

Rare late complications of femoral arteriovenous fistulas following cardiac catheterizations: Report of two cases

Muhammet Bozgüney¹, Tamer Erođlu¹, Burak Açıkgöz², Alper Sami Kunt¹

¹) Department of Cardiovascular Surgery , Kayseri Training and Reserach Hospital, Kayseri, Turkey

²) Department of Cardiovascular Surgery, Bakirkoy Dr. Sadi Konuk Training and Research Hospital, Istanbul, Turkey

Abstract

An arteriovenous fistula (AVF) is a vascular malformation with a direct communication between an artery and a vein and can lead to bleeding, thromboembolic events, aneurysm formation or heart failure. AVF is a rare but potentially harmful complication of cardiac catheterization. The sites of associated artery and vein are important for surgical exposure. We report two cases of femoral AVFs following diagnostic cardiac catheterizations with rather interesting extensions, originating from right deep femoral arteries and draining into right superficial femoral veins in both cases. The tracks were divided and the defects on deep femoral arteries and superficial femoral veins were primarily sutured. Symptoms of the patients, which were mainly edema and pain, relieved after surgeries. Both the patients were discharged without any complications. During cardiac catheterization, the cardiologist should master the anatomy of the femoral puncture site to avoid the complications which can be hazardous and life-threatening such as AV fistula.

Keywords: Arteriovenous fistula, Femoral artery, Femoral vein, Cardiac catheterization, Vascular malformations

Bozgüney M., Erođlu T., Açıkgöz B., Kunt A. S.,: Rare late complications of femoral arteriovenous fistulas following cardiac catheterizations: Report of two cases EJCM 2018; 06 (2): 92-95. Doi: 110.15511/ejcm.18.00292.

Introduction

Diagnostic and interventional cardiac catheterizations, by the most common site of arterial access being the femoral artery, have increased recently.⁽¹⁾ Arteriovenous fistulas (AVFs) are potentially harmful but curable complications of cardiac catheterization. Since these fistulas can cause congestive heart failure and may threaten limb circulation, prompt diagnosis and appropriate treatment are essential.⁽²⁾ Here, we present femoral arteriovenous fistulas which were originating from the right deep femoral arteries and draining into the right superficial femoral veins. Informed consent was obtained from both of the patients before surgery. Surgical repairs were successfully performed, and clinical signs and symptoms improved afterwards.

Case Report 1

A 48-year-old woman was admitted to our hospital due to leg pain and edema. A continuous bruit was audible in the right groin on auscultation. She had a history of diagnostic cardiac catheterization via the right femoral artery 3 years ago. AVF was detected via Duplex ultrasonography scan. Magnetic resonance angiography imaging (MRAI) was performed and extension of AVF was revealed (**Figure 1**). AVF, which was from the right deep femoral artery to the right superficial femoral vein, was observed during surgical operation (**Figure 2**). After division of the fistula track, both defects in femoral artery and vein were primarily repaired. Leg pain and edema improved following surgery.

Figure 1. MRA examination of the first patient. AVF site is showed with an arrow.



Figure 2. Arteriovenous fistula of the first patient is exposed; it is between deep femoral artery and superficial femoral vein (arrow).

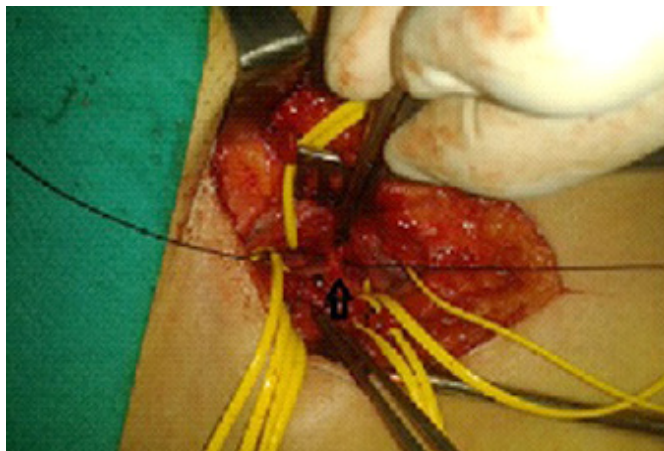
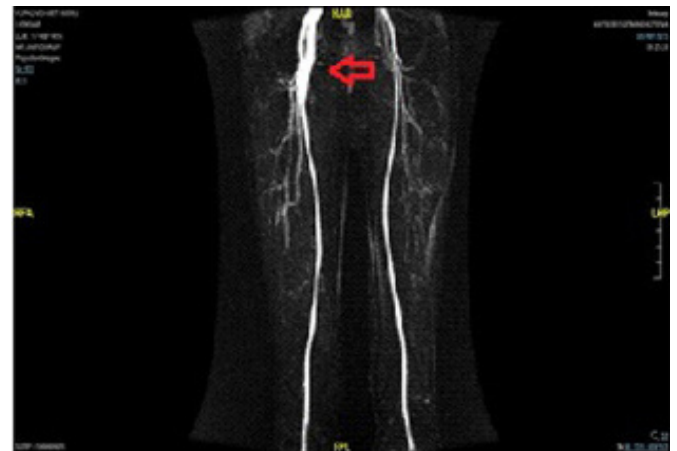


Figure 3. MRA examination of the second patient. AVF site is showed with an arrow.



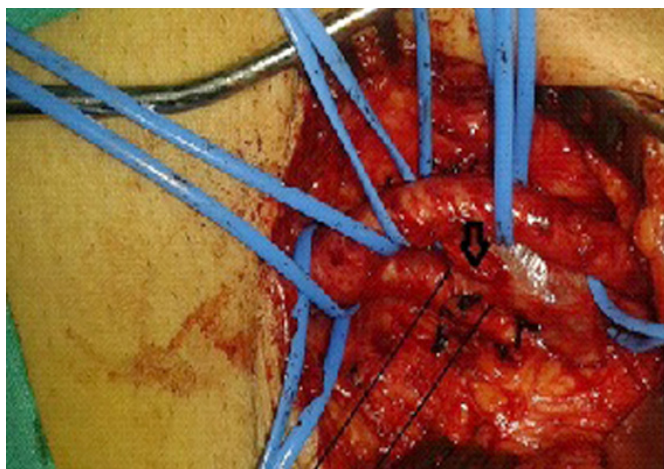
Case Report 2

A 59-year-old man admitted to our hospital with right-sided inguinal pain and leg edema. He had undergone over ten coronary angiograms via right femoral artery. Multiple puncture marks were seen related to cardiac catheterizations in the right groin with physical examination. Duplex ultrasonography and MRAI revealed a femoral AVF (**Figure 3**). AVF which was originating from the right deep femoral artery to the right superficial femoral vein was seen intraoperatively and the defects were sutured following interruption of the communication (**Figure 4**). The symptoms of the patient declined after the operation.

Discussion

The complications of cardiac catheterization are AVF, pseudoaneurysm (PSA), haemorrhage, arterial

Figure 4. Arteriovenous fistula of the second patient is exposed; it is between deep femoral artery and superficial femoral vein (arrow).



thrombosis and peripheral embolisation.⁽³⁾ We present AVFs as a complication of cardiac catheterization which is fairly rare among the other reasons. According to a study of Perings et al., the rate of AVF after transfemoral cardiac catheterization as 0,86%.⁽⁴⁾ Ohlow et al. reported the rate of AVF and PSA after transfemoral cardiac catheterization as 2%.⁽⁵⁾

Female gender, arterial hypertension, puncture side (left groin), anticoagulation therapy and emergency procedure are the risk factors for developing AVF.^(4,5) Arterial complications usually occur when the arterial puncture was done through the distal segments of the common femoral artery.⁽⁶⁾ In the both cases we present, the arterial puncture site was deep femoral artery rather than common femoral artery.

The potential adverse effects of traumatic AVFs can be reduction in distal arterial blood flow and heart failure,⁽⁷⁾ but it has been reported that these adverse effects are rarely seen in patients with femoral AVFs following cardiac catheterization.⁽⁵⁾

A femoral AVF following cardiac catheterization is because of a puncture through both femoral artery and vein at a kissing site in which they lie behind one another.⁽⁸⁾ When the femoral triangle anatomy is considered, deep femoral artery to superficial femoral vein AVFs as in our cases are rather rare and interesting.

In conclusion, during cardiac catheterization, the cardiologist should master the anatomy of the femoral puncture site to avoid the complications which can be hazardous and life-threatening such as AV fistula.

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Received: 15/08/2017

Accepted: 14/05/2018

Published: 05/06/2018

Disclosure and conflicts of interest:

The authors declare no conflict of interest.

Corresponding author:

Burak Açıkgöz

Mail: medrat80.bilimsel@gmail.com

Bozgüney M., Eroğlu T., Açıkgöz B., Kunt A. S.,: Rare late complications of femoral arteriovenous fistulas following cardiac catheterizations: Report of two cases EJCM 2018; 06 (2): 92-95. Doi: 110.15511/ejcm.18.00292.