

LATE DRUG ELUTING STENT THROMBOSIS: MORE THAN MEETS THE EYE?

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Contribution

OR conceived the idea , planned the case report and helped in final draft. AW and POK helped with procedure and photographs. All authors contributed significantly to submitted manuscript

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ABSTRACT

Under expanded stents are in consequence of a non-dilatable fibrocalcific lesion. These are not uncommon, pose a technical challenge and are associated with adverse procedural and long-term clinical outcomes. Excimer coronary laser atherectomy has well-established role in treating under expanded stents to achieve successful dilatation. We describe a case report in which a patient with an under expanded stent presented with an acute stent thrombosis resulting in a large thrombus burden. We utilized excimer coronary laser atherectomy in successfully treating both the under expanded stent to achieve maximal dilatation as well as the associated large thrombus burden. Intra coronary imaging in the form of optical coherence tomography was undertaken throughout the case.

INTRODUCTION

A 64-year old man presented with chest pain and ST-segment elevation on his ECG in the pre-cordial leads consistent with an acute anterior myocardial infarction (AMI). His previous medical history included hypertension, cerebrovascular disease and percutaneous coronary intervention (PCI) with drug eluting stents to his left anterior descending (LAD) and diagonal (D1) arteries using a mini-crush technique 10 months ago. The patient was haemodynamically stable and emergent coronary angiography revealed a haziness in the LAD at the proximal end of the LAD stent (Figure 1 A and B) with TIMI III flow distally. The left circumflex and right coronary arteries were unobstructed. To elucidate a diagnosis, we performed optical coherence tomography (OCT) which revealed three pathologies, as demonstrated in Figure 1 (C-F):

- 1) Severely underexpanded stent in the LAD at the LAD / D1 bifurcation.
- 2) Severely underexpanded stent at the ostium of D1.
- 3) Grossly malapposed stent in the proximal LAD with extensive thrombus formation.

Figure 1: Multimodality imaging of the left anterior descending artery (LAD) prior to treatment.

A postero-anterior projection of the LAD with a guide wire seen distally
(A). A magnified version of the same projection demonstrating stent malapposition at arrow C, large intra-coronary thrombus burden at arrow D and stent under expansion at arrow E
(B). Optical coherence tomography revealed stent malapposition
(C) large intra-coronary thrombus burden **(D)** and distal stent under expansion
(E) corresponding to the arrows C-E in the image B. Severely unexpanded stent can be appreciated at the D1 ostium in the long axis OCT image. (arrow, F).

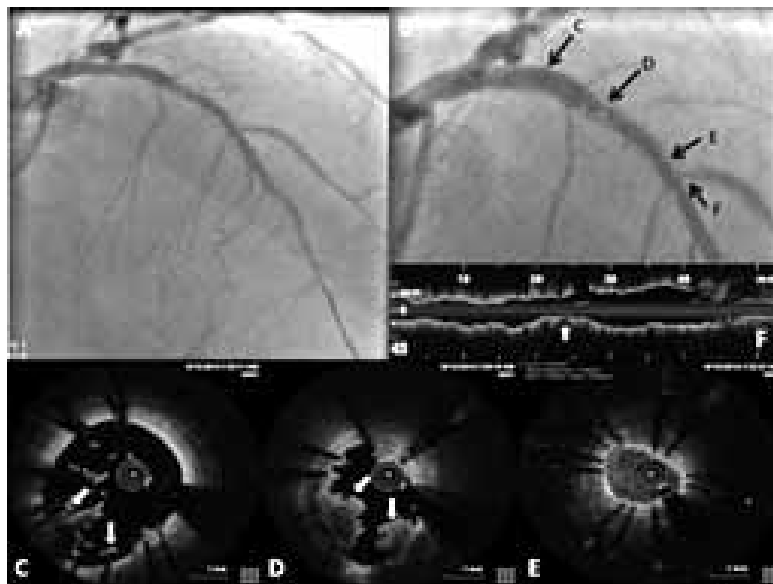
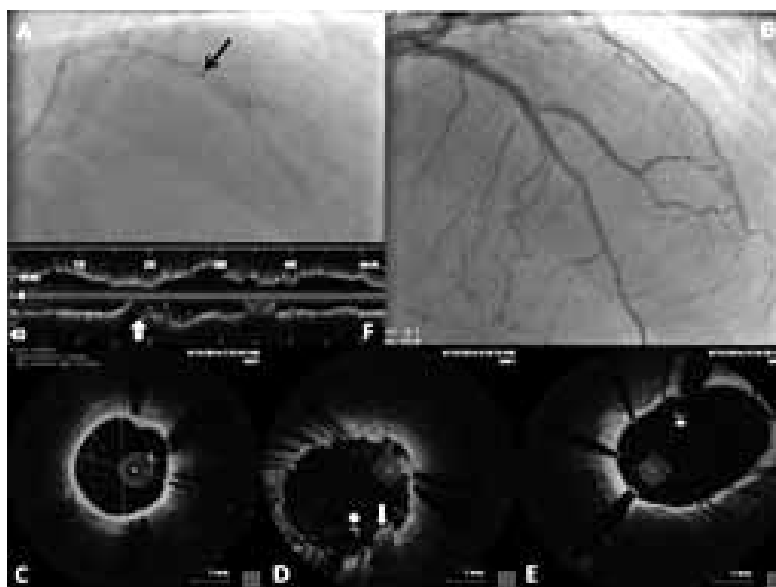


Figure 2: Multimodality imaging of the left anterior descending artery (LAD) during and following treatment. A postero-anterior projection of the LAD with a 0.9 mm excimer laser coronary atherectomy catheter in the artery **(A)**. Final angiographic result **(B)**. Final optical coherence tomography analysis revealed a well apposed stent proximally **(C)** minimal thrombus burden attached to the stent struts **(D)** and a well expanded distal stent with a 47% gain in minimal lumen area under expansion **(E)**. The stent at the D1 ostium is well expanded as seen in the long axis OCT image (arrow, F).



DISCUSSION

A diagnosis of an under expanded distal LAD stent in conjunction with a grossly malapposed proximal stent causing extensive late stent thrombosis was established. We used excimer laser coronary atherectomy (ELCA) to help treat this dual pathology. We felt that the best outcome for the patient could be secured with the use of ELCA to ablate the extensive thrombus and weaken the fibro-calcific ring behind the under expanded stent to facilitate full stent expansion followed by aggressive post-dilatation of the proximal stent. Although the role of ELCA is reported for these indications independently, this is the first reported case of ELCA utilization for these dual pathologies during the same procedure in the same patient.¹⁻³ Our group has recently described the utilization of ELCA in treating under expanded stents in a large multi-centre case series.⁴ Subsequently, a separate guide wire was also advanced into the D1 and following post-dilatation in both limbs with non-compliant balloons, final kissing balloon dilatation was performed using drug eluting balloons in both branches. The final angiographic result was excellent with TIMI III flow and an OCT analysis revealed a fully expanded LAD stent distally with a minimal lumen area of 3.56 mm² (47% gain). The ostium of D1 was well expanded and in addition, the proximal LAD stent was well apposed with minimal

thrombus attached to the stent struts (Figure 2 A-F). The patient was subsequently asymptomatic at a two-month follow-up visit.

CONCLUSION

This case highlights the importance of ELCA in treating an under expanded stent as well as a heavy thrombus burden in the setting of acute stent thrombosis requiring primary PCI with a successful end-result.

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