Broken Guidewire Fragment

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Abstract

Keywords

- coronary intervention
- coronary artery disease
- stent

Advances in technology and greater operator experience have increased the success rate of percutaneous coronary intervention while lowering the complication rates. The broken guidewire is a rare complication of percutaneous coronary intervention. We present this rare complication in a patient who was medically treated.

Advances in technology and greater operator experience have increased the success rate of percutaneous coronary intervention (PCI) while lowering the complication rates. However, complications still occur. The incidence of broken guidewires is 0.1 to 0.8%.¹ Most reported cases have been treated either percutaneously or surgically. We present this rare complication in a patient who was medically treated.

Case Report

A 67-year-old woman with chest pain for 6 months was admitted to the hospital. Her medical history was remarkable for 10 years of diabetes mellitus, and for 15 years of hypertension. Physical examination and electrocardiography (ECG) were normal. The treadmill test revealed marked ST segment depression in inferolateral leads. Coronary angiography showed significant stenosis in the mid part of the circumflex artery (CFX), and in the proximal part of the well-developed intermediate artery (IMA) (►Fig. 1). A hydrophilic light support (HLS) guidewire was advanced in the distal CFX, and a 2.75 mm x 18 mm Biolimus A9-eluting coronary stent (BES) was placed. Later on, same HLS guidewire were placed in the distal IMA. While advancing the balloon, the guiding catheter came out from the left main ostium, and the operator decided to advance the guidewire more distally. The guidewire was positioned in a small side branch (SB) coming from the mid part of the IMA. The guidewire was kinked and stuck in the SB, and it could not to be retracted. With forcefull retraction, the proximal part of the guidewire came out from the coronary system while the distal part of the guidewire was still in the SB. The attempts to place another guidewire to

twist around the retained guidewire, and a snare into the SB were unsuccessful. The patient did not experience any compliant, and the contrast injection showed no leakage at the site of the broken guidewire. The operator decided to continue the procedure. Another guidewire was advanced in the IMA and after predilatation, a 2.75 mm x 14 mm BES was placed. After IMA stenting, the ostium of the CFX was compromised, and the kissing balloon inflation in the ostia of the CFX and IMA performed at high pressure (►Fig. 2). The procedure was finished with coronary angiography of the left coronary system, and no leakage was observed (►Fig. 3). The patient was taken to the coronary intensive care unit. Hypotension developed two hours after the procedure, and echocardiography showed large pericardial effusion. Pericardial drainage was performed at the angiography laboratory, and pigtail catheter left in the pericardial sac for 24 hours. The patient became clinically stabile and echocardiography revealed no pericardial effusion. The patient was discharged on the seventh day of his hospitalization with recommendation of 1 year dual anti platelet therapy. The patient was free of symptoms for the following 6 months.

Discussion

The complications associated with guidewires during PCI are rare, and often unrecognized. Hartzler et al reported only eight cases of fracture, and retention of a guidewire fragment within the coronary circulation in 5,400 PCI procedures.¹ The traction on the guidewire that was trapped in a small branch (as in our case) or in between the guiding catheter and the coronary artery, and over rotation of the guidewire are

Fig. 1 Severe stenoses in the circumflex and intermediate arteries.

Fig. 3 Optimal results after stenting.

Fig. 2 Broken guidewire.

possible mechanisms.² It is generally believed that the retained guidewire material may result in thrombosis and ischemia, and should be removed from the coronary system.^{1,2} Though, it can be left in the site of chronic total occlusion.^{1,2} Several percutaneous techniques have been described to remove the retained material in the coronary system.^{3–5} A graft coronary stent or bare metal stents have been used to isolate the retained guidewire from the blood stream.^{5,6} Surgery is also an option.^{7,8} In our case, the guidewire was stuck in the small SB and possibly with forceful withdrawal broke the guidewire. Two guidewires were tried to twist around the retained guidewire, but it was not possible to do it due to small size of the SB. Snare was not tried because of small size of the SB. The distal IMA was too small to use a stent to isolate the retained guidewire from blood stream. The operators did not choose surgery due to lack of the any cardiac symptoms, ECG changes, and visible leakage from the SB. The procedure was finished with another guidewire while the material was left inside the SB. Although, no visible leakage was observed during the angiogram, the large pericardial effusion and eventually cardiac tamponade

was developed. This may result from very tiny leakage that could not be seen with angiogram. After pericardial drainage, the effusion was not repeated. Our patient did not have any cardiac symptom, and cardiac enzymes did not raised during the hospitalization.

In conclusion, the broken guidewire is a rare but a serious complication. The position of the guidewire is very important to prevent this complication. The described catheter techniques to removing the retrieve the retained guidewire might not succeed. Medical therapy, and follow-up with echocardiography might be a good option in asymptomatic patients when it is not possible to retrieval the remnant of the guidewire.

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