A Late Vascular Complication of Cardiac Catheterization

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Citation

Abstract
Diagnostic and therapeutic cardiac interventions have been performed in expanding numbers during the last years. Femoral and iliac arteries thromboembolisms are most often seen in the setting of previous femoral artery catheterization.
In this study, we aim to declare our approach to a case under the light of the literature. Our case suffered from claudication of the right lower extremity after walking a distance of 10 meters following a diagnostic coronary arteriography carried out through her right femoral artery 20 days ago. After the investigations, revascularization was planned. Early definition and early treatment are very important in thromboembolisms. Even if the treatment time delays, it is getting much harder that treatment and complication risks are increasing, also the extremity and/or loss risk is increasing.

INTRODUCTION
Peripheral vascular complications after cardiac catheterization constitute an increasing portion of traumatic vascular injuries(1). To determine the incidence of these complications and the sequelae of their treatment, Ricci et al reviewed 7,690 catheterizations performed over a 40-month period. One hundred eleven vascular complications were detected (1%), 41 of which required surgical repair (0.5%). Pseudoaneurysm (10), arteriovenous fistula (4), thromboembolism (9), infection (5), and other bleeding complications (83) were all found.In this study we present a late vascular complication due to cardiac catheterization under light of literature.

CASE PRESENTATION
Our case was a 38-year-old female. Twenty days before admission to our clinic she had undergone diagnostic coronary arteriography through her right femoral artery. Following this procedure she started to suffer from claudication of her right leg after a walking distance of 10 meters.
At first institution where she had been evaluated, right iliofemoral bypass surgery had been recommended. Our physical examination revealed loss of right femoral and distal arterial pulses. Ankle-brachial index on the right was calculated as 0.6. Color Doppler ultrasound showed no fistulation between right femoral artery and vein. Low velocity and low resistance biphasic flow pattern was observed in the arteries of right lower extremity due to occlusion of the right external iliac artery (Figure 1 and 2).

Figure 1
Figure 1: Color Doppler ultrasound view of our case.
Figure 2
Figure 2: Color Doppler ultrasound view of our case showing low velocity and low resistance flow pattern

Figure 3
Figure 3: MR angiographic view of our case

Occlusion of a long segment of right external iliac artery was found out according to MR angiography (Figure 3).

Blood pressure values were within the normal range. The patient had no significant changes in standard biochemical findings on admission. She was a nonsmoker. The cholesterol and triglyceride levels were within the normal range. After all these investigations, she was referred to our clinic for revascularization. At first, it was thought that the possible diagnosis would be thromboembolization due to catheterization, and femoral embolectomy was planned.

Then, transverse femoral arteriotomy was carried out. A Fogarty catheter of 7F was introduced into proximal segments and large amount of organized thrombus was extracted.
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Figure 4
Figure 4: Extraction of organized thrombi from the proximal arterial segment during femoral embolectomy

David Muller et al. aimed to determine whether complex cardiovascular interventional procedures (including coronary stent implantation, directional atherectomy, aortic valvuloplasty, and the use of an intraaortic balloon pump or cardiopulmonary bypass support) are associated with an increased likelihood of vascular access site complications, 2,400 consecutive cardiac catheterization procedures were prospectively screened over a 12-month study period(). 43% of the complications occurred after procedures of ≥2 hours' duration and 14% occurred in patients in whom arterial sheaths remained in situ for >24 hours.

Femoral artery is the region where complications after diagnostic and therapeutic interventions such as bleeding and thromboemboli are mostly seen().

Although complications could be overcome mostly by simple surgical techniques, length of stay, cost and mortality rates could rise. Long duration of in-hospital stay causes problems related not only to cost but also to psychological discomfort.

Previous studies have indicated that women experience more vascular complications after cardiac catheterization (CATH) and percutaneous coronary intervention (PCI) than men. Whether awareness of this gender risk or implementation of strategies to reduce the overall incidence of vascular complications has had an effect on the incidence of vascular complications in women is unknown().

During catheterization, choosing appropriate site for intervention becomes important, as well as the size of the catheter. The possible smallest size of the catheter must be preferred.

By this way the complication rate (rupture, stenosis, dissection, etc) could be minimized(). Precautions such as insertion of the needle with an appropriate angle and depth, waiting adequate period before intervention for anticoagulant therapy administered before angiography (dropping the activated clotting time to below 180 seconds), application of pressure on the intervention site with sufficient force and period after the intervention, absolute immobilization of the patient for a period of 4 to 6 hours must be taken in order to reduce the incidence of vascular complications. Compliance of patient is also important(),.

Development of thromboembolic complications could be prevented especially by controlling the bleeding and checking the intervention site periodically. Nurses of the wards should be trained for how to follow these patients.

DISCUSSION
Vascular complications continue to be a significant problem after cardiac catheterization, especially when coronary angioplasty is performed. The sequelae of surgical repair are significant, adding to their morbidity(). Complications of vascular access are one of the most common adverse events after coronary angiography and percutaneous coronary intervention (PCI) and are reported to occur in 1% to 9% of cases().

Figure 5
Figure 5: View of organized thrombi after embolectomy.

The arteriotomy was closed primarily using continuous polydioxanone 6-0 sutures. All of the lower extremity pulses were palpable. The hospital stay was 4 days. Color Doppler ultrasound performed on the two month postoperative visit showed no restenosis.
These precautions would reduce the incidence of the serious complications (3,8,9).

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