

How a Multidisciplinary Approach Can Change the Fate of Our Patients with Diabetic Foot Ulcers

By Giacomo Clerici, MD

The diabetic foot is not a disease but a syndrome that leads to a heightened risk of amputation and mortality. Diabetic foot syndrome is complex, often affected by overlapping and conflicting factors (such as neuropathy, ischemia and infection). Patients at higher risk of major amputation usually have infection, ischemia or both. This includes patients with advanced diabetic foot syndrome. To reduce the risk of amputation, health-care teams must pursue an aggressive treatment plan.

The rate of death for patients with diabetic foot ulcers is 2.5 times higher than for patients with diabetes who do not have diabetic foot ulcers.¹ Ulceration is also correlated to a higher mortality rate than the most frequent oncological diseases or cancers.² In 2006 we published the data of 564 patients with ischemic diabetic foot. The mortality rate of the patients who underwent a successful revascularization was 50% after five years; when revascularization could not be carried out, mortality was 50% after six months.³

A skillful interprofessional team and timely therapeutic strategies are essential for effectively managing diabetic foot ulcers, and a multidisciplinary approach can have a substantial impact on

the prognosis of these patients.⁴ Studies around the world have shown that setting up an interdisciplinary foot care team and implementing strategies for the prevention and management of diabetic foot disease is associated with a decrease in the frequency of diabetes-related lower extremity amputations (LEAs): in Italy from 2001 to 2010, nationwide analyses confirmed a progressive reduction of hospitalization and amputation rates for major LEAs when using a multidisciplinary approach.⁵

A multidisciplinary approach should be based on the following four key aspects:

- **Medical:** to ensure metabolic control, to evaluate long-term complications and factors like infections, ischemic heart disease, renal insufficiency, nutrition and anemia
- **Vascular:** to evaluate the degree of ischemia related to wounds, to define the treatment plan, to perform open or endovascular surgery and to manage peripheral arterial disease
- **Surgical:** to perform emergent debridement or amputations for infection control, to plan advanced surgery, for surgical management of osteomyelitis, to perform amputations, to per-

Case Study

A picture of a patient's foot with an ischemic and infected ulcer was circulated on the social media platform Twitter to seek provider input (Figure 1). The post received several suggestions that recommended that the foot be taken for immediate primary amputation. The patient had a very high white blood cell count, but by removing all of the infected tissues and pursuing an aggressive treatment plan, the multidisciplinary team only had to amputate the toes (transmetatarsal amputation) and treat superficial ulceration with a dermal substitute. Within a few weeks, the wound was healed.

Figures 1 (a–e): The healing progression of an ischemic, ulcerated foot after amputation



form reconstruction of the foot and to correct foot deformities and joint instabilities

- **Rehabilitation and prevention:** to screen and classify risk, to select shoes and orthotics, and to educate the patient and provide psychological support

It is also helpful to have a team leader who can manage impaired metabolic control, diabetic com-

plications, comorbidities and acute and chronic ulcers, and diagnose soft tissue or bone infections.

Foot-care is a cornerstone for treating patients with active ulcers or wounds. Three essential therapies increase the chances of ulcers healing: correct offloading (with the use of a total contact cast, or non-removable or removable knee-high walkers), aggressive treatment of infection and revascu-

larization in case of ischemic lesions or chronic limb-threatening ischemia.^{6–10}

One procedure that can work to reduce amputation is revascularization down to the foot in patients with chronic limb-threatening ischemia (CLTI). This procedure has yielded impressive results and has contributed to a reduction in the amputation rate over the last 20 years. However, patients with amputation still face high mortality rates. It is imperative, therefore, that a multidisciplinary team continue to follow the patient.

Revascularization is recommended even if patients have no tissue loss but do have rest pain, as revascularization eases rest pain and reduces amputation risk. Revascularization can help preserve the limb by improving blood flow and can be performed on patients without significant tissue loss (small ischemic ulcers) as a curative mechanism. (In the author's personal experience, 99% of amputations are preceded by an ulceration.) Revascularization is not synonymous with limb preservation, however. It has to be deployed alongside corrective offloading, foot care and adjunctive therapies (e.g., negative pressure therapy, dermal substitutes).

Conclusion

Today we have many effective therapies, tools and strategies that can reduce the amputation rate. As we move forward, amputation must be an option only rarely for patients with diabetes. Since a majority of amputations are preceded by an ulceration, the most effective way to reduce them is to prevent ulcers. Screening for neuropathy and arteriopathy, the use of correct shoes and insoles, and patient education could effectively change the fate of our patients. ■

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