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A Ten Year Review of Extremity Amputations in Jos University Teaching Hospital

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Abstract
Background: Amputation is a major undertaking in the life of any patient. This study determined the indications and the changing trend of extremity amputations in Jos University Teaching Hospital from January 2004 to December2013.
Design: A retrospective study of patients that presented at the accident and emergency department, referred cases to the orthopedic clinics and wards at the Jos University teaching Hospital, Nigeria. Data was obtained from case notes, operation record and, discharge summaries of patient who meet the inclusion criteria. Data was entered epi version 3: 5:3 and analyzed.
Results: Three hundred and two patients had amputations within the study period (2004 to 2013).There were 196 males and 106 females with a male to female ratio of 1.8:1. Ages range was 1year to 90 years with mean of 42.68 ± 21.52 years. Trauma and diabetic foot diseases were the leading indications for amputation 139 (46%) and 99(32.8%) respectively, others were mitotic lesions, peripheral vascular diseases, severe burns, snake bites and electrocution. Extremities involve were lower limbs, 262(86.8%) and 40(13.2%) upper limbs. Type of amputations carried out were above knee 156(51.7%), below knee 72(23.8%), lower limb digit 34(11.3%),above elbow 24(7.9%),below elbow 12(4%)) and upper limb digits was 4 (1.3%) in descending order of frequency.
Conclusion: Amputation is a life saving measure and central to the process of rehabilitation of patients with extremely diseased extremities. Indications are however multiple, vary from place to place and change with time.

***Key words:** Amputation, indication, extremities, trauma*

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I. Introduction

Amputation is an ancient surgical procedure known in the history of mankind and was indicated for punitive, ritual or therapeutic purpose[1,2]. This procedure was routinely associated with major problems of hemorrhage, shock and sepsis which could be life threatening necessitating inclusion in the statement of informed consent prior to surgery[3,4].In modern day practice only therapeutic amputations are ethically and legally permitted to be carried out on anyone.

Therapeutic limb amputations may be carried out as limb or life-saving measures when the extremity or part of it is deemed non salvageable due to severe functional deficiency that is live threatening to the individuals. In our setting however, complications arising from primary pathologies most often than not warrants such interventions. These complications resulted from delays in presentation, failure of early recognition of the extent of the underlying primary disease condition and late intervention[5,6]. Appropriate and early intervention could rescue a significant number of limb parts lost to therapeutic amputation.

In some climes mention of the word amputation evokes profound social, economic and psychological effect on the patient and their families. Psychological feeling is varied and could range from sympathy, apathy, guilt to even regrets for not presenting sooner. Sometimes even resentments could arise between the patient, informant and the managing team. Losing a limb is associated with some degree of stigmatization in our society; therefor It is a dreaded procedure that patients and their relatives accept after a lot of hesitation[7]. It is even more devastating when it involves a breadwinner or respected dependent.Loss of a useful body part leading to subsequent loss of function and changes in the body image could cause profound effect on individual psycho-social activity, long term economic implications in addition to shrunken employment opportunities[1,8]

The incidence and indications for amputation varies across the different regions of the world. Trauma has been reported to be the leading cause of amputation in Nigeria, Malaysia, Pakistan and Kenya[9,19,11,12]. Young males below 40 years are commonly involved [13,14].In Pakistan non traumatic cause are responsible for amputation in those over 40 years[12]while in Europe the incidence rises steeply with age reaching a peak at 60

years[15].More lower extremity amputations are done than in upper limbs globally[13,14,15,16]. Peripheral arterial diseases characterize by occlusion or stenosis of lumen of peripheral arteries leading to decrease perfusion to the limbs is a leading indication for amputation in the United States[17]. Those at risk for amputation include uncontrolled diabetics with diabetic foot diseases, hypertensive's, smokers, peripheral arterial disease and being an African race living in Africa[18].

Although amputation is generally dreaded by many for the fear of mutilation, improved surgical skills in performing the procedure advancement on rehabilitation has made it become more acceptable as an alternative to limb salvage and considered a reconstructive procedure[1,2,19,20]. In life threatening states it is regarded as the initial milestone of acknowledging the patients' chance to live and to contribute to the society despite the absence of some useful body part.

Reports from various parts of the country indicate increasing number of amputations. In our environment and other developing economies, amputation still remains a tragedy due to poorly developed rehabilitation sciences[21]. Therapeutic limb amputation is however unavoidable in our society and is still one of the common procedures performed by the orthopedic surgeons practicing in Africa. This study retrospectively analyzed data on patients that underwent therapeutic limb amputation over the ten years in Jos university teaching hospital. The study aims to assess the yearly incidence, indications, body parts involved, age and sex of patients commonly affected with a view to finding areas of interventions.

II. Materials And Methods

Jos University Teaching Hospital is a tertiary level reference center for other hospitals in Plateau state and neighboring states in the North central Nigeria. The study period was January 2004 to December 2013. Therewere 313 patients that underwent various forms of extremity amputations in Jos University Teaching Hospital during. Patients data was extracted from cases notes, operation registry, admission and discharge registers. Data retrieved include patients bio-data, indications, site of election, duration of hospital stay, surgery outcomes and type of complications where applicable. Patients who had amputations outside Jos university teaching hospitalwere excluded from the study.Eleven patients' case notes that could not be traced were also excluded from the study.Data was entered into excel spread sheet and analysis using epi info version 3.5.3.

III. Results

A total of 302 amputations were carried out on 302 patients with 152 on the right and 150 on the left. There were 196 (64.9%) male and 106 (35.1%) females with a male: female ratio of 1.8:1. . The mean age is 42.6+-21.5 with variance of 463.2. Extremity amputation was highest in the age group 21-30years and 61-70 years with an incidence of 53(17.5%) and 48(15.9%) respectively; and least in the age group 81 to 90 year with an incidence of 4(1.3%). Most of the amputation 55 (18.2%) were performed in 2011.

More lower limbs 262 (86.7%) were amputated than upper limbs 40(13.2%) in the ratio of 6.5:1. Trauma was the leading indication 139 (46%), diabetic foot gangrene 99 (32.8%), peripheral vascular disease 39 (12.9%), mitotic lesions account for 15(5%) and others comprising of severe burns, electrocution and snake bites accounted for 10 (3.3%). Forms of mitotic lesions seen include osteosarcoma 8(2.6%), Kaposi sarcoma 4(1.3%), rhabdomyosarcoma 3(1%%) and malignant histiocytoma 1(0.3%). Patients who had amputation following complicated traditional bone setter's intervention were 75(24.8%). A significant number 38 (50.7%) of those exposed to traditional bone setters were below 21 years of age while the rest 37 (46.7%) were below 18 years.

In the lower limb the most common level of amputation was Above knee (AK) 156(51.7%), Below knee 72(23.8%) and lower limb digits (LLD) 34(11.3%). In the upper limb amputations above elbow was 24(7.9%), below elbow (BE) 12(4%) and upper limb digit (ULD) 4(1.3%).

The duration of hospitalization range from six days to ninety-six days. The most common complication was wound infection which occur in 52 (17.4%) patients and wound swab yielded polymicrobial organism in 48(92.3%) while, the rest 4(7.3%) did not have wound swab done. Wound dehiscence occurred in 17 (5.6%), other complications which included flap necrosis, hematoma collection, ring sequestrum sinus discharge and stump overgrowth accounted for 185(77%). There was more than one intervention in 91(30%) and Re-amputations in 15(5%) for various reasons.

A total of 7(2.3%) mortality was recorded: 4(57.1%) were due to overwhelming septicemia, 2(28.6%)due to deep vein thrombosis and subsequent pulmonary embolism while 1(1.4%) from metastasis to the lungs. Survival was 295(97.7%).

Table 1. Age distribution of patients who had extremity amputation from 2004 -2013 in Jos university teaching hospital.

Agegroup	Frequency	Percent
0-10	25	8.3%
11-20	28	9.3%
21-30	53	17.5%
31-40	41	13.6%
41-50	38	12.6%
51-60	41	13.6%
61-70	48	15.9%
71-80	24	7.9%
81-90	4	1.3%
Total	302	100.0%

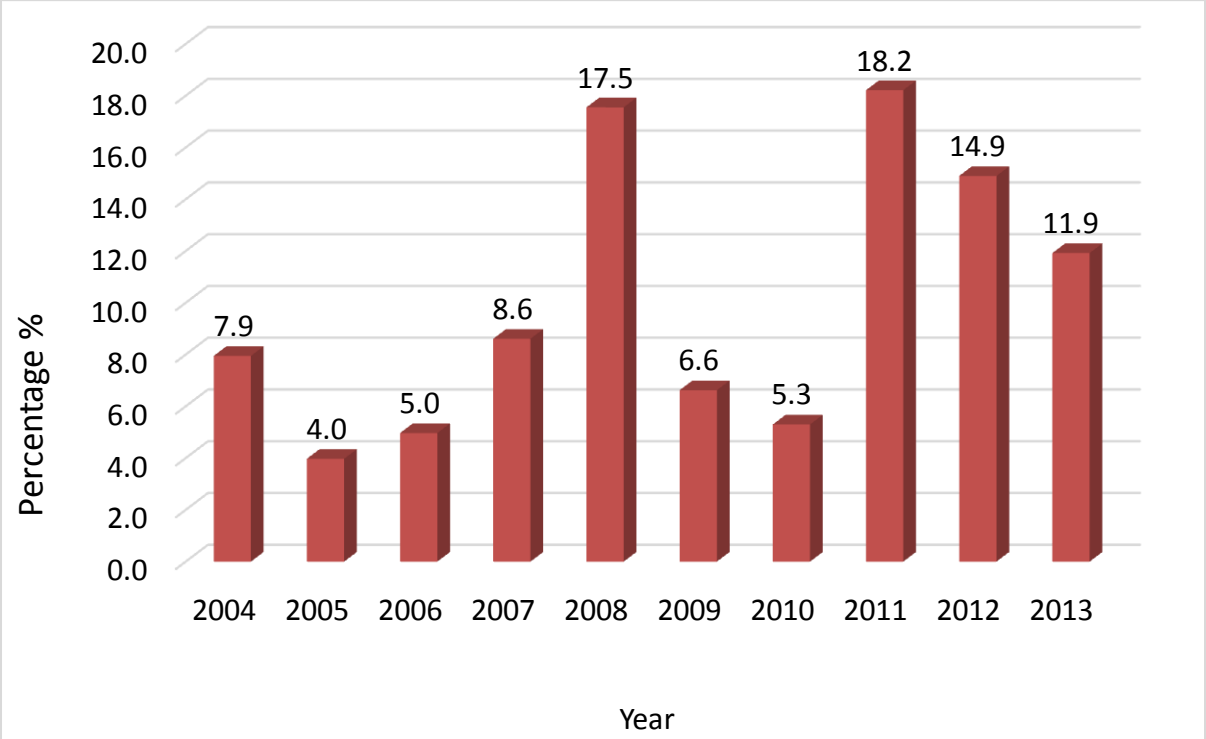

FIGURE 1: Yearly frequency of amputations done in Jos university teaching hospital from 2004 to 2013, N=302.

Table 2. Indications for extremity amputations in Jos university teaching hospital from 2003-2013, N=302.

DIAGNOSIS	Frequency	Percent
DIABETES M	99	32.8%
OTHERS	10	3.3%
TRAUMA	139	46.0%
PVD	39	12.9%
TUMOR	15	5.0%
Total	302	100.0%

Table 3. Distribution of sites of extremity amputation in Jos university teaching hospital from 2003 -2013, N=302

SITE OF ELECTION	Frequency	Percent
Above Elbow	24	7.9%
Above Knee	156	51.7%
Below Elbow	12	4.0%
Below Knee	72	23.8%
Lower Limb Digits	34	11.3%
Upper Limb Digits	4	1.3%
Total	302	100.0%

IV. Discussion

A significant number of amputations were performed in Jos university teaching hospital and the most common indication was trauma, followed by metabolic disease (diabetes mellitus) and peripheral vascular disease respectively. This could be due to high rates of motor vehicular accidents and communal clashes in our country.This finding is similar to other parts of Nigeria where Kano, Lagos and Port-Harcourt had high rates of amputation as a result of trauma.[13,14,25]In Warri and Lagos however, diabetic foot disease were found to be more common[16,31]. These are two densely populated highly commercialized coastal cities with high daily human influx with cosmopolitan demographics, eating of more refined diet and lack of exercise.

There were more amputations of the lower limb amputation than the upper limb amputations. This picture is similar to the findings of Phillipo et al in Tanzania, however diabetes mellitus was the major indications for amputation rather than trauma[8].In a similar study reported in Kenyan urban tertiary hospital, there was high rate of lower limb amputation although peripheral vascular diseases was the major indication for the amputations[8,28].This difference could be explained by the increase in terrorism and motor vehicular accidents in our country.While the lower limbs are more often injured, diabetic gangrene commonly inflicts the foot[31,32]. Other conditions that commonly inflict damage with predilection to the lower extremity include peripheral vascular diseases, chronic leg ulcers and snake bites which were also found among our patients.

Males were more affected than females in our study. The predominance of the male gender has not changed as in other parts of the country and even in the world and is similar to our finding[6,9,13,14]. In Maiduguri, a significant high male: female ratio of 3.5:1 was reported[9]. This could be explained by male gender being more vulnerable in our setting. They are the ones commonly recruited into gangs, rebel soldiers, terrorism and victims of communal clashes while defending their territories.

Above knee amputation was the most frequently performed lower limb amputation in our study. There are two common and competing indications, trauma and diabetic vasculopathy. Trauma occurs from vehicle accidents, getting involved in communal clashes, terror attacks and victim of bomb blasts sustain fractures. Badly managed fractures by traditional bone setters accounted for about a third of the AK indications often as a result of flap necrosis and overwhelming sepsis. This is not strange as similar study carried out in Maiduguri, Lagos, Kano and aria, revealed similar pictures where trauma and diabetic foot disease were the leading indications for AK.[9,13,14,27] In Europe and the US however diabetes has remained consistently a leading indication for extremity amputation.[8,15,17] This could be explained by the more stable society and technology that encourages more refined diet.

Tumors were responsible for 15 (5%) of the lower extremity amputation. Various mitotic lesions seen include rhabdomyosarcoma, osteosarcoma, Kaposi'ssarcoma and malignant histiocytoma. Amputation in this group could be explained by delayed help seeking and could not benefit from limb salvage rather, life saving intervention. This is seen in Adis Ababa.[32]

In conclusion Indications for amputation vary in our setting. There is a competing rise in number of diabetic gangrenes as indication for amputation. This change in the trend of indications over the years could be an indication of increasing number of conditions that are non-communicable and affected by life style changes as seen with peripheral vascular disease. Strict road traffic legislation and enforcement of traffic rules with lifestyle modification, health education and advocacy to encourage health seeking behaviors may curb the rising trend the underlying diseases

Limitation of this study lies with fact that it is retrospective and a hospital base study.

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