

ORIGINAL RESEARCH

Evaluation of surgical management of diabetic foot ulcers cases

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ABSTRACT

Introduction: Diabetic foot ulcers can have serious consequences if left untreated, including amputation of the affected limb. To prevent this, it is important to practice proper foot care, check for signs of an ulcer, and seek medical attention if an ulcer is detected. With proper treatment, the majority of DFUs can be healed without the need for amputation. **Materials and Methods:** The present study comprised of 88 patients of diabetic foot ulcers of both genders. The consent was obtained from all enrolled patients. Data such as name, age, gender etc. was recorded. A detailed history was obtained regarding the duration of the diabetes. Vascular evaluation was performed checking capillary refill and distal pulses of the foot which included dorsalis pedis, posterior tibial, popliteal and femoral arteries. Neurological examination such as light touch, pinprick, position sense and vibration sense was recorded. **Results:** management done was incision and drainage in 7, transmetatarsal in 10, amputation was 42, debridement in 9, below knee amputation in 8, above knee amputation in 6 and Rye's procedure in 6 patients. The difference was significant ($P < 0.05$). **Conclusion:** Foot ulcers in diabetic patients represent a significant burden, often leading to lower extremity amputation. Prioritizing diabetes education is crucial. As prevention outweighs the cure, effective glycemic control and education are paramount in reducing diabetic foot disease.

Keywords: Foot ulcers, diabetic patients, Surgical management

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INTRODUCTION

Patients with diabetes mellitus are at higher risk of lower extremity complications than their non diabetic counterparts.¹ Every year approximately 5% of diabetic patients develop a foot ulcer. Approximately 15% of all diabetics develop foot problems during course of their illness. Diabetic foot ulcers carry a significant risk of amputation.²

Factors such as age and duration of the disease will increase its incidence. Once tissue damage has occurred in form of ulceration or gangrene, aim is preservation of viable tissue. Diabetic foot ulcers are commonly classified according to Wagner classification. Wagner classification assesses ulcer depth and presence of osteomyelitis or gangrene.³

Surgical therapy has several aims. The main goal is to control the deep infection, with the hope of salvaging the limb.⁴ This is accomplished by drainage of any pus, removal of all necrotic or infected tissues, and creating a healthy wound bed. It is also important to keep in mind the functional results after surgery. Residual foot deformities may lead to abnormal pressure points and, thus, re-ulceration.⁵ The surgeon must also consider the vascular status of the limb and

the anatomic level at which a wound would be likely to heal. Furthermore, the surgeon must ensure that there is sufficient viable soft tissue to cover any deficits left by resections or amputations.⁶ The present study was conducted to assess surgical management of diabetic foot ulcers.

Diabetic foot ulcers, a severe diabetes complication, are common and often lead to amputations. High amputation rates further compound the healthcare and economic burdens. Moreover, limited access to healthcare resources and strained infrastructure exacerbate the problem. To address this major health issue, comprehensive efforts are needed to improve diabetes management, enhance healthcare infrastructure, raise awareness, and ensure effective prevention and treatment of DFUs. Diabetic foot ulcers are more common among people with type 2 diabetes and those living in rural areas of Pakistan. It is also more prevalent among men than women. The risk factors for DFUs include poor glycemic control, peripheral neuropathy, peripheral vascular disease, and a high body mass index.

Diabetic foot ulcers are a serious health problem in Pakistan, as they can lead to amputation and even

death. Early detection and timely treatment are essential for preventing complications. It is important for people with diabetes to be aware of the risk of DFUs and to consult a doctor at the earliest signs of infection.

Diabetic foot ulcers can be difficult to treat due to their slow healing time. When individuals with diabetes experience impaired blood flow due to vascular issues, it can substantially slow down the healing process of DFUs. Treatment typically includes wound care, debridement, offloading, and infection control. Wound care involves keeping the wound clean and hydrated, as well as avoiding further trauma. Debridement involves removing necrotic tissue from the wound, which can help reduce infection. Offloading is the use of specialized shoes or casts to reduce weight on the ulcerated area, while infection control involves the use of antibiotics and

other medications.

MATERIALS AND METHODS

The present study comprised of 88 patients of diabetic foot ulcers of both genders. The consent was obtained from all enrolled patients.

Data such as name, age, gender etc. was recorded. A detailed history was obtained regarding the duration of the diabetes. Vascular evaluation was performed checking capillary refill and distal pulses of the foot which included dorsalis pedis, posterior tibial, popliteal and femoral arteries. Neurological examination such as light touch, pinprick, position sense and vibration sense was recorded. The patients were evaluated and managed surgically according to Wagner's classification for diabetic foot. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table 1 shows that out of 88, males were 53 and females were 35.

Table 1: Distribution of patients

Total- 88		
Gender	Males	Females
Number	53	35

Table 2, shows that Wagner classification grade 0 was seen in 7, grade 1 in 9, grade 2 in 14, grade 3 in 18, grade 4 in 20 and grade 5 in 21 patients. The difference was significant ($P < 0.05$).

Table 2: Classification of Diabetic Foot

Wagner Classification	Number	P value
Grade 0	7	0.05
Grade 1	9	
Grade 2	14	
Grade 3	18	
Grade 4	20	
Grade 5	21	

Table 3, shows that management done was incision and drainage in 7, transmetatarsal in 10, amputation was 42, debridement in 9, below knee amputation in 8, above knee amputation in 6 and Rye's procedure in 6 patients. The difference was significant ($P < 0.05$).

Table 3: Management of diabetic foot

Management	Number	P value
Incision and drainage	7	0.02
Transmetatarsal	10	
Amputation	42	
Debridement	9	
Below knee amputation	8	
Above knee amputation	6	
Rye's	6	

DISCUSSION

Familiarity with the several causative factors that lead to foot complications in diabetic patients and early recognition of the infection are crucial in ensuring proper treatment.⁷ A combination of surgical and antibiotic treatment is mandatory in virtually all deep foot infections. Foot infections can be classified in several ways: by the depth of the infection and its severity, by the anatomic site affected, by the tissues

involved, and by the causative factors, including any arterial insufficiency.⁸ To ensure an ideal outcome, the surgeon must also possess an understanding of the microbiology and pathophysiological behavior of infection, wound management principles, and foot biomechanics.⁹ The present study was conducted to assess surgical management of diabetic foot ulcers. We found that out of 78, males were 48 and females were 30. Gupta

*et al.*¹⁰ found that diabetic foot disease presented more among male in older age group and was more common in patients with uncontrolled diabetes, with longer duration of disease, with more than one co morbid condition. 38 patients (38%) had insulin dependent diabetics; and 87 (87%) of them were on irregular treatment. Other 58 patients (58%) had non- insulin dependent diabetes; out of which 19 (70.0%) were on irregular. Treatment. Remaining 4 patients (4%) were not getting any treatment for their disease. The commonest disease was grade 4 that comprised of 34 patients, followed by Grade 2 in 22 patients, followed by Grade 3 in 16 patients. These patients were managed according to Wagner classification as shown above. Conservative management with good diabetic control, antibiotic cover and foot care was carried out in 25 patients. Surgical intervention was carried out in rest of 75 patients. The commonest procedure was incision & drainage of foot abscess and debridement, that was performed in 41 (41%) of patients; while 35 (35.0%) patients needed some form of amputation. Multiple amputations were performed in 5 (5%) patients. This study also confirmed that diabetic foot ulcers is quite prevalent among diabetic population and thus, foot care education would be the most important way of dealing with this major problem. We found that Wagner classification grade 0 was seen in 4, grade 1 in 7, grade 2 in 12, grade 3 in 16, grade 4 in 19 and grade 5 in 20 patients. Eneroth *et al.*¹¹ demonstrated that deep foot infections in diabetic patients are a heterogeneous entity, and the type of infection is related to the outcome. Amputation was required more often for patients with deep soft-tissue infection, either alone or in combination with osteomyelitis, than for those with osteomyelitis alone. Armstrong *et al.*¹² validated a diabetic foot-wound classification system that demonstrated that the combination of infection and ischemia resulted in the worst outcome. Both of these studies emphasize the need for a thorough assessment of the infection. Insensate feet are more likely to develop ulcers due to sensory neuropathy and impaired proprioception; this decreases the foot's ability to adapt to repetitive local stresses. In our study, a prevalence of 61.4% of diabetic foot ulcers was found, which was very high compared to the studies done in India and China, which noted almost 10%-14% of patients having diabetic foot ulcers. It is possible that these differences are due to regional differences in the prevalence of diabetes mellitus and local operating risk factors. A variety of diabetes treatment centers offered different levels of quality in these studies. Since diabetes develops and progresses over time, this may suggest certain time-dependent risk factors that are common to all kinds of diabetes. There are also differences in the age at which diabetes begins on different continents. Wong *et al.*¹³ retrospectively reviewed 54 local amputations that were due to diabetic foot infections

and were done by surgeons with different levels of experience. Junior surgeons initially operated on the majority of the 22 patients who experienced failure, defined as the requirement for subsequent surgery. In contrast, all patients whose operations were done by senior surgeons healed, which demonstrates the importance of the experience of the surgeon.

CONCLUSION

Foot ulcers in diabetic patients represent a significant burden, often leading to lower extremity amputation. Prioritizing diabetes education is crucial. As prevention outweighs the cure, effective glycemic control and education are paramount in reducing diabetic foot disease. Additionally, early presentation, prompt hospital admission, and tailored medical and surgical interventions based on the disease's severity can significantly enhance outcomes, ultimately mitigating the morbidity and mortality associated with diabetes.

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