Clinical Research on Foot & Ankle

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Amputation of the Foot or Toe

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Abstract

The aim of this study is to determine the predictors for reulceration, reamputation and mortality in patients with diabetes following toe amputation, and the impact of activities of daily living on clinical outcomes. This prospective cohort study included 245 patients who had undergone toe amputation (202 healing and 43 non-healing) and was followed for a 5-year period. Data regarding new foot ulceration, reamputation and mortality were recorded, and the patients' activities of daily living were evaluated. The rate of wound healing was 82·4%. The rate of follow-up in the healed group was 91·6%. In years 1, 3 and 5, the cumulative incidence of patients who developed a new foot ulcer was 27·3%, 57·2% and 76·4%, respectively, leading to reamputation in 12·5%, 22·3% and 47·1%, respectively. The cumulative mortality was 5·8%, 15·1% and 32·7% at 1, 3 and 5 years, respectively. Multivariate analysis showed that GHbA1c > 9% (75 mmol/mol) was identified as an independent predictor of impaired wound healing, reulceration and reamputation. An age of >70 years was identified as an independent predictor of reamputation, mortality and impairment of activities of daily living. Despite a satisfactory initial healing rate after the first toe amputation, with the extension course after the toe amputation, the long-term outcomes are not optimistic. In developing countries like China, taking measures to prevent reulceration and reamputation is very important for patients with diabetic foot minor amputations, especially following toe amputation.

Keywords: Diabetic foot; Mortality; Toe amputation; Ulcer

Introduction

This amputation surgery removes a toe, foot, or part of a foot. As a result of the relentless increase in the prevalence of diabetes mellitus (DM) in Africa, a corresponding rise in diabetes complications is expected. The International Diabetes Federation and World Health Organization jointly warn that these complications, if unchecked would threaten the viability of many African nations [1]. With diabetes prevalence of 5.7%, Nigeria is currently home to about 5 million adults living with diabetes. This appears to be a tip of the iceberg as it is estimated that about two-thirds of diabetes cases in Nigeria are yet undiagnosed. Consequent upon this high prevalence of chronic undetected hyperglycemia, many individuals with diabetes present with already established chronic complications at the time of diagnosis [2].

One potentially preventable complication of diabetes that is associated with high morbidity and mortality is diabetic foot ulcer (DFU). It is estimated that a person with diabetes has up to 25% chance of developing DFU in his/her lifetime [3]. The burden of DFU is high both in Africa generally, and in Nigeria in particular A recent update suggests that nearly 2 out of every 10 out-patients with diabetes in Nigeria have diabetic foot disease, and DFU accounts for nearly a third of diabetes-related hospital admissions [4]. Diabetic foot ulcer is associated with prolonged hospital stay, substantial economic burden and high mortality. Perhaps the most unpleasant potential consequence of DFU besides death is lower extremity amputation (LEA) [5].

More than three-quarters of all LEAs performed in people with diabetes is secondary to DFU which is currently the leading cause of non-trauma related LEA globally. The negative medical and psychosocial consequences of LEA in people with DM are substantial [6]. About 10% of those who suffer major LEAs die intra-admission. And post LEA survivors have a significantly reduced quality of life and higher risk of depression which may be related to impaired psychosocial functioning [7]. The long term prognosis after DFU-related LEA is also reportedly abysmal, with 3-year mortality after diabetic foot amputation ranging from 35 to 50%. In fact, long term prognosis after major LEAs in people with diabetes has been shown to be comparable to breast and prostate malignancies in females and males respectively [8].

Diabetes-related LEA rates have significantly declined in many western countries [9]. This is however not the case in many parts of Africa where DFU-related LEA rates are still very high Less than half a decade ago, amputation rate as high as 52% was reported among patients hospitalized for DFU in one tertiary healthcare centre. Nigeria Efforts to prevent this unpleasant scenario therefore deserve utmost attention, and this could be partly accomplished by risk factor identification. Regrettably, not much has been done in this direction in Nigeria. This research represents an effort to fill this very important gap [10].

Reasons for Procedure

An amputation may be done for:

- Poor blood flow that cannot be fixed
- Severe infection
- Trauma or injury
- Tumors
- Problems at birth, such as a foot that has not formed properly

Complications

- Excess bleeding
- Problems from anesthesia, such as wheezing or sore throat

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- Infection
- Blood clots
- Skin breakdown and swelling of the remaining body part
- Poor healing that may result in further amputation
- Feeling pain in the amputated foot or toe or feeling that it is still there

Risks

- Smoking
- Drinking
- Chronic diseases, such as diabetes or obesity

Prior to Procedure

The surgical team may meet with you to talk about:

- Anesthesia options
- Any allergies you may have

Current medicines, herbs, and supplements that you take and whether you need to stop taking them before surgery. Fasting before surgery, such as avoiding food or drink after midnight the night before [11]. Whether you need a ride to and from surgery. Tests that will need to be done before surgery, such as images [12].

Anesthesia

Local anesthesia—the area will be numbed

General anesthesia—you will be asleep

Regional anesthesia—a section of the body is numbed

Preventing Infection

During your stay, staff will take steps to lower your chance of infection, such as:

- Washing their hands
- Wearing gloves or masks
- Keeping your incisions covered

You can also lower your chance of infection by:

- Washing your hands often and reminding visitors and staff to do the same
- Reminding staff to wear gloves or masks
- Not letting others touch your incisions

Conclusion

We concluded that amputation of the great toe contributes to the development of deformities of the second and third toes and lesser MTPJs and new ulcer formation in patients with diabetes. When deformities were present, the second and third toes and second MTPJ were more severe in feet with a great toe amputation.

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