

Percutaneous closure of a femoral arteriovenous fistula with an endovascular stent graft: a case report

Femoral arteriyovenöz fistülün endovasküler stent greft ile perkütan tedavisi: Olgu sunumu

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A 25-year-old male patient underwent primary femoral artery repair following a gunshot injury. Postoperative examination showed a thrill and bruit in the right femoral region. Peripheral angiography performed under right femoral Doppler ultrasound guidance revealed an arteriovenous fistula between the right superficial femoral artery and femoral vein. Through selective angiography from the left femoral artery, an endovascular stent was implanted in the right femoral artery. Control contrast injection showed near-total closure of the fistula and Doppler ultrasonography on the following day showed total closure.

Key words: Arteriovenous fistula; blood vessel prosthesis implantation; coronary angiography; femoral artery; stents.

The growing increase in femoral artery catheterization results in an increase in hematomas, pseudoaneurysms, arteriovenous fistulae and arterial occlusions. Risk factors include, advanced age, low femoral arterial puncture, aggressive anticoagulation, use of a large arterial sheath size and valvuloplasty.¹ Arteriovenous fistulae may also be observed following penetrating or gunshot injuries. Colored Doppler ultrasonography and peripheral angiography are known to facilitate the diagnosis of pseudoaneurysms and arteriovenous fistulae. On the other hand, many iatrogenic arteriovenous fistulae and pseudoaneurysms are also known to close by compression or spontaneously with ultrasonic guidance.² Recent effective and safe use of stent-grafting in the treatment of abdominal and thoracic aortic aneurysms has been reported.³ Here, we present a case with femoral arteriovenous fistula associated with gunshot injury who was treated with percutaneous stent-grafting following diagnosis by peripheral angiography.

CASE REPORT

A 25-year-old male patient underwent primary femoral artery repair following a gunshot injury. Postope-

Ateşli silah yaralanması sonrasında femoral artere primer tamir uygulanan 25 yaşındaki erkek hastanın takiplerinde sağ femoral bölgede titreşim (trill) ve üfürüm duyuldu. Sağ femoral Doppler ultrasonografi eşliğinde yapılan periferik anjiyografide sağ yüzeysel femoral arter ile femoral ven arasında arteriyovenöz fistül görüldü. Selektif anjiyografi yapılarak sol femoral yol ile sağ femoral artere stent greft yerleştirildi. Yapılan kontrol enjeksiyonunda fistül akımının tamama yakın azaldığı, bir gün sonra yapılan Doppler incelemesinde ise fistülün tamamen kapandığı görüldü.

Anahtar sözcükler: Arteriyovenöz fistül; kan damarı protez implantasyonu; koroner anjiyografi; femoral arter; stent.

rative examination showed a thrill and bruit in the right femoral region. Normal peripheral pulses and a blood pressure of 150/100 mmHg were reported from the physical examination in addition to the thrill and bruit in the right femoral artery. Peripheral angiography performed under right femoral Doppler ultrasound guidance revealed a high output fistula between the right superficial femoral artery and femoral vein (Figure 1a), and filling of the femoral vein and artery and the inferior vena cava during the arterial phase. A more than normally dilated superficial femoral artery and femoral vein were observed at the fistula region. Selective angiography was performed in the right femoral artery by implanting an 8F sheath into the left femoral artery. The fistula orifice was found to be situated about 45 mm distal to the deep femoral artery outlet. The femoral artery diameter was found to be larger (10 mm) than at the proximal region, while the femoral vein was also dilated at the level of the fistula. A 0.014 guide wire was inserted in the right superficial femoral artery around the aortic bifurcation. The 10 mm x 4 cm stent graft (Wallgraft, Boston Scientific/Meditech, Newton, MA, USA) which was inserted through the left femoral route opened

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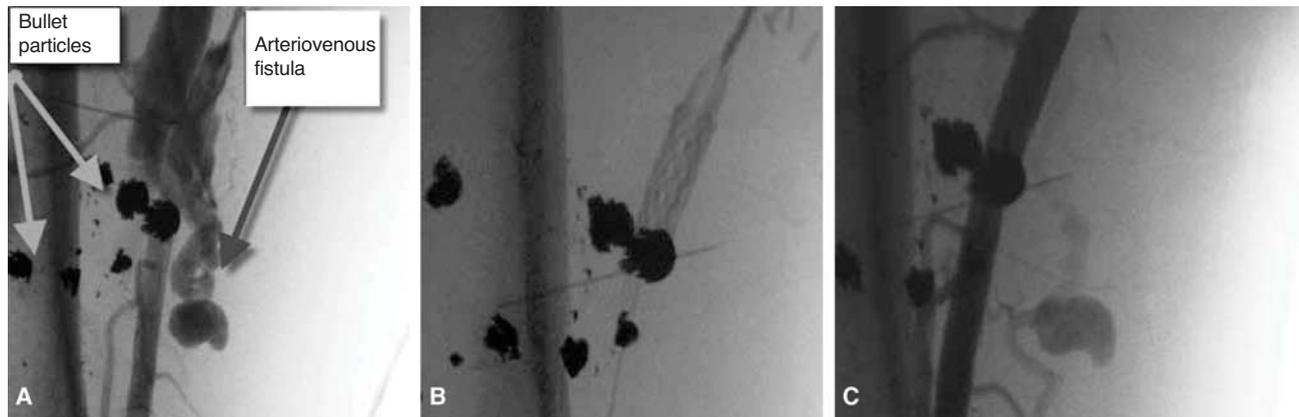


Figure 1. (A) Angiographic image of the fistula. (B) Peripheral graft stent implantation in the arteriovenous fistula region. (C) Angiographic image following peripheral stent implantation.

around the fistula region (Figure 1b). The follow-up angiography demonstrated that fistula flow had almost completely reduced, and the procedure was stopped after realizing there was only a small leak remaining (Figure 1c). Post-procedural examination revealed the thrill to have disappeared, however, a faint bruit could still be heard on auscultation. No bruit was heard during the examination performed a day later; the fistula was found to have closed up completely in the Doppler evaluation.

DISCUSSION

The growing increase in femoral artery catheterization procedure parallels an increase in the number of complications such as hematomas, pseudoaneurysms, arteriovenous fistulae and arterial occlusions. Risk factors responsible for this increase include, advanced age, low femoral arterial puncture, aggressive anticoagulation, use of a large arterial sheath and valvuloplasty.¹ Arteriovenous fistulae may also be observed following penetrating or gunshot injuries. Colored Doppler ultrasonography and peripheral angiography are known to facilitate the diagnosis of pseudoaneurysms and arteriovenous fistulae. Treatment of these lesions is surgery. However, ultrasound-guided compression or spontaneously closure are known to be possible with iatrogenic arteriovenous fistulae and pseudoaneurysms.² The need for surgical treatment has been reported in only 14% of cases with arteriovenous fistulae and pseudoaneurysms.³ Successful use of stent-grafting has recently been reported in the treatment of abdominal and thoracic aortic aneurysms, providing a surgical treatment alternative.⁴ However, their use in the iliac and femoral regions is limited. Very few cases have been reported on the treatment of pseudoaneurysms and fistulae with stent-grafting.^{5,6} Another advantage of the endovascular method is the possibility of the patient to get out of bed the next

day. Basic contraindications of treatment with stent-grafting include the danger of proximity of the lesion to the femoral artery bifurcation and of deep or superficial femoral artery occlusion. The relationship of the lesion with femoral bifurcation can be assessed by peripheral angiography, as it was in our case.

In conclusion, despite a limited number of reported cases, treatment of arteriovenous fistulae associated with gunshot injury by stent-grafting can be considered as an alternative to surgical treatment.

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