A Novel Approach to a Case of Stent Embolization during a Primary PCI

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Abstract: A 60 year old smoker male presented with acute anterior ST elevation Myocardial Infarction (STEMI) and underwent primary percutaneous coronary intervention (PCI). Thrombus aspiration to a totally occluded proximal LAD (Left Anterior Descending artery)/D1 (first diagonal branch) revealed complex bifurcation disease. PCI complicated by unexpected stent embolization to first obtuse marginal (OM1) branch. After successful revascularization to the D1 branch, different approaches initially failed to retrieve the embolised stent in the OM1 branch. Finally the stent was successfully retrieved using a Filter Wire catheter. To our knowledge this is the first case to retrieve an embolised stent using the filter wire.

Keywords: Stent embolization, Primary PCI, Filter wire.

PRESENTATION OF THE CASE

A 60- year- old male presented to our heart attack center with anterior STEMI (ST elevation Myocardial Infarction). The only known cardiovascular risk factor was smoking. He was admitted directly to the cardiac catheter laboratory and underwent a Primary PCI procedure after a written consent. The patient was given 600mg loading dose of clopidogrel and 300 mg of Aspirin.

His angiogram was performed *via* a right transradial approach using a 6 Fr catheter. His right coronary artery showed minor, non-obstructive coronary artery disease (CAD). An EBU 3.5 6F guiding catheter was used to engage the left main stem and angiography revealed a thrombotic occlusion of p LAD (proximal Left anterior descending artery). A thrombus aspiration device was used restoring TIMI III flow in the occluded coronary. ECG showed immediate ST segment resolution and patient's chest pain settled.

Complex disease in LAD and D1 with a critical narrowing of the D1/LAD bifurcation was seen following restoration of TIMI 3 flow. The first diagonal (D1) appeared larger in caliber than the LAD with significant disease and LAD also showed a severe proximal stenosis (90 %) (Figure **1**). The culprit lesion in proximal LAD extended to involve the larger calibre, diagonal branch.

The decision was made to stent the disease from the proximal LAD into the larger D1 and then treat the LAD/D1 bifurcation. This is previously defined as a modified T stent approach [1, 2] where the side-branch stent is deployed first and balloon and wire are removed. The stent deployed in the main branch completely covers and crushes the protruding segment of the side branch stent against the vessel wall of the main branch. Initially, a 2.0mm, semi-compliant balloon was used to predilate the LAD. Then a 3.0 x 28.00 mm Everolimus –eluting platinum chromium stent was placed from proximal LAD into the D1. Another overlapping Evrolimus 3 X 15 mm stent was deployed distally overlapping the first stent.

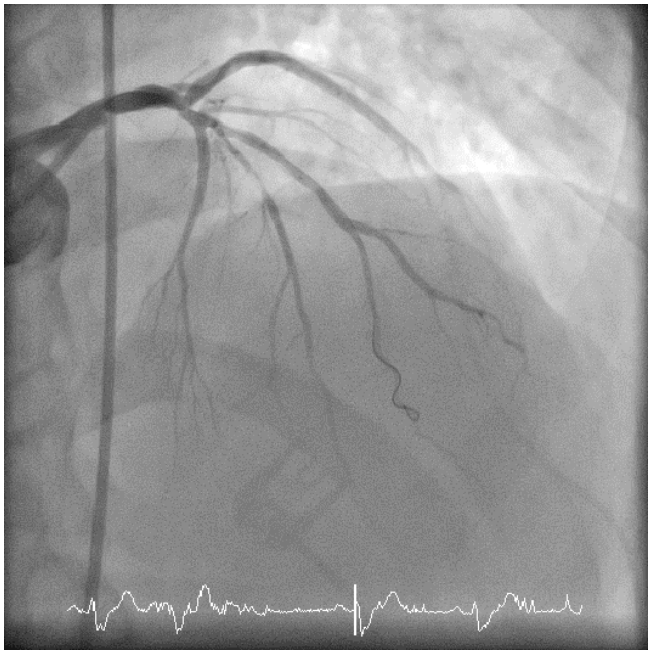

Figure 1: LAO view after thrombus aspiration revealing complex LAD/D1 bifurcation disease and LAD dissection.

Subsequently, it was decided to stent the LAD stenosis using a modified T-Stenting approach. This approach used as we considered the large caliber D1

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is the main vessel and LAD as a subsequent target to treat [1, 2]. Firstly the D1 stent was fenestrated using a 1.5 mm semi-compliant balloon followed by 2 mm balloon to ensure the passage of the LAD stent through the struts (Figure **2**).

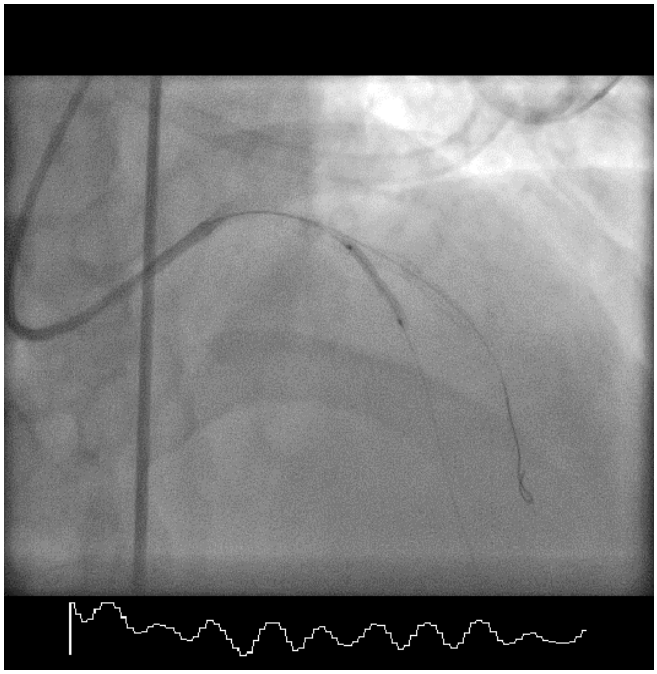


Figure 2: RAO view Balloon dilatation to struts of LAD/D1 stent to facilitate stent passage to LAD trough T-Stenting approach.

Then an attempt was made to pass a 2.25 x 24 mm Evorolimus DES through the LAD-D1 stent into the LAD. However, during passage, through the stent struts, the stent appeared to come off the stent balloon and unexpectedly embolised to a small OM1 (obtuse marginal) branch.

Attention at that stage was given to revascularise and treat bifurcation disease in order to stabilize dissection noted in LAD/D1 branches. Therefore, final kissing balloon (to stabilize LAD dissection and possible carina bifurcation deformation) was successfully performed to the LAD-D1 bifurcation.

Initial attempt to retrieve the stent was by passing a small balloon distal to the stent in order to pull it back to the guiding catheter. However this was unsuccessful. Second attempt was made to push the stent more distally to OM in order to compress it against the wall (by 2 mm semi compliant balloon). However, this approach was unsuccessful also (Figure **3**). Attempt to snare the stent [3] was also unsuccessful and we resorted to a novel approach which using a distal protection device.

This approach involved passing a Filter Wire (Boston Scientific) beyond the stent, opening the basket and trapping the stent within the filter basket. This eventually removed the stent which was retrieved successfully into the guiding catheter (Figure **4**). This represents a novel indication of such a device [4].

The final picture (Figure **5**) showed minor proximal LAD dissection but as the patient was stable with

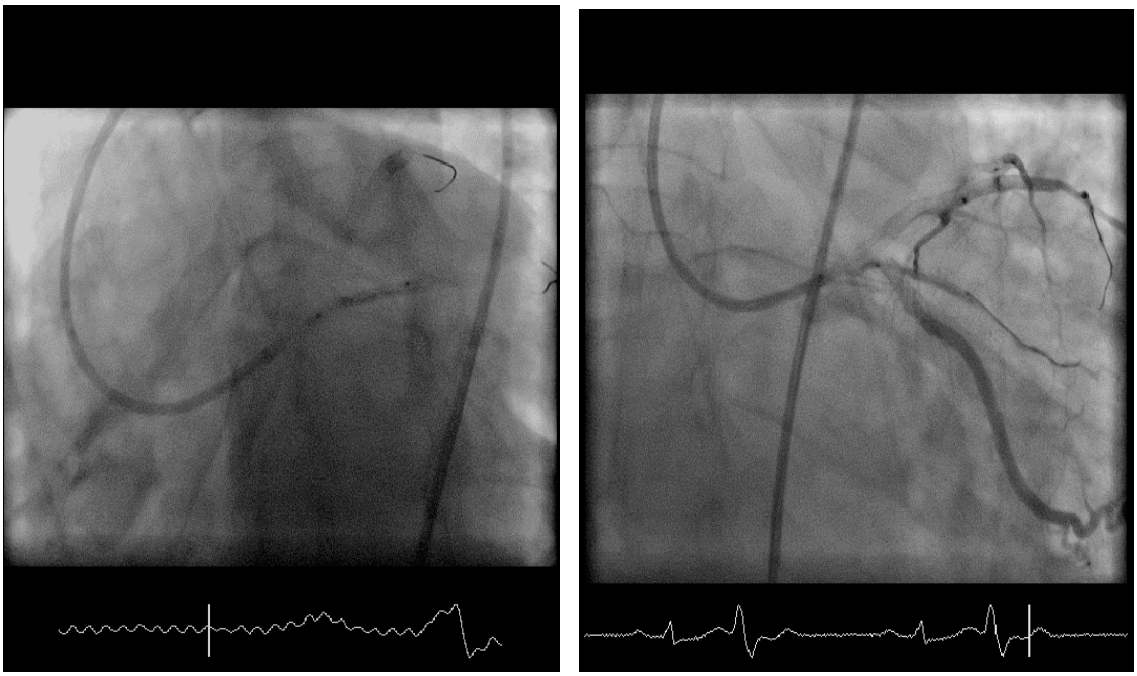


Figure 3: RAO and LAO oblique views: Stent embolization to OM1 with a trial to retrieve it by a low-pressure 1.5 mm balloon.

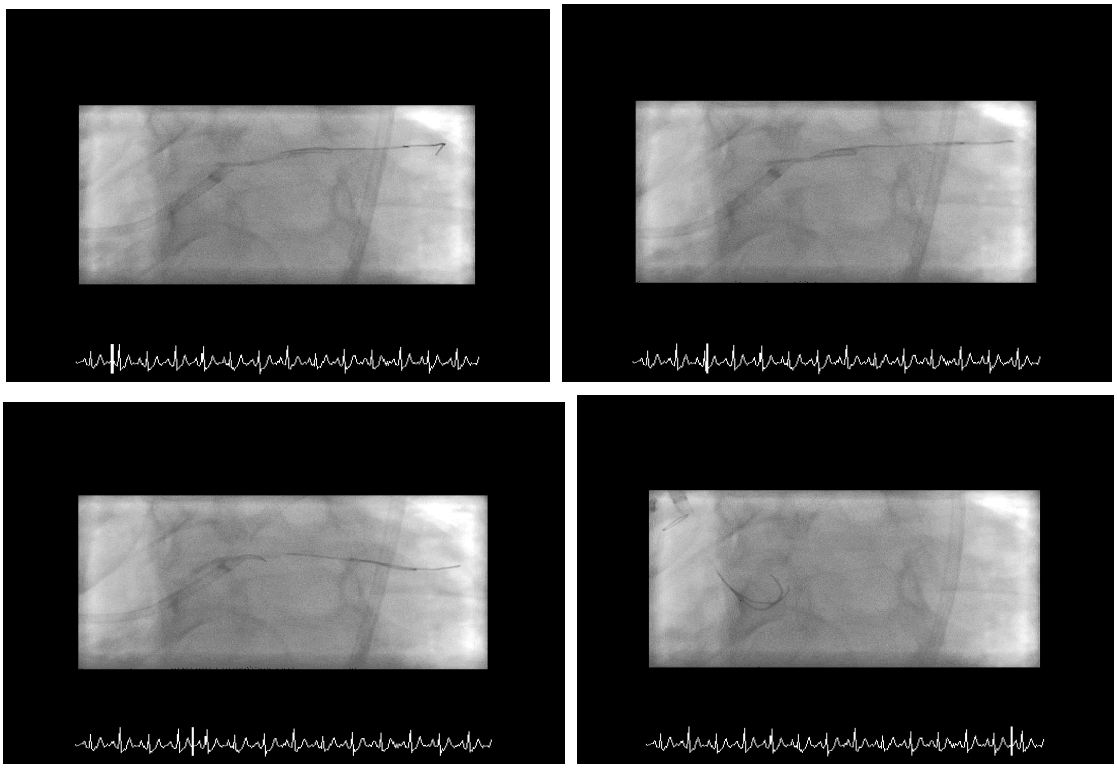
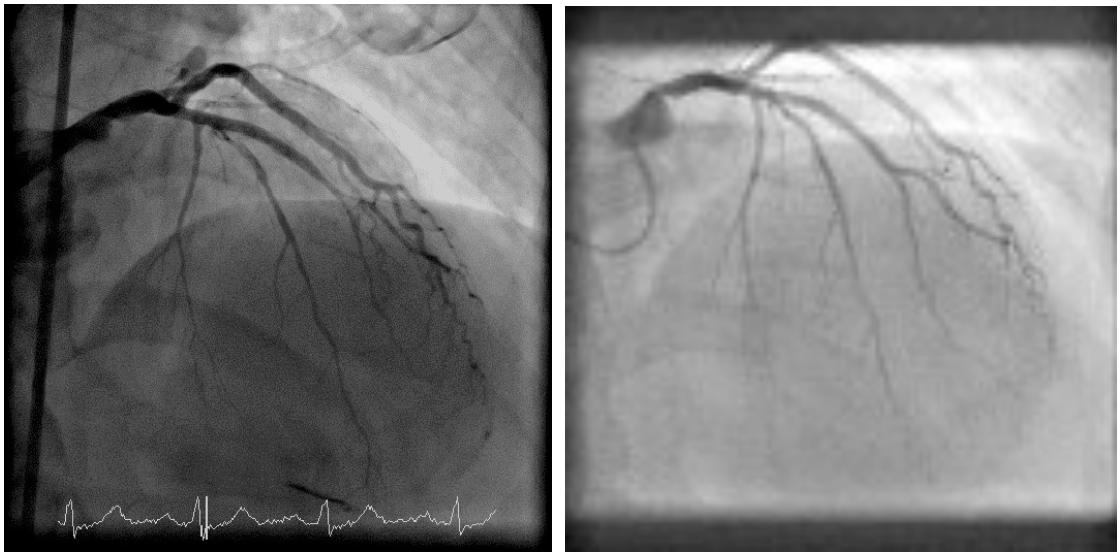


Figure 4: LAO serial views showing Filter wire device to retrieve the stent into the guiding catheter from OM1 branch.



A **B**

Figure 5: AP cranial View, Final angiographic picture.
A. Immediately post procedure showing minor LAD dissection.
B. One week later with good final results.

TIMI III flow and ECG resolution it was decided not to perform any further PCI but to repeat the angiogram prior to discharge. The patient was re-admitted into the cath lab for repeat angiography before discharge and this showed a good result which was confirmed with intravascular ultrasound.

DISCLOSURES

No conflict of interest to declare.

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