

East African Medical Journal Vol. 81 No. 8 August 2004

LOWER LIMB AMPUTATION IN JOS, NIGERIA

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**ABSTRACT**

**Objective:** To determine the pattern of lower limb amputation (LLA) and highlight preventable causes in our hospital.

**Design:** A retrospective study.

**Setting:** University Teaching Hospital, Jos, Nigeria.

**Subjects:** Eighty seven patients who had LLA over a five and a half year period. There were 62 males and 25 females aged between three and 83 years (mean $\pm$ SD = 44.5  $\pm$  21.1).

**Main outcome measures:** Indications, morbidity and mortality.

**Results:** A total of 94 LLA were performed in the 87 patients managed. Trauma, diabetic foot sepsis and malignant conditions of the limb were the main indications for LLA in 26(29.9%), 23(26.4%) and 20(23%) patients respectively. Others were peripheral vascular gangrene (PVG) in eight (9.2%) patients; chronic osteomyelitis, three (3.5%); chronic leg ulcers, three (3.5%); Ainhum, three (3.5%) and snake bite in one patient (1.1%). Above knee amputation (AKA) was the most common procedure performed (48.9%) followed by below knee amputation (BKA) in 37.2%. There were 11 deaths (12.6%), out of which eight were due to sepsis with multiple organ failure following diabetic foot sepsis, two cases of clostridial myonecrosis complicating compound fractures and a case of metastatic osteosarcoma in a child.

**Conclusion:** Majority of the cases of LLA could have been avoided with early presentation and appropriate management. A case is made for community health education on the need for early presentation to hospital for limb lesions.

INTRODUCTION

In developing countries, amputation remains a tragedy mainly because of poor rehabilitation. Where an adult male or female is the sole breadwinner of the family a situation that is almost a norm in developing countries, lower limb loss with inadequate or no rehabilitation can lead to critical survival problems(2). Despite the fact that most of the cases of amputation in developing countries are avoidable, surgeons are often left with no option than amputating a limb to save life(1-3). Ignorance and faulty belief about management of traumatic fractures and poor diabetic control often due to patient's reliance on open claims by traditional healers to cure diabetes mellitus have been adduced as contributing to preventable limb loss(4). Patients with malignancies of the extremities, which could have been managed without amputation, end up losing their limbs because of late presentation. This study reviews retrospectively, our experience with lower limb amputations.

MATERIALS AND METHODS

Jos University Teaching Hospital (JUTH), receives referral cases as well as routine cases from Plateau state and the neighbouring states in central Nigeria. During the period, March 1992 to July 1997, 87 patients underwent lower limb amputations in JUTH. These patients were identified from the operating room registers and their case notes retrieved from the hospital record department. Information extracted included demographic data, indication and type of amputation performed, morbidity and mortality data. These were analysed and the results presented in diagrammatic and tabular form.

RESULTS

A total of 94 amputations were carried out in 87 patients over a fifty one and half year period. The age and sex distribution are as shown in Figure 1. Over sixty percent of the patients were within the age group 21 to 60 years. The mean age (+SD) was 44.5 $\pm$ 21.1 (range 3 to 83 years) with a male to female ratio of 2.5:1.

Trauma and diabetic foot sepsis topped the list of indications for lower limb amputations accounting for 26 (29.9%) and 23(26.4%) patients respectively. Malignant lesions of the lower limb accounted for 20(23.0%) while peripheral vascular gangrene ranked fourth, accounting for eight patients (9.2%). Other indications are as shown in Table 1. Sixteen of the 26 trauma cases (61.5%) received initial treatment for their limb fractures from traditional bonesetters and presented with gangrene. Half of these were aged ten years and below. Of the 23 diabetics, four had Meggitt and Wagner(5) grade III while 19 had grade IV diabetic foot gangrene requiring some form of ablative surgery. All cases of squamous cell carcinoma and majorlin's ulcers had affectation of the underlying bones. The most frequent sites of amputation were above and below knee, accounting for 46(48.9%) and 35(37.2%) respectively. Major lower limb amputations (proximal to ankle) accounted for 89.4% (Table 2). Fifty six (59.5%) amputations were performed on the left side.

Figure 1

Age and sex distribution of lower limb amputees

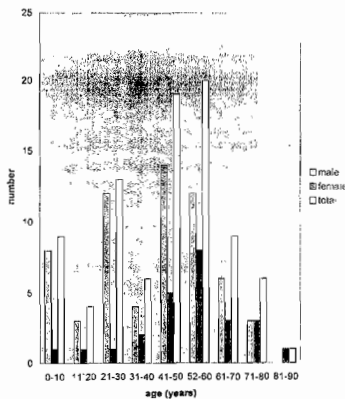


Table 1

Indications for amputations

	No.	(%)
Trauma	26	29.9
Diabetic foot gangrene	23	26.4
Malignancy	20	23.0
Squamous cell carcinoma	9	
Marjolin's ulcer	5	
Osteosarcoma	4	
Giant cell carcinoma	2	
Peripheral vascular gangrene	8	9.2
Chronic Osteomyelitis	3	3.4
Chronic leg ulcers	3	3.4
Ainhum	3	3.4
Snake bite (with gangrene)	1	1.1
<b>Total</b>	<b>87</b>	<b>100</b>

Table 2

Sites of amputations

	Right LL	Left LL	Total (%)
Hip disarticulation	0	2	2(2.1)
AKA	18	28	46 (49.9)
BKA	12	23	35 (37.2)
Through Knee	1	0	1 (1.1)
Symes	1	1	2 (2.1)
Trans-metatarsal	1	-	1 (1.1)
Ray	2	1	3 (3.2)
Toe	3	1	4 (4.3)
<b>Total</b>	<b>38</b>	<b>56</b>	<b>94 (100)</b>

BKA=Below knee Amputation; AKA=Above knee amputation, LL=Lower limb.

Duration of hospitalisation ranged from a day to six months, with a mean ( $\pm$ SD) of  $37.5 \pm 28.6$  days. Wound infection was the most common complication occurring in 34 patients. Of these, 20 had no documented evidence of bacteriological diagnosis while 14 had culture results that grew *staphylococcus aureus*; 11, *proteus spp.*, 4, *pseudomonas spp.*, 4, *klebsiella spp.*, 2 and *E. coli* in 2. Five of the patients had poly-microbial growth. Anaerobic cultures were not done. Stump gangrene and dehiscence occurred in seven patients, six of whom had diabetic foot gangrene while one had peripheral vascular disease. This group had re-amputations (overall re-amputation rate of 7.4%). Haemorrhage, malignant recurrence at the stump and bedsores were recorded in one patient each. There were a total of 11 deaths (12.6%). Of these, eight were due to septicaemia with multiple organ failure complicating diabetic foot sepsis, two cases followed clostridial myonecrosis complicating compound fractures and a case of metastatic osteosarcoma in a child. The specific mortality rate for diabetic foot sepsis was 34.8%. Rehabilitation was generally poor. Initial mobilisation was by the use of crutches and only twelve of the amputees were referred for prosthesis. Majority were lost to follow up.

## DISCUSSION

Majority of our patients are young adult males, upon whom most extended family responsibilities lie. Lower limb amputations in this group almost always result in a serious economic crisis for the family, especially that prosthesis are either unavailable or unaffordable(1,2).

The peak age incidence observed in the 5th and 6th decade contrast to those from Ghana(3), where peak age incidence was in the seventh decade with diabetic foot and peripheral vascular gangrene (PVG) topping the list of causes. Trauma was the leading cause of lower limb amputation in our center. The triad of trauma,

diabetic foot gangrene and malignancy accounted for about 80% of all lower limb amputations. This is similar to the finding from Port Harcourt(4), Nigeria, where the same triad accounted for about 90% of lower limb amputations. Holcombe and Hassan(2) from Maiduguri, Nigeria, reported a similar age distribution(1) but a small preponderance of malignancy over trauma with no case of PVG recorded. There were eight cases PVG in this study. Adotey and Jebbin(4) had three cases of PVG in their report.

Most of our patients presented late with spreading gangrene or advanced diabetic foot gangrene or malignant lesions that had involved the underlying bones requiring radical procedures to save life.

Above knee amputation (AKA) was performed more frequently than below knee input (BKA). This seems to be the pattern in our sub-region(1,4), as opposed to studies from developed countries(6,7). Late presentation as earlier alluded to and the tendency on the part of surgeons in developing countries to opt for a higher level of amputation(1-3) when there is spreading cellulitis or absent popliteal pulse may be the reason for this. Lack of sophisticated diagnostic armamentaria such as(8-10) doppler indices, skin blood flow, skin perfusion pressure, transcutaneous oxygen measurement and thermography used to predict successful wound healing is also a factor. It had been shown that more limited amputation especially for diabetic foot gangrene and peripheral vascular disease in the quest for limb salvage often result in higher re-amputations thereby subjecting the patient to multiple operations and prolonged hospitalisation(6).

Early presentation and appropriate management of the three most common indications - post-traumatic gangrene, diabetic foot sepsis and malignant leg lesions may have prevented amputations(2). Community health education to encourage early presentation to hospital

coupled with education(4) and encouragement of traditional healers to recognise and refer problems beyond their abilities would go a long way in reducing the incidence of lower limb amputations.

#### ACKNOWLEDGEMENTS

To the consultant surgeons in the department of surgery, Jos University Teaching Hospital, for allowing us to include their patients in this review and to the staff at the Medical Records Department.

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