OCT-guided management in a patient with anterior STEMI

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DESCRIPTION

A 64-year-old man presented with an anterior ST elevation myocardial infarction. He had experienced sudden onset chest pain at the end of a hockey game. His medical history was unremarkable. His blood pressure was 150/65 mm Hg and he had a heart rate of 70 bpm. Cardiovascular examination revealed normal heart sounds and no murmurs or added sounds.

Coronary angiography revealed haziness in the proximal left anterior descending artery (figure 1). Presumed to be thrombus, the patient underwent thrombectomy followed by implantation of two drug eluting stents. Imaging with optical coherence

tomography (OCT) showed the area of plaque rupture and overlying thrombus (figure 1).

Haziness on coronary angiography could be caused by aetiologies such as thrombosis with underlying plaque rupture, embolism, mural calcification, spontaneous coronary artery dissection (SCAD) and unopposed stent struts in previously stented segments.¹

OCT utilises infrared light to image the inside of the coronary artery, providing superior resolution (10 µm) of plaque morphology.² It helps to identify features that increase the likelihood of plaque rupture and myocardial infarction. These include thin fibrous cap atheroma below 65 µm, superficial

Figure 1 Upper left panel: A caudal right anterior oblique view showing filling defect in the proximal left anterior descending artery (LAD; blue arrow) with TIMI 3 flow in a patient presenting with anterior ST elevation myocardial infarction. Upper right panel: A cranial left anterior oblique view showing the filling defect in the proximal LAD (red arrow). Bottom left panel: optical coherence tomography (OCT) image showing the area of plaque rupture (white arrow) resulting in thrombus formation (grey arrow) and the filling defect shown in the upper left panel (blue arrow). Stent struts (blue arrow) are seen covering the area of plaque rupture. Postdilation of the stent was performed to cover the small area of malapposition (green arrow). Bottom right panel: Control angiography and OCT after 3 months showing healing of the area of plaque rupture and mild in stent restenosis (yellow arrow).

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Learning points

- ▶ ST elevation myocardial infarction could be caused by a number of aetiologies (eg, plaque rupture, embolism, spontaneous coronary artery dissection).
- ▶ Haziness on coronary angiography could be caused by a number of aetiologies (eg, plaque rupture, calcification, unopposed stent struts or dissection).
- ▶ Intracoronary imaging with optical coherence tomography provides superior resolution of the inside of the coronary artery to help explain the aetiologies of haziness seen on coronary angiography and also to identify features that can predict the likelihood of acute coronary syndrome (eg, thin fibrous cap atheroma).

calcium nodules and a necrotic lipid core with microchannels.³ OCT is useful in other ACS presentations, such as SCAD, where it can show diagnostic images of compressive intramural

haematoma.³ It has been also used to identify coronary arteries susceptible to spasm with resting thickening of the media layer.² Limitations of OCT include potential artefacts in up to a third of cases,³ and difficulty with imaging the left main artery and vein grafts due to limited depth penetration (5 mm).

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Competing interests None declared.

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REFERENCES

- 1 Jaffe R, Irfan A, Hong T, *et al*. Intraluminal filling defects on coronary angiography: more than meets the eye. *Clin Cardiol* 2007;30:480–4.
- 2 Tanaka A, Shimada K, Tearney GJ, *et al*. Conformational change in coronary artery structure assessed by optical coherence tomography in patients with vasospastic angina. *J Am Coll Cardiol* 2011;58:1608–13.
- 3 Sinclair H, Bourantas C, Bagnall A, *et al*. OCT for the identification of vulnerable plaque in acute coronary syndrome. *JACC Cardiovasc Imaging* 2015;8:198–209.

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