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Research Letter

Pigtail assisted tracking of guide catheter for navigating the difficult radial: Overcoming the “razor effect”



ABSTRACT

Keywords:

Transradial angioplasty
Radial artery loop
Radial artery spasm
Tortuous radial artery

During transradial procedures, sharp edge of the guide catheter tip may act like a “razor-blade” and can prevent the catheter navigation. It is especially common with radial artery loop, tortuous radial artery and radial artery spasm. We describe a cost effective and easy technique which overcomes this “razor-blade” effect and helps in tracking the guide catheter in complex radial anatomy for the easy and successful completion of procedure.

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1. Introduction

Sometimes, during transradial angioplasty (TRA) it is really difficult to track a guide catheter through the difficult radial anatomy like complex radial loops, tortuous radial artery, radial artery spasm and small caliber radial artery. In these situations, the sharp edge of the guide catheter tip produces a “razor blade effect” which can prevent the guide catheter navigation and sometimes can lead to the radial artery perforation and forearm hematoma formation.¹ Here, we describe a technique for navigating the guide catheter in three different types of difficult radial artery anatomy.

2. Case report

2.1. Case 1

A 61-year-old diabetic female with recent onset angina was taken up for transradial coronary angiography and possible angioplasty. After insertion of a 6 Fr radial sheath (Radifocus, Terumo, Japan), marked resistance was noted in passing the standard 0.035” J tipped guidewire (Medtronic Inc., Minneapolis,

USA). Guidewire could not cross the elbow region. Radial artery angiogram was done through the side port of the introducer sheath and showed 360° radial loop (Fig. 1a). Loop was easily crossed with a hydrophilic 0.035” J-tip guidewire (Glidewire, Terumo, Japan). Loop was straightened by the guidewire (Fig. 1b). Angiography was easily completed using 5 Fr Optitorque TIG catheter (Terumo, Japan) and showed severe disease in the left anterior descending (LAD) artery. We proceeded for the angioplasty of LAD. Catheter was taken out over an exchange wire (Guidewire M Stiff type, Terumo, Japan). But, 6 Fr EBU guide catheter (Launcher, Medtronic Inc., Minneapolis, USA) could not be negotiated through the radial artery loop. Marked resistance in the advancement of catheter was felt below the elbow region. Patient complaints of severe forearm pain. Repeated attempts were failed even after the administration of multiple doses of spasmolytic cocktail. “Razor-blade” effect was thought to be the reason.

Then, a 5 Fr pigtail catheter (Boston Scientific, USA) was inserted inside the 6 Fr EBU guide catheter. Pigtail catheter went easily inside the guiding catheter with both proximal as well as its distal ends outside the guide catheter (Fig. 2). Both the ends of pigtail catheter were outside the guide catheter because of relatively lengthier pigtail catheter (110 cm) than the guide catheter (100 cm). This assembly was tracked over the exchange

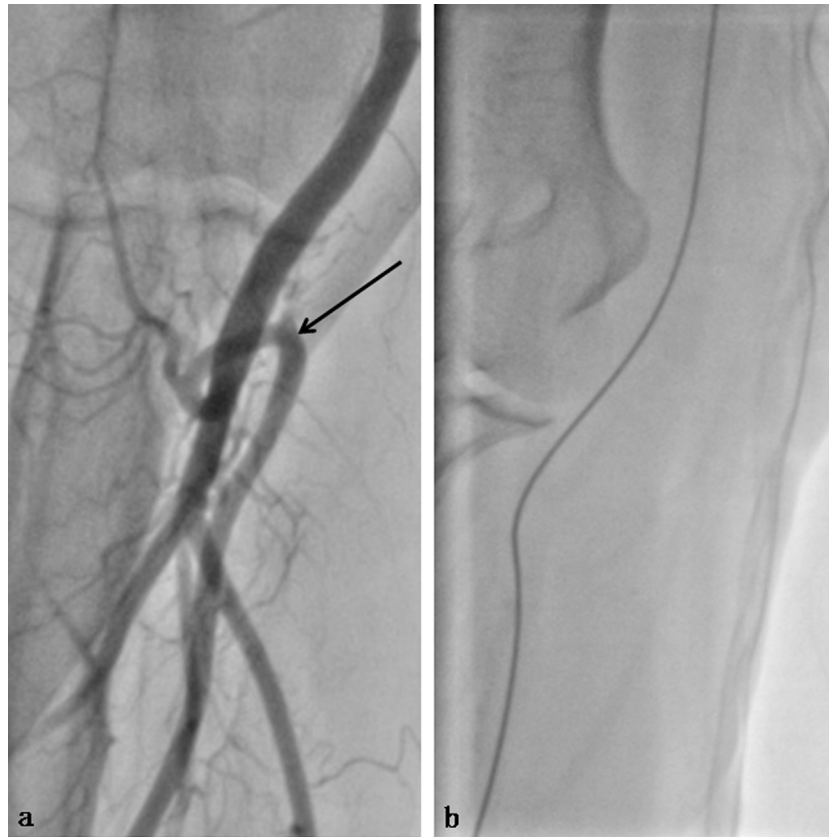


Fig. 1 – (a) Radial angiogram revealing 360° loop in the proximal segment of radial artery (black arrow). (b) Loop was easily crossed with 0.035" hydrophilic J-tip guidewire. Note the straightening of radial loop by the guidewire.

wire without any resistance up till ascending aorta (Fig. 3). Pigtail catheter and the exchange wire were taken out from the guide catheter and subsequently left coronary artery was easily hooked with the guide catheter in usual manner. LAD stenting was completed without any complication. Post procedure radial angiogram was done again through the side port of introducer sheath and revealed no damage to the radial artery. Radial pulse was well felt at the time of discharge.

2.2. Case 2

A 60-year-old diabetic female with recent non ST elevation myocardial infarction with near total block of LAD and normal other coronaries was taken up for TRA of LAD. But, 6 Fr EBU guide catheter could not be navigated through the radial artery. Marked resistance in the advancement of catheter was felt below the elbow region. Patient complainants of severe forearm pain. Contrast injection through the side port of radial sheath revealed severe radial artery spasm (Fig. 4a). Again the spasmolytic cocktail was given twice at 1 min interval, but spasm persisted. Guide catheter was successfully navigated through the radial artery spasm segment using same PAT technique as described for case 1. Navigation was easy and without any forearm pain. LAD stenting was completed successfully. Post procedure radial angiogram revealed a total

relief in the radial artery spasm and no damage to the radial artery (Fig. 4b). Radial pulse was well felt at the time of discharge.

2.3. Case 3

A 63-year-old diabetic female with acute anterior wall ST elevation myocardial infarction was urgently taken up for the primary angioplasty. A 6 Fr radial introducer sheath was inserted (Radifocus, Terumo, Japan). We experienced severe resistance in the movement of standard 0.035" J tipped guidewire and it could not be navigated through the radial artery. Contrast injection through side port of introducer sheath revealed tortuosity in the radial artery with atherosclerosis (Fig. 5). Hydrophilic 0.035" J-tip guidewire (Glidewire, Terumo, Japan) could easily be passed through the tortuosity and angiography was easily completed using 5 Fr Optitorque TIG catheter (Terumo, Japan) and showed blocked LAD with normal other vessels. We proceeded for the angioplasty of LAD. But, 6 Fr EBU guide catheter could not be navigated through the radial artery tortuosity because of marked resistance in the advancement of catheter with severe forearm pain. Guide catheter was navigated successfully using the same PAT technique as described for case 1. Navigation was easy and was without any forearm pain. LAD stenting was completed successfully. Post procedure radial angiogram

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