Case Report: Treatment of Infected Femoral Artery Pseudoaneurysm (IFAP) in a High-Risk Female Patient

Nguyen Anh Dung, Tran Cong Quyen, Phan Vu Hong Hai, Tran Quoc Hoai, Le Chi Hieu, Doan Thu Ha*

ABSTRACT:

Infected femoral artery pseudoaneurysm (IFAP) is a rare but potentially life-threatening vascular condition. Its management poses significant challenges, especially in patients with complex comorbidities. We present a case of a 66-year-old female patient diagnosed with an infected pseudoaneurysm of the left superficial femoral artery (SFA), with a background of obesity, type 2 diabetes mellitus, hypertension, dyslipidemia, and Cushing's syndrome secondary to long-term corticosteroid use. The patient underwent a staged treatment strategy, including initial endovascular exclusion of the aneurysm with a covered stent, surgical abscess debridement with negative pressure wound therapy (VAC system), and subsequent femoropopliteal bypass using an in-situ great saphenous vein graft.

***Outcome**:* The patient achieved full recovery without signs of limb ischemia at the 12-month follow-up. This case illustrates that a combined endovascular and surgical approach may be an effective and limb-preserving strategy for managing IFAP in high-risk patients with multiple comorbidities.

Keywords: *Infected femoral artery pseudoaneurysm, endovascular intervention, bypass surgery, vascular infection.*

1. Introduction

Infected femoral artery pseudoaneurysm (IFAP) is a rare vascular condition that can lead to severe complications such as rupture, sepsis, limb necrosis, or even death. Managing IFAP is particularly challenging due to the complexity of the infection, altered local anatomy, and the frequent presence of multiple underlying comorbidities[1]. In this report, we describe a case of IFAP in a high-risk female patient with an extensive abscess and multiple chronic conditions, successfully treated with a staged hybrid approach combining endovascular intervention and open surgery.

2. Patient Information

A 66-year-old female patient with a medical history of type 2 diabetes mellitus, hypertension, dyslipidemia, and Cushing's syndrome secondary to prolonged corticosteroid use. She had no

Tam Anh General Hospital, Ho Chi Minh City, 2B Pho Quang Street, Ward 2, Tan Binh, Ho Chi Minh City
**Corresponding author: Nguyen Anh Dung.*
Email: nguyenanhdung.sgn@gmail.com, - Tel: 0913747348
Received date: *05/06/2025* ***Revised date:*** *14/06/2025*
Accepted date: *20/06/2025*

history of trauma, lower limb vascular intervention, or prior surgery involving the lower extremities.

2.1. Clinical History

The patient was admitted with a two-week history of persistent fever and progressive pain

and swelling in the left thigh. Over the course of two days, the swelling rapidly extended to the lower leg and foot, resulting in complete loss of mobility in the affected limb.

2.2. Physical Examination

On examination, the left thigh was markedly swollen compared to the right side. The overlying skin was warm and erythematous. A large, tender, and warm mass measuring approximately 15 cm was palpable along the medial aspect of the left thigh. A small ulcer (approximately 1 cm in diameter) was noted on the left heel. On initial examination, peripheral pulses at the ankle level were absent on the left but palpable on the right, consistent with impaired distal perfusion.

2.3. Laboratory and Imaging Findings

Initial laboratory tests revealed a significantly elevated white blood cell count of 33.3 × 10 /L, with 90% neutrophils. Serum procalcitonin level was 0.11 ng/mL. Blood glucose was persistently elevated above 200 mg/dL, and glycated hemoglobin (HbA1c) was 10.29%. The patient was switched from oral hypoglycemic agents to subcutaneous insulin therapy. The ankle-brachial index (ABI) was markedly reduced on the left side (0.59) compared to the right (1.24), indicating significant impairment of distal limb perfusion.

Imaging findings included:

- Ultrasound of the distal third of the left thigh showed a pseudoaneurysm of the superficial femoral artery (SFA) measuring approximately 46 × 34 mm, likely ruptured into a surrounding hematoma measuring 129 × 87 mm. No neovascularization was observed around the fluid collection. Downstream arteries demonstrated monophasic flow.

- CT angiography of the lower limb arteries revealed a large fluid collection extending from the left groin to the popliteal fossa, with fusiform dilation of the distal half of the SFA measuring approximately 36 × 69 mm, originating from the mid-third of the vessel.

- MRI of the left lower limb demonstrated a large abscess-like fluid collection (maximum size approximately 7 × 16 cm) infiltrating the thigh musculature, along with extensive soft tissue edema involving the entire thigh and popliteal region. A pseudoaneurysm adjacent to the femoral artery was identified. Collateral flow from the profunda femoris artery to the distal leg was limited, suggesting a high risk of distal limb ischemia without timely revascularization.

2.4. Treatment

The patient underwent a staged, multidisciplinary treatment approach:

- January 13, 2024: A covered stent was deployed in the left superficial femoral artery to exclude the pseudoaneurysm and prevent further bleeding.

- January 16, 2024: Surgical drainage of the abscess and debridement of necrotic and infected tissues in the left thigh were performed. A vacuum-assisted closure (VAC) system was applied to facilitate drainage, control local infection, and promote granulation tissue formation. Bacterial cultures of the infected tissue were negative, likely due to the patient having

received empirical antibiotic therapy for two weeks at another hospital prior to admission. Despite the negative culture, the clinical presentation and imaging findings were consistent with an ongoing deep soft tissue infection.

- January 23, 2024: After stabilization and improvement of the infection profile, the stent was removed, followed by a femoropopliteal bypass using an in-situ great saphenous vein graft.

- February 7, 2024: Secondary wound closure was performed after local infection had been fully controlled.

2.5. Follow-up

Prior to surgery, the patient was unable to walk due to severe pain, extensive swelling, and widespread infection. Following the staged treatment, she progressively regained functional mobility and was eventually able to walk unassisted.

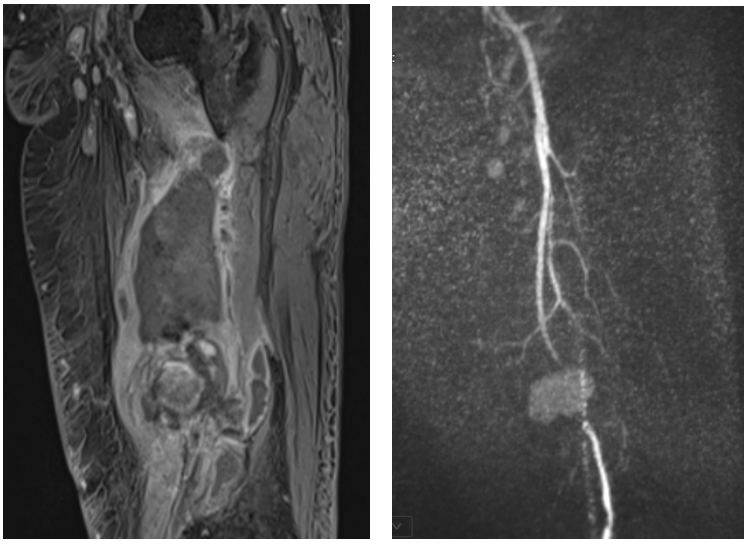

Figure 1. MRI of the left thigh showing a large intramuscular abscess (~7 × 16 cm) with adjacent pseudoaneurysm and diffuse soft tissue edema

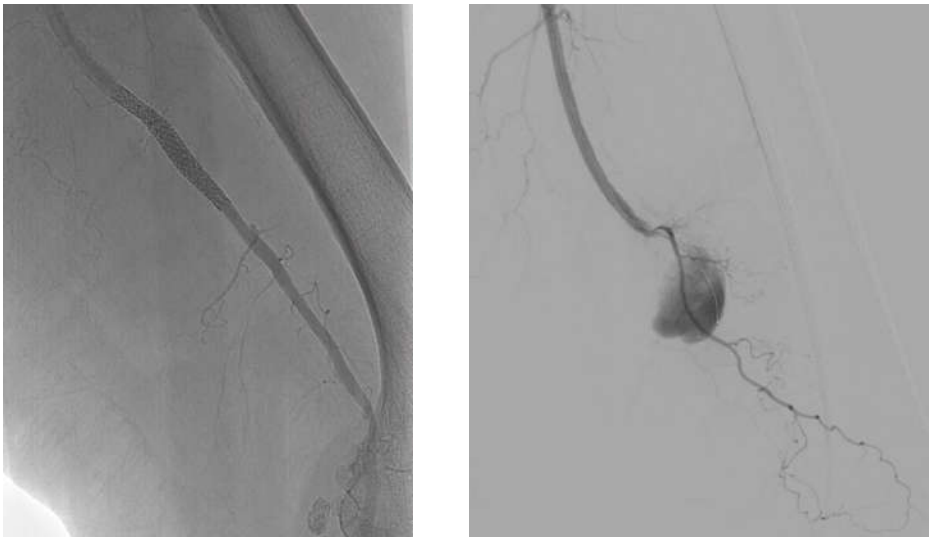

Figure 2. Intraoperative angiographic image during endovascular stent placement in the superficial femoral artery

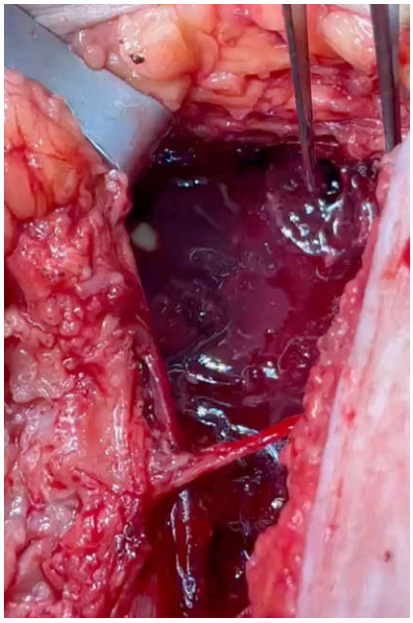

Figure 3. Intraoperative view showing abscess drainage and debridement of necrotic tissue

At the 12-month follow-up, there were no signs of claudication, and the surgical wound had healed completely, without evidence of infection or pseudoaneurysm recurrence. The ankle-brachial index (ABI) of the left leg had improved markedly from 0.59 to 1.02. Duplex ultrasound showed a transition in downstream arterial waveforms from monophasic to biphasic flow, indicating restored limb perfusion.

Figure 4. Healed surgical wound at follow-up

3. Discussion

Infected femoral artery pseudoaneurysm (IFAP) is a serious vascular complication, often arising in the context of systemic or local infection. Traditional open surgical repair has been the mainstay of treatment, but it carries significant perioperative risks, including widespread infection, high morbidity, and mortality—especially in emergency settings or patients with multiple comorbidities[2]. Recently,

endovascular intervention has emerged as a viable alternative, particularly for high-risk patients or those with hemodynamic instability[3,4].

A staged treatment approach should be considered in complex IFAP cases. In our patient, the pseudoaneurysm developed on a background of uncontrolled type 2 diabetes, obesity, hypertension, dyslipidemia, and exogenous Cushing's syndrome due to chronic corticosteroid use, along with systemic sepsis and critical limb ischemia. We opted to deploy a covered stent as a bridging strategy to exclude the pseudoaneurysm, prevent active bleeding, and maintain distal perfusion while allowing time for systemic antibiotic therapy. This approach is supported in the literature, especially in patients deemed poor candidates for immediate open repair[4,5]. The BeGraft balloon-expandable stent used in this case provided accurate deployment and adequate sealing, though its relative stiffness may limit flexibility in the setting of hip joint motion.

Post-surgery, the patient received intravenous Raxadin® (Imipenem 500 mg + Cilastatin 500 mg) every 8 hours and Vancomycin 1 g every 12 hours. This broad-spectrum regimen targeted Gram-positive, Gram-negative, and anaerobic bacteria, including MRSA and ESBL producers. Imipenem–Cilastatin was chosen due to severe infection, extensive soft tissue damage, and the patient's immunocompromised state (diabetes, prolonged corticosteroid use). Despite negative wound cultures (likely due to prior empirical treatment), clinical and imaging evidence strongly suggested deep, polymicrobial infection. The antibiotic regimen was maintained for 4 weeks, adjusted by clinical progress. For high-risk patients like this, a prolonged antibiotic course with close outpatient follow-up is warranted to prevent recurrence. In the absence of microbiological guidance, clinical judgment, imaging, and inflammatory markers (e.g., CRP, WBC count) are crucial for determining antibiotic duration and intensity.

Following hemorrhage control and infection stabilization, the abscess was surgically drained, and necrotic tissue was debrided. A vacuum-assisted closure (VAC) system was applied to optimize local infection control and promote granulation[6]. Once systemic and local infection were under control, the stent was removed to avoid long-term infection risk, and an extra-anatomic femoropopliteal bypass was performed using autologous in-situ great saphenous vein. Secondary wound closure was performed after satisfactory granulation and infection resolution. The excellent clinical outcome at 12 months highlights the feasibility and effectiveness of this staged hybrid strategy in high-risk patients with IFAP.

4. Conclusion

A multi-stage management strategy—including temporary endovascular exclusion, meticulous infection control, and definitive bypass reconstruction—represents a contemporary and effective approach to treating complex IFAP. This method can reduce the risk of limb loss and systemic complications. However, its long-term durability remains to be confirmed in larger studies, and careful patient selection is essential to optimize outcomes.

Acknowledgements

We would like to express our sincere gratitude to the organizing committee, esteemed colleagues, and all medical staff for their valuable

support and contributions. We look forward to continued collaboration and shared clinical experience in the future.

References:

[1] D'Oria M, Sgorlon G, Calvagna C, et al. Endovascular management of infected femoral artery pseudoaneurysms in high-risk patients: a case series. Cardiovascular and interventional radiology. 2017;40:616-620.

[2] Tsao JW, Marder SR, Goldstone J, Bloom AI. Presentation, diagnosis, and management of arterial mycotic pseudoaneurysms in injection drug users. Annals of vascular surgery. 2002;16(5):652-662.

[3] Fu Q, Meng X, Li F, et al. Stent-graft placement with early debridement and antibiotic treatment for femoral pseudoaneurysms in intravenous drug addicts. Cardiovascular and Interventional Radiology. 2015;38:565-572.

[4] Klonaris C, Katsargyris A, Vasileiou I, Markatis F, Liapis CD, Bastounis E. Hybrid repair of ruptured infected anastomotic femoral pseudoaneurysms: emergent stent-graft implantation and secondary surgical debridement. Journal of Vascular Surgery. 2009;49(4):938-945.

[5] Moulakakis KG, Sfyroeras GS, Alexiou VG, et al. Endovascular management of infected iliofemoral pseudoaneurysms: a case series. Vascular and Endovascular Surgery. 2016;50(6):421-426.

[6] Thang, D. N., Uoc, N. H., Tu, V. N., Hai, H. T., Binh, K. T., Thanh, T. D., & Nhu, T. T. (2023). The use of vacuum assisted closure therapy (V.A.C) for the treatment of infection at level of scarpa's triangle. The Vietnam Journal of Cardiovascular and Thoracic Surgery. 2023; 32, 24-30.