

Protected Complex Left Main PCI Complicated by Fracture of Micro- Catheter and Intimal Dissection: Imaging and Management

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Disclosures

The authors have no relevant relationships with commercial interests to disclose.

Patient History

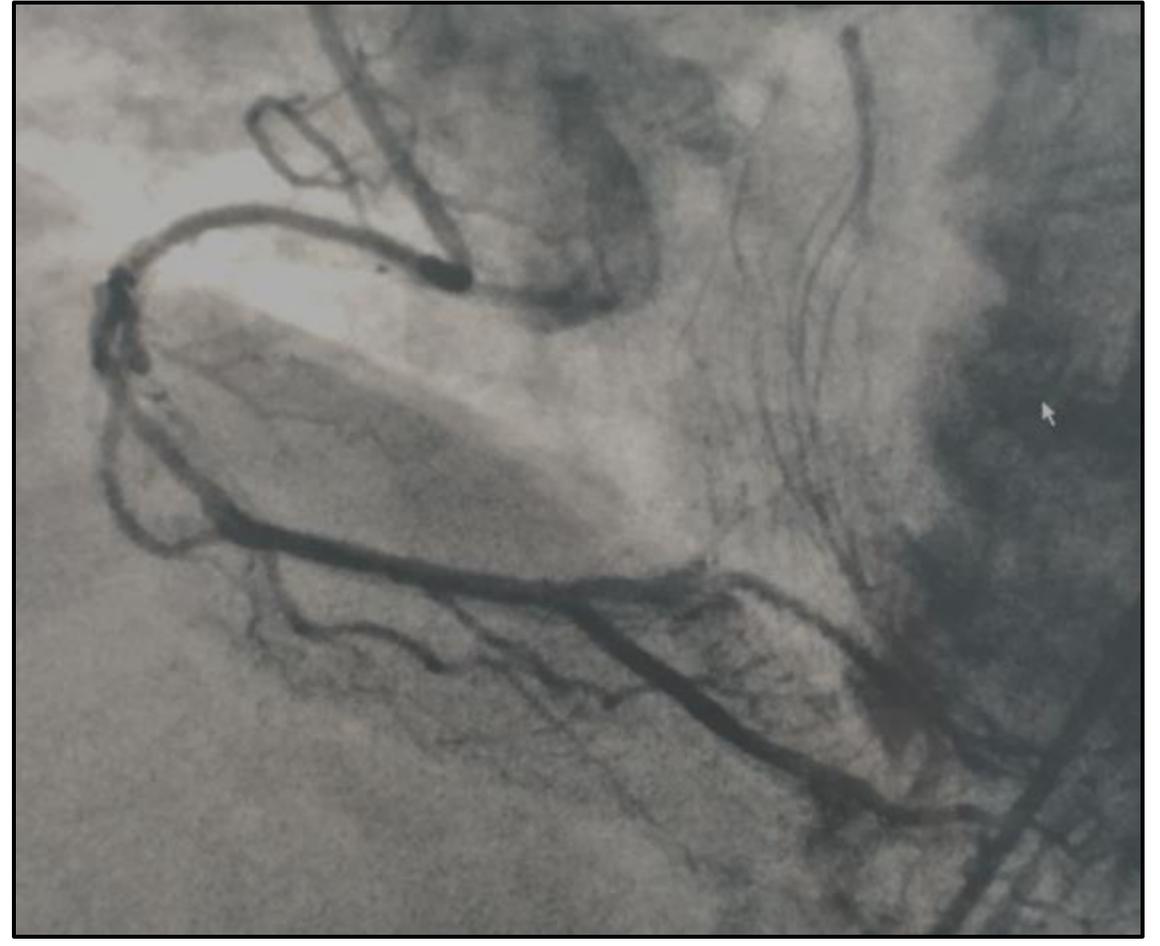
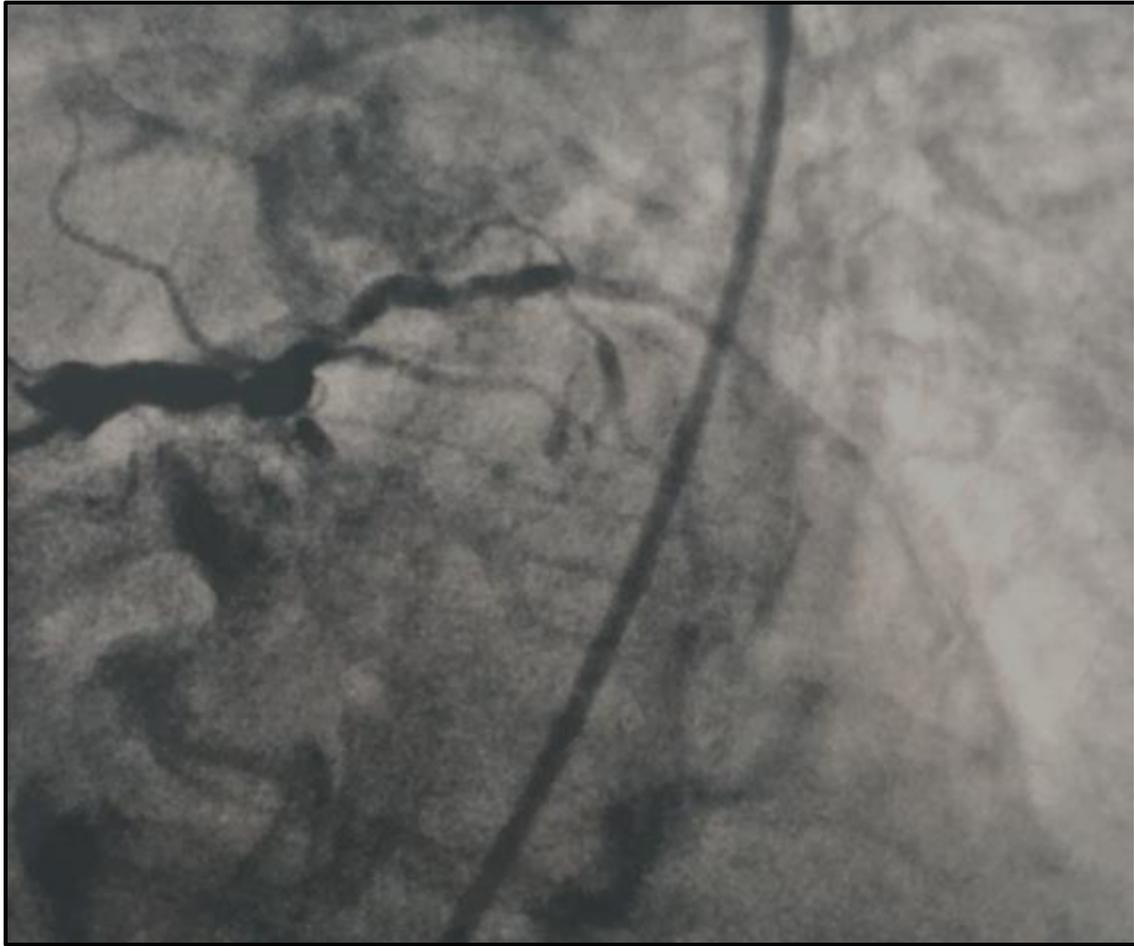
- 81 year old South-East Asian woman presented with *worsening exertional dyspnea and chest pain* for a month prior to presentation.
- Past Medical History was significant for:
 - Hypertension
 - Coronary artery disease (s/p PCI to RCA six years ago)
 - Stage 2 lung cancer (s/p radiation)

Evaluation

- Diagnosis
 - NSTEMI
 - New cardiomyopathy (EF 30-35%)
- Invasive coronary assessment revealed:
 - **critical 95% heavily calcified lesion in the left main extending in to the circumflex artery**
 - CTO of the LAD with right to left collaterals
 - Patent RCA

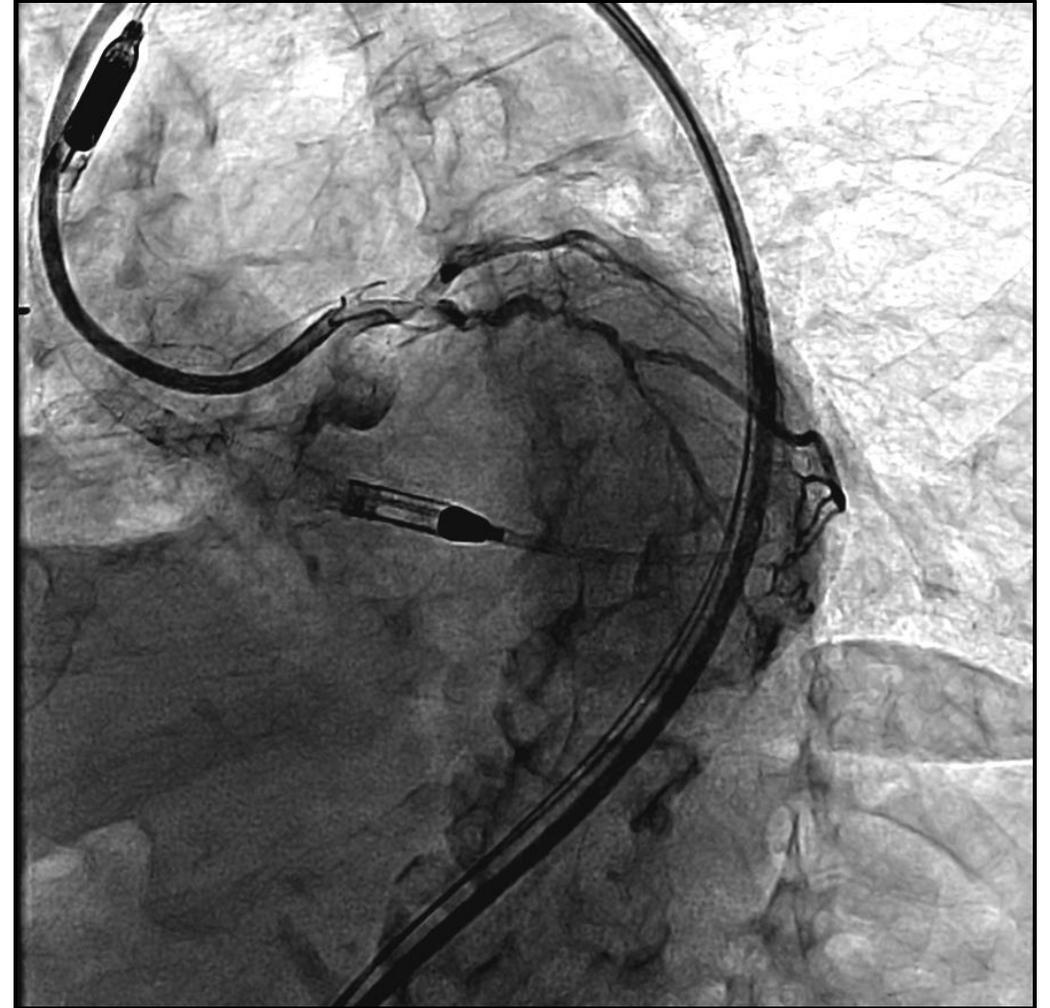


Evaluation- Coronary Angiogram



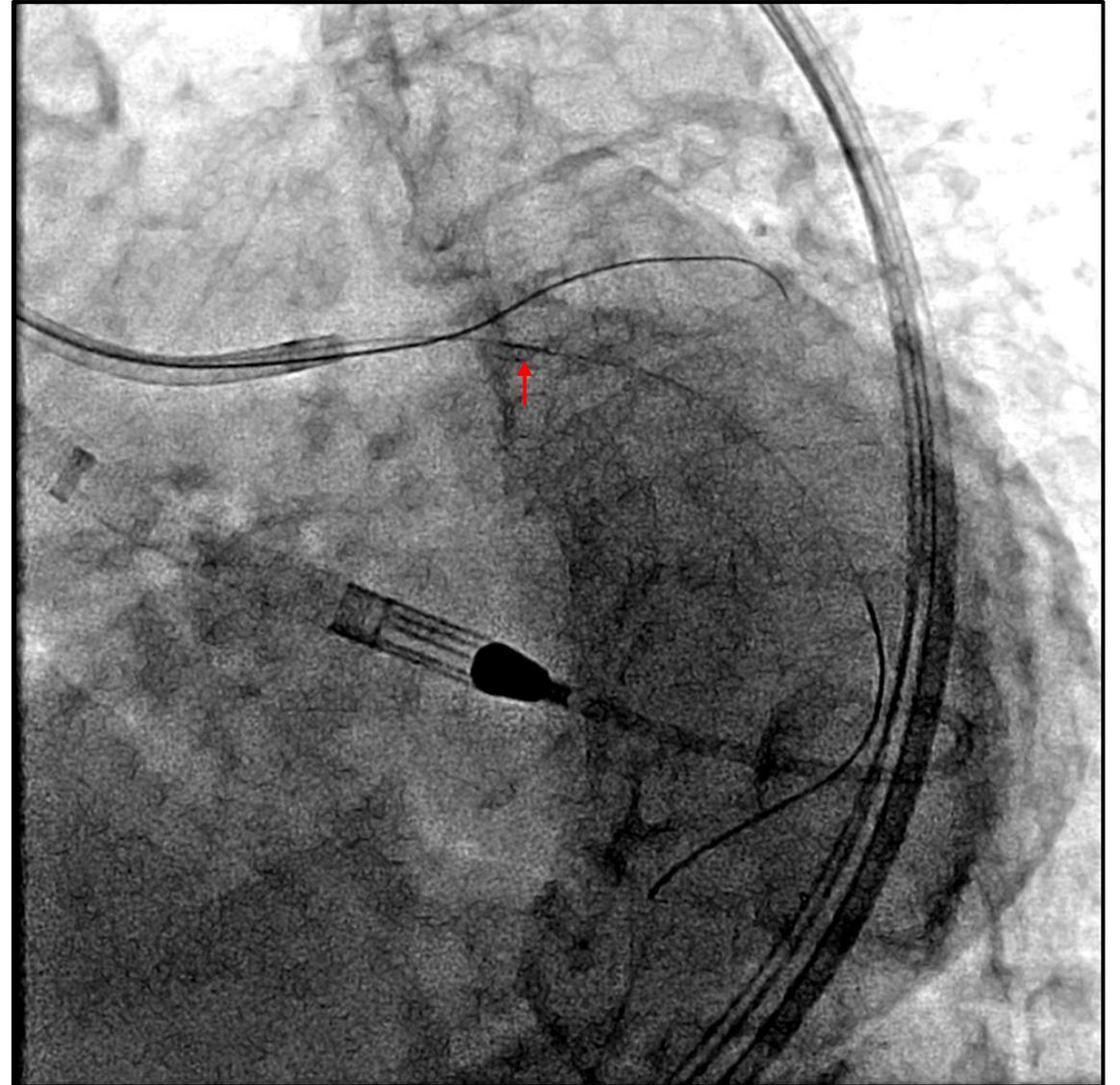
Management

- Surgical revascularization was declined given patient's age, frailty and co-morbidities.
- She was then planned for Impella-assisted high risk atherectomy and PCI of the left main and circumflex arteries.

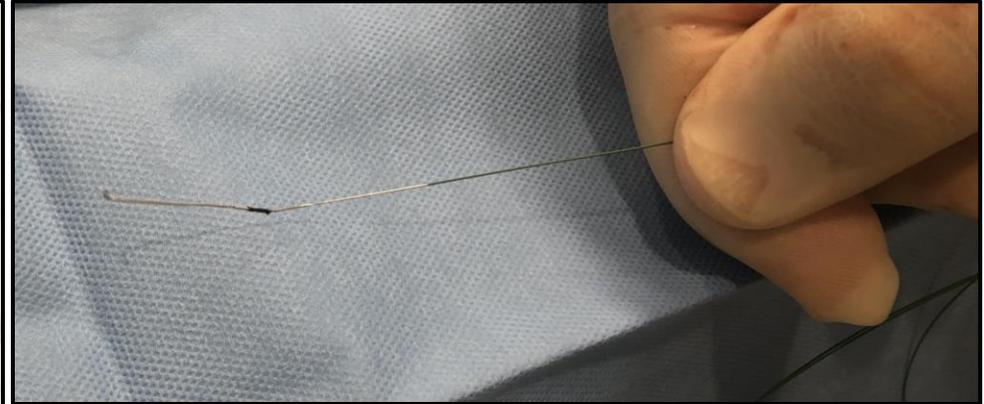
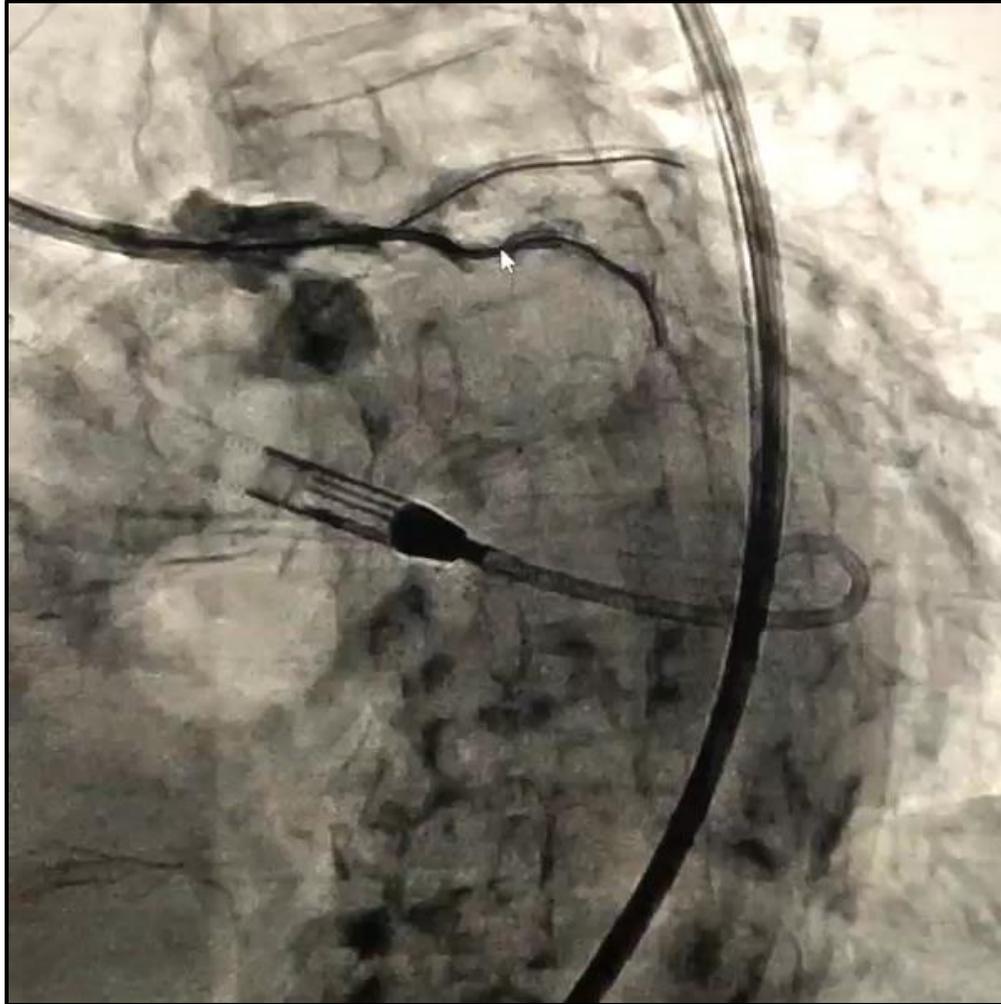


Interventional Procedure

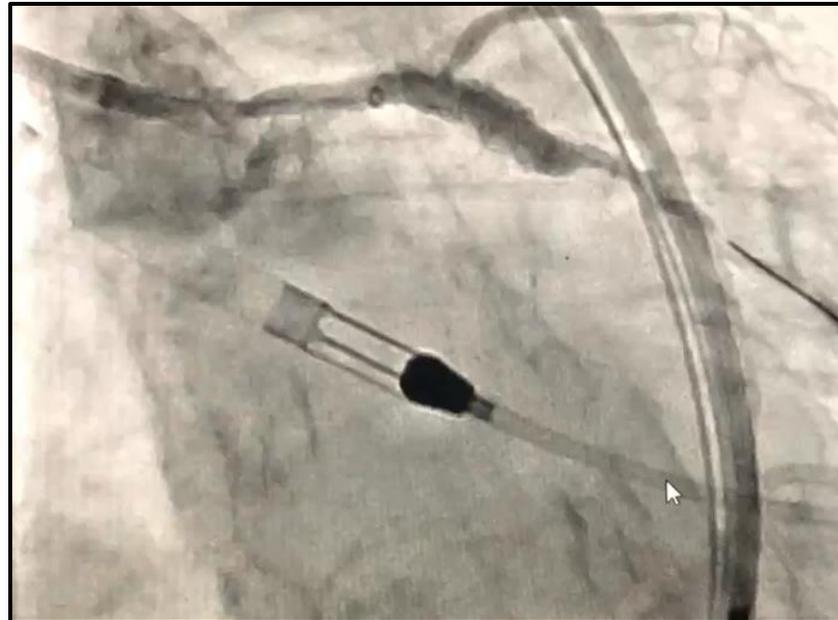
- Fielder XT wire was advanced into the distal circumflex artery followed by a Caravel catheter, to exchange the wire for a support wire (Grand Slam).
- When pulling out the Caravel, there was some resistance pulling back and the tip fractured.



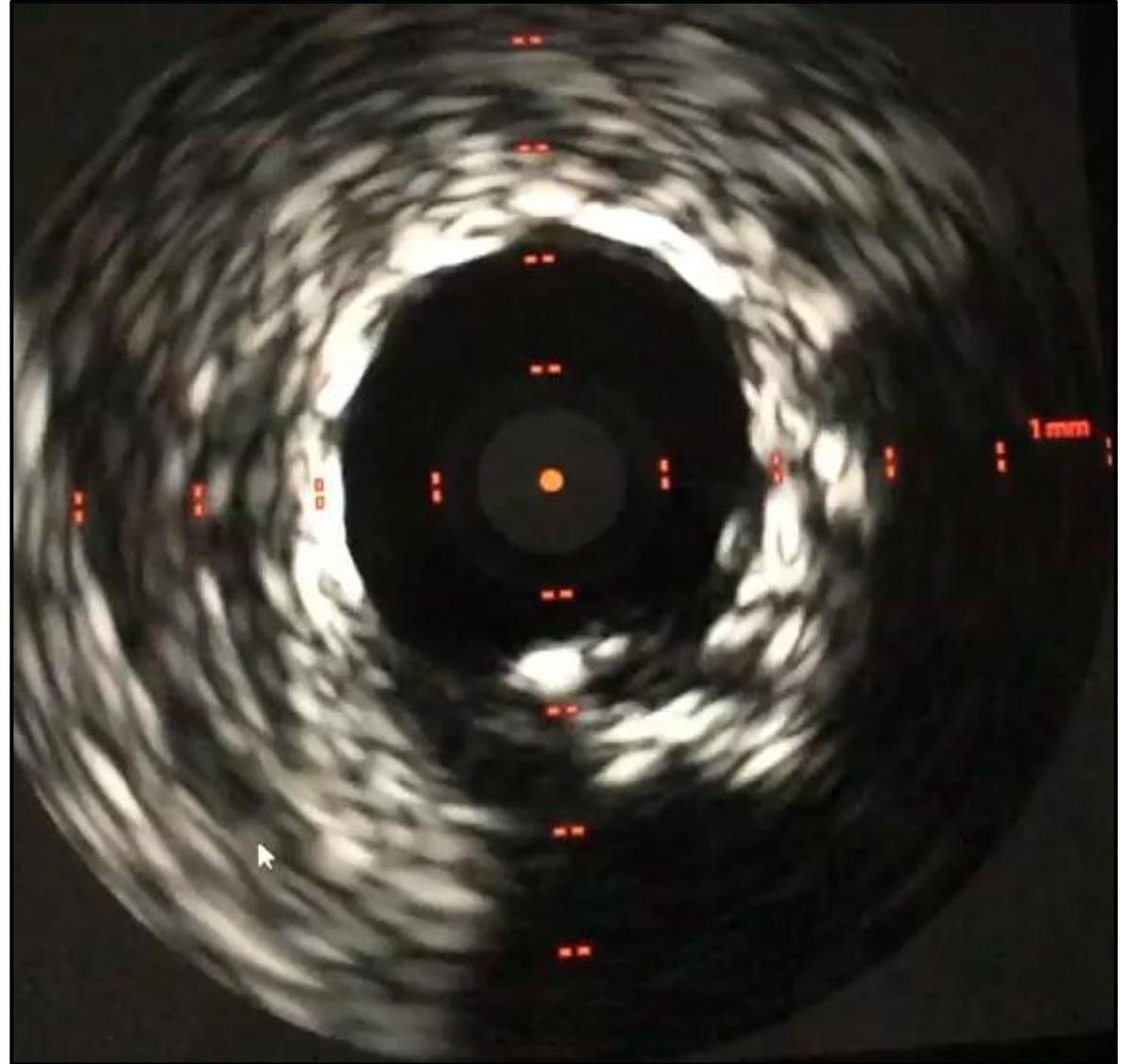
At that point, a second wire was advanced parallel to the first wire, and using a guide-liner for support, the first grand Slam wire and the fractured catheter trip were able to be retrieved.



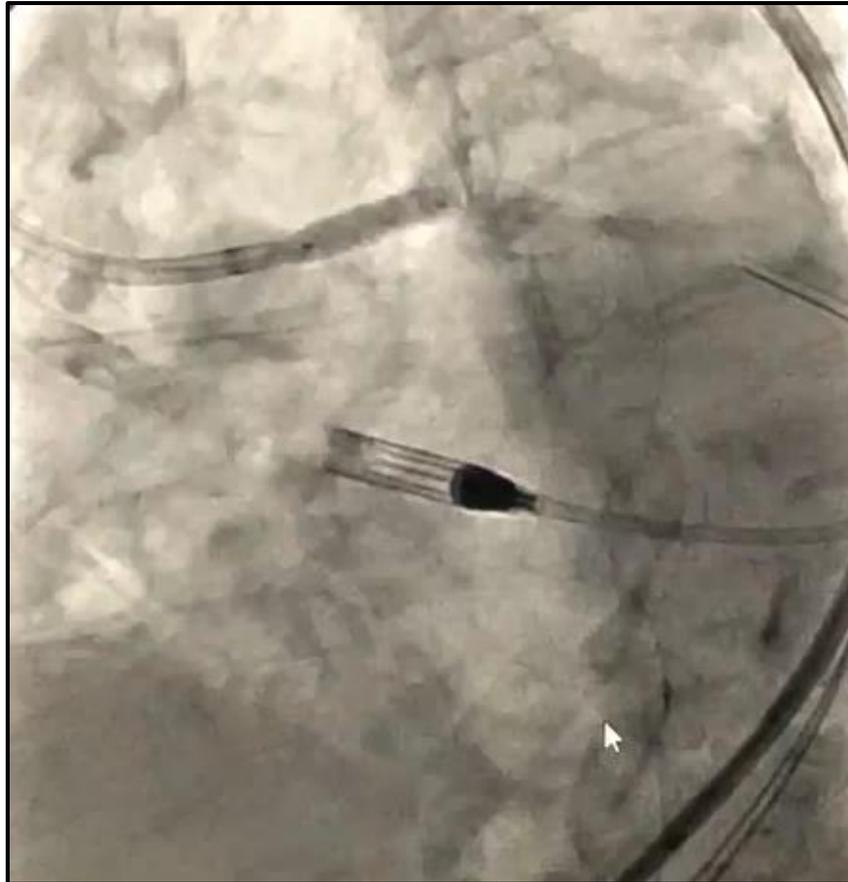
- Excimer Laser atherectomy was performed with 0.9 mm laser in the proximal and mid segment of the circumflex artery.
- After balloon pre-dilatation, a 3.5 X 16 mm PROMUS DES was deployed in the proximal circumflex extending into the left main.
- Stent was well expanded on angiography.



- Intravascular ultrasound (IVUS) showed a flap of intimal dissection proximal to the stent extending into the left main ostium and into the aorta



- A 4 mm X 12 mm PROMUS DES was placed in the left main.
- The stent was expanded which closed the dissection flap completely
- Final angiography demonstrated excellent results in the left main and proximal circumflex artery.



Hospital Course and Follow-Up

- The patient was monitored in the hospital for 48 hours after the procedure.
- She needed 2 units of blood transfusion, likely due to blood loss during the procedure combined with hemolysis due to Impella.
- There was no evidence of retroperitoneal bleed, no significant pericardial effusion on her echocardiogram and the access site did not have any significant hematoma.
- She endorsed significant improvement in her symptoms.
- She was discharged home with home care services on DAPT (with aspirin and ticagrelor) for an year.

Question

- What is the best approach for retained PCI equipment in the coronary circulation?
 - a. Conservative management- leave the fragment
 - b. Entrapment with a stent
 - c. Retrieval guided by a balloon
 - d. Micro-snare
 - e. Helical snare using two guide wires
 - f. All of the above

Correct Answer, Rationale, and Reference

- The correct answer is **f. All of the above**
- There are multiple options to deal with a retained wire or catheter fragment.
- If the retained fragment is very small, it can be left in place and allowed to endothelialize as a stent would. Alternatively, a stent can be deployed to trap the wire in place and avoid any possibility of further migration.
- If the wire fragment is very long and extends into the guiding catheter, then a balloon can be advanced to the end of the guide catheter and inflated, thereby trapping the wire against the side of the guide.
- If a longer wire is retained but does not extend into the guide, then removal with a micro-snare is the best choice.
- If a micro-snare is not readily available, then using two new guide wires through one torqueing device can create an effective helical snare to entrap the retained wire
- **SCAI Interventional Cardiology Board Review; 3rd Edition, 2018; Chapter 25, Complications of Coronary Intervention**

Conclusions and Learning Points

- Retention of PCI equipment fragments is a rare event. However, when it happens, multiple options are available. Management depends on the size of the fragment, location of the fragment within the vessel (proximal or distal), equipment available (micro-snare) and local expertise.
- Coronary dissection is much more frequent during PCI than coronary angiography alone. The guide catheter can cause coronary dissection with extension to the aortic root. However, more commonly, dissection is caused by advancement of the coronary guide wire or by balloon inflation.
- IVUS should always be utilized to evaluate stent sizing and expansion for left main and proximal LAD and circumflex PCI. In this case, intimal dissection may have been missed if we relied on angiography alone.
- Stenting the dissected area remains the standard of treatment.