A Case of a Mycotic Aneurysm of the Superficial Femoral Artery Infected by Mixed Bacterial Species

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A 65-year-old woman, recently diagnosed with diabetes, presented with fever and a warm, pulsatile, tender mass over the medial aspect of her left thigh. She gave a history of diarrhea two weeks earlier. All lower limb pulses were present. CRP was 18.3 mg/l with evidence of neutrophil leukocytosis.

Contrast angiography demonstrated a saccular aneurysm in her left superficial femoral artery (SFA). The aneurysm and surrounding infected, necrotic muscle was excised, and the limb was re-vascularized in-situ. Cultures from the aneurysmal wall grew both coliform bacilli and staphylococcus aureus. A mycotic aneurysm of the SFA, following a previous gastroenteritis, harbouring both staphylococcal and coliforms, makes this case unique.

Keywords: mycotic, aneurysm, rare

INTRODUCTION

A mycotic aneurysm is a localized, irreversible arterial dilatation due to destruction of the vessel wall by infection. It is a serious, clinical condition with significant morbidity and mortality, first described by Osler in 1885. 1

Mycotic aneurysms can arise after an infection of a previously healthy artery wall, or through secondary infection of a pre-existing aneurysm. Historically, mycotic aneurysms have been documented in most sites, including the abdominal aorta, femoral artery, as well as superior mesenteric, brachial, iliac, and carotid arteries. 2 Myotic aneurysms of the femoral artery, however, are a rarity, accounting for merely 0.8% of all aneurysms. 2

Gram positive organisms, such as Staphylococcus and Streptococcus species, as well as gram negative Salmonella, are some of the commonly cultured pathogens. A mycotic aneurysm of the superficial femoral artery (SFA), following a previous gastroenteritis and harbouring both staphylococcal and coliforms, makes this case even rarer and all the more unique.

CASE DESCRIPTION

A 65-year-old woman, recently diagnosed with diabetes, presented with fever and a warm, pulsatile, tender mass over the medial aspect of her left thigh with overlying bluish discoloration. There was no preceding history of trauma, superficial infection or any medication that would predispose her to infections. However, she had had right lower quadrant abdominal pain and fever two weeks earlier. There was no associated blood or mucous passage.

On examination, she was febrile and had a pulsatile, tender, rapidly enlarging mass over the medial aspect of her left thigh with bluish discoloration of the underlying skin. All her lower limb pulses were present. Preliminary investigations revealed a CRP value of 18.3 mg/l with a white blood cell count of 22700 /μl with neutrophil leukocytosis. Her fasting blood glucose level was 6.8 mmol/l and within normal parameters.

Contrast angiography, preceded by color duplex, localized a saccular aneurysm in the SFA, 6 cm from its origin (Figs. 1 and 2). Surgical exploration was undertaken, considering the rapid expansion and septic nature of the lesion. The entire aneurysm with a segment of SFA and its surrounding infected, necrotic muscle was excised.
The limb was re-vascularized using a proximal to distal SFA reverse saphenous vein graft, which was inserted through uninfected tissue.

Histopathology revealed arterial wall musculature infiltrated by neutrophils, with areas of calcification and mucinous degeneration (Fig. 3). The surrounding skeletal muscles, too, showed necrosis and diffuse infiltration with neutrophils and abscess formation. Culture taken from the aneurysmal wall grew both coliform bacilli and staphylococcus aureus. Serum agglutination test for salmonella serotypes was negative.

The postoperative period was uneventful. The CRP fell to 8.7 mg/dL, and the WBC fell to 13700, 1 week after the aneurysmal operation. At the time of discharge, the values had further declined to normal parameters. Patient is to be followed up at the surgical clinic as an outpatient.
Discussion

We report a case of a mycotic aneurysm of the SFA as a delayed complication of gastroenteritis due to coliform bacilli. Although she had a rapid recovery from the diarrheal episode, bacteremia from gastroenteritis probably ensued and established a vascular focus for infection.

The commonest organisms involved are Staphylococcus (30%) followed by Salmonella (10%), whereas, Escherichia coli is the commonest cause of bacteraemic induced mycotic aneurysms. This patient demonstrates an example of a microbiological growth, cultured from the aneurysmal wall consisting of both staphylococcus and coliform species.

The reason as to why she harbored a mixed growth can be explained by the immuno-compromised state of the patient owing to diabetes mellitus. The primary focus of sepsis remains to be the gastroenteritis, which was incompletely managed. A second infection through the canula site may account for the staphylococcal septicemia. Interestingly, the patient revealed very little symptoms of harboring a virulent organism like Staphylococcus aureus.

Her presentation was typical of that of a mycotic aneurysm, with a pulsatile mass (52%), bruit (50%) and fever (48%). The diagnosis was also supported by leukocytosis (64%-71%).

Surgical options for operative treatment of mycotic aneurysm include either extra-anatomic or in-situ reconstruction. There is, however, no clear indication for a certain operative technique, and the decision is usually made according to the surgeon’s preference.

Extra-anatomic reconstruction requires multiple operations to restore the natural direction of blood flow, whereas in-situ reconstruction offers a definitive solution via a single operation. However, in-situ reconstruction has been discouraged due to concerns regarding anastomotic or graft destruction by persistent infection. In recent years, in-situ reconstruction has slowly gained popularity. Currently, endovascular repair has emerged as an alternative therapy for patients who have high operative risks that prohibit open surgery.

Taking into consideration, the general health status of the patient, the site of arterial infection and local surrounding, we too opted for an in-situ reconstruction. All infected and devitalized tissue was excised at the time of surgery. We were able to ensure successful graft patency by preserving a 3 cm long, macroscopically healthy arterial segment both proximal and distal to the aneurysm. Even though the anastomosis had taken place in its wound bed, containing infected arterial and muscle tissue, the patient recovered well and was discharged for future follow up.

Conclusion

A pulsatile vascular mass with evidence of inflammation and infection is most often a mycotic aneurysm, even if in an uncommon site.

This patient demonstrated a mixed microbiological growth of both staphylococcus and coliform species and maybe explained by her immune-compromised state owing to diabetes mellitus. The primary focus of sepsis appears to be the gastroenteritis, which was incompletely managed. A second infection through a canula site may account for the staphylococcal septicemia.

An extra-anatomic reconstruction is not essential for mycotic aneurysms. Case experience recommends adequate debridement with preservation of a 3-cm long, macroscopically healthy arterial margin for future in-situ reconstructions of mycotic aneurysms.

References

1) Oslor W. The Gulsottonian lectures on malignant endocarditis. Brit Med J 1885; 1: 467-70. [Medline] [CrossRef]