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CASE REPORT

Podiatric intervention to salvage diabetic lower limbs: a case report

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In South Africa (SA), podiatrists play an important role in the multidisciplinary team in diabetic limb salvage. Preventive ulcer development strategies offered by a podiatrist include regular monitoring, routine care of calluses, and offloading. Furthermore, podiatric intervention includes prophylactic and acute interventions that can translate to the preservation of a functional limb and ultimately prevent amputation. This report presents a unique case of how podiatric intervention in a public hospital in SA has prevented a diabetic foot amputation. The importance of referral to a podiatrist prior to diabetic foot amputation is highlighted in this case report, and how the subtle second opinion for podiatric intervention saved a limb.

Keywords: diabetic foot ulcer, podiatric intervention, amputation, referral, lower limb salvage

Introduction

Amputation leads to a permanent disability and brings a dramatic change in the life and function of the individual.[1] The incidence of minor foot amputations is 10–15 times higher in people with diabetes mellitus (DM).[2] Severe diabetic foot infections (DFI) are both limb-threatening and life-threatening and often require surgical intervention.[3] The goal of treatment for DFI should be limb preservation and eradication of infection. Minor amputations are required in approximately 40% and major amputations in approximately 20% of diabetic patients.[2,3] Hence, lower limb salvage is of utmost importance in the prevention of lower extremity amputation for patients with DFI.[4]

Care of the diabetic foot involves a focused interdisciplinary team. This team approach translates to decreases in major amputation rates by 50% and overall improved outcomes for this challenging patient population.[3] The podiatry profession in South Africa (SA) is rather small, with only one institution offering the undergraduate qualification. This is problematic, leaving a minority of qualified podiatrists in the public sector whereas the majority practise privately. With reference to this case study, the public hospital (Charlotte Maxeke Johannesburg Academic Hospital [CMJAH]) only had one qualified podiatrist employed to service the entire public hospital at the time.[5]

Figure 1: Pre-podiatric intervention images. (A) Ulcer on the right foot, post-TMA amputation, (B) ulcer on left foot plantar aspect, stretching from the midfoot to the apices of digits.

Case report

A 69-year-old male with known type 2 DM, hypertension, and renal dysfunction presented with bilateral diabetic foot ulcers, one on the plantar aspect of the right foot stump (Figure 1A), which had not healed following a transmetatarsal amputation (TMA) in January 2020, and another on the left foot plantar aspect, stretching from the midfoot to the digit apices (Figure 1B). The patient reported seeing blisters on the apices of digits, which later ruptured and deteriorated into micro-ulcerations, which he tried to self-treat at home. When he realised that the wounds were progressively getting worse, he decided to go to a public hospital. The patient initially developed an ulcer on the plantar aspect of the left foot in June 2023. The patient reported that he had been struggling to get the ulcer to heal. This occurred despite the patient re-dressing the ulcer as advised by doctors. When the ulcer did not heal the patient was referred to the surgical department, which later recommended that he undergo a below-knee amputation (BKA). The patient refused to provide consent for BKA and sought medical advice. The patient then reached out to a relative, the Head of Surgery at the CMJAH cluster, to intervene. The Head of Surgery decided to assess the patient and referred the patient to the CMJAH Podiatry Department. He expressed that he was shocked and saddened to see that the patient had resorted to wrapping his feet with plastic bags to avoid infection, as he could not wear closed shoes.

On the first podiatry consultation, both legs were oedematous, synonymous with renal disease. All pedal pulses on both feet were palpable and strong. The ulcer on the right foot had a granulating base with no signs of infection. The exudate was moderate with no malodour; the edges were hyperkeratinised, indicating high pressure (Figure 1A). The left foot ulcer spread from the midfoot area to the digit apices. The base of the ulcer had some parts that were hyper-granulating, sloughy,

necrotic, and hyperkeratinised with elements of plantar keratoderma on the entire plantar aspect (Figure 1B). The patient reported pain and imbalance only when walking.

The patient was treated through a combination of sharp debridement of necrotic tissue and hyperkeratinised skin, silver nitrate sticks were used to treat hypergranulation tissue, foam dressings for absorbing exudate and cushioning, and a moon boot to offload the left foot. During his second consultation, the patient received a custom foot orthosis (simple insole with a valgus and heel pad) to aid with offloading and support for both feet. A shoe filler was procured for the right foot. The patient had not received any form of offloading prior to consultation with the podiatrist. The patient was also advised on diabetic foot care and footwear.

The patient returned every week for sharp debridement and wound redressing. The patient was compliant with treatment, including the offloading shoe, which helped reduce callus buildup. Both wounds progressively healed and significantly decreased in size (Figure 2A and B). After two months of continuous wound management and offloading with foam dressings and a moonboot, both foot ulcers had healed completely (Figure 3). The patient was advised to continue using a custom foot orthosis with appropriate footwear and follow-up once a month for review.

Diabetic lower limb amputation

In SA, upon discharge from the hospital to home following a lower limb amputation, patients with post-amputation wounds are predominantly managed in the primary healthcare (PHC) setting by nurses who assist with patients' transition to stability and normality.[6–8] Effective wound care is an essential part of the continuity of care and therefore plays an important role in a patient's recovery physically and psychologically.[9] However, with the sheer volume of patients seen at PHC, medical doctors and the nursing staff are often unable or ill-equipped to assist with foot and lower limb-related conditions. Currently, there is a lack of podiatrists and ill-defined referral pathways in the public sector, which hinders the availability of podiatric services, resulting in patients being mismanaged.[6] The National Policy on Quality in Health Care for South Africa provides a way to improve the quality of care in both the public and private sectors.[7] The policy sets out the government's main objectives to assure quality healthcare and continuously improve care. Nevertheless, the incidence of diabetic amputation and the mortality rate remain high.[10]

Figure 2: Post-podiatric intervention images. (A) Ulcer on the right foot, post-TMA amputation, (B) ulcer on left foot plantar aspect, stretching from the midfoot to the apices of digits.

Podiatric intervention and limb salvage

Podiatric intervention is distinctive in that the diabetic wound is not viewed in isolation but rather in the context of the overall structure and function of the foot and lower limb. Podiatrists offer wound care and offloading with biomechanical limb function in mind. This makes podiatric wound care uniquely different. Typically, systemic manifestations of diabetes often present first in the foot, yet in SA podiatrists are rarely the first to encounter these patients.[2] Podiatrists are trained to assess and treat problems involving the diabetic limb, specifically with a deep understanding of the anatomy and function of the foot and lower limb, to allow for an extensive level of expertise. For this reason, podiatrists should be part of the limb salvage team in SA. Podiatrists are trained to recognise factors that may predispose to amputation and are able to address them in an efficient manner. Prevention through regular monitoring and podiatric intervention is essential in preventing a host of diabetic foot complications that may precede lower limb amputation. Published literature has demonstrated the need and role for podiatric intervention as part of the diabetic limb salvage team.[4,11] A study conducted by Paisey et al.[12] sought to find the relationship between high diabetes-related lower limb amputation incidence and foot care services in the South-West region of England. The study concluded that major diabetes-related lower limb amputation incidence was significantly inversely correlated with foot care services provision.[12] Limb salvage through a multidisciplinary team for the diabetic patient is crucial and has been published and advocated in other countries. The vital role podiatrists play in salvaging the lower extremities in patients with diabetic foot disease in SA is still ill-defined as the profession grows.[6] A study published by Patel et al.[13] highlighted the financial benefit of including podiatry in a limb salvage team and the value of close collaboration between podiatry and vascular staff in a limb salvage programme.

Discussion

Limb salvage is a complex and multidisciplinary approach to treating patients with diabetic foot complications.[14] It involves a team of healthcare professionals working together to prevent amputations and restore function. Limb salvage is a treatment approach that aims to prevent amputations in patients with chronic wounds and foot and ankle complications.[11,15,16] This team of healthcare professionals, including podiatrists, vascular surgeons, orthopaedic surgeons, wound care specialists, and physical therapists, has the goal of limb

Figure 3: Both diabetic foot ulcers completely healed.

salvage, which is to restore function, reduce pain, and improve quality of life for patients.[17] The international literature has shown that podiatry is well defined and should form part of the limb salvage team for diabetic limb salvage.[14] It is contrary to the position of podiatry in SA, where podiatry is ill-defined and is not part of the diabetic limb savage team.[6,18]

In SA, podiatrists are trained healthcare professionals who can diagnose and treat conditions affecting the foot and lower limb. In the limb salvage team, podiatrists play a crucial role in managing diabetic foot and lower limb complications. Podiatric interventions provided by podiatrists include wound care, diabetic foot care and education, and custom orthotics to improve gait and mobility.[19] Podiatrists are an integral part of the limb salvage team because they bring specialised knowledge and expertise to the management of foot and lower limb complications.[17,19] They work closely with other healthcare professionals to develop a comprehensive treatment plan that addresses the patient's individual needs.[18] By providing timely and appropriate foot and lower limb care, podiatrists can help prevent amputations and improve patient outcomes. Currently, podiatric services are unevenly distributed in selective central/academic hospitals, with only a few or none at all in the primary health sector. Sadly, in SA, the structure of podiatry in the public sector is yet to be defined. An overwhelming majority of patients are seen in the public healthcare system in SA, and congestion of one healthcare system results. Due to the large volume of patients, required foot screening and assessments are rarely done, resulting in high-risk patients being missed. This poses great disadvantages to patients needing podiatric services in the public sector, where there is no referral pathway to a podiatrist and patients presenting with foot and lower limb pathologies are predominantly managed in the PHC setting by nurses.[18,20]

A South African study done by Ntuli and Letswalo[6] found 1 862 diabetic amputations were recorded at Gauteng's central and provincial hospitals between January 2017 and June 2019. This is alarming, as the evidence indicates that diabetic amputations result from a failure to access foot health services, resulting in poor foot care practices. The main goal of podiatry is to prevent the need for amputation. If amputation does occur, then the aim will be shifted to helping the patient avoid further tissue loss and additional amputation. Given the significant socioeconomic burden of diabetic foot and lower limb amputations, the gatekeeper role of podiatrists in routine foot care and early management of the diabetic foot becomes ever more important. In addition to the values added to patient care and the healthcare system, this study clearly outlines the value of podiatrists to a limb salvage team.

Conclusions

Podiatrists are essential members of the limb salvage team, providing specialised foot and lower limb care to patients with diabetic foot disease. Their unique expertise in wound care, diabetic foot care, limb salvage, and orthotic management is crucial in preventing amputations and restoring function. By working together with other healthcare professionals, podiatrists can help improve patient outcomes and quality of life.

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