

Post-procedural necrotizing fasciitis following femoral coronary angiography in patient with chronic endocarditis: A case report

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Case Report

Abstract

BACKGROUND: Necrotizing fasciitis is a life-threatening soft tissue infection characterized by rapid tissue necrosis, often leading to sepsis and multisystem organ failure. Necrotizing fasciitis can rarely occur as a post-procedural complication, particularly following cardiac catheterization or angiography. This case report presents the clinical presentation and management of a 64-year-old female with a history of chronic endocarditis and valvular involvement who developed necrotizing fasciitis after femoral coronary angiography.

CASE PRESENTATION: A 64-year-old female with a history of chronic endocarditis and valvular involvement underwent femoral coronary angiography as part of her cardiac evaluation. On the first postoperative day, the patient developed worsening pain, swelling, and redness in her right lower extremity, which worsened despite antibiotic therapy and pain management. The patient was diagnosed with necrotizing fasciitis. An emergent right lower extremity fasciotomy was performed to debride the necrotic tissue and release the tension caused by acute compartment syndrome.

CONCLUSION: This case underscores the importance of maintaining a high index of suspicion for NF in patients with persistent soft tissue infection symptoms post-procedure. Early recognition, prompt diagnosis, and aggressive surgical intervention are crucial for the successful management of post-procedural NF following femoral coronary angiography. This report emphasizes the need for a multidisciplinary approach and vigilance in caring for patients to ensure optimal outcomes in such rare but severe complications.

Keywords: Necrotizing fasciitis; Coronary angiography; Endocarditis; Compartment syndrome; Fasciotomy

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Introduction

Necrotizing fasciitis (NF) is a severe, devastating soft tissue infection characterized by rapidly progressing tissue necrosis¹. It is a rare but life-threatening infectious disease associated with a high mortality rate². Early recognition and aggressive treatment are crucial for successful management, as delayed recognition and treatment can cause rapid disease progression and increase the risk of a poor outcome^{3,4}.

NF, in most cases, develops after an identifiable cause. Multiple events can lead to bacteria entering the subcutaneous tissue, including laceration, contusion, burn, subcutaneous injection, or operative incision^{5,6}. However, few studies report NF following Femoral Coronary Angiography (CAG). Even though femoral angiography is widely performed by cardiologists, the uncommonness of this complication has made many of them not familiar with it.

This paper aims to report post-procedural

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necrotizing fasciitis following Femoral CAG and emphasizes the challenges in diagnosing and managing this condition.

Case presentation

A 64-year-old Iranian woman with a medical history of cardiac surgery 13 years ago for aortic valve replacement (AVR) and mitral valve replacement (MVR) was admitted to the hospital with complaints of weakness, weight loss, and intermittent fever for the past 7 months. On admission, she was pale and afebrile with stable hemodynamics. Basic lab data revealed anemia (Hb: 7.8 mg/dL) without leukocytosis and a normal ESR level. A 12-lead ECG showed an AF rhythm.

Echocardiography showed mild LV systolic dysfunction (ejection fraction: 42%), normal motion, and acceptable hemodynamic function of both prosthetic valves. An important finding was a tethered, non-coapted TV, torrential TR, and a dense, hypermobile mass on the tricuspid valve compatible with organized vegetation (size 19 x 6 mm). Blood cultures were taken, and empirical antibiotic therapy was initiated. However, due to negative cultures, the antibiotic therapy was discontinued. Considering the

timeline of the clinical course, chronic endocarditis became the best diagnosis.

A surgical consultation for redo surgery and tricuspid valve replacement was conducted, and the surgeon recommended evaluating the coronary arteries. Coronary artery angiography (CAG) revealed normal epicardial coronary arteries. On the first post-procedural day, the patient developed bruising and a palpable mass at the puncture site on her right groin. A color Doppler ultrasound confirmed a 121 x 30 mm hematoma, which was initially managed with local compression and placing a sandbag.

On the fourth postoperative day, the hematoma enlarged and ulcerated, but there were no systemic symptoms. Upon consultation with the infectious disease team, a diagnosis of cellulitis was established, leading to the initiation of cefazolin and vancomycin therapy. By the seventh postoperative day, despite antibiotic treatment, the patient developed multiple bullae at the puncture site, with severe tenderness, oozing, and malodor. Additional symptoms included swelling, erythema, tenderness in the right groin, decreased pulses, coolness compared to the contralateral side, and systemic symptoms such as fever, chills, and unresponsive pain to NSAIDs (Figure 1).



Figure 1. appearance of the patient's right thigh indicating ulceration and bullae



Figure 2. pelvic CT scan showed a large size hematoma in right thigh

Repeated color Doppler ultrasound and pelvic computed tomography (CT) showed a large hematoma measuring 200 x 54 x 86 mm (Figure 2).

Following discussion with the surgical team, the patient underwent emergent surgery for necrotizing fasciitis, and the right thigh skin was incised. During the exploration of the surgical site, extensive necrosis of the subcutaneous tissue extending to the fascia was observed. Necrotic tissues were then removed, a large hematoma was incised, and 1 liter of hematoma and 1 liter of bloody serous fluid were evacuated. A fasciotomy to relieve acute compartment syndrome tension was performed.

A small perforation in the superficial femoral artery was detected and repaired. The incisions were left open for gradual healing. Postoperatively, the

patient's condition improved, marked by reduced fever, chills, localized pain, and gradual healing of the wounds. The patient was discharged with wound care and ongoing antibiotic therapy. Drainage of wound discharges with a vacuum was performed, and after 20 days, the vacuum was removed, and the thigh skin returned to its normal appearance.

Discussion

In this case report, a patient with a rare complication of necrotizing fasciitis of the femoral artery puncture site following angiography was presented. The patient developed bruising and erythema at the site of the puncture in the right thigh post-operatively, which is a common complication following angiography. Due to the expanding hematoma, a color Doppler

ultrasound was performed, confirming the diagnosis of hematoma. At this stage, there were no signs of infection. Three days later, wounds near the hematoma site appeared, indicating an infectious process, for which the patient was appropriately placed on antibiotic therapy. However, despite antibiotic treatment, the wound secretions accompanied by severe pain and induration at the site persisted, along with systemic signs of sepsis such as fever and chills, indicating the spread of infection to deeper layers of the skin and subcutaneous tissue.

One of the challenges in this case is confirming the diagnosis of necrotizing fasciitis and ruling out other possible differential diagnoses. Since confirming the diagnosis of necrotizing fasciitis is primarily clinical⁷, in this patient, the rapid spread of infection despite antibiotic therapy, the presence of clear systemic symptoms, and the observation of extensive necrosis of the subcutaneous tissue extending to the fascia during surgical exploration, all supported the likelihood of a diagnosis of necrotizing fasciitis over other possible differential diagnoses such as infected hematoma. Although in a patient with long-standing diabetes and resulting immune deficiency, the hematoma itself likely served as a source of nutrition for skin surface bacteria, contributing to the spread of infection into deeper tissues and its transformation into necrotizing fasciitis.

One limitation of this study was the lack of tissue biopsy and microbiology, which could have aided in confirming the diagnosis. One important point in this case is the daily monitoring of hematoma progression. Normally, it should gradually decrease in size and resolve. However, if, as in our patient, the hematoma becomes ulcerated and follows a different course, appropriate measures should be taken. Another important point is the observation of systemic symptoms such as fever post-operatively. While there are various causes for post-operative fever, if a specific site for post-operative fever, as in our patient's case of skin infection, is identified, the cause of the fever is determined, and necessary actions should be taken.

In this case study, it is essential to explore the possible relationship between endocarditis, vegetations, and the subsequent onset of necrotizing fasciitis. Endocarditis often leads to the formation of vegetations on cardiac valves. These vegetations pose a significant risk of embolization and systemic

dissemination of infection. When endocarditis occurs concurrently with vascular procedures like femoral coronary angiography, the presence of vegetations increases the likelihood of hematogenous spread of pathogens to distant sites, potentially establishing a route for infection in soft tissues and increasing susceptibility to necrotizing fasciitis. Studies by Tsai *et al.*⁸ and Sergi *et al.*⁹ have shed light on the association between endocarditis, vegetations, and the development of necrotizing fasciitis.

Conclusion

Necrotizing fasciitis following femoral coronary angiography is rare but could occur. The present case underscores the significance of a multidisciplinary approach, early recognition of clinical symptoms, prompt diagnosis, and aggressive treatment in improving patient outcome.

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Conflict of interests

Authors have no conflict of interests.

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Author's Contributions

All authors discussed the results and contributed to the final manuscript.

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