



CASE REPORT

Utility of optical coherence tomography and intravascular ultrasound for the evaluation of coronary lesions



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Abstract Optical coherence tomography (OCT) and intravascular ultrasound (IVUS) are imaging methods used in the diagnosis of coronary lesions. IVUS is widely used in interventional cardiology laboratories, but OCT is now increasingly used. Conventional coronary angiography can identify different types of coronary lesions but sometimes is unable to diagnose them correctly. Both intravascular imaging methods are useful for better interpretation of these lesions, and can accurately diagnose ruptured plaques, thrombosis, stent restenosis and hazy images. However, the resolution of OCT is ten times higher than IVUS, and so an accurate diagnosis cannot always be achieved with ultrasound imaging. We present three cases in which IVUS was unable to identify the lesion causing the condition and OCT was required to obtain clearer images that helped to confirm the diagnosis. The advantages and disadvantages of each method are then discussed.

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PALAVRAS-CHAVE

Tomografia de coerência ótica;
Ultrasonografia intravascular;
Reestenose coronária;
Calcificação coronária;
Trombose coronária

Utilidade da tomografia de coerência ótica e ultra-som intravascular para a avaliação de lesões coronárias

Resumo A tomografia de coerência ótica (TCO) e o ultrassom intravascular (USIV) são métodos de imagem geralmente utilizados nos serviços de cardiologia de intervenção. O USIV é um sistema de imagem intravascular, muito utilizado nos laboratórios de cardiologia de intervenção. A utilização de TCO começou mais tarde a ser divulgada na prática diagnóstica intracoronária. A angiografia coronária convencional pode identificar diferentes tipos de lesões coronárias que por vezes não são devidamente diagnosticadas. Os métodos de imagem são também utilizados para uma melhor interpretação destas lesões. As roturas de placas, trombose, reestenose de

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stent e outras imagens nebulosas podem ser diagnosticadas fielmente através da sua utilização. No entanto, a resolução da TCO é 10 vezes superior à do USIV. Portanto não é possível obter sempre um diagnóstico fiel com uma imagem ultra-som. Este artigo apresenta três casos em que a utilização de USIV não foi suficiente para identificar a lesão, tendo sido necessário recorrer à TOC para obter imagens mais claras que ajudaram a confirmar o diagnóstico. Segue-se a discussão das vantagens e desvantagens de cada método.

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Case reports

Case 1: stent thrombosis

An 86-year-old woman with a history of severe three-vessel disease was treated in 2006 with a drug-eluting stent in the proximal left anterior descending artery. She was recently readmitted with an acute anterior infarction, coronary angiography showing a contrast defect in the left anterior descending artery (LAD) stent and a contrasting image outside suggestive of stent malapposition. OCT images showed extended stent malapposition, severe circumferential aneurysm with a diameter of 5 mm and abundant intraluminal thrombi. IVUS was used to better visualize the aneurysmal structure, and confirmed the lesion and thrombus image inside. Thrombus aspiration was not performed due to lack of the appropriate aspiration device. A 3.5 mm × 28 mm MGuard coated stent was implanted, with a good angiographic result (Figure 1).

Case 2: calcified lesion

A 64-year-old man with unstable angina symptoms presented a chronic calcified lesion in the LAD on angiography. IVUS and OCT images revealed severe mixed plaque with a large calcium component occupying the entire circumference of the artery, with a luminal area of 2.5 mm² in the distal artery and another lesion in the proximal segment with superficial calcium and a luminal area of 4 mm².

Rotablator debulking was performed around the mid segment and in the distal artery with a 1.5-mm burr. A 2.5 mm × 20 mm balloon was expanded and two overlapping drug-eluting stents (DES), 2.5 mm × 23 mm and 3 mm × 33 mm, were implanted, with a successful result on angiography and intracoronary imaging (Figure 2).

Case 3: "black hole"

A 37-year-old man presented ST-elevation myocardial infarction in 2010, treated with primary angioplasty to the left

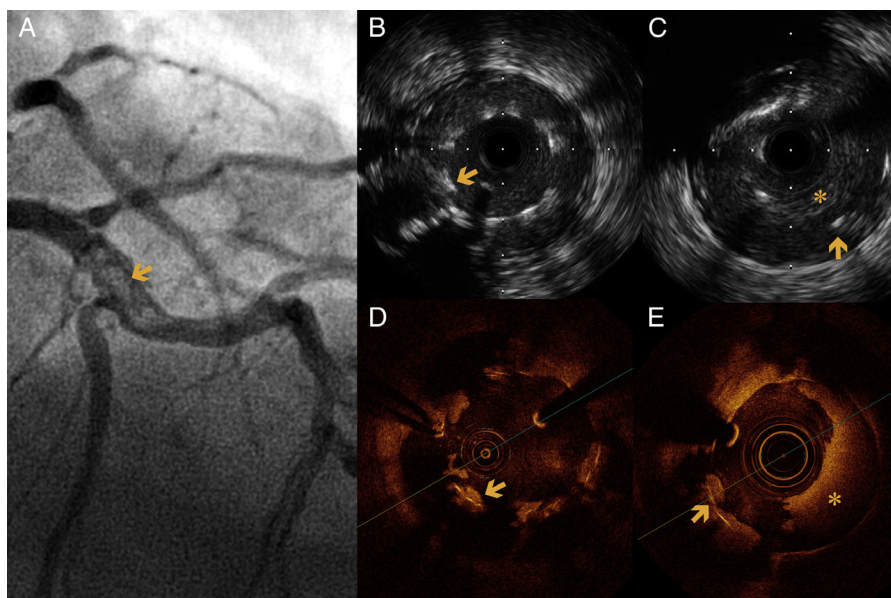


Figure 1 (A) Coronary angiography of the left anterior descending artery (LAD) in right anterior oblique cranial view, showing an extensive intraluminal filling defect, multilobed, compatible with stent thrombosis (arrow). (B and C) Intravascular ultrasound (IVUS) images showing extensive stent strut malapposition (arrow), which appears to be coated with echogenic tissue that could correspond to adherent thrombus. (C) Extensive stent thrombosis (asterisk) and aneurysmal dilatation of the vessel outside the struts (arrow). (D and E) Optical coherence tomography (OCT) images at the same level as the previous IVUS, showing strut malapposition (arrow) with adherent platelet thrombus. (E) Extensive stent thrombosis (asterisk).

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