

CASE REPORT

Intra-Arterial Abscess with Complete Destruction of Artery Following Angioplasty and Stenting of Stenosed Common Femoral Artery

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ABSTRACT

Vascular access site complications, including infections, have become increasingly prevalent with the rise of interventional procedures. This case report presents a 48-year-old male with a history of coronary artery disease who developed a rare intra-arterial abscess following angioplasty and stenting of the right superficial femoral artery through the left femoral access. Initially, the patient underwent percutaneous coronary intervention (PCI) via the right femoral artery, followed by peripheral angioplasty and stenting for right femoral artery stenosis. Post-procedure, he developed a superficial abscess at the right groin, which persisted despite initial drainage and medical therapy. Surgical exploration during debridement revealed extensive arterial destruction, with complete femoral artery destruction, thrombosis both proximal and distal to the stent, and a localized infected stent. The patient was initiated on culture-directed antibiotic therapy. This case highlights the rare but severe complication of intra-arterial abscess formation following endovascular procedures, with significant potential for stent thrombosis, vessel rupture, and arterial destruction. It underscores the critical need for routine antibiotic prophylaxis, vigilant post-procedural surveillance, and prompt intervention in cases of stent infection. Furthermore, it emphasizes the importance of deferring revascularization procedures until the infection has resolved to mitigate the risk of further complications.

KEYWORDS:

- Intra-arterial Abscess • Stents • Arterial Thrombosis • Femoral Artery
- Vascular Surgical Procedure

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INTRODUCTION

Vascular complications following femoral artery access for interventional procedures are an acknowledged risk, with pseudoaneurysm formation being a notable example. The incidence of this complication is documented at 0.1%–0.2% during diagnostic angiograms and 0.8%–2.2% during interventional procedures.² Local arterial site infections are also reported, with risk factors including prolonged cannula placement, lack of fluid line change, and local skin site inflammation.³ Endovascular interventions for peripheral arterial disease, while a modern approach, carry a risk of implant-associated infection.⁴ This case highlights the development of an intra-arterial abscess following stenting, underscoring the need for vigilance and preventive strategies.

CASE PRESENTATION

A 48-year-old male with a two-year history of retrosternal chest pain, aggravated by exertion and relieved by rest, was diagnosed with stable angina and coronary artery disease. He underwent percutaneous transluminal coronary angioplasty (PTCA) and stenting of the left anterior descending artery via right femoral access. No antibiotic prophylaxis was administered during or after the procedure. Following the procedure, the patient experienced swelling in the right groin, which was likely a hematoma, and developed severe claudication in both lower limbs, with the right leg being more affected.

Subsequent peripheral angiography identified a stenosis in the right femoral artery. The patient underwent further peripheral angioplasty and stenting of the right femoral artery via the left femoral access site, using a 6x40mm covered stent graft. No antibiotic prophylaxis was administered during this procedure either. Three months later, the patient developed pus discharge from the right groin site, and a superficial abscess was diagnosed and drained. Despite appropriate medical treatment, the patient's right lower limb pain persisted, and a recurrence of pus discharge occurred. This is when the patient came to us for consultation. A repeat CT angiography revealed critical disease in the right superficial femoral artery with in-stent re-thrombosis. Given the failure to resolve the discharge, the patient was planned for

open debridement of the wound and distal revascularization.

The patient has a history of smoking (30 pack-years).

Investigations

- **Ultrasound Doppler:** Revealed an in-situ stent in the right common femoral artery (CFA) and proximal superficial femoral artery (SFA), with a thrombosed stent and small peri-arterial pus collection.
- **CT Angiography:** Confirmed in-stent thrombosis of the right CFA with non-visualization of the right posterior tibial artery (PTA).

Differential Diagnosis

1. Superficial abscess
2. Peri-arterial hematoma
3. Intra-arterial abscess

Treatment

The patient was scheduled for local debridement and distal arterial revascularization (ilio-femoral bypass using a ringed PTFE graft). During surgery, the findings included:

- An infected stent with pus within the lumen of the artery (Figure 1)

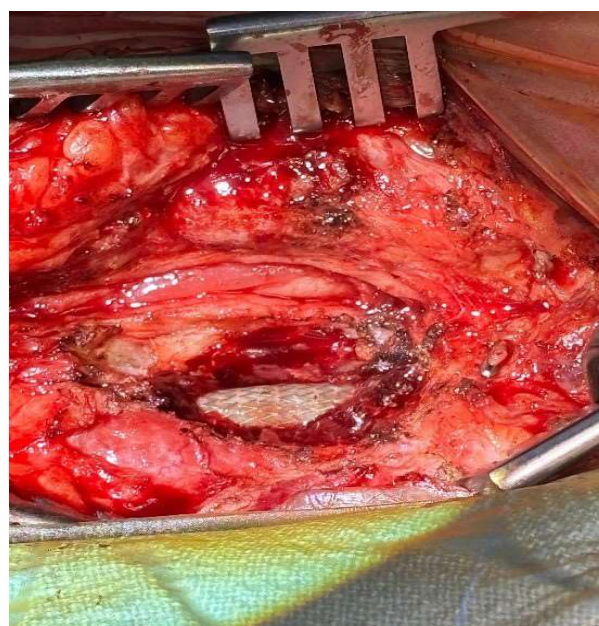


Figure 1: Stent in situ in a destroyed right femoral artery.

- Complete destruction of the femoral artery [Figure 2]



Figure 2: Post-removal of stent and drainage of intra-arterial abscess

- Thrombosis of the femoral artery both proximal and distal to the stent.

Due to the extensive local infection, distal revascularization was postponed. The infected stent was sent for culture, which identified *Pseudomonas aeruginosa*. The patient was initiated on culture-guided antibiotic therapy.

Outcome and Follow-up

The patient had an uneventful postoperative recovery. Plans for a peripheral bypass surgery are being considered at a later date, once the local infection has fully resolved.

DISCUSSION

Infections of peripheral arterial stents are rare but serious complications, with a review of the literature in 2014 identifying 48 cases.⁵ These infections are associated with a mortality rate of 20% and major amputation rates of 25%. Infections of endovascular stents, when compared to peripheral bypass grafts, exhibit higher pathogenicity and colony counts.⁶ The diagnostic approach for vascular implant infections includes the use of imaging modalities such as CT angiography and nuclear scans⁷. However, CT angiography has a higher false-negative rate in low-grade infections. Peripheral artery stent infection predisposes to stent thrombosis and the development of mycotic aneurysms.⁸ The sequence of events during an infection typically includes progressive arterial destruction, stent thrombosis, septic embolization, and potential vessel rupture. While the underlying pathophysiology remains unclear, studies suggest that vascular implants may act as a nidus for bacterial colonization.⁹

Vascular trauma that had happened during the initial introduction of implant is generally the most common event which leads to vascular implant infection.¹⁰ This if neglected may culminate in destruction of vessel. Animal models suggest that improper stent (implant) incorporation predisposes the artery to infection which predisposes to stent thrombosis.¹¹ However, it cannot be definitively determined which occurs first, infection prohibiting incorporation or incorporation prohibiting infection.

The defining criterion for peripheral artery stent thrombosis are mentioned in Table 1.

Table 1. Peripheral Artery Stent Thrombosis

Category	Definition
1. Based on Event Certainty	
Definite stent thrombosis	Confirmation of a thrombotic occlusion of the lower extremity peripheral artery involving the stented segment (± 5 mm proximal and distal to a stent edge) during peripheral angiography, surgical exploration, or autopsy in patients presenting with an acute onset of lower limb pain
Probable stent thrombosis	Acute symptomatic occlusion involving the stented arterial segment was diagnosed by duplex ultrasonography, computed tomographic angiography, magnetic resonance imaging or angiography, in the absence of angiographic, surgical, or an autopsy confirmation
Possible stent thrombosis	Diagnosis of thrombus of a lower extremity peripheral artery with previous stent placement by any imaging modality, surgical exploration, or autopsy, however not involving the stented segment

2. Based on event timing**Early stent thrombosis** ≤30 d**Acute stent thrombosis** ≤48 h

Subacute stent thrombosis >48 h, but ≤30 d

Late stent thrombosis ≥31 d to 1 y**Very late stent thrombosis** >1 y

Management of infected stents involves debridement of all infected tissue and, where appropriate, distal revascularization. In cases where autologous tissue is unavailable, the use of homografts or prosthetic material may be necessary.¹² Prophylactic antibiotics should be administered to prevent infections, particularly during procedures with a risk of transient bacteremia.¹³

Antibiotics should not only be administered at the time of the initial procedure, but also during subsequent procedures where the risk of transient bacteraemia exists, i.e., colonoscopy, dental extraction, or repeat arterial access for subsequent procedures.¹⁴

CONCLUSION

This case underscores the rare but potentially catastrophic complication of intra-arterial abscess formation following endovascular interventions. The development of an infected stent, resulting in significant arterial destruction, thrombosis, and persistent infection, highlights the importance of early detection and appropriate management. Routine antibiotic prophylaxis should be considered standard practice prior to all interventional procedures to mitigate the risk of infection. Additionally, careful monitoring and prompt intervention are essential for preventing the progression of infection, which can lead to severe complications such as stent thrombosis and arterial rupture. In cases of stent infection, surgical debridement and culture-guided antibiotic therapy remain critical components of treatment. Furthermore, revascularization procedures should be postponed until local infections have resolved to reduce the risk of recurrence and to ensure optimal patient outcomes. This case also emphasizes the need for further research into the pathophysiology of stent-related infections

and the development of preventive strategies to improve patient safety during vascular interventions.

Learning Points / Take-Home Messages

Antibiotic prophylaxis should be routinely administered before any endovascular intervention.

Definitive peripheral bypass surgery should be performed only after the resolution of local site infections.

Reuse of the same vascular access site for multiple procedures should be avoided to minimize infection risk.

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