

# Diabetic Foot Wound Heals With Early Detection And Care: A Complicated Case

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*This case study describes the importance of accurately finding the etiological causative agents of a foot wound, considering all aspects of the patient's health and external factors. As age increases, geriatric patients have experienced much more of life, which can often contribute directly to external complicated healing factors that need to be considered. Having type 2 diabetes can be problematic enough, but when treating an individual, it is critical to listen and have good history-taking skills to avoid any assumptions. Building the patient rapport by gaining trust allows for a multifaceted health history to unfold.<sup>4</sup>*

People living with diabetes are at an elevated risk for foot wounds, especially those who do not regularly receive preventative measures with or who have multiple co-morbidities. If wounds do not heal, an amputation of the foot or lower limb can ensue, with a mortality rate for those with amputations noted at the five-year mark.<sup>5</sup> In Ontario alone, there is a lower limb amputation rate of one every four hours.<sup>6</sup> Prevention and education are keys for early detection and improved health outcomes, by empowering the patient to take care of themselves and their feet.<sup>7,11</sup>

Obtaining a thorough and complete patient history is a cornerstone of effective medical care. It can never be overstated by those performing care. Excellent patient-practitioner communication skills are necessary to build a framework for healing that connects all the

patient's health conditions.

According to Statistics Canada, Canadians are living longer with an average life expectancy of 81.6 years of age.<sup>1</sup> Mount Sinai Hospital in Toronto defines a geriatric patient as anyone over age 65.<sup>2</sup> Those who were born in the 1930's may have been exposed to diseases during a time when appropriate vaccinations were not yet developed. As such, consideration must be given to these early conditions when obtaining a good health history. Combining the patient's current health status with the years of life experiences allows for a complete picture, and results in a better treatment regimen. Foot experts, such as chiropodists, combine all the information gathered to put together complete patient management plans.

When a foot wound presents, and a patient is diabetic, assumptions may be made about the

cause of the wound. The patient in this particular case had polio as a child, as well as other conditions that added to a complex care plan to heal the wound. The patient's foot biomechanics loaded pressure onto the area of the wound.<sup>3</sup> Without addressing the biomechanical changes and with the presence of diabetes, a different outcome may have prevailed.

### **Facts About Diabetes Foot Ulcers**

- There are approximately 5.7 million Canadians living with diabetes (type 1 & type 2 diagnosed + type 2 undiagnosed).
- There are 11.7 million Canadians living with diabetes or prediabetes, a condition that, if left unmanaged, can develop into type 2 diabetes.
- Approximately \$30 billion CAD per year is spent on diabetes services.
- The lifetime risk for foot ulceration in people with diabetes is higher, at 19–35%, compared with the general population.
- Up to 25% of the nearly 5.7 million Canadians living with diabetes will develop a diabetic foot ulcer in their lifetime.
- Collectively, the health-care costs associated with diabetic foot ulcers amounts to \$750 million annually.

*Source: Best Practice Recommendations For Skin Health And Wound Management 2025. Toronto (ON): Wounds Canada; 2025*

### **Presentation**

This clinical case is based on an elderly male diabetic patient's foot wound. The patient had a history of polio and is living with post polio syndrome (PPS).<sup>8</sup> As a child, the polio affected his left limb. He was also hit by a car in the late 1940's. The motor vehicle accident (MVA) required reconstruction surgery of the left limb, and he was in rehab for a year, with extreme physiotherapy. The results left him with plates in the femur and screws in the hip; with no feeling remaining in the foot of the affected left limb. Muscle atrophy was also a result that left him with an abnormal gait pattern, and permanent neuropathy in his left foot.

Type 2 diabetes was his the most recent contributory factor for a wound to develop; however, the wound could also be related to his childhood health issues. The patient was educated by the chiropodist to focus on his diabetes for any foot-related complications. Since polio had preceded the MVA, it was not the foremost concern to the patient compared to the MVA. When giving responses to his health history, polio therefore was not mentioned.

### **Clinical Findings**

The patient's foot wound occurred during the COVID-19 pandemic. Virtual phone visits to the family physician were being conducted at the time, adding the complexity of lacking access to a quicker source of action. Many challenges persisted during that time to keep the patient's wound from healing.<sup>9</sup> The patient did contact COVID-19 post vaccinations, however, no long-term effects have been experienced.

At the time the patient sought treatment for the foot wound, he was an 85-year-old healthy male with type 2 diabetes and had a varied health history. His diabetes was controlled with diet and

metformin for 16 years. He is now in his 89th year and stays very physically active.

The presentation of a left first plantar wound appeared post-debridement during the COVID-19 pandemic.

The patient had also suffered with bouts of gout attacks in both first digits for many years and was on allopurinol for prevention of flare ups. The patient was diagnosed with diabetes in 2009. There was no familial history of diabetes. Diet was controlled for a few years and he graduated to increased dietary changes and metformin. Currently, he takes Jardiance™. He checks his blood twice a week, averaging 6.5mmol/L in his blood sugar readings.

Other major ailments that affect his gait and were job related include osteoarthritis in both knees, with replacements to the left in 2000, and to the right in 2008. Occupations throughout his life included odd jobs as a teen, a journeyman plumber for his father's business and factory worker in a winery, before become a firefighter for 30 years. At the time there were no work accommodations made for his physical limitations. Resilience and fortitude encompassed all aspects of fulfilling employment expectations. He has been married for 67 years with two children and two grandchildren.

## Care Plan

The patient is a member of a family health team and is fortunate to have an interdisciplinary care team at his disposal. Dietitians, nurse practitioners, chiropody and the family doctor were some members of the primary care team following his health status. The *Inlow's 60-Second Diabetic Foot Screen* tool was regularly used as a screening tool for the patient's foot health.<sup>10</sup> Both feet were systematically checked using the tool in order to note any changes to his foot health.<sup>12</sup>

During COVID-19, the foot in question, became an issue with disruptive changes to routine care, and healthy exercise habits. Upon noticing changes to the integrity of the skin, a visit to the chiropodist helped in early detection. Debridement of the wound and overlying tissue callus took place weekly. The wound was dressed by the chiropodist, and the patient followed until he could more manage the treatments of dressing and checking the wound himself.

At the height of the wound breakdown, offloading by a walking cast aided in taking the pressure completely off the wound of the affected toe. Custom-made orthotics were manufactured by the chiropodist to accommodate, and deflect pressure away from the wound, thereby offloading pressure from it.<sup>3</sup> The wound went on to healing in six months time, delayed by some patient compliance issues and poor footwear that did not accommodate the orthotics.



**Figure 1:** Open Toe Wound    **Figure 2:** Closed Toe Wound

## Discussion

Practitioners are often quick to see what presents in front of them with a patient and can combine this with their knowledge of body systems. Obvious connections can be made when a patient presents with diabetes and a foot wound is located around the highest pressure. When

the practitioner is formalizing treatment of the condition, all other social and health factors are essential and must be considered by the practitioner; otherwise, vital pieces of the healing puzzle can be missed.

Excellent communication skills are needed by the professionals when a patient presents with a complicated historical past. Listening to the patient for 'cues' could aid in a faster positive health outcome for them. In gaining the trust of the patient, more open dialogue is encouraged and can lead to a full, and complete patient history.<sup>4</sup>

This patient has lived to a good age, with a long history of complicated ailments, such as polio and post polio syndrome (PPS), as well as a major car accident that changed his musculature and affected his biomechanics and the gait cycle. An increased amount of pressure distributed onto the toe during push off in the gait cycle contributed to the formation of the wound. Diabetes alone was not the sole causative factor in this patient's case. Understanding the complete historical picture of the patient allowed for a prognosis that took all factors needing to be addressed into account and was thus believed to be particularly appropriate and good for him.

Footcare protocols for diabetics were followed using the *Inlows 60-second Diabetes Foot Screen*, initially to set up the baseline of foot health for this patient. Once changes to the area presented, immediate treatment by a chiropodist (for debridement), dressing of the wound and offloading were performed. This treatment regime allowed for the tissues to heal in an abbreviated period. Long-term planning incorporated the PPS biomechanic effects from the MVA changes. Orthotics in improved footwear reduced the increased pressure and redistributed it so that the foot and limb would function closer

to 'normal.' A healthy foot that continues to be checked by the patient and professional team was the result.

Five years on, and there has been no reoccurrence of a wound to the area.

The question remains: was it a true diabetic wound

or the effect of a complex patient history of PPS, and other contributing factors combined? More research in post polio syndrome, and the intersection with diabetes is needed.



**Figure 3:** Patient from the back

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