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Systematic Review

Ruptured Mycotic Superficial Femoral Artery Aneurysm: A Case Report and Systematic Literature Review

Stjepan Ištvanić [1,2,*], Vedran Farkaš [1,2], Marijan Ćuk [3], Romana Serdarušić [2], Lucija Stanić [2], Alen Rončević [2,4], Tomislav Meštrović [5,6], Hrvoje Roguljić [2,7], Nenad Koruga [2,4] and Tomislav Ištvanić [1,2]

1 Department of Vascular Surgery, Clinic of Surgery, University Hospital Center Osijek, 31000 Osijek, Croatia
2 Faculty of Medicine, J. J. Strossmayer University of Osijek, 31000 Osijek, Croatia
3 Department of Infectious Diseases, University Hospital Center Osijek, 31000 Osijek, Croatia
4 Department of Neurosurgery, University Hospital Center Osijek, 31000 Osijek, Croatia
5 Department of Vascular Surgery, Clinic of Surgery, University Hospital Center Zagreb, 10000 Zagreb, Croatia
6 Faculty of Medicine, University of Zagreb, 10000 Zagreb, Croatia
7 Department of Cardiovascular Diseases, Clinic of Internal Medicine, University Hospital Center Osijek, 31000 Osijek, Croatia
* Correspondence: stjepan.istvanic3@gmail.com

Abstract

Background/Objectives: Superficial femoral artery aneurysms (SFAAs) are rare. Often mycotic in origin, they remain a diagnostic challenge because of a lack of clear symptoms. The authors' objective was to report on one case of a true ruptured mycotic SFAA and perform a systematic literature review of available data. **Methods**: The patient is a 59-year-old person with diabetes with a previous ipsilateral transmetatarsal amputation and newly discovered SFAA. Because of radiological signs of rupture, an emergency aneurismectomy was performed, and a bypass using a contralateral venous graft was constructed. Microbiological and pathohistological analyses confirmed the presence of a true ruptured mycotic SFAA. The recovery was complicated by wound infection and dehiscence; however, after treatment, the wound healed completely. A systematic literature review was conducted where Pubmed and Scopus were searched. **Results**: Six studies and seven limbs were identified. Most ruptured mycotic SFAAs were treated with open surgery; however, in recent years, the endovascular approach is becoming more common. Most patients ended treatment without complications. In two cases there were reported complications, namely, graft infection after endovascular stenting and death. **Conclusions**: The available literature in this review seems to prefer open surgical treatment of SFAAs, and when an infection is suspected, established surgical protocols should be followed. The endovascular approach is a minimally invasive approach that could be utilized in select patients only.

Keywords: superficial femoral artery aneurysm; mycotic aneurysm; rupture; vascular infection; open surgical repair

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1. Introduction

True superficial femoral artery aneurysms (SFAAs) are rare and frequently discovered in advanced stages of development [1]. The first case of an SFAA was reported in the literature in 1967, underscoring the rarity of this condition [2]. Their diagnosis can be challenging due to the deep anatomical location of the superficial femoral artery (SFA) within the thigh. The most common clinical presentation is a palpable, tender, pulsatile mass in the thigh, although rupture and acute or chronic limb ischemia may also occur, reported in approximately 42% and 13% of cases, respectively. Surgical repair is generally recommended for degenerative

aneurysms exceeding 2.5 cm in diameter; however, in mycotic aneurysms, timing of the intervention should be individualized. Open surgical reconstruction with interposition vein grafting remains the most frequently reported treatment, while endovascular exclusion has been described in only a limited number of cases [1]. Due to the rarity of SFAAs, their natural history and optimal management remain poorly defined [3,4].

The aim of this study was to present a case of a large, ruptured, microbiologically and histopathologically confirmed mycotic SFAA with a suspected source of infection and to systematically review the available literature to better characterize the clinical presentation, etiology, diagnostic approach, and treatment of this rare condition.

2. Case Report

A 59-year-old male reported to the Emergency department after a color Doppler imaging (CDI) study of veins of the right lower extremity, which verified deep vein thrombosis (DVT) as well as an SFAA 36 mm in diameter. The patient had multiple comorbidities including diabetes, hypertension, and cardiomyopathy. He also underwent a transmetatarsal amputation of the right foot owing to diabetic foot complications. The patient was admitted to the cardiology department for DVT treatment. During the hospitalization, the patient was evaluated by a vascular surgery specialist who recommended a computed tomography (CT) angiography. He underwent DVT therapy for 6 days with therapeutic doses of low-molecular-weight heparin (enoxaparin 2 × 80 mg administered subcutaneously). After that he was prescribed rivaroxaban 2 × 15 mg for 9 days and, after that, rivaroxaban 20 mg.

The CT, which was performed 15 days after the completed DVT treatment, revealed an SFAA with a maximum diameter of 65 mm (measuring only the blood vessel) and irregular arterial walls (Figures 1–3). At that point, the patient had complained of progressive pain in the thigh. Clinically, there was a palpable enlarged SFA in the middle third of the right thigh. It was also noted that there was redness of the right foot stump. After the patient was assessed by a vascular surgeon at the Emergency, he was immediately admitted to the vascular surgery department and prepared for surgery because of clinical and CT signs of a rupture of the mycotic SFAA. The suspected mycotic origin and aneurysm rupture were substantiated by the fast growth of the SFAA and clinical deterioration reported by the patient.

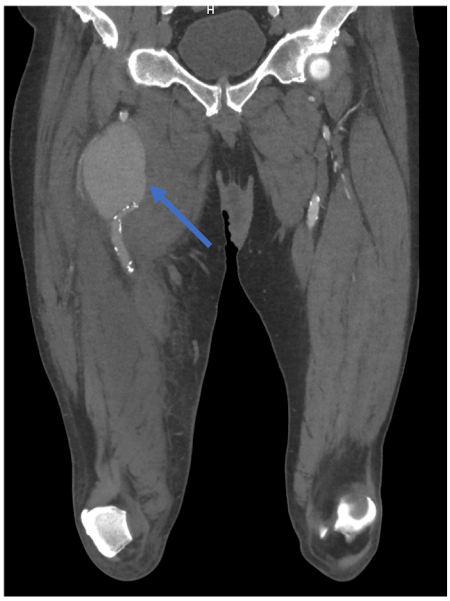


Figure 1. Coronal multiplanar reconstruction of CT angiography revealed the right-sided SFAA (arrow).

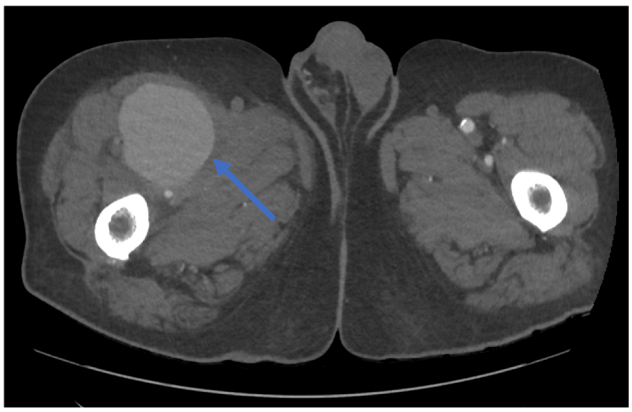


Figure 2. Axial image of CT angiography revealed the right-sided SFAA (arrow).



Figure 3. 3D reconstruction of CT angiography revealed the right-sided SFAA (arrow).

At admission the patient had a leukocyte count of 19.9 × 10^9/L, hemoglobin of 113 g/L, d-dimer levels of 3366 µg/L FEU, and CRP level of 268.9 mg/L.

The surgery was performed the same day. The SFA was dissected proximal and distal to the aneurysm and mobilized. After visualization of the SFAA, rupture was confirmed. The proximal and distal SFA was clamped, as it was important to control the bleeding before beginning the reconstruction. The SFAA was dissected, opened and resected. Samples, both tissue and swabs, were sent to pathology and microbiology for analysis. After hemorrhage control, hematoma evacuation and thorough aneurysm wall and muscle debridement, the SFA was reconstructed. An autologous contralateral reversed great saphenous vein, which was of adequate caliber, was chosen as the conduit. It was harvested only after adequate bleeding control and after addressing the affected aneurysmal segment. In the setting of a ruptured aneurysm, establishing adequate hemorrhage control and managing the immediate vascular emergency took precedence over harvesting the conduit required for subsequent reconstruction. After reconstruction and hemostasis, a continuous antiseptic irrigation and drainage system was employed, and, subsequently, wounds were closed. A few days later, an incision was performed on the red area of the right foot stump. Before the arrival of the microbiology report, the patient received intravenous antibiotics *ex iuvantibus* (vancomycin 2 × 1 g and meropenem 3 × 2 g, both administered intravenously).

Several days after surgery, the pathology and microbiology reports arrived. It was reported that the tissue samples comprised blood vessel wall with adjacent fibrin and inflammatory infiltrate, as well as fibroblastic connective tissue. Swab samples resulted in a *Staphylococcus aureus* culture sensitive to multiple β-lactam antibiotics. Subsequently, 3 days after surgery, the antimicrobial therapy was adjusted to cloxacillin 6 × 2 g administered intravenously, which was administered until the end of the hospitalization. The tissue sample returned from pathology as being a blood vessel section with accumulated blood, fibrin, mixed inflammatory infiltrate and fibroblastic connective tissue. Since the tissue samples showed a complete arterial wall, including the adventitia, media and intima, with inflammatory infiltrate, and the swabs of the aneurysm wall returned positive, a mycotic true aneurysm of the SFA could be diagnosed.

Further treatment during hospitalization was uneventful and consisted of intermittent doses of low-molecular-weight heparin thromboprophylaxis (enoxaparin 40 mg administered subcutaneously), wound toilette and dressing, as well as antibiotic treatment according to the microbiological report. The patient was discharged in good condition with a recommendation to continue per os anticoagulation for DVT treatment as well as clindamycin 3 × 300 mg per os for 2 weeks, and, after that to replace it with sulfamethoxazole + trimethoprim 2 × 960 mg per os for 6 weeks.

Ten days after surgery, the patient came to the emergency department because of pus discharge from the surgical wound of the right thigh. A CDI of the area was performed and showed a collection of hypoechogenous content in the medial part of the thigh, which was spreading towards the groin area. The patient was evaluated by a vascular surgery specialist and admitted to the department. During hospitalization, three surgeries were performed. Firstly, lavage and drainage of the area with installation of vacuum-assisted closure (VAC). Secondly, a debridement with the installation of instillation VAC. After that, a dehiscence of the wound was observed. Lastly, a debridement of the wound with secondary sutures and another VAC installation was performed. After surgery, swabs were sent for analysis, which yielded *A. baumannii* and *E. faecalis* as the main infection sources, as well as *C. albicans*. He was treated with fluconazole 400 mg, piperacillin + tazobactam 3 × 4.5 g and colistin 2 × 3,000,000 IU, administered intravenously. During hospitalization, granulation tissue spread extensively over the skin defect and without further complications. The patient was discharged with amoxicillin + clavulanic acid 3 × 1 g per os for 10 days. During the postoperative follow-ups after 1, 2, 3, 5, and 6 months, the limb remained viable, and the stump incision wound was noted to have almost healed. The patient underwent CDI three months after the procedure, which revealed a patent reconstructed superficial femoral artery. Since the regular clinical follow-ups revealed no ischemia or new infections and the CDI showed a patent reconstructed SFA, we did not opt to perform a postoperative CT. It would not provide new relevant information that was not obtained by a thorough clinical exam, but would expose the patient to significant doses of radiation and intravenous contrast. The patient also had a follow-up with a plastic and reconstructive surgeon who noted a complete healing of the skin defect five months after surgery.

3. Materials and Methods

A comprehensive and systematic literature review was conducted to evaluate cases of mycotic ruptured superficial femoral artery aneurysm (SFAA). Eligible studies included those reporting cases of mycotic ruptured SFAAs and their management, while cases focusing on traumatic origins, iatrogenic pseudoaneurysms, or vasculitis were excluded.

The literature search was performed on the 4 July 2026, using PubMed and Scopus. The search string applied in Pubmed was ((superficial femoral artery[Title/Abstract]) OR (SFA[Title/Abstract])) AND (aneurysm[Title/Abstract]) AND (rupture[Title/Abstract])

with Free Full Text, Case Reports and English filters applied. The search string used in Scopus was TITLE-ABS-KEY ("superficial femoral artery" OR "SFA") AND TITLE-ABS-KEY ("aneurysm") AND TITLE-ABS-KEY ("rupture") AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (OA, "all") AND (LIMIT-TO (LANGUAGE, "English")) respectively. The queries yielded 18 and 57 results, respectively [3,5–66].

3.1. Inclusion Process

Before review, 12 articles were removed as duplicates. A review of titles and abstracts was performed, and 25 articles were removed because they did not focus on SFAA [5–29]. An additional six articles about anastomotic pseudoaneurysms, traumatic origin, and access site complications were removed [30–35]. Two more articles were removed due to underlying vasculitis [36,37].

Following a full-text assessment of the remaining articles, 19 were excluded because they did not discuss mycotic ruptured SFAAs [38–56]. Two were removed because of insufficient data [3,57]. Another two were removed because the lesion appeared after stenting [58,59]. One article was removed because it was not about SFAA and its treatment per se [60]. Ultimately, six articles containing reports of seven affected limbs met all criteria and were included in this systematic literature review [61–66]. Supplementary relevant literature was also reviewed and incorporated into the discussion.

3.2. Analysis of Available Literature

The included studies were analyzed to extract the following variables: author(s), year of publication, patient age and sex, aneurysm type (true vs. pseudoaneurysm), reported aneurysm diameter, presence of DVT, treatment approach, and postprocedural complications. Aneurysms were categorized as either true or false (pseudo) aneurysms. In cases of uncertainty, the aneurysm was designated as being of an unknown type. Management strategies were classified as either surgical or endovascular. Complications were recorded as positive if patients met a composite endpoint of clinical deterioration, major adverse limb events (including re-intervention), or mortality.

These reports were further evaluated for the isolated bacteria and the diagnostic specimen type utilized for microbiological analysis (tissue cultures or blood cultures). The synthesized data are summarized in Tables 1–3. The data was screened by S.I. and T.I. and extracted by S.I. Any disagreement about potential inclusion or data extraction was resolved by mutual agreement between S.I. and T.I. Formal quality analysis has not been performed.

Table 1. Reported patient ages.

	18–30	31–40	41–50	51–60	61–70	71–80	81–90	91–100
M	1	0	0	1	4	0	0	0
F	0	0	0	0	1	0	0	0

Table 2. Reported cases of mycotic ruptured SFAA.

Authors	Year of Publication	Age	Sex	Aneurysm (True/False)	Diameter (mm)	DVT	Treatment	Complications
Cheng et al. [61]	2015	60	M	Unknown	26	N	Surgical	None reported
Papadoulas et al. [62]	2000	66	M	Unknown	60	N	Surgical	None reported
		66	M	Unknown	50	N	Surgical	None reported
Mokhtari et al. [63]	2022	69	M	False	60	N	Surgical	None reported

Table 2. *Cont.*

Authors	Year of Publication	Age	Sex	Aneurysm (True/False)	Diameter (mm)	DVT	Treatment	Complications
Oshodi et al. [64]	1998	19	M	True	80	N	Surgical	None reported
Ono et al. [65]	2021	67	F	Unknown	58	N	Endovascular	Y
Donald et al. [66]	1996	64	M	False	n/a	Y	Surgical	Y

Table 3. Reported diagnostic workup of mycotic SFAA.

Authors	Age	Sex	Hemoculture	Tissue Sample	Bacteria Isolated	Treatment	Complications
Cheng et al. [61]	60	M	Y [1]	Y [1]	*T. pallidum*	Surgical	None reported
Papadoulas et al. [62]	66	M	Y	N	C beta-hemolytic *Streptococcus*	Surgical	None reported
	66	M	Y	N	C beta-hemolytic *Streptococcus*	Surgical	None reported
Mokhtari et al. [63]	69	M	Y	Y	*E. coli*	Surgical	None reported
Oshodi et al. [64]	19	M	Y	Y	*E. coli*	Surgical	None reported
Ono et al. [65]	67	F	Y	N	*C. fetus*	Endovascular	Y
Donald et al. [66]	64	M	Y	N	*Y. enterocolica*	Surgical	Y

[1]—*Diagnosis was established using both samples, blood for serologic testing and tissue for pathohistological confirmation.*

Statistical analysis was not performed, since the sample size is too small for adequately powered analysis.

4. Results

There were six studies and seven limbs included. The study included one woman and five men. The patient ages are shown in Table 1.

There were two reported ruptured mycotic SFAA pseudoaneurysms and one true aneurysm. In four cases, the types of aneurysms were not reported. In the reviewed studies, there were six reported aneurysm diameters. There was one reported case of DVT. In one case the patient was treated with endovascular intervention, and surgically in six cases. There were two reported complications after treatment (inflammation of the endograft; death after AAA rupture). An overview of all data collected is presented in Table 2.

Cases reported to be mycotic SFAAs were interrogated for their diagnostic pathway as well as the causative agent. In one case, a mycotic aneurysm was presumed to be luetic due to positive serologic markers for *T. pallidum*. In this patient, the confirmation of the diagnosis was a pathohistological and microbiological analysis of the tissue sample. In four cases, a positive blood culture was used to diagnose aneurysm infection. In two cases, both positive blood cultures and tissue samples were used to establish the diagnosis. Isolated microorganisms were *E. coli* in two cases, C beta-hemolytic *Streptococcus* in one case involving two limbs, and *C. fetus*, *Y. enterocolica* and *T. pallidum* in one case. The results are presented in Table 3.

5. Discussion

A ruptured mycotic superficial femoral artery aneurysm is an exceptionally rare and potentially life-threatening condition that bears significant diagnostic and therapeutic challenges. The deep anatomical location of the superficial femoral artery may sometimes

delay its recognition, while infection-related arterial wall weakening can lead to rapid aneurysmal expansion and rupture. Clinical manifestations are usually nonspecific, and diagnosis is complicated, especially in patients who do not present with any external signs. Early recognition, appropriate imaging, identification of an infectious source, and prompt surgical management are essential to prevent catastrophic hemorrhage and limb-threatening complications. In our case, a large mycotic ruptured superficial femoral artery aneurysm was confirmed both microbiologically and pathohistologically and was associated with a suspected infectious source. The accompanying systematic literature review summarizes the limited published experience with mycotic ruptured superficial femoral artery aneurysms, their clinical presentation, microbiological findings, and available treatment strategies. Given the scarcity of reported cases, this experience contributes to the understanding of this uncommon but serious vascular entity.

The rarity of our case was emphasized by its microbiologically and pathohistologically proven mycotic aneurysm of SFA with clinical and radiological signs of rupture. The patient with diabetes originally presented with DVT and SFAA (36 mm, as measured by CDI). Several months prior, the patient had undergone a transmetatarsal amputation of the ipsilateral foot, which healed uneventfully. On clinical examination before admission, erythema was noted on the foot stump. A palpable progression in size of the SFAA was present. After a CT angiography showed signs of a ruptured SFAA (65 mm in diameter) with features suggestive of an infectious etiology, emergency surgery was performed. Given the high suspicion of infection, reconstruction was performed using an autologous vein graft. Intraoperative tissue and swab specimens were obtained for microbiological and histopathological analyses. Microbiological examination subsequently identified *Staphylococcus aureus*, and the antibiotic therapy was adjusted in accordance with the susceptibility profile. Histopathological examination confirmed the presence of a true aneurysm with inflammatory changes, establishing the diagnosis of a ruptured mycotic true superficial femoral artery aneurysm. Further treatment after the first surgery was complicated by pus discharge from the wound as well as dehiscence. Three interventions were performed consisting thorough debridement and installation of VAC. Five months later, complete wound closure was observed.

The most common presentation of a ruptured SFAA was swelling and pain of the thigh [62,65,66]. Although repair of degenerative SFAAs should be considered at 25 mm in diameter even when asymptomatic, the SFAAs reported in the literature included in this review were always larger. It must be acknowledged that indications for repair of suspected mycotic SFAAs should be individualized to the patient. However, diagnosing SFAA while asymptomatic poses a challenge since the vessel runs deep between the muscles and fat of the thigh. The most common reported presentation of SFAA is rupture (42%) [1].

In most cases included in this review, the source of the infection of the SFAA remained unclear. However, in all included cases of mycotic ruptured SFAA, a definite causative agent was identified. Papadoulas et al. reported an interesting case of bilateral ruptured mycotic SFAAs. The patient was a 66-year-old man who was treated for a urinary tract infection caused by *E. coli* 30 days prior to admission [62]. On admission, he was febrile, with bilateral tender, erythematous thigh masses. A few hours after admission, his right SFAA ruptured and was urgently excised. The artery was reconstructed with a PTFE graft. The patient was selected for elective repair of the left SFAA; however, during preoperative conditioning the aneurysm ruptured, and the patient underwent another urgent repair of the SFAA with PTFE graft in the same manner as on the right leg. Hemocultures yielded C beta hemolytic *Streptococcus*. There were no reported complications one year after the surgeries.

Donald et al. reported of a 64-year-old male who suffered from diarrhea and fever lasting 6 weeks. He later complained of progressive thigh swelling and pain lasting 3 days.

CT angiography discovered a large hematoma of the thigh, which was intraoperatively confirmed to be a ruptured SFA pseudoaneurysm. Hemocultures yielded *Y. enterocolica*. The thigh was debrided and the SFA reconstructed using an autologous venous graft. Unfortunately, the patient developed a ruptured pseudoaneurysm of the infrarenal aorta a few days later, which was surgically repaired, and died in the intensive care unit postoperatively.

These cases highlight the most common presentation of the ruptured SFAA: pain and progressive thigh swelling. A thorough medical history was taken in both cases, which undoubtedly helped in the differential diagnosis of this complex disease. Furthermore, the case reported by Papadoulas et al. is the only case included in this review which did not include a saphenous vein graft, but a prosthetic graft, with good results [62].

To the authors' knowledge, there is one reported case of a syphilitic SFAA [61]. In this case, reported by Cheng et al., a patient presented with numbness, coldness and pain of their right lower limb lasting one month [61]. After performing CDI and CT, right SFAA was diagnosed [61]. Syphilis infection was suspected after discovering swollen popliteal lymph nodes on CDI and CT images and after thorough patient history-taking [61]. Serologic testing using a treponemal and non-treponemal test was performed, both of which tested positive [61]. This is in line with the current screening and diagnosis algorithms [67]. The patient underwent endovascular surgery and attempted stenting of the aneurysm; however, the distal end of it was occluded and the surgery had to be converted into open reconstruction of the SFA. During surgery, a tissue sample was sent for pathohistological examination which confirmed inflammatory infiltration of the arterial wall with fibroplasia and mucoid degeneration. The authors concluded that, considering the tests, a diagnosis of syphilitic aneurysm can be established [61]. The importance of knowledge of open surgical reconstruction is highlighted by this case, as the surgery could not have been finished without it [61]. It is also important to highlight the thorough patient history taken in this case, as the final diagnosis could not have been made without it.

In the case reported by Ono et al., the patient, a 67-year-old woman, presented with a ruptured mycotic SFAA (58 mm in diameter) [65]. An endovascular approach was chosen, and a covered stent implanted. The postoperative course seemed uneventful. However, on the 17th postoperative day, the patient was re-admitted after a high-grade fever prompted further workup. CT angiography showed severe inflammation around the stent. After hemocultures yielded *C. fetus*, a suitable antibiotic therapy was prescribed. The antibiotic therapy was prescribed for 1 year. The authors reported that the patient had recovered well during the available 19-month follow-up.

While the typical presentation of an SFAA is a painful thigh mass, in rare cases, it can present as acute limb ischemia (occurring in roughly 13% of cases) [1]. In one such rare instance, a patient presented with knee pain and localized inflammation [63]. CT angiography showed a ruptured SFA pseudoaneurysm with signs of necrotizing fasciitis. Blood cultures tested positive for *E. coli*. An extensive debridement and lavage were performed, followed by a bypass with an autologous venous graft. Managed with targeted antibiotic therapy, the patient had an uncomplicated recovery and follow-up [63].

Overall, in this review, open surgery seems to be the preferred strategy for suspected mycotic aneurysms. It allows for thorough local debridement and irrigation, which cannot be done when using an endovascular approach.

6. Conclusions

The SFAA is an exceedingly rare disease with multiple possible etiologies. Understanding the etiology of the SFAA allows for the correct choice of therapy. Mycotic SFAAs are rare. It might be of value to discuss diagnostic pathways and treatment plans focusing on this potentially fatal disease. An open surgical approach may be beneficial in patients with

suspected mycotic SFAA to obtain tissue samples and perform thorough debridement and lavage of the area, as well as an autologous vein bypass. Endovascular stenting is rarely used and could be reserved for patients with degenerative or atherosclerotic aneurysms.

Limitations

This study is limited by a small number of reported cases of mycotic ruptured SFAAs which do not allow for a powerful enough statistical analysis for drawing conclusions. The included cases are heterogeneous in origin and are constrained by publication and reporting bias. The search queries used are very narrow and specific. This approach was intended to prioritize readily accessible scientific literature and facilitate the review of publications directly relevant to the case. However, we recognize that restricting the search to freely available full-text articles and a specific publication type may have excluded relevant studies, including those published in subscription-based journals or classified under other article categories. Consequently, the search was not intended to represent an exhaustive account of all available evidence, and the possibility of selection bias and incomplete literature coverage should be acknowledged as limitations of this report. Conclusions drawn from the included cases cannot be quantified but are a synthesis of vascular surgical experience. A retrospective or cross-sectional study with a statistically significant sample should be performed for further understanding of the natural history of this disease as well as the best overall treatment modality.

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Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

SFA	Superficial femoral artery
SFAA	Superficial femoral artery aneurysm
CDI	Color Doppler imaging
DVT	Deep vein thrombosis
CT	Computed tomography
VAC	Vacuum-assisted closure

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