Symmetric gangrene of the legs revealing granulomatosis with polyangiitis leading to double transtibial amputation

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Abstract

Antineutrophil Cytoplasmic Antibody (ANCA) vasculitis can cause serious complications, leading to bilateral amputations in a young patient. This is a case of a 23-year-old black African patient with a case of previous pathological history. He was admitted to emergency surgery because of necrotic lesions on his feet extending down his legs. The symptoms progressed rapidly and extensively to necrosis within three days. The patient also presented with epistaxis. Initially, local care was attempted, but the necrosis spread, reaching the lower third of the legs. The clinical picture on admission showed almost normal vital signs, with the exception of tachycardia and severe pain. Physical examination revealed limited necrosis from the feet to the middle third of the legs, with grey to black discolouration of the skin. The lesions had a putrid odour, loss of cutaneous and muscular substance, and pedal pulses. Biological tests revealed an inflammatory syndrome. Given this picture, urgent bilateral amputation of the legs was recommended to the patient, who also developed mild reactive depression. Following amputation, the patient experienced worsening skin necrosis in other areas, leading to a diagnosis of Granulomatosis with Polyangiitis (GPA) according to the ACR/EULAR 2022 criteria. Despite treatment, the patient suffered a repetition and died of septic shock following cutaneous sepsis on readmission to emergency, two hours after admission.

Key words: Gangrene, Vasculitis, Depression, Amputation

Introduction

ANCA-associated vasculitis (Antineutrophil Cytoplasmic Antibody) emerges as a severe and complex condition characterized by inflammation of small blood vessels. This pathology involves an autoimmune response targeting vascular system cells, triggering a cascade of inflammatory events and impairment of blood perfusion, ultimately leading to tissue necrosis[1]. In some cases, the rapid progression of ANCA-associated vasculitis can result in devastating complications, necessitating drastic measures such as amputations. Bilateral leg gangrene in a young adult is a highly debilitating condition, especially when complicated by double amputation. To our knowledge, only few cases of simultaneous double leg amputation due to gangrene have been reported in the literature[2]. Furthermore, inaugural bilateral leg gangrene in ANCA-associated vasculitis is exceptional[3]. This clinical case describes GPA complicated by gangrene, requiring double leg amputation in a young adult.

Case report

Mr. MA was a 23-year-old student, non-tobacco user, single, with no significant medical history. There was no history of substance abuse or traditional therapy. He presented to the surgical emergency department with necrotic lesions on his feet extending to the legs. Symptoms began a week ago with symmetrical, ascending tingling in the toes, evolving rapidly within 72 hours to necrosis at the same sites. This occurred in the context of intermittent, minor epistaxis, with no fever, no general condition alteration, and no other dermatological lesions or associated visceral signs. The patient initially sought local care using Dakin dressing and oral paracetamol. As necrosis became extensive, involving the lower third of the legs, he consulted primary care before an immediate referral to our specialized care. On admission, vital signs were at the normal limit, except for tachycardia at 125 beats per minute and intense pain with a 9/10 pain intensity on the visual analog scale. The physical examination revealed preserved general condition and normal consciousness. Necrosis affected the feet, ascending to the middle third of the legs, well-defined, with discoloured skin ranging from grayish to blackish (Figure 1).

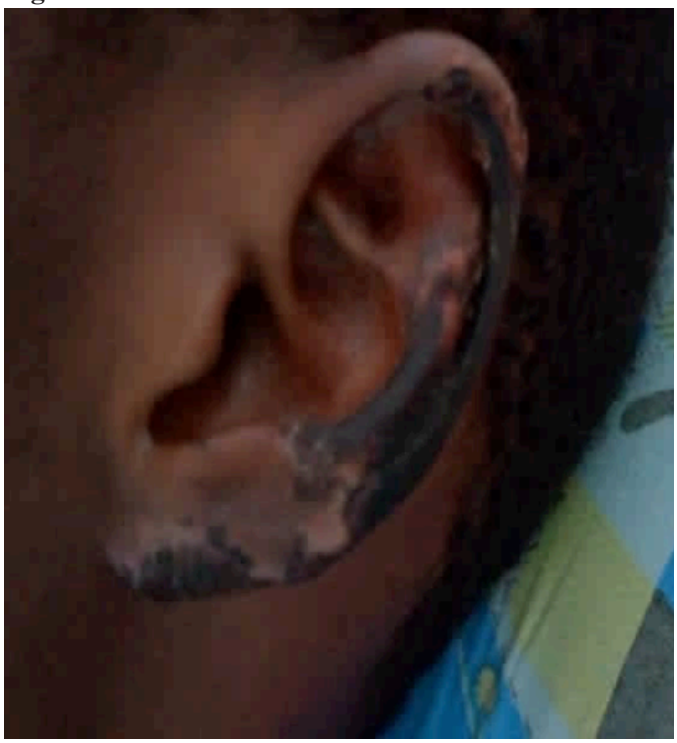
Figure 1: Necrotic lesions of the feet

The lesions emitted a putrid odour, with cutaneous and muscular substance loss revealing the phalanges associated with dark serous exudate. Popliteal pulses were well-perceived, but pedal pulses were not appreciable due to the extent of the lesions. Other limb examinations were normal, as were examinations of other systems. Urgent laboratory tests revealed an inflammatory syndrome with microcytic anaemia at 10g/dl, leukocytosis at 13,000 with neutrophil predominance, and an elevated C-reactive protein at 132mg/dl. Haemostasis, renal function, and liver function were unremarkable. Faced with this clinical picture, the patient was informed of the urgent need for bilateral leg amputation. Injectable tramadol for pain relief, enoxaparin, and antibiotic therapy with ceftriaxone, metronidazole, and gentamicin were initiated and continued. With his consent, a transtibial bilateral amputation was performed without stump closure, and the immediate postoperative course was uneventful (Figure 2).

Figure 2: Amputation stump of the left leg

During hospitalization, the patient developed persistent sadness, psychomotor slowing, and somatization in the form of insomnia and anorexia. In-depth interviews led to the diagnosis of mild reactive depression according to the Beck Depression Inventory (BDI). At one week post-amputation, there was progressive and extensive skin necrosis, involving the ears and elbows symmetrically (Figure 3).

Figure 3: Necrosis of the earlobe



In the aetiological assessment, c-ANCA returned positive at 320, and antinuclear antibodies were negative. Bacteriological samples revealed no pathogens, and histopathological examination was not performed. HIV, hepatitis B, and hepatitis C serologies were normal. Arterial and venous Doppler ultrasound of the lower limbs and chest X-ray were normal. We diagnosed ANCA-associated vasculitis of the GPA type according to ACR/EULAR 2022 criteria, complicated by wet gangrene of the legs and moderate depression (Table 1). The patient was started on corticosteroid therapy at 1mg/kg/day, aspirin as an antiplatelet agent, and adjuvant treatments with corticosteroids. Fucidic acid ointment was applied to peripheral necrotic lesions, and depression was managed with fluoxetine and supportive psychotherapy. Evolution at the third week of hospitalization showed clinical and biological improvement with reduced necrosis and an improvement in the depressive syndrome. Secondary closure of the amputation stump was performed in the operating room. Corticosteroid therapy was continued at home for one month with a 10% reduction every 10 days, along with hydroxychloroquine at 400mg per day. Evolution at the second month was marked by a recurrence with the appearance of extensive necrotic lesions on the amputation stump, covering the lower third of the thigh and scrotum (Figure 4).

Figure 4 (a): Necrosis at the level of the scrotum

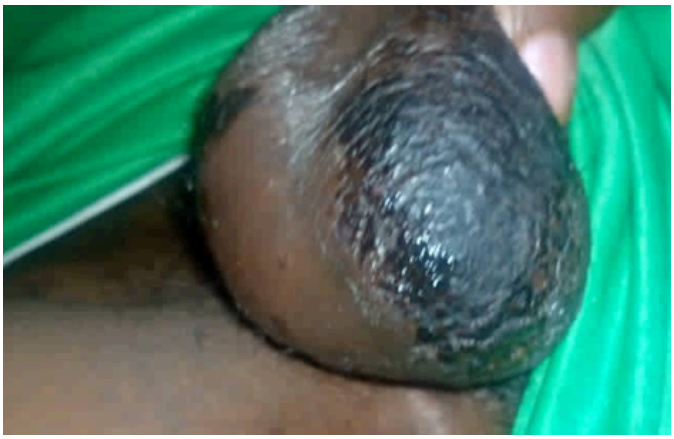


Figure 4 (b): Necrosis of the stump extending to the thigh after amputation

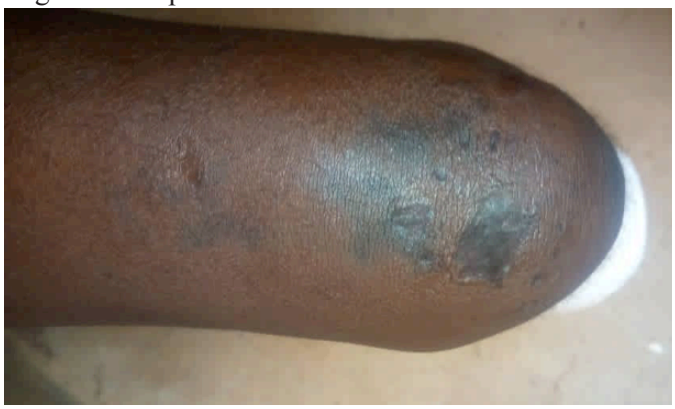


Table 1: ACR/EULAR 2022 classification or diagnostic criteria applied to our patient

Criteria	Points	Signs of our patient
Nasal involvement: epistaxis, ulceration, crusted lesion, congestion, nasal obstruction, or septal perforation	3	+
Cartilaginous involvement (inflammation of ears or nasal cartilage), hoarse voice or stridor, endobronchial involvement, or pot-like nos	2	+
Hypoacusis of transmission or sensorineural	1	NA
Presence of C-ANCA or anti-PR3 antibodies	5	+
Lung nodule, mass, or cavity on thoracic imaging	2	Absent
Histological presence of granuloma, extravascular granulomatous inflammation, or giant cells	2	NA
Inflammatory aspect, inflammation, congestion, or nasal discharge, sinusitis, or mastoiditis on imaging	1	Absent
Pauci-immune glomerulonephritis on histology	1	Absent
Pauci-immune glomerulonephritis on histology	-1	Absent
Pauci-immune glomerulonephritis on histology	-1	Absent
Total points for the patient		10

- Diagnosis confirmed if points >5
- NA : Not Available

Cyclophosphamide-based treatment was indicated, but the patient died of septic shock after sepsis originating from a cutaneous source at the second hour of readmission to the emergency department.

Discussion

Simultaneous double leg amputation resulting from lower limb gangrene is a severe complication with a significant impact on patients' quality of life. Causes of amputations are typically traumatic, related to diabetes complications, or tumours[4,5]. Double amputation in ANCA-associated vasculitis, especially in the context of GPA, is an exceptional event. Specific epidemiological data on double amputation in this context are limited, emphasizing the complexity of this complication. However, cases of bilateral amputation have been reported in complications of polyarteritis nodosa[6,7]. This type of amputation has also been described in drug intoxication and cocaine use[2,5]. In Africa, a few cases of peripheral and symmetrical gangrene leading to double amputation have been described in the literature[8]. However, the aetiology of these gangrenes was not elucidated due to a lack of technical facilities for in-depth exploration. ANCA-associated vasculitis is generally associated with systemic manifestations, but the extent of tissue necrosis leading to double amputation is rare. To our knowledge, our case is one of the few cases of ANCA-associated vasculitis associated with simultaneous double leg amputation described in the literature.

GPA, formerly known as Wegener's disease, is a rare systemic necrotizing vasculitis linked to

ANCA involving small vessels[9]. First described in 1931 by Klinger, the unique clinical and pathological characteristics were added to the description in 1936 by Wegener[9]. It is characterized by the frequency of renal, ENT, and pulmonary involvement. Skin manifestations are frequently described in this vasculitis and are dominated by necrotic vasculitic purpura[10]. The presented necrotic lesions can take various nonspecific clinical manifestations, usually associated with active phases of the disease involving multiple organs, although their appearance as inaugural symptoms is rare[11]. Furthermore, cases of finger gangrene secondary to GPA have been described in the literature[12].

Although the majority of studies have been conducted outside the African continent, recent reports highlight its global impact, especially in Northern Europe and Asia[13]. African epidemiological data on GPA remain limited due to diagnostic challenges in our resource-limited context, but rare cases have been reported[14-16].

Depression, anxiety, phantom limb pain, and post-traumatic stress syndrome are frequently reported in amputation cases. This depression affects 80% of amputees, with severe cases in 7%[17]. While each case is unique, psychological challenges after amputation are a shared reality. By adopting integrated psychological approaches, such as cognitive-behavioral therapy, social support, and rehabilitation, it is possible to improve the psychological quality of life of amputee patients, as in our case.

Faced with clinical pictures similar to ours, it is crucial to consider other aetiologies of positive ANCA vasculitis, notably microscopic polyangiitis associated with anti-myeloperoxidase antibodies (p-ANCA), as well as Eosinophilic Granulomatosis with Polyangiitis (EGPA). The confirmation of the GPA diagnosis in our patient relied on comprehensive clinical evaluation and the positivity of c-ANCA, frequently associated with GPA. These elements reinforced the specificity of the diagnosis, in accordance with the ACR/EULAR 2022 classification criteria, after eliminating other aetiologies that could mimic vasculitis[18]. Although biopsy remains essential for confirming the diagnosis of GPA, it may not always be feasible, particularly in complex clinical situations like ours.

The corticosteroid treatment for our patient, based on therapeutic criteria for GPA, aligns with current recommendations. Studies emphasize the effectiveness of corticosteroids as initial treatment to control inflammation in GPA[19]. The addition of immunosuppressants, particularly cyclophosphamide or rituximab, may be considered to maintain long-term remission[19]. However, it is crucial to individualize treatment based on the severity of symptoms, therapeutic responses, and the African context. Comparing the mortality prognosis of our patient with literature data on GPA underscores the variability of clinical outcomes. Studies such as that of Sanchez Alamo *et al*[20] in 2023 reported a significant improvement in the overall prognosis of patients with ANCA vasculitis in general, thanks to advances in therapeutic strategies, with a median survival of 17.8 years[20]. However, predictive factors for death in this same study were influenced by the severity of visceral involvement, advanced age, male gender, low glomerular filtration rate, and thrombocytopenia[20]. Therefore, close monitoring and multidisciplinary management remain crucial to optimize outcomes.

Conclusions

The case of leg gangrene revealing ANCA-associated vasculitis, complicated by transtibial double amputation, highlights the severity of this group of systemic diseases. The rarity of this complication underscores the importance of increased vigilance for early diagnosis of ANCA vasculitis and prompt therapeutic management. Specific epidemiological data on double amputation in this context remain limited, emphasizing the need for in-depth research to better understand the risk factors and frequency of this complication.

Conflict of interest: None to declare.

Consent to publish the case: This was obtained from the patient and his family

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