

The Wholey Wire in the Radial Age

How old technology still has a place in radial access catheterizations

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Transradial access for diagnostic and interventional coronary procedures is preferred in many catheterization labs because of its lower vascular complication rate compared to the femoral approach. Greater patient comfort, reduced time to ambulation, and shorter hospital stays are also benefits. However, in up to 15% of radial cases, access to the heart can be complicated by difficult, tortuous vascular anatomy, most commonly occurring as a radial loop near the elbow. In older patients, there can be significant calcification and tortuosity involving the subclavian and innominate arteries, making catheter passage difficult. To operate a dedicated radial catheterization lab, special catheters and guidewires are essential to navigate these areas. We present several cases in which use of the Wholey Floppy wire (Covidien, Mansfield, MA) was instrumental in negotiating difficult anatomy during radial catheterization cases.

CASE 1

A 70-year-old woman with chronic hypertension and hyperlipidemia was admitted to the coronary care unit with chest pain and nonspecific ST changes on electrocardiography that subsequently normalized. Cardiac enzymes were negative for infarction, and echocardiography revealed normal left ventricular function.

Heart catheterization was performed using the right radial approach. A 5-F sheath was placed in the right radial artery without difficulty. Numerous attempts were made to pass a J wire; however, the wire could not be advanced past the elbow. Subsequent angiography performed through the sheath (Figure 1) revealed abnormally high bifurcation of the brachial artery with a small-cal-

iber radial artery, with multiple areas of narrowing, probably representing spasm from attempted passage of the J wire.

A 0.014-inch Choice PT wire (Boston Scientific Corporation, Natick, MA) was initially used to try to pass this area; however, the tip continued to enter multiple side branches, and the wire could not be passed. A 0.035-inch Wholey Floppy wire was then used to cross the area without difficulty, and angiography showed a significant right coronary artery lesion that was stented using a 6-F system.

CASE 2

A 68-year-old woman with chronic atrial fibrillation on warfarin was admitted to the hospital with unstable angina symptoms. On the second hospital day, she underwent heart catheterization from the right radial approach with an INR of 2.0. The 23-cm, 5-F radial sheath was only inserted halfway because the 0.021-inch wire from the radial sheath kit would hang up near the elbow and could not be advanced any further. The sheath dila-



Figure 1. High bifurcation of radial artery with spasm.

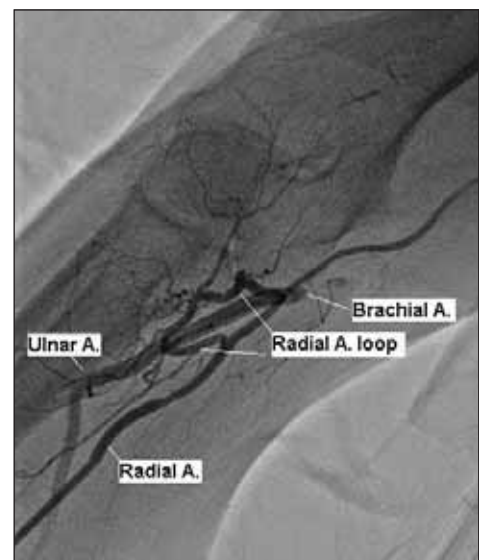


Figure 2. An example of radial artery loop.

“We have found that the Wholey Floppy wire is instrumental in running a dedicated radial catheterization lab.”

tor and wire were removed, and the usual radial cocktail was administered through the sideport of the sheath. Subsequent angiography performed through the sheath (Figure 2) revealed a significant radial loop. Because of the patient being on warfarin with a high INR, converting to a femoral approach was not considered ideal. A 0.035-inch Wholey Floppy wire was used to easily traverse the radial loop. Once the stiffer portion of the Wholey wire crossed the loop, the artery significantly straightened, and the case was completed with a 5-F, JR4 guiding catheter used to stent the right coronary artery.

DISCUSSION

Most radial artery sheath kits contain 0.021-inch wires that are good at initial cannulation of the radial artery but relatively poor at negotiating tortuosities further upstream. The wire can frequently get hung up at difficult anatomy at the elbow. In this situation, the 23-cm sheath is frequently delivered halfway into the radial artery, and a different wire is used to traverse areas of tortuosity. A regular J wire frequently will not traverse areas of even mild tortuosity. Coronary 0.014-inch wires with hydrophilic tips have been used; however, these wires tend to find small side branches, and the risk of perforation is not small. Likewise, the use of a 0.035-inch, angled hydrophilic Glidewire (Terumo Interventional Systems, Somerset, NJ) has been tried, with similar problems of inadvertent side branch entry and potential vessel perforation. Many times, even if the Glidewire is successful in negotiating difficult anatomy, a catheter may not be able to be tracked over it because of its soft body.

Our catheterization lab is dedicated to the radial approach and, since 1997, we have performed more than 11,000 diagnostic and interventional coronary and peripheral vascular procedures using the radial approach. Because we are a teaching institution, the majority of the diagnostic procedures are performed by a second-year fellow as the primary operator. For that reason, it is important to have a wire that is safe and easy to manipulate when difficulties arise. We have found that the 0.035-inch Wholey Floppy wire has become the wire of choice for navigating difficult anatomy in the area of the elbow and in tortuous, calcified subclavian arteries. The soft,

atraumatic tip tends to stay out of side branches, and we have not experienced a single case of vessel perforation from this wire. Once access to the ascending aorta has been obtained, the gradual transition from the floppy portion to the stiffer portion aids in tracking the coronary catheter through very tortuous anatomy.

A major benefit of the Wholey Floppy wire is that it has been on the market essentially unchanged for over 25 years, a virtual dinosaur when compared to other catheters and wires in interventional cardiology. Experienced operators know what the wire can and cannot do. It cannot reliably cross chronic total occlusions of the arterial system. It is not a good wire to cross the aortic valve because of its floppy tip. It is an excellent wire for safely negotiating difficult anatomy, including severely tortuous, stenotic, and calcified lesions in the peripheral arterial system. As opposed to the hydrophilic wires, it is safe to advance a Wholey Floppy wire when the tip is prolapsed, and this frequently keeps it out of side branches. Unlike 0.035-inch hydrophilic wires, the Wholey Floppy wire has 1:1 torqueability and excellent steerability. There is also much better tactile feel and control of the Wholey Floppy wire when negotiating tortuous vessels. Hydrophilic wires tend to jump uncontrollably through difficult anatomy, and the risk of dissection is always a concern.

Wholey wires come in 145- and 175-cm lengths and can be extended using the LOC screw-on exchange system. They also come in exchange lengths of 260 and 300 cm, both standard and extra support. The TAD wire (Covidien) has a tapered 0.018-inch tip that transitions to a 0.035-inch body and may be useful for crossing very tight lesions.

SUMMARY

Performing heart catheterizations from the radial approach requires a special skill set, and frequently, special equipment is required given the tortuous nature of the arterial anatomy of the arm. We have found that the Wholey Floppy wire is instrumental in running a dedicated radial catheterization lab. ■

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