

FALSE ANASTOMOTIC FEMORAL ANEURYSM ASSOCIATED WITH MULTI-ANEURYSMAL DISEASE

ABSTRACT

Anastomotic pseudoaneurysms and true femoral aneurysms are two infrequent arterial entities of low incidence, and together, they are even less common. We present the case of a 71-year-old patient with a history of arterial hypertension who has a history of multiple long-standing vascular interventions: abdominal aortic aneurysm with aortic-iliac anastomosis with subsequent femoral-femoral bypass crossed by occlusion of the left branch; and femoropopliteal bypass for left popliteal artery aneurysm. She presents a large pulsatile mass in the left inguino-femoral region without left popliteal and pedal pulses with the viable limbs. The tomographic study showed a pseudoaneurysm of the left common femoral artery with partial thrombosis, dependent on the distal anastomosis of the old femoral-femoral bridge, and a bilateral true fusiform aneurysm of the common and superficial femoral artery with extensive mural thrombosis. It was decided to perform surgery to resect the mixed aneurysmal lesions, perform a right iliac-femoral prosthetic bridge, and replace the crossed femoral-femoral bypass; both included shunts to the deep femoral arteries. With suspicion of thrombosis of the old femoropopliteal bypass, thromboembolectomy of the left leg is performed through the superficial femoral artery, the anastomosis is permeabilized with recovery of the distal pulses.

Keywords: pseudoaneurysm, femoral artery, aneurysm, anastomosis, vascular surgery.

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INTRODUCTION

An anastomotic pseudoaneurysm is a pulsatile hematoma produced at the rupture of the anastomosis between the vessel and the prosthesis, contained by the perivascular tissues¹, associated with vascular manipulation, generally aorto-iliac-femoral. It is a rare entity and is considered a long-term postoperative complication of the range of procedures of the structures above. True femoral artery aneurysms, also infrequent, can be classified into two types: type I, when there is involvement of the common femoral artery up to its bifurcation, and type II, with involvement beyond the origin of the deep femoral artery². We present the case of a patient with an anastomotic femoral pseudoaneurysm on bilateral type II true aneurysmal disease, which required surgical management due to the large size of the lesions.

CLINICAL CASE

A 71-year-old male patient with arterial hypertension consults for a painful pulsatile mass sensation in the left

inguinofemoral region (*Figure 1A*). He has a history of abdominal aortic aneurysm 14 years ago, repaired with aorto-biliac anastomosis and reintervened for acute ischemia of the left lower limb due to occlusion of the iliac branch, performing femoral-femoral cross bridge; and, left popliteal artery aneurysm two years ago, repaired with a femoropopliteal bypass with autologous greater saphenous graft. Popliteal and left pedal pulses, with a viable limb, were absent on physical examination. Arterial Doppler ultrasound of the lower limbs showed a partially thrombosed pseudoaneurysm of the left common femoral artery, dependent on the distal anastomosis of the femoral-femoral bypass (*Figure 1B*).

Angiotomography was requested, which revealed a pseudoaneurysm of the left common femoral artery (*Figure 2A*) with thrombosed content adjacent to the bypass anastomosis and a fusiform aneurysm of the bilateral common and superficial femoral artery (*Figure 2B*) with extensive eccentric mural thrombosis and involvement of the origin of the deep femoral arteries (*Figure 3*).

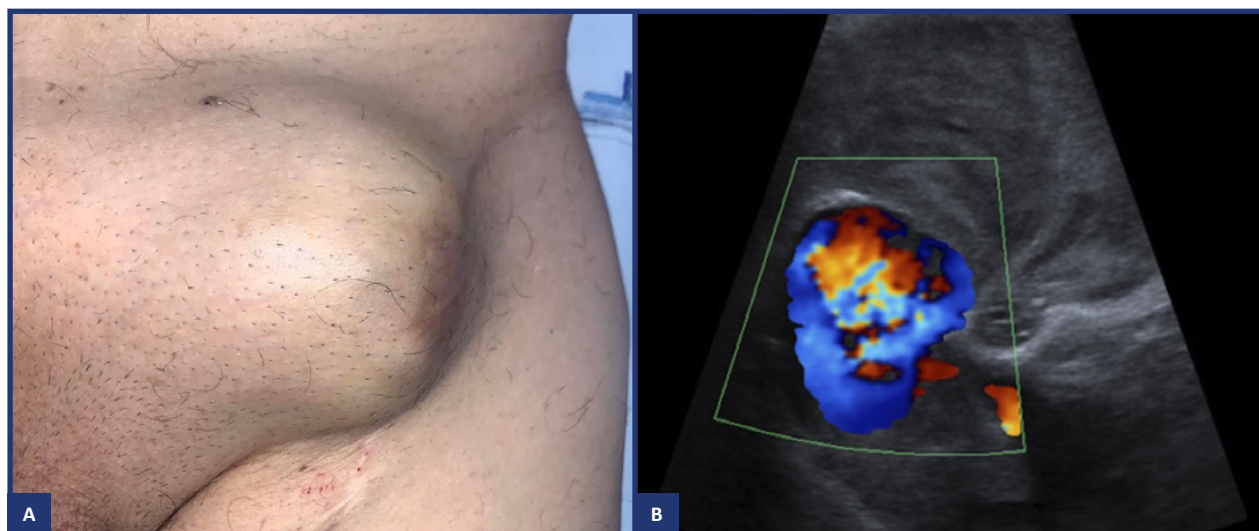


FIGURE 1. Left common femoral pseudoaneurysm, mass (A), and echo-Doppler (B).

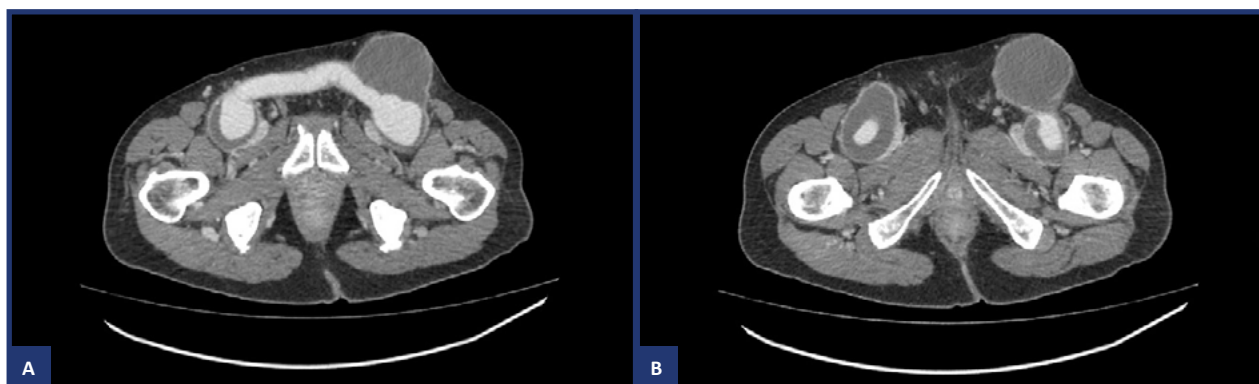


FIGURE 2. Angiotomography of the abdomen. A. Old crossed femoral-femoral bypass. B. Giant right common femoral aneurysm.

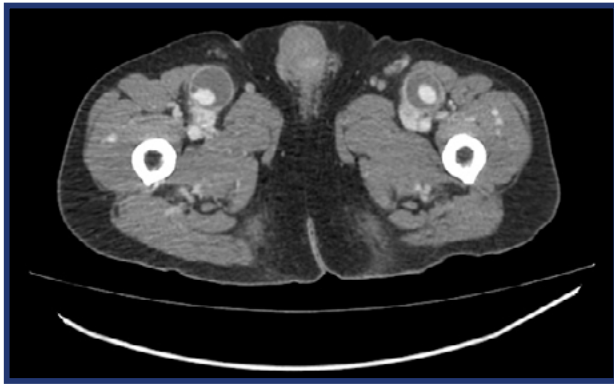


FIGURE 3. Angiotomography showing bilateral superficial femoral artery aneurysms with mural thrombosis.

After the findings, it was decided to take the patient to surgery due to the high risk of rupture of the lesions. A four-way approach was performed: bilateral “golf club” incisions in the iliac fossae and bilateral longitudinal inguino-femoral incisions. Inferiorly, a giant aneurysm of the right femoral artery is identified, and superiorly (iliac fossa), the right external iliac artery is clamped and sectioned.

The femoral aneurysm is incised, the chronic thrombus is removed, and deep femoral bleeding is controlled with Fogarty No. 5[°]; the 10 mm Dacron Hemashield[®] prosthesis is tunneled, and proximal and distal end-to-end anastomosis is performed with Prolene 4-0[°]; a superficial iliac-femoral bridge is

configured, and the deep femoral artery is bypassed with an 8 mm prosthesis (Figure 4).

The 10 mm lateral-terminal prosthesis (Figure 5) is anastomosed to the right iliac-femoral prosthesis to configure the new crossed femoral-femoral bridge and tunneled to the interior of the old bypass. Through the left inguino-femoral route, the large false aneurysm is incised, with thrombus resection and controlling the deep femoral bleeding with Fogarty. Given the suspicion of aneurysm embolism, thromboembolectomy is performed through the left superficial femoral artery to the foot for permeabilization of the femoropopliteal bypass. An anastomosis of the contralateral origin prosthesis is made to the superficial femoral artery (Figure 6A) and bypassed to the deep femoral artery (Figure 6B). A Doppler ultrasound was performed, where good flow was observed in both lower limbs, with recovery of the popliteal and left pedal pulses, which were absent before the intervention. In the postoperative period, the patient had a right pneumothorax and required a thoracostomy; in the control paraclinical studies, severe anemia was observed with hemoglobin of 7.2 g/dL, so two units of packed red blood cells were transfused. He underwent antibiotic prophylaxis, and given the clinical improvement, he was discharged from the hospital on the twelfth postoperative day, with orders for outpatient follow-up.

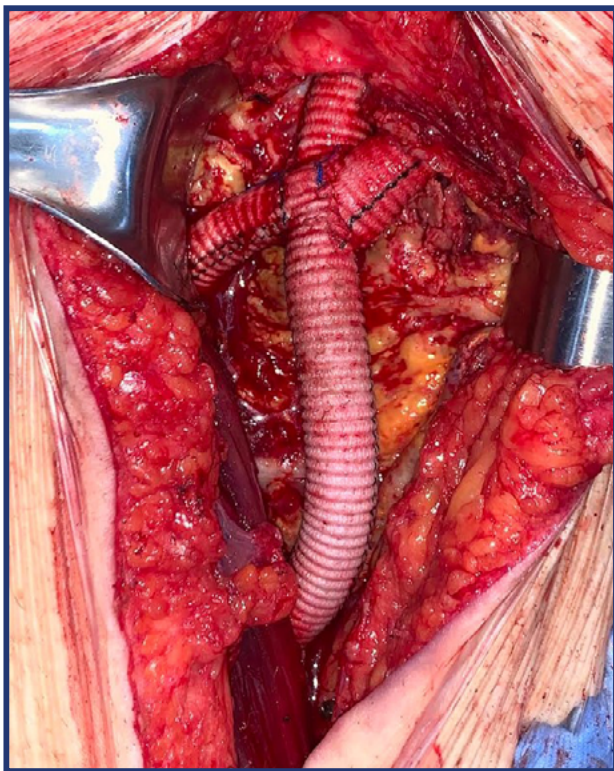


FIGURE 4. Right superficial iliac-femoral bridge with two derivations: to the deep femoral artery (left) and to the crossed femoral-femoral bridge (right).

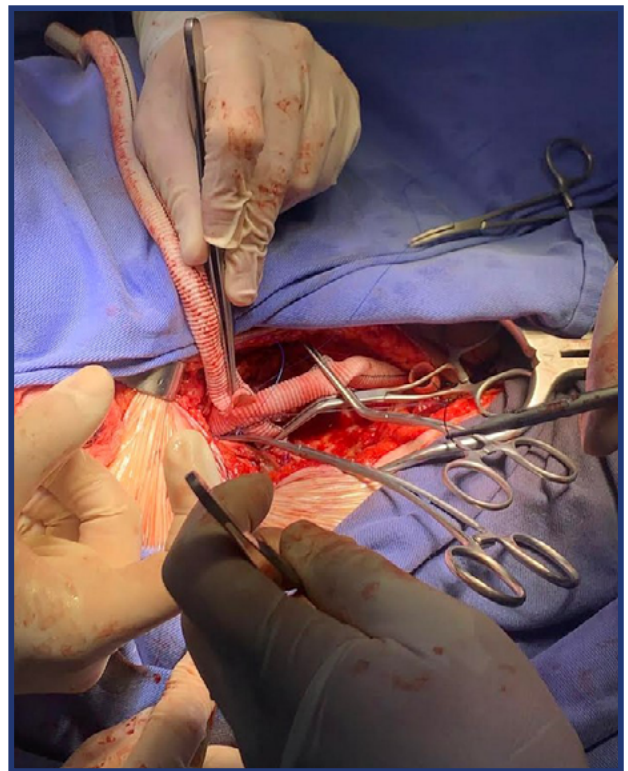


FIGURE 5. Proximal anastomosis of the new femoral-femoral bridge.

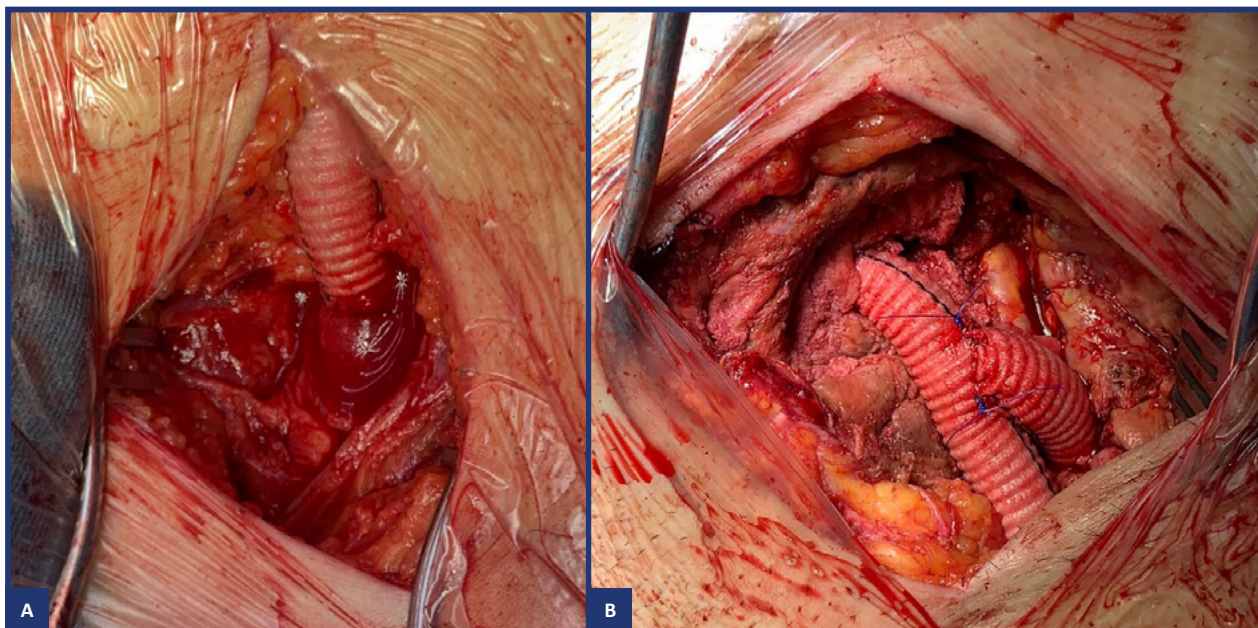


FIGURE 6. Distal anastomosis of the superficial femoral bypass **(A)** and left deep femoral bypass **(B)**.

DISCUSSION

Anastomotic pseudoaneurysms are considered a late complication of arterial bypasses³, generally of aorto-iliac-femoral reconstructions with an incidence of approximately 1-24%⁴. The causes may be inappropriate technique, material fatigue, or trauma³. Their occurrence is related to gender, prosthetic material, and time of evolution¹. Most of these pseudoaneurysms appear after arterial reconstruction. The incidence may depend on the strength of the anastomosis and the bonding of the prosthetic material, along with the integration of the suture; this not only causes possible wear on the materials but also loss of structural integrity that degenerates the vessel and the resulting fibrosis causes decreased elasticity and circulatory stress response mechanisms⁵. Independent processes of local degeneration, such as atherosclerosis or excessive mobilization in previous procedures, as is often the case in femoral artery anastomoses, also increase the risk of pseudoaneurysms^{5,6}.

Pseudoaneurysms are subject to the same complications as a true aneurysm, such as cutaneous necrosis, progressive growth, rupture, and distal embolisms¹. This patient presented embolisms with an exacerbated risk of limb involvement due to having the anastomotic pseudoaneurysm, as well as the extensive true aneurysmal and atherosclerotic lesions in the iliac-femoral tract. True femoral aneurysms are another infrequent clinical problem, which, as in this case, usually occur bilaterally⁷ associated with other episodes of aneurysmal disease, 40-70% with

aortoiliac aneurysms and 54% with popliteal artery aneurysms⁸, both present in the history for this patient. The most common cause is weakness and wasting of the artery due to atherosclerosis, and its rarest presentation is type II, where the origin of the deep femoral artery is involved⁹.

Because of those above, it is noteworthy that this patient had two infrequent peripheral arterial entities that respond to forms of vascular deterioration and damage, and that, together, increase the risk of thrombosis and exacerbation of this to cause regional and paranastomotic pathology. The crossed femoral-femoral bypass was advantageous in this case since it avoids the aortic approach in high-risk patients, offers acceptable long-term patency results, and constitutes an alternative in managing unilateral occlusions¹⁰.

RESULTS

A patient who consulted for a mass of clear vascular origin, where, given multiple antecedents of aneurysmal disease and open vascular intervention, the paraclinical and physical evaluation were essential in the anatomical characterization and dependence of mixed aneurysmal lesions (false and true), depending on the extra-anatomical bridge due to the unilateral iliac occlusion that she presented.

The patient underwent surgery, where a large anastomotic pseudoaneurysm of the left common femoral artery was resected, and the extensive bilateral true iliac-femoral aneurysmal lesions were replaced with prosthetic grafts, with preservation of the crossed femoral-femoral bypass technique given the history of

complete occlusion of the left common iliac branch. A right superficial iliac-femoral bridge was performed with a prosthesis with a deep femoral bypass and a right-to-left crossed femoral-femoral bridge with a left deep femoral bypass. Given the absence of popliteal and left pedal pulses preoperatively, a thromboembolectomy was performed through the superficial femoral artery, and the thrombosis with probable origin in the femoral pseudoaneurysm was removed, with repermeabilization of the old femoropopliteal bypass that the patient had, and recovery of the distal pulses. The patient presented pneumothorax, resolved with thoracotomy, and severe anemia requiring transfusion. After complying with antibiotic prophylaxis, he was discharged from the hospital in good clinical condition on the twelfth postoperative day.

CONCLUSIONS

An anastomotic pseudoaneurysm is a late complication of low incidence that can occur after prosthetic vascular manipulation. The femoral-femoral crossover bypass is the most appropriate therapeutic option for partial or total occlusions of unilateral iliac origin. For this reason, it is necessary to preserve it in managing these mixed aneurysmal lesions, which generate both the risk of pseudoaneurysmal rupture and of producing distal embolisms that compromise old bypasses and, therefore, the irrigation of the limb.

REFERENCES

1. Medina R, González B, Hernández P, et al. Giant para-anastomotic pseudoaneurysm after aorto-bifemoral bypass revascularization: A case report. *CorSalud*. 2021; 13(1):104-108.
2. Vilariño J, Vidal J, Cachaldora J, Segura R. Aneurisma verdadero de la femoral superficial a propósito de un caso. *Angiología*. 2008; 60(2): 149-154.
3. Muñoz R, Díaz I, Muñoz J. Large pseudoaneurysm in proximal anastomosis of aorto-bifemoral bypass. *Angiología*. 2021; 73(5): 260-261.
4. Hoed P, Veen H. The late complications of aorto-ilio-femoral Dacron prostheses: dilatation and anastomotic aneurysm formation. *Eur J Vasc Surg*. 1992; 6(3): 282-7.
5. Candia R, Cordoba I, Candia R. Pseudoaneurisma de la arteria femoral después de cateterización cardíaca. *Rev Sanid Milit Mex*. 2000; 54(5): 244-248.
6. Rubio R. Complicaciones agudas de los aneurismas arteriales periféricos. *Cir Urug*. 1973; 43(3): 219-27.
7. Gavilanes P, Carrera E, Ruiz R, Ramirez L, Cruz J. Aneurisma verdadero de arteria femoral. *Ciencia Latina Revista Científica Multidisciplinar*. 2022; 6(2): 373-382.
8. Moreno J, Corso C. Aneurisma verdadero de la arteria femoral: Informe de caso. *Rev Colomb Cardiol*. 2013; 20(1): 43-47.
9. Sieswerda C, Skotnicki S, Barentsz J, Heystraten F. An underdiagnosed complication after aorto-iliac reconstructions. *Eur J Vasc Surg*. 1989; 3(3): 233-8.
10. González J. Historic development of the extra-corporeal bypass. *Angiología*. 2018; 70(3): 138-140.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical considerations

The patient gave written informed consent for the publication of this article.