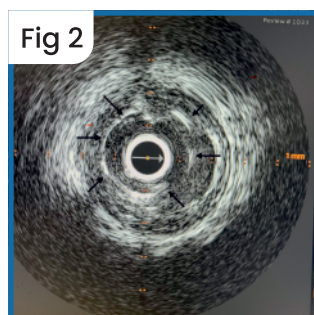
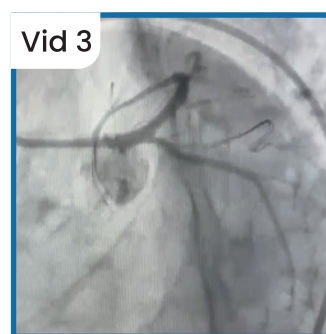
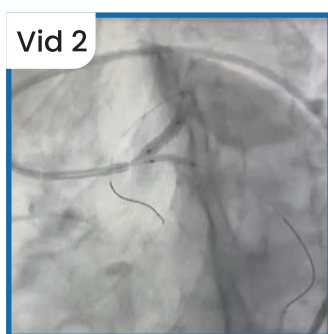
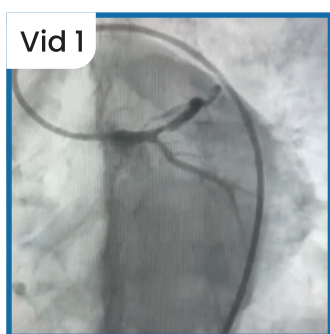


## Stent edge malapposition causing restenosis and ACS

A 69 y old female had undergone angioplasty and stenting to LAD in February 2021 for unstable angina at another hospital. A 3.0 mm x 15 mm DES was deployed in proximal LAD and was post dilated by a 3.5 mm non compliant balloon. In January 2026 she presented with anterior wall STEMI and was immediately thrombolysed. She was compliant with statin and dual antiplatelet therapy (Clopidogrel and Aspirin). Coronary angiogram revealed presence of a 70–80% stenosis in proximal LAD just after the ostium abutting on the proximal edge of the stent (Video 1). IVUS evaluation revealed presence of a well deployed stent in proximal LAD (Fig 1) however the proximal edge of the stent was clearly malapposed with a wide gap between the stent and the vessel wall (Fig 2, black arrows). The MLD at the edge was 2.6 mm (Fig 3). There was a good landing zone at the LAD ostium (Fig 4). The malapposed stent proximal edge probably acted as a nidus for development of plaque which ruptured this time to cause STEMI. The lesion was first dilated with a 3.0 mm NC balloon and was then treated with another overlapping 3.5 mm x 12 mm DES with excellent angiographic result. (Note: A 2.5 mm x 12 mm balloon was placed in the circumflex at the time of stent deployment to prevent carina shift) (Videos 2 & 3).



Under-expansion of stent is a well established cause of acute and chronic complications like stent thrombosis and in-stent restenosis (ISR). It is generally due to resistance from a hard calcific lesion which prevents full expansion of the stent. However localised under-expansion of stent edge often occurs as a result of

1. Deliberate avoidance on the part of the operator to post-dilate the edge due to fear of dissecting the adjacent normal vessel.
2. Using balloons with longer shoulder (and balloon overhang) which fail to post-dilate the distal part and the stent edge (Fig 5A). It is important to make sure that the stent edges lie in the true cylindrical zone of the balloon (which is inside its shoulders) which is the true dilating part of the balloon. The shoulders do not exert much radial force on the stent. Most of the newer generation balloons have a very short shoulder and the overhanging portion. This makes the geographic miss of the stent edge less likely (Fig 5B).
3. A wedge of calcium under the edge of the stent

Mechanisms 1 and/or 2 could have played a role in this case. The vessel around the malapposed stent edge appeared normal making mechanism 3 unlikely.

### Take home point

Under-expansion of the stent edge causing malapposition can cause in-stent restenosis (ISR) and ACS. This usually occurs due to deliberate non-dilation of stent edge due to fear of dissection of adjacent normal vessel or use of post-dilatation balloons with long shoulder.



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