

Case Report

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Guidewire Knot Formation during Angiography through the Radial Artery

Minkyung Kim¹, Dong-won Lee² and Dong-Ju Choi^{3*}

¹Department of Internal Medicine, Healthcare system Gangnam Center, Seoul National University Hospital, Republic of Korea ²Department of Internal Medicine, Seoul National University Hospital, Republic of Korea ³Cardiovascular Center, Seoul National University Bundang Hospital, Republic of Korea

Introduction

Although the technique and accuracy of noninvasive testing continues to improve, coronary angiography (CAG) remains the criterion standard for diagnosing coronary artery disease. Major complications of CAG (such as MI, CVA, and vascular access problem) occur in up to 2% of patients [1,2]. Knotting of intravascular device is rare, but is a source of morbidity. Despite knotting of a coronary catheter is a relatively well recognized complication, there is little reported literature regarding a guidewire knotting during radial CAG.

We report one case of CAG complicated by guidewire knotting and present its subsequent method of removal.

Case Report

A 61-year-old patient was admitted to our hospital to undergo elective CAG for angina pectoris. Angiography was performed through the right radial artery with a 20-gauge puncture needle. After confirming the regurgitation of arterial blood, a short guidewire was inserted to allow insertion of a guiding sheath over the guidewire by the Seldinger technique. While advancing the guidewire, the operator encountered restriction to the movement of the wire and observed that the tip of wire did not move smoothly. Therefore, the operator decided to remove the guide wire. However, the tip of the wire did not move, and the situation worsened as the operator attempted to manipulate the guidewire. The guidewire seemed to have formed a knot in the radial artery (Figure 1). Therefore, the operator stopped attempting to manipulate the guide wire and contacted the vascular surgeon. The patient underwent endarterectomy under local anesthesia, and a knot was removed from the lumen of the radial artery (Figure 2). The operation was completed without any further complication. The angiography was subsequently performed via the femoral artery. On the next day, the color of the right hand was normal, and the patient showed normal palpation of the peripheral pulse. Currently, the patient is being followed up at an outpatient clinic, and no abnormal symptoms or signs have been noted in the right hand or at the operation site.



Figure 1: A still image of fluoroscopy during insertion of the short guidewire via 20-gauge puncture needle. The guidewire seemed to have formed a knot in the radial artery.

Discussion

Various types of devices have been implicated in knot formation including central venous catheter, pulmonary artery catheter (Swan-Ganz), arteriography catheter, and guidewire and pacemaker electrodes [3-6]. If the catheter is thin walled long and soft and is placed in venous system without fluorescence guidance, knotting of intravascular catheter is more common. Actually, pulmonary artery catheter and central venous catheter are more than 80% of total reported intravascular knots [3].

But like this case, knotting of stiff guidewire is very rare, especially in narrow and small radial artery during CAG. So there is no little known about how to manage it.

There are several different methods for removal of knotted intravascular device. One approach is to pull the knotted device against the introducer sheath. Another method is to attempt to unwire the knot. This may be achieved by gentle manual attempts such as clockwise or counter-clockwise rotation or by interventional radiological techniques using a second catheter or guidewire through another vascular access.

Unfortunately, above attempts to unwire the knots were unsuccessful in the present case. Because of tight knot positioned in small radial artery, it was not possible to remove the knot by gentle



Figure 2: A knot was removed from the lumen of the radial artery.

*Corresponding author: Dong-Ju Choi, Cardiovascular Center, Seoul National University Bundang Hospital, Republic of Korea, E-mail: ilicat78@gmail.com

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traction without the risk of damaging the vessel and to unwire the knot by interventional radiological techniques using a second guidewire. But the knot is in an easily accessible distal radial artery. So, the patient underwent endarterectomy under local anesthesia, and a knot was removed from the lumen of the radial artery without any complication.

In the case of tight guidewire knots in small peripheral artery that do not respond to standard maneuver, we would recommend the use of this simple and safe surgical extrication.

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