

Evaluation of Surgical Management of Diabetic Foot: An Institutional Based Study

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ABSTRACT

Background: Most deep infections are preceded by tissue breakdown, with local penetration of bacterial pathogens to the deeper tissues. A multidisciplinary team approach is essential to maximize outcomes in the attempt to limit amputation and decrease patient morbidity. Hence; the present study was undertaken for assessing the patients undergoing surgical management for diabetic foot lesions.

Materials & Methods: A total of 50 patients were enrolled for present study with presence of diabetic foot and schedule to undergo treatment for the same in the Department of General Surgery, Chhattisgarh Institute of Medical Sciences, Bilaspur, Chhattisgarh, India. Complete demographic and clinical details of all the patients were obtained. Thorough clinical examination was carried out and surgical treatment planning was done. Results of surgical treatment of diabetic foot were obtained and compiled in Microsoft excel sheet.

Results: In majority of the patients, mean duration of diabetes was more than 5 years. Lower limb amputation was done in 74 percent of the patients. Skin grafting was done in 12 percent of the patients while Sequestrectomy was done in 8 percent of the patients. Surgical site infection, stump gangrene, wound

hematoma and skin grafting failure were seen in 6 percent, 2 percent, 4 percent and 2 percent of the patients respectively.

Conclusion: Diabetic foot ulceration comprises of significant source of morbidity and mortality among patients with diabetes mellitus. A multidisciplinary team approach aiming at significant glycaemic control and early surgical intervention is required.

Key words: Diabetic foot, Surgery.


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INTRODUCTION

Most deep infections are preceded by tissue breakdown, with local penetration of bacterial pathogens to the deeper tissues. In many cases, the extent of the infection is underestimated; in 10%–15% of mild infections and in ~50% of serious infections, an underlying contiguous osteitis can be demonstrated. 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. A combination of surgical and antibiotic treatment is mandatory in virtually all deep foot infections.¹⁻³

Foot ulceration and subsequent infection are a major complication of diabetes mellitus. Without proper diagnosis and treatment, these infections often lead to amputation. A multidisciplinary team approach is essential to maximize outcomes in the attempt to limit amputation and decrease patient morbidity. Mild to moderate diabetic foot infections often respond favorably to local wound care, offloading, and antibiotic therapy. When conservative measures fail or when faced with limb- or life-threatening infection, surgical intervention, whether it be incision and drainage or possible amputation, is warranted.⁴⁻⁶ Hence; the present study

was undertaken for assessing the patients undergoing surgical management for diabetic foot lesions.

MATERIALS & METHODS

The present study was undertaken for assessing the patients undergoing surgical management for diabetic foot lesions. A total of 50 patients were enrolled for present study with presence of diabetic foot and schedule to undergo treatment for the same in the Department of General Surgery, Chhattisgarh Institute of Medical Sciences, Bilaspur, Chhattisgarh, India. Complete demographic and clinical details of all the patients were obtained. Thorough clinical examination was carried out and surgical treatment planning was done. Operative characteristics included: type of operations performed and post-operative complications; Major lower limb amputation was defined as amputation at or proximal to the ankle joint whereas amputation distal to the ankle joint were termed as minor lower limb amputation. Results of surgical treatment of diabetic foot were obtained and compiled in Microsoft excel sheet.

Table 1: Demographic data

Variable		Number	Percentage
Age group (years)	Less than 30	12	24
	30 to 50	15	30
	More than 50	23	46
Mean age (years)		51.9	
Gender	Males	29	58
	Females	21	42

Table 2: Clinical variables

Variable		Number	Percentage
Duration of diabetes (years)	Less than 5	18	36
	5 to 10	16	34
	More than 10	16	34
Duration of diabetic foot (weeks)	Less than 5	11	22
	5 to 20	28	56
	More than 20	11	22
Side affected	Right	27	54
	Left	23	46

Table 3: Type of treatment performed

Variable		Number	Percentage
Lower limb amputation	Minor	26	52
	Major	11	22
Skin grafting		6	12
Incision and drainage		3	6
Sequestrectomy		4	8

Table 4: Post-operative complications

Complications	Number	Percentage
Surgical site infection	3	6
Stump gangrene	1	2
Wound hematoma	2	4
Skin grafting failure	1	2

RESULTS

Mean age of the patients was 51.9 years. Out of 50 patients enrolled, 58 percent were males while the remaining were females. 46 percent of the patients belonged to the age group of more than 50 years. In 56 percent of the patients, duration of diabetic foot was between 5 weeks to 20 weeks. In majority of the patients, mean duration of diabetes was more than 5 years. Lower limb amputation was done in 74 percent of the patients. Skin grafting was done in 12 percent of the patients while Sequestrectomy was done in 8 percent of the patients. Surgical site infection, stump gangrene, wound hematoma and skin grafting failure was seen in 6 percent, 2 percent, 4 percent and 2 percent of the patients respectively.

DISCUSSION

Foot ulcers affect one in ten diabetics during their lifetime. Patients with diabetes have increased risk of lower-extremity amputations and the main cause is diabetic peripheral arterial disease accelerated by the direct damage to the nerves and blood vessels by high blood glucose levels. Wound healing is also impaired from affected collagen synthesis. Diabetic vascular disease has three main components: arteritis and small vessel thrombosis; neuropathy (possibly ischaemic in cause); and large

vessel atherosclerosis. In combination these are almost bound to cause problems in the weight-bearing areas. The diabetic foot ulcers are often deeper and more frequently infected than other leg ulcers reflecting the severe end vessel ischaemia and opportunistic infection which is the common experience of the diabetic. Surgical therapy has several aims. The main goal is to control the deep infection, with the hope of salvaging the limb. 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, reulceration. 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.⁷⁻⁹ Hence; the present study was undertaken for assessing the patients undergoing surgical management for diabetic foot lesions.

In the present study, mean age of the patients was 51.9 years. Out of 50 patients enrolled, 58 percent were males while the remaining were females. Our results were in concordance with the results obtained by Phillip L Chalyae et al who also reported similar findings. In their study, mean age of the patients was 54.3

years and 54.4 percent of the patients were males.³ In the present study, in 56 percent of the patients, duration of diabetic foot was between 5 weeks to 20 weeks. In majority of the patients, mean duration of diabetes was more than 5 years. Lower limb amputation was done in 74 percent of the patients. Skin grafting was done in 12 percent of the patients while Sequestrectomy was done in 8 percent of the patients. Eneroth et al 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 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.^{10, 11}

In the present study, surgical site infection, stump gangrene, wound hematoma and skin grafting failure was seen in 6 percent, 2 percent, 4 percent and 2 percent of the patients respectively. In another study conducted by Amir Denjalić et al, authors examined two modalities of surgical treatment of diabetic foot based on two different approaches, classical and multidisciplinary. Two groups of patients were analyzed according to two treatment approaches: the first group included patients treated with classical method (in the period 1999-2002), and the second group included patients treated with multidisciplinary approach (in period 2003- 2006). Duration of the disease ($p=0.24$), the level of blood glucose ($p=0.52$) and glycosylated hemoglobin ($p=0.10$) had no statistically significant effect to the outcome of the treatment of diabetic foot, while the level of hematocrit (p less than 0.006), fibrinogen (p less than 0.003), cholesterol (p less than 0.000001), and the absence of a pulse in the peripheral arteries (p less than 0.000002), and the outcome of surgical treatment of diabetic foot had the influence to the outcome of the treatment of diabetic foot with statistical significance. Aggressive and appropriate medical and surgical treatment according to a grade of disease could improve the outcome and reduce the morbidity and mortality of diabetic foot.¹²

CONCLUSION

Diabetic foot ulceration comprises of significant source of morbidity and mortality among patients with diabetes mellitus. It is also the leading causative factor for non-traumatic lower limb amputation. A multidisciplinary team approach aiming at significant glycaemic control and early surgical intervention is required.

REFERENCES

1. Morbach S, Lutale JK, Viswanathan V, Mollenberg J, Ochs HR, Rajashekar S, Ramachandran A, Abbas ZG: Regional differences in risk factors and clinical presentation of diabetic foot lesions. *Diabetic Medicine*. 2004, 21 (1): 91-5.

2. Akanji AO, Adetuyidi A: The pattern of foot lesions in Nigerian diabetic patients. *West Afr J Med*. 1990, 9: 1-5.
3. Phillipo L Chalyae et al. Surgical management of Diabetic foot ulcers: A Tanzanian university teaching hospital experience. *BMC Research*. 2011; 4: 365.
4. Abdulrazak A, Ibrahim Bitar Z, Ayesh A, Mobasher LA: Bacteriology study of diabetic foot infection. *J Diab Compl*. 2008, 19: 138-41.
5. Alavi SM, Khosravi AD, Sarami A, Dashtbozorg A, Montazeri EA: Bacteriologic study of diabetic foot ulcer. *Pak J Med Sci*. 2007, 23: 681-4.
6. Atif SH, Abdul HK, Naila M, Naila S: Study for Microbiological Pattern and In vitro Antibiotic Susceptibility in Patients Having Diabetic Foot Infections at Tertiary Care Hospital in Abbottabad. *World Applied Sciences Journal*. 2011, 12 (2): 123-31.
7. Alnour AM, Aamir AH, Alguili El: Diabetic Septic Foot in Omdurman Teaching Hospital. *Sudan journal of Medical Sciences*. 2009, 4 (2): 129-32.
8. Mahboob G, Ali R, Imran S: Frequency of lower extremity amputation in diabetics with reference to glycemic control and Wagner's grade. *J Coll Physician. Surg Pak*. 2006, 16 (2): 124-8.
9. Al-Ebous AD, Hiasat B, Sarayrah M: Management of diabetic foot in a Jordanian hospital. *East Mediterranean Health Journal*. 2005, 11 (3): 490-3.
10. Eneroth M, Apelqvist J, Stenstrom A. Clinical characteristics and outcome in 223 diabetic patients with deep foot infections. *Foot Ankle Int*, 1997; 18: 716-22.
11. Armstrong DG, Lavery LA, Harkless LB. Validation of a diabetic wound classification system. The contribution of depth, infection and ischemia to risk of amputation, *Diabetes Care*, 1998; 21: 855-9
12. Amir Denjalić, Hakija Bečulić, Aldin Jusić, Lejla Bečulić. Evaluation of the surgical treatment of diabetic foot. *Med Glas (Zenica)*. 2014 Aug;11(2):307-12.

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