Clinical case report based study

Simple nonsurgical method of reduction of coronary catheter knot

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ABSTRACT

Knotting and kinking of the coronary catheter is one of the complications during diagnostic or interventional procedures. These complications can be tackled percutaneously without subjecting the patient to surgery. We are reporting one such case of catheter knotting and how it was reduced percutaneously.

1. Introduction

Catheter knotting during coronary angiography is an uncommon but well recognized complication. It usually occurs during cannulation of the right coronary artery and especially during radial angiography.1 There are only a few case reports of catheter unknotting in the literature. We report a percutaneous technique employed to unknot the catheter during coronary angiography.

2. Case report

A 70-year-old nondiabetic, hypertensive patient presented with symptoms of chronic stable angina to our clinic. He was taken up for diagnostic angiography as he was on maximal medical therapy. Coronary angiogram was done through the right radial artery access. We had difficulty in engaging the left coronary artery because of the subclavian tortuosity. But after several attempts we were able to intubate the left coronary artery and perform the angiogram with a 5 French diagnostic catheter. Engagement of the right coronary artery was very difficult despite several attempts of rotation of the catheter. We then noticed damping of the arterial pressure and we were not able to aspirate blood through the catheter or inject dye through the catheter. Fluoroscopic screening for the catheter revealed a tight kink in the region of the axillary artery and subclavian artery junction [Fig. 1]. We tried to reduce the catheter knot by passing the catheter into the aorta but we could not succeed. Then we tried passing the 0.035 inch guidewire and reduce the knot. But the knot could not be reduced even after passing both the soft and stiff end of the wire. Also we tried reducing the kink using the 0.014 inch guidewire but we could not succeed. Then we tried to straighten the knot by snaring the catheter from the femoral artery. Through a right femoral artery access a 10 mm microvenae snare was passed to snare the end of the kinked catheter which was manipulated through the radial artery access [Figs. 2 and 3]. The kinked catheter was snared and straightened [Fig. 4]. Then the 0.035 terumo guidewire was passed through the snared catheter and the catheter kink straightened and removed through the radial artery. Then the angiography was completed through the femoral route using the Judkins right catheter.

3. Discussion

Catheter kinking and knotting during coronary angiogram is an uncommon complication but a recognized complication. It occurs more commonly during the engagement of the right coronary artery.1 It occurs because of the excessive torqueing of the catheter in the setting of a tortuous subclavian artery.2 The knot developed because of the excessive torqueing of the catheter. The torqueing of the catheter did not get transmitted to the catheter because of the presence of the subclavian tortuosity. There are few methods described for reduction of catheter knot or kinking. We tried several attempts like passing the soft and stiff end of the 0.035 inch guidewire but we did not succeed as the kink was too tight and excessive force would result in perforation and breaking of the catheter. Different techniques are described for catheter knot reduction depending on the arterial access. Tanner et al,3 described
a knot reduction by fixing the catheter distal to the knot using the W grabber device from the contralateral femoral route. Once the catheter was fixed in the segment distal to the knot, simple counter-clockwise rotation from outside was sufficient to unknot the catheter. Chinichian et al,2 introduced a second catheter through the contralateral femoral artery. The second catheter was passed alongside the knotted catheter and directed through the loop of the knot. The knot was then pulled back to the bifurcation of the aorta and moved gently to and fro, enabling its reduction. We could not apply this technique because of the smaller calibre of the radial artery. Patel et al,2 described a new but relatively easy technique of fixing catheter distal to the knot by inflating the sphygmomanometer cuff to 200 mm of mercury and then reducing the knot through repeated anticlockwise rotations. We could not employ this technique as the knot is very proximal. Hence we had to straighten the catheter by going through the femoral access and straightening the catheter by snaring it from the femoral artery. After snaring the catheter got straightened and the kink reduced with a wire and the catheter was removed through the radial artery. Khoubyari et al,4 also reported a similar approach to the reduction of the coronary catheter knot. They also used a microvenae snare from the femoral approach and by rotating the proximal and distal...
portions of the catheter in the opposite direction, reduced the knot and retrieved the catheter. This technique is simple and though a femoral access is required, it obviates the need for surgery.

References


