Remission of Heart Failure Through Endoluminal Repair of Femoral Arteriovenous Fistula with the Use of a Covered Stent

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We report the case of a 21-year-old male with high-output heart failure due to a femoral arteriovenous fistula caused by a firearm wound. A new balloon expandable stent covered with polytetrafluoroethylene was implanted in the artery to occlude the arteriovenous fistula. The fistula was immediately occluded and the artery remained patent. On the following day, the patient felt much better, with no symptoms of heart failure. Additional follow-up is required to assure the usefulness of this less invasive procedure in the treatment of arteriovenous fistulas.

Peripheral arteriovenous fistulas caused by vascular trauma are rare and are difficult to repair surgically. Their recognition and repair are mandatory to avoid local and systemic complications, such as ischemia and ulceration of the limbs and congestive heart failure. Surgical repair of arteriovenous fistulas is the traditional treatment. In recent years, percutaneous treatment has been used more and more.

We report the case of a femoral arteriovenous fistula in a young male, who had a firearm wound in his left thigh causing high-output congestive heart failure. Endoluminal repair of the femoral arteriovenous fistula was performed with a metallic prosthesis covered with polytetrafluoroethylene (PTFE).

Case report

A 21-year-old male was admitted to the emergency department complaining of dyspnea and tachycardic palpitations one month after suffering a firearm wound in his left thigh.

On physical examination, the patient was tachypneic, tachycardic (120bpm), with paleness (++/4) in mucosas and skin, wide pulses, his blood pressure being 140/60mmHg. A pulsing mass was palpated in the middle third of his thigh with local elevation of the temperature, where a regurgitating murmur was present. Heart auscultation showed cardiac sounds of normal intensity, arrhythmic, tachycardic, and with no murmurs. Pulmonary auscultation was within the normal range. The electrocardiogram showed signs of left ventricular hypertrophy, supraventricular extrasystoles, and sinus tachycardia. Doppler echocardiogram showed a mild enlargement in the cavitory diameters, and a cardiac output of 10 L/min. A peripheral arteriography was performed, depicting the extension and location of the arteriovenous fistula in the middle third of the left thigh, measuring approximately 12 mm of extension (fig. 1).

In view of the technical difficulties of the conventional surgical treatment with the possibility of venous vascular lesion, bleeding, and difficulty of access, we chose the percutaneous treatment.

We punctured the right femoral artery, implanted a 9F valvate introducer, inserted a Simmons 6F catheter, which was manipulated to the contralateral superficial femoral artery. An arteriography was performed and showed a high-output femoral arteriovenous fistula in the middle third of the left thigh, measuring about 12mm. A 0.35” exchange guidewire with 260cm of length was placed through the catheter. The catheter was withdrawn and a peripheral JOSTENT Graft (standard version Jomed) of 38 mm of length was mounted on a balloon of peripheral angioplasty with 8x40mm. This attempt of implanting the stent through the contralateral femoral artery was not very successful because the stent was dislocated from the balloon when we tried to pass from the right to the left iliac artery at the level of the distal aorta. We then had to pull the stent and withdraw it by arteriotomy. After that, we dissected the left femoral artery and proceeded to an anterograde puncture with direct view, inserting the 9F introducer and directing it to the fistula. The stent was then successfully implanted in the region.
References


