

Case Report

Successful Retrieval of A Migrated Guide Wire Using an Angioplasty Balloon and Guiding Catheter

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Abstract

Loss of a guide wire in the radial artery is an occasional complication occurring with transradial catheterization. We report a novel, simple approach for retrieval of a migrated guide wire after failure to capture the guide wire with a gooseneck snare.

Keywords: Percutaneous coronary intervention; Coronary angiography; Complication; Guide wire

Introduction

Coronary intervention via the radial artery has become a routine and standard practice. Therefore, developing treatments for complications of transradial catheterization is necessary [1,2]. Inadvertent loss of a guide wire occasionally occurs during advancement of the radial sheath, especially for inexperienced operators. Using a snare device to retrieve the guide wire is the most commonly used approach [3,4]. In

case of failure to capture the guide wire, surgical intervention may be needed. Herein, we present a novel, simple approach for retrieval of a migrated guide wire by combined use of an angioplasty balloon and a guiding catheter.

Case Report

A 72-year-old male patient was admitted for 3 years of intermittent chest pain and underwent diagnostic angiography. After successful puncture, a 45 cm hydrophilic-coated guide wire (HCGW, Terumo, Japan) was placed into the right radial artery, followed by 6-Fr radial sheath insertion. After removal of the dilator, it was determined that the HCGW was pushed into the radial artery (Figure 1A). Using a 6-Fr JR3.5 guiding catheter (Vista Brite Tip, Cordis, U.S), a 15mm gooseneck snare (Amplatz, Medtronic, U.S) was introduced into the radial artery to capture the HCGW. However, the gooseneck snare failed to capture the wire after a one-hour attempt. Then, the operator decided to use a snare to capture the distal tip of the HCGW via femoral arterial access. Followed by left femoral artery puncture, a 6-Fr femoral sheath was inserted and a 6-Fr catheter (Simmons, Cook, U.S) was engaged at the right subclavian artery. A 15mm gooseneck snare was used to capture the HCGW at the site of the brachial artery (Figure 1B). However, this attempt failed once again.

Subsequently, the 6-Fr. JR3.5 guiding catheter was placed into the radial sheath. One 0.014" Sion guide wire (Asahi, Japan) was introduced into the guiding catheter and crossed over the whole segment of the HCGW (Figure 1C). Over the Sion guide wire, a 2.5mm×15mm angioplasty balloon (Sprinter, Medtronic, U.S) was placed at the middle segment of

the HCGW and inflated at 6 atm for anchoring. Maintaining 6 atm, the balloon was gently pulled back toward the guiding catheter. Due to being anchored, the HCGW was synchronously retreated with the movement of the inflated balloon. When the HCGW was adjacent to the tip of the guiding catheter, the guiding catheter was advanced and adjusted to meet the guide wire (Figure 1D). The HCGW was successfully pulled into the guiding catheter with the retreat of the inflated balloon (Figure 1E). After the inflated balloon entered the guiding catheter, 6 atm of pressure was maintained to anchor the HCGW. Finally, the entire system including HCGW, JR3.5, balloon, and Sion guide wire were completely retrieved from the radial sheath (Figure 1F). After that, the patient underwent diagnostic angiography and was discharged the following day. No complications occurred for the remainder of the procedure and after the procedure.

Discussion

The lost guide wire in the radial artery may result in potential risk of complications such as vascular perforation, spasm and thrombus formation. Using a snare to retrieve the guide wire is an effective, safe approach. However, a mismatched size or shape of the snare, or challenging location of the guide wire (such as adherent to the vessel wall) often result in capture failure and as a result, surgical incision of the radial artery becomes the next resort. However, surgical retrieval is potentially associated with other unpredictable complications such as nerve injury, incomplete artery occlusion and upper limb dysfunction. Compared with snare capture and surgical incision, our report provides a more simple, efficient and easily used approach to retrieve the guide wire

with the combined use of the angioplasty balloon and guiding catheter. Several reports have described the application of the balloon for retrieval of a foreign body including an entrapped guide wire in the coronary artery and a broken catheter fragment in the peripheral arteries [5,6]. To our knowledge, this is the first report of a balloon anchoring and retreating technique for the retrieval of a migrated HCGW in the radial artery.

There are several critical points that warrant discussion. Firstly, when retreating the inflated balloon, the operator should pay attention to the resistance from the stiff tip of the guide wire and frequently assess the patient for pain symptoms. Once the operator perceives resistance from the tip of the guide wire and the patient complains of pain, balloon retreat should be immediately ceased and examination will be taken to ascertain whether the vessel is injured by the stiff tip of the guide wire. Secondly, an appropriate balloon size should be chosen and proper inflation pressure should be maintained. An oversized balloon or excessive pressure may cause vessel injury. Conversely, an undersized balloon or insufficient inflation pressure may not be enough to fix the guide wire. For most patients, a 2.0 mm to 2.5 mm balloon with 6-8 atm will be sufficient. Thirdly, taking efforts to shorten the distance between the guiding catheter and the guide wire will be helpful for the guide wire to enter the guiding catheter. If the guide wire in the radial or brachial artery migrates too far from the radial sheath, then the balloon-assisted technique (remaining balloon half outside guiding catheter with 4-6 atm and pushing guiding catheter forward) is recommended in order to advance the guiding catheter close enough to the guide wire. In the present case, we

did not use this technique because the guide wire had not migrated too far from the radial sheath.

Conclusion

As a novel approach different from snare capture, an anchoring and retreating technique by combined use of the angioplasty balloon and guiding catheter is simple, safe and effective, and can be used as an important alternative for retrieval of a guide wire lost in the radial artery.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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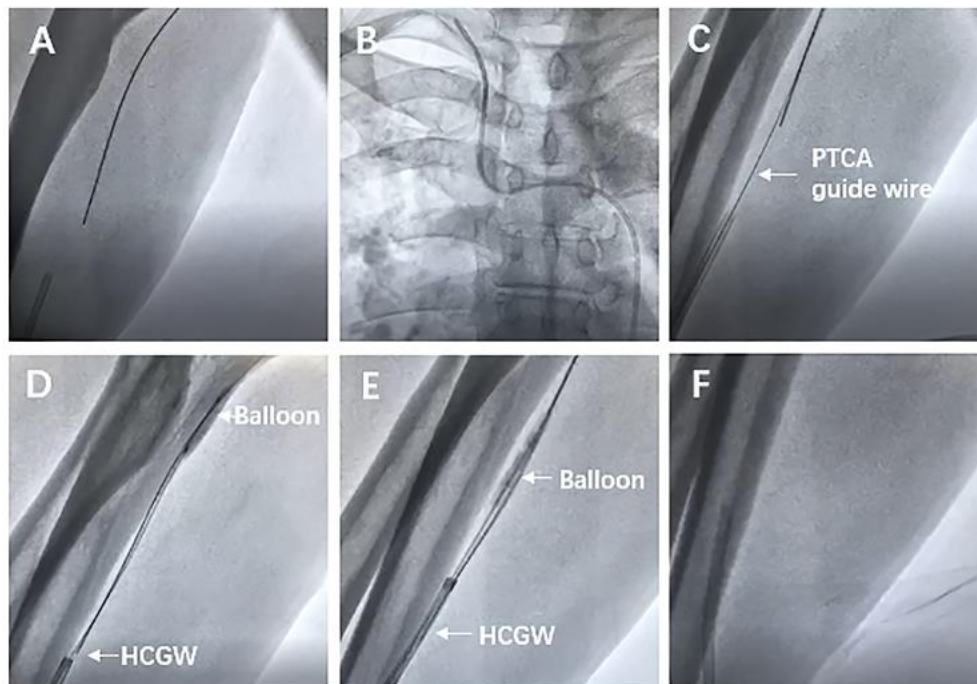


Figure 1: Retrieval of the guide wire using a balloon anchoring and retreating technique. (A) Migrated hydrophilic-coated guide wire in the right radial artery. (B) Attempted to capture guide wire by use of a snare via femoral artery but failed. (C) A 0.014" PTCA guide wire was introduced into the radial artery. (D) The tip of guide wire was retreated adjacent to the guiding catheter with the movement of inflated balloon. (E) The guide wire entered the guiding catheter by adjusting the guiding catheter and pulling back the inflated balloon. (F) The guide wire was successfully retreated.

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