



## **The Cases Where We Had To Bite The Bullet**

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### **ABSTRACT**

Guidewire fracture, though a rare complication can be encountered during percutaneous interventions. The importance of the retained guidewire in the coronaries points to fact that it can cause thrombosis, embolic events, perforation, dissection of vessel and vessel occlusion. The ways in which it can be managed, though there is no definite consensus on the same are, we can go for retrieval by snare or wire intertwining, use of second stent to crush the wire, balloon assisted fractured segment removal, open heart surgery and finally to proceed with conservative management with anticoagulation.

### **INTRODUCTION**

Coronary guidewire fracture is a rare complication of percutaneous coronary intervention (PCI). Guidewire fracture could be due to (a) entrapment into or behind stent struts, (b) wire cutting by rotational atherectomy

devices, (c) stuck wire into distal tortuous vessel, and (d) structural failure of the wire.

### **CASE NO 1**

60 year old gentleman who presented with CAD ACS STEMI IWMI on 31.12.2021 , Thrombolysed with Tenecteplase, later taken up elective angioplasty , showed LMCA with two vessel disease of RCA and LAD. Initially, d RCA was stented with 2.5 x28 DES, after OCT study, it was decided to stent from p LMCA to mid LAD . Considering the protection of major diagonal, balloon embedded technique was opted for LAD stenting, proximal LMCA to mid LAD was stented with 3.5 x48 DES. On attempting recrossing, the jailed wire got entangled in the stent struts , and got fractured , was hanging in the aortic sinus. Tried to remove the fractured wire segment with balloon assisted technique, but stent got

deformed. Thereupon, a shared decision was made in consultation with cardiovascular surgeons to proceed with conservative management as there was no chest pain, no ECG changes and no enzyme elevation. He

was started on anticoagulation. On follow up after 2 years now, he is asymptomatic and continuing anticoagulation.



## **CASE NO 2**

59 year old gentleman, case of CAD ACS STEMI IWMI on 24-11-2018 underwent thrombolysis, subsequently had exertional angina FCII, was taken up for Coronary Angiogram which showed distal LCX chronic total occlusion, JCTO 2 with rentrope II Collaterals. The lesion was crossed with GAIA 2 with microcather support, and wire was exchanged for versaturn and placed in distal OM3, Another, versaturn wire was used to wire OM2. The distal LCX to OM3 was stented with 2.5 X 19 DES. On attempted removal of jailed wire from OM2, it got entangled and fractured. Attempted removal of the wire using balloon technique, caused stent deformation. Post dilation of the stent and attempts for

removal of fractured wire failed. On further pulling both wires came out, jailed wire broke and its free edge was found floating in aortic sinus. Check injection showed guide induced dissection of pLAD extending to mid LMCA, patient developed cardiac arrest, resuscitation started, guide was disengaged and cannulated with 7 F JL 4, crossed with Fielder FC and opLMCA and p LAD was stented with 3.5 x38 DES, hence further attempts to remove the fracture wire was abandoned and decided to proceed with conservative management. We gave the option of open heart surgery to relatives, but deferred and he was started on anticoagulation. He became clinically better later, and he was discharged in stable condition.



## DISCUSSION

The guidewire consists of shaft or central core, spring coil, and coating. Central core is usually composed of stainless steel, [nitinol](#), or in combination. Spring coil is made of either platinum or tungsten. Spring coil is coated with [polytetrafluoroethylene](#), silicon, hydrophobic microglide coating, or hydrophilic epoxy hydrocoat. Guidewires are usually broken at the junction, of distal 3cm opaque region and remainder of wire where it is weakest. The incidence of such complication varies from 0.2 to 0.8%.<sup>1</sup> The complication arises frequently when we go repeated use of guidewires as in our case.<sup>2</sup> Entrapment, excessive rotation, and forceful traction of the guide wires are responsible factors.<sup>3</sup> Retained guide wire fragments in the coronary tree can cause thrombosis, embolic phenomena, dissection, perforation, and vessel occlusion. The jailed wire will be difficult to remove if there is a side branch at 90 degrees, also if there is carinal narrowing with plaque shift in main vessel. The described techniques for retrieval include snaring guidewires, paired guidewires together, wire loop snares.

All interventional cardiologists should be familiar with different retrieval techniques. One can take two or more guidewires to intertwine the fractured guidewire and then try to bring it back into the guide catheter. Use of different coronary snares also help many times. Stent should be used to crush the wire into the vessel wall can be tried. We can pass a second guidewire and pass a small sized semi compliant balloon and dilate it and disentangle wire, helping its removal. When all these measures fail then, surgery is the next method and surgical options are considered.<sup>4</sup> In small branches of the vessel, we can consider conservative measures using anticoagulation. In our two cases, all our efforts failed to retrieve the fractured wire, and we decided to proceed with conservative management.

## CONCLUSION

Guidewire fracture is an infrequent complication of angioplasties, and is seen in complex procedures like bifurcation stenting. When attempts to retrieve the broken guidewire fail, we can also consider conservative management with anticoagulation as a

shared decision with cardiovascular surgeons after considering the option of open heart surgery, as fractured guidewire will always be a nidus for thrombus formation. On follow up, we found both our patients are asymptomatic till date.

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