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Spontaneous coronary dissection: optical coherence tomography "live flash" angioplasty guide

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AUTHORS' CONTRIBUTION: (A) Study Design · **(B)** Data Collection . **(C)** Statistical Analysis · **(D)** Data Interpretation · **(E)** Manuscript Preparation · **(F)** Literature Search · **(G)** No Fund Collection

ABSTRACT

Optical coherence tomography (OCT) is a light-based imaging modality with great potential in coronary imaging. Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome (ACS). The diagnosis of SCAD is made primarily by invasive coronary angiography, although additional imaging modalities such as CT angiography, IVUS, and OCT may enhance the diagnostic outcome. The authors describe the clinical case of a young woman hospitalized with a diagnosis of SCA. SCA-induced SCAD was detected in coronary angiography and OCT-guided angioplasty. The use of OCT in the context of SCAD has been described and the real innovation in this case is this unique use of OCT. Short and direct visual angioplasty guidance is very useful because it allows the location of the guide wires to be clearly determined at all times without the need for a large amount of contrast medium. Optical coherence tomography (OCT) is a light-based imaging modality with great potential in coronary imaging. Compared with intravascular ultrasound (IVUS), OCT has ten times the image resolution. It has the ability to describe the structure and extent of coronary artery disease in unprecedented detail because different components of atherosclerotic plaque have different properties. In everyday practice, OCT is useful to guide complex interventions. Image acquisition has some peculiarities because the blood must be moved during the OCT scan. In fact, OCT images are obtained and recorded when the coronary artery is flushed with contrast and the imaging tip of the catheter is withdrawn.

Keywords: Hip surgery; Hydrocele surgery; Hysterectomy surgery; Implants surgery; Laparoscopic surgery; Minimally invasive surgery

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INTRODUCTION

Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome (ACS) that usually affects young, healthy individuals. The population-based incidence of SCAD is unknown. Retrospective registry studies have reported detection of SCAD in 0.07% to 1.1% of all coronary angiograms performed. There is clearly a female predominance and an association with perinatal or postnatal status. Other identified SCAD associations include connective tissue disorders, vasculitis, polycystic kidney disease, and exercise, suggesting an underlying vascular predisposition in some individuals, despite systemic structural abnormalities most of the vessel wall has not been determined [1]. Diagnosis of SCAD is primarily based on invasive coronary angiography, although additional imaging modalities such as CT angiography, IVUS, and OCT may enhance the diagnostic outcome [2]. OCT provides unique insights into the most relevant morphological features of the disease, including entrance laceration, endothelium flap, double lumen morphology, intramural hematoma, and associated thrombosis [3]. The optimal therapeutic strategy for acute SCAD expression has yet to be determined and may vary depending on the type and severity of the manifestation. Reports have demonstrated favorable outcomes with conservative management (with documented angiographic resolution), fibrinolysis, percutaneous coronary intervention (PCI), and coronary artery bypass grafting (CABG) [4]. Regardless of the initial treatment strategy, in-hospital and initial outcomes are generally reported to be favorable [5]. A 41-year-old obese woman with polycystic kidney disease was referred to the catheterization department after an episode of chest pain with troponin elevation 1 week after primary PCI due to an acute ST-segment elevation myocardial infarction. Simultaneous angiography showed balanced dominant circulation, with TIMI 3 flow in the right coronary artery (RCA) without stenosis and sub obstructive lesions in the small posterior lateral branch (PLB) of the circumflex artery [6]. Is considered to be injurious [7].

DISCUSSION

Balloon angioplasty was performed with good results and TIMI 3 flow. Spontaneous dissection was suspected due to the presence of opacities at the site of occlusion and the disappearance of some acute lesions. Marginal branch compared to the previous examination [8]. We then decided to perform an OCT (Terumo Longwave® OFDI system)

which clearly showed the dual luminous flux morphology and the conductor was also in the pseudo luminescence [9]. We then performed angioplasty under the control of OCT [10]. With the live OCT images, which did not record any actual shrinkage, we used small contrasting clusters until we could confirm that the guide was on real light and. OCT was also able to very clearly identify the entrance tear. After the true lumen was protected, we performed angioplasty with a drug-eluting stent to seal the tear at the entrance of the proximal right coronary artery. There is a final TIMI 3 outflow, and the acute marginal branches are visible again, but there is narrowing in the distal vessel where the false lumen is still visible but with signs of thrombosis. To avoid making an all-metal jacket, we decided to accept the results and perform a follow-up angiogram a month later. After a peaceful month, follow-up angiography showed persistence of a large dissection extending to the distal vessel. There is a significant trade-off between true light and false light. Considering the previous STEMI presentation and negative angiography within one month, we performed an OCT that confirmed the dissection and showed that the conductor was now in the true lumen In this context, we decided to seal the incision by implanting two additional drug-eluting stents into the medial and distal RCA to ensure long-term patency of the vessel (Figure 8). The dissection remains at a very far distance, which is a small ship. The diagnosis and management of SCAD is very difficult. However, an accurate and early diagnosis is still essential. There are limited data regarding the use and interest of OCT in this rare disease. In the case cited above, the OCT could easily visualize the characteristic double lumen morphology of this entity and identify the entry tear as well as the circumferential nature and extent of disease. The trade-off between the true luminous flux distribution and the spurious luminous flux is also clearly visualized.

CONCLUSION

The low profile (catheter cross profile: 2.6 Fr) and higher resolution of the OCT are useful in this case as it allows the image to be obtained. High quality images of long arterial segments. However, OCT is not without potential risks. In the SCAD situation, it may further spread dissection and/or tear of the endometrium, due to the rapid change in coronary flow, so its use must be weighed against the potential benefits. Compared with the potential harm. A careful rate of contrast injection is of the utmost importance. In this case, OCT proved to be particularly useful, as it not only allowed precise identification of dissections and tears of the endothelium, but also made it possible to precisely wire real light, with direct imaging. continue during wire manipulation with a fixed device. OCT catheter. The usefulness of OCT in the context of SCAD has been reported, and the technique we describe in this case represents an innovation that may become more interesting in the future, with the technical evolution of OCT. This technique opens up a promising field of software development; For example, we believe it would be helpful to be able to capture images with a fixed OCT catheter and not just those obtained during automated removal with complete coronary artery lavage. Another potential advantage of this technique (OCT) in the SCAD context is the ability to perform 3D OCT online to improve input tear identification. For the angioplasty itself, we will use biodegradable scaffolds, if they are available in our catheterization room at the time of this procedure. In a more detailed analysis of the OCT images after the final procedure, we found that the entrance tear was posterior to the distal part of the previously implanted stent. Now we are wondering if we can seal the incision with just a balloon after dilation.

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