Guidewire Fracture during Crossing A Chronic Coronary Total Occlusion: A Troublesome Experience

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Abstract
Increased interest focusing on coronary chronic total occlusions has emerged since several studies have proven improved cardiovascular outcomes and quality of life after successful revascularization of chronic total occlusion (CTO) [1]. CTO of an epicardial coronary artery is one of the leading challenging complex lesion type when percutaneous coronary intervention (PCI) is indicated. Advanced antegrade and retrograde techniques performed with dedicated equipment have provided significant improvements in procedural success and decrease periprocedural complications leading to PCI failure. However, entrapment and fracture of intracoronary devices may complicate PCI procedures even though these occur rarely. We represent a case of a guidewire fracture and entrapment in the subintimal space during antegrade crossing of a CTO.

Keywords
Complication, Guidewire, Fracture, Entrapment

Introduction
Increased interest focusing on coronary chronic total occlusions has emerged since several studies have proven improved cardiovascular outcomes and quality of life after successful revascularization of chronic total occlusion (CTO) [1]. CTO of an epicardial coronary artery is one of the leading challenging complex lesion type when percutaneous coronary intervention (PCI) is indicated. Advanced antegrade and retrograde techniques performed with dedicated equipment have provided significant improvements in procedural success and decrease periprocedural complications leading to PCI failure [2,3]. However, in spite of these advanced equipment and appropriate techniques by experienced operators, periprocedural complications may occur which may also result in procedural failure, increased morbidity and mortality. We represent a case of a right coronary artery CTO procedure which was complicated after fracture and entrapment of the guidewire in the sub-intimal space during antegrade crossing of the occlusion.

Case Report
A 56-years old man was admitted to our cardiology outpatient department with Canadian Cardiac Society Class II stable angina pectoris that has been continuing for the last six months. His past medical history revealed hypertension and hyperlipidemia. Myocardial perfusion scintigraphy demonstrated inferior ischemia and diagnostic coronary angiography showed a long CTO of the right coronary artery (RCA) and retrograde distal filling of RCA from septal collateral channels of left anterior descending artery (Figure 1). Afterwards, percutaneous coronary intervention (PCI) to CTO of RCA was planned. We decided to recanalize the occluded vessel by...
Discussion

Entrapment of the guidewires in the coronary arteries is rarely seen but may be complex to handle. The reported incidence of guidewire fracture varies between 0.02–0.08% of cases undergoing PCI [4,5]. Hartzler et al. reported eight cases of guidewire entrapment and only one case of retained guidewire [6]. Treatment is controversial, since retained intraluminal guidewire can cause thrombosis and ischemia and retrieval is strongly suggested [7-9]. Surgery and different percutaneous techniques can be used for removing these entrapped guidewires [9-12]. Similar to us, there are cases of periprocedural guidewire entrapments with device loss successfully treated without snaring [4,5]. The possibility of guidewire fracture and entrapment increases in conditions in which guidewire is trapped between two stent struts, or between the guiding catheter and the artery. Over rotation of the guidewire and forceful manipulations in complex lesion anatomy such as severe calcification and/or chronic total occlusions may also cause guidewire fracture as in our case. There were two reasons why we did not try to remove it. The first reason was the patient’s clinical condition and control angiographic evaluation of the angiographic views including collaterals, proximal stump, severe calcification, lesion length and side branches adjacent to the occlusion. However, more importantly, forceful manipulations should be avoided especially in cases of severe calcifications, long occlusions and excessive tortuosity. Over rotation and aggressive pushing of stiff guidewires could easily result in entrapment and device loss in the coronary artery and should also be avoided. Even though, snaring of the entrapped guidewire is strongly recommended in majority of the cases, covering the entrapped material with a stent could be the alternative treatment option in such conditions as in our case.

References


