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Case Study
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Twisted in Ostial Left Descending Artery

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Abstract

A middle age female presented with chest pain. She was a daily marijuana user. Coronary Angiography (CAG) revealed a focal severe ostial stenosis in the Left Anterior Descending (LAD) artery. Optical Coherence Tomography (OCT) demonstrated twisted ostial LAD resulting in severe stenosis. Resolute stent was implanted from Left Main into proximal LAD. It was interpreted as a kink leading to severe occlusion.

Case Presentation

A 48-year-old premenopausal female presented to the emergency department with acutely worsening chest pain. Patient described chest tightness radiating to left chest wall and neck associated with diaphoresis. She reported progressively worsening exertional chest discomfort for 3 months with one encounter to the emergency department a month before; ECG and troponin were then negative. She had no previous known cardiac history and denied alcohol, tobacco or IV drug use but reported daily marijuana smoking. First Troponin was negative but after repeating it was elevated (1.1 ng/mL). ECG showed V1-V6 deep T wave inversion. CAG revealed tortuous left anterior descending artery course with a very focal severe ostial stenosis in pre percutaneous coronary intervention (PCI) (Pre-PCI, Figure 1A, level 3). Left ventriculography showed antero-apical hypokinesis. Fractional Flow Reserve (FFR) was 0.50. OCT revealed normal three layers vessel with no atherosclerosis and significant stenosis in ostial LAD. However, OCT rather demonstrated twisted ostial LAD resulting in severe stenosis (Figure 1B- segment 3, Figure 1C, arrow. OCT also demonstrated the levels of segments on LAD artery from left to right, Figure 1D).

PCI was performed with a Resolute 5.0 mm × 12 mm stent that was implanted from distal Left Main into ostial and proximal LAD. She was discharged on dual-antiplatelet therapy in a stable condition. "Twisted-artery" induced ischemia has been previously described in a case of twisted carotid artery resulting in symptomatic cerebral hypoperfusion [1] and induced ischemia in coronary artery disease in women [2]. Non-atherosclerotic coronary artery disease is an important cause of myocardial ischemia in young patients, but it is often missed on coronary angiography [3,4].

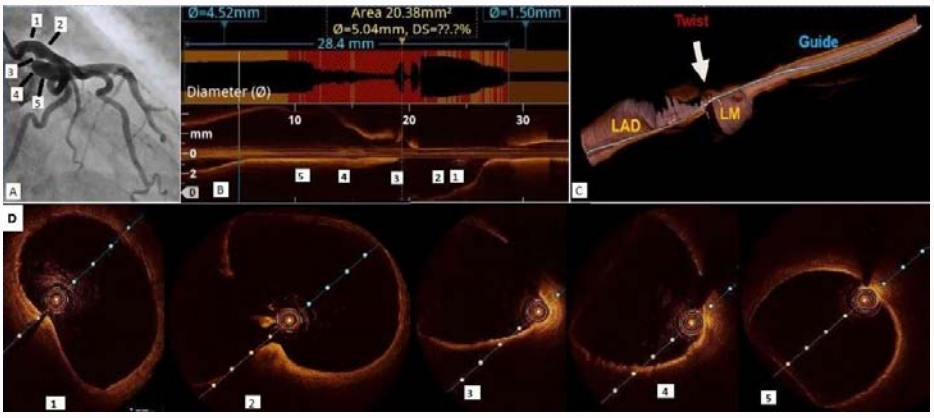

Figure 1: A): Pre-PCI image shows bifurcation of distal Left main artery and ostial LAD and the level of lesion. B): Pre-PCI OCT shows longitudinal images and the pre, post and the levels of stenosis. C): OCT shows longitudinal images and the pre, post and the levels of stenosis. D): Three dimension- cross sectional OCT pre-PCI shows twisted LAD ostial, level of segment 3.

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Our case demonstrates a twisted coronary artery as an unusual pathology resulting in acute coronary syndrome demonstrated by both hemodynamic assessment with FFR and intracoronary imaging with OCT. It was interpreted as a kink leading to subtotal-occlusion in the absence of atherosclerosis.

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