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Research Letter

Retrieval of fractured guide wire with balloon support in intermediate coronary artery: A rare complication and management



Keywords:

Fractured guide wire
Percutaneous coronary intervention
Balloon support

Fracture of coronary guide wire during percutaneous coronary intervention is a very uncommon complication.¹ Guide wire remnants may produce important consequences, such as intracoronary thrombus formation, embolization, and perforation.^{1,2} There are a few techniques being recommended for the treatment of fractured guide wire remnants. Here, we present a case whereby we managed to extract the coronary guide wire fragment in the artery with balloon support.

A 43-year-old male with a history of smoking, hypercholesterolemia, hypertension, and a family history of coronary artery disease was admitted with stable angina pectoris. Electrocardiogram on admission showed normal sinus rhythm with negative T waves in lead II, III, and a VF. Exercise treadmill test on the Bruce protocol revealed 2 mm ST depression in V4–V6 at stage 3. Left ventricular ejection fraction was 48% with the Simpson method. Angiography demonstrated a significant proximal stenosis in left intermediate coronary artery (IMA) (Fig. 1A). Using a 7F extra backup (EBU, Medtronic, Inc., Minneapolis, USA) guiding catheter, a 0.014-inch hydrophilic guide wire (HI-TORQUE PILOT 50[®] Guide Wire, Abbott, USA) was introduced into the IMA with a balloon (2.0 × 15 mm Maverick balloon, Boston Scientific, USA). The guide wire crossed the lesion sub-intimally and became trapped. The lesion was difficult to cross. During this struggle, the distal part of the guide wire became inadvertently wedged in a small side branch. The wire tip could not be freed and withdrawal attempts led to wire fracture. The distal fractured wire remained in the side branch and the proximal fractured wire was shaking in the IMA. A 1.5 × 1.5 mm balloon (Maverick balloon, Boston Scientific, USA) was advanced over a second long

hydrophilic guide wire, and then was inflated in the distal part of the artery to withdraw the fragment of the wire. The fractured wire was wriggled out of the side branch and dropped in IMA. The distal 1.5 cm remained in the IMA (Fig. 1B). The fractured wire was not withdrawn and a 2.0 × 15 mm distal balloon inflation retrieval was attempted. The fractured guide wire was withdrawn by cannulation EBU catheter into the ostium of the IMA and the wire fragment was completely extracted outside through the catheter (Fig. 1C). The proximal lesion was successfully stented using 2.75 × 32 mm stent (Promus Element Plus) (Fig. 1D). The patient was treated with intravenous heparin for 48 h and discharged on aspirin and clopidogrel. At the 6-month follow-up, the patient was free of symptoms.

There are several treatment choices recommended for the management of fractured guide wires, including conservative treatment, loop snare removal, balloon angioplasty over guide wire, two- or three-wire rotation, stenting over the retained wire, and surgery (Table 1). Interventional methods and/or conservative treatment should be preferred over the surgery for most of the cases. If entrapped guide wire remnants are fragmented and nonmetallic or localized in the distal part of the vessels or chronically occluded vessels, they can be followed up conservatively. Another choice is leaving the guide wire fragment within the coronary artery with systemic anticoagulation. Such fragments are less thrombogenic compared with metallic parts and can be mobilized or draw

Table 1 – Methods for the management of fractured guide wires.

1. Conservative follow-up
2. Interventional techniques
 - Extraction with snare catheter
 - Balloon angioplasty over guide wire
 - Stenting over guide wire
 - Mobilization and fixing into small side branch
3. Surgery

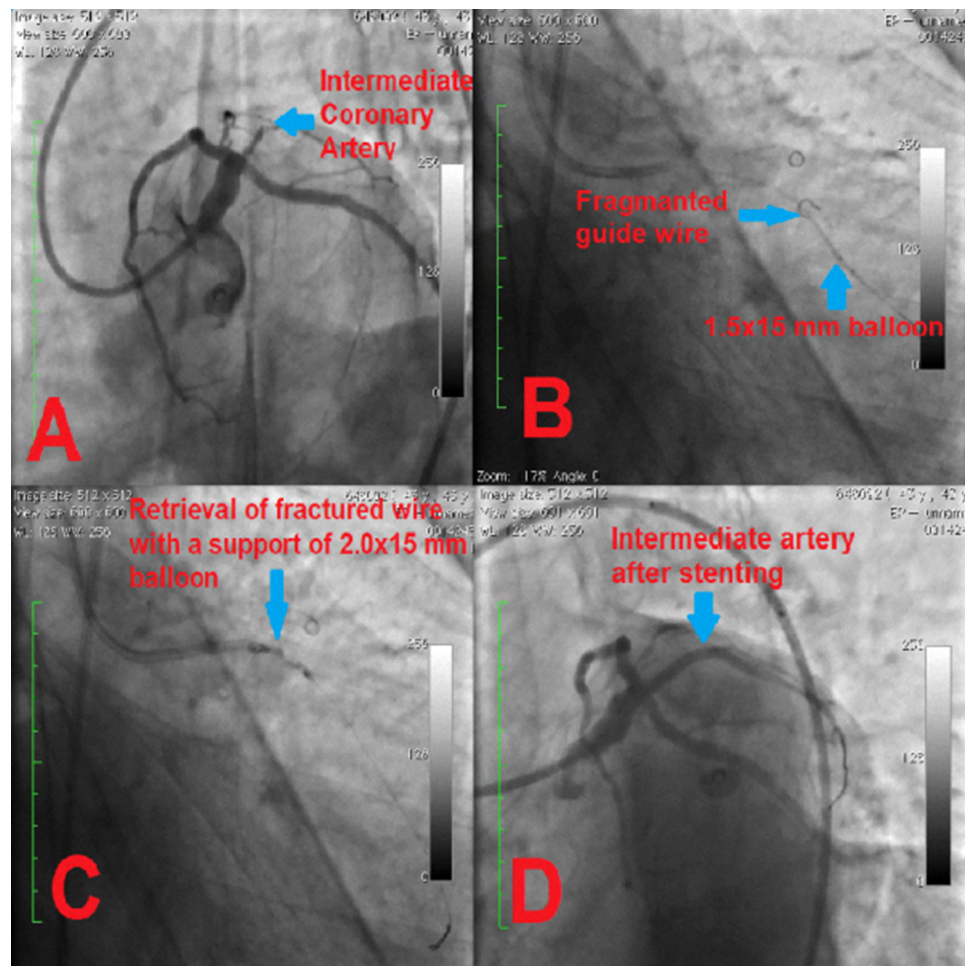


Fig. 1 – Angiography demonstrated a significant proximal stenosis in left intermediate coronary artery (A). The distal 1.5 cm remained in the IMA (B) and the wire fragment was completely extracted outside through the catheter (C). The proximal lesion was successfully stented using Promus Element Plus (D).

the guide wire to a side branch with its slippery properties. Small and underinflated balloon catheters can be used for mobilization and dragging guide wire fragments into the lumen of a side branch. Extracting the guide wire with a snare catheter can be used in proximal segment entrapment. If entrapped guide wires stick to stenotic lesions and are fixed in the surface of lesions, they should be stented. Surgery should be considered if interventional techniques are unsuccessful, in the presence of larger and longer entrapped fragments, or if entrapment is within the left main coronary artery and accompanied by multivessel disease.^{2–5}

In our case, we first started with balloon support to withdraw the fragment of the wire and managed to take it into the catheter. In conclusion, if the guide wire enters a small branch of an artery and becomes trapped and fractured, an alternative for the retrieval with a snare or stenting is to pass the lesion with a second guide wire and retrieve the retained filament with balloon support.

Conflicts of interest

The authors have none to declare.

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Available online 3 March 2016

<http://dx.doi.org/10.1016/j.ihj.2016.02.012>
0019-4832/

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