

Pattern of Limb Amputations in Male Patients in a Sub-Urban Teaching Hospital

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Background: *Extremity amputations represent a major disability and it is compounded by the difficulty in obtaining prosthesis in developing nations. The consequences of loss of earning abilities, particularly when the patient is the only wage earner in a large extended family is high. The aim of this study was to evaluate the pattern of limb amputations in male patients in Irrua specialist teaching hospital, Irrua, Edo state of Nigeria.*

Methods: *This is a retrospective review of the pattern of limb amputation surgeries in male patients in Irrua over a five year period. Data was obtained from the medical records department. Extracted data were analyzed using simple statistical method of proportions and percentages.*

Results: *Fifty-nine male patients had sixty-four limb amputation surgeries during the study period. Median age of patients was forty-nine years. The most frequent level of amputation was below knee level in 53.1% of cases, followed by above knee in 31.2% of cases. The lower limb was involved in 92.1% of cases, the rest 7.9% involved the upper limb. Diabetic foot disease was the commonest indication for amputation, 26 patients (40.6% of cases) followed by trauma in 23 patients (35.9% of cases). Wound infection was the most frequent post-operative complication occurring 34.4% of wounds in this study.*

Conclusion: *Diabetic foot disease and trauma were the commonest indications. The middle aged was the most involved. Preventive measures such as education of diabetic patients on foot care, regulation of the activities of traditional bone setters, and public enlightenment on road safety rules would assist in no small measure in addressing this problem.*

Keywords: Pattern, male, limb amputation, Teaching Hospital.

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Introduction

Amputation is the removal of the whole or a part of a limb by cutting through bone or joint. It is one of the most ancient of all surgical procedures with a history of more than 2,500 years dating back to the time of Hippocrates¹. It is the last resort when limb salvage is impossible or when the limb is dead or dying, viable but non functional or when it is threatening the patient's life.¹

In Western Countries, rise in amputations is for the most part due to increased life expectancy. Newest statistics in the United States of America (USA) reveals that about 1.7million people live with amputations² and the number has increased in the recent years³. It is estimated that 25 – 27 in 100,000 of the German population have undergone amputation⁴. The estimated prevalence of extremity amputation in Nigeria is 1.6 per 100000.⁵ Limb amputations are essentially disfiguring operations that carry a fairly high peri-operative mortality and morbidity. Persons who have undergone amputations are often viewed as incomplete individuals⁶

In developed Countries, peripheral vascular disease ranks first as a cause for amputation whereas trauma, infections, uncontrolled diabetes mellitus and malignancies are the leading cause for amputation in developing countries^{7,8}. Most amputees in developed countries are older than 60 years of age, and 80 – 90% of lower limb amputations are performed as a result of vascular disorders^{6, 9 - 12}. However, in the developing world like Nigeria, the majority of amputees are young^{13,14} and the major cause of limb amputation varies from one centre to

another. Sadly, most often, patients in developing countries present late when limb salvage is not a viable option.

Studies have shown that the males are the most frequently involved in amputations. It is the prominent risk factor for limb amputations^{5,8,12 - 20}. The plausible reason for this may be due to the fact that males are more prone to trauma and are more predisposed to present late with limb gangrene following a mismanaged limb problems by quacks. The loss of a limb by any individual, especially in developing countries where prosthetic services are poor, often has profound economic, social and negative psychological impact on the patient and his family^{6, 12, 21, 22}. The man, being the bread winner in many families, is more prone, especially in a resource poor society like ours.

There is therefore, need to determine the pattern and indications for extremity amputations among male patients in Irrua Specialist Teaching Hospital, Irrua in Edo State of Nigeria in order to make suggestions on preventive measures, proper rehabilitation in terms of prosthetic acquisition.

Patients and Methods

This was a retrospective study of male patients who underwent limb amputation surgeries in Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria, between July 2005 and June 2010. Institutional research and ethics committee approval was obtained. Case notes of all male patients who had limb amputations during the period were retrieved from the medical records department after checking through theatre and ward records to collate list of amputees. Information on age, indication, levels of amputation limb involvement, post-operative complications and other relevant data were extracted and entered into a previously prepared proforma for that purpose. Patients with incomplete records or missing case notes were excluded from this study. Data were analyzed by simple statistical method for calculation of mean, median and percentages.

Results

Ninety patients had amputation surgeries in Irrua Specialist Teaching Hospital during the study period, out of which, 59 were males and 31 were females giving a male to female ratio of 1.9:1. The ages of the male patients ranged from 14 – 86 years with a median age of 49 years. Table 1 shows the age distribution of the male patients. Age groups 31 – 40 and 51 – 60 had the highest number of patients making up 21.9% and 25% respectively.

Table 1. Age Distribution of Male Patients

Age in Years	No. of Patients	Percentage
20 – 30	9	14.1
31 – 40	14	21.9
41 – 50	9	14.1
51 – 60	16	25
61 – 70	8	12.5
71 – 80	4	6.25
81 – 90	4	6.2

Table 2. Levels of Amputation in Male Patients

Level of Amputation	No. of Patients	Percentage
Below knee	34	53.1
Above knee	20	31.2
Below elbow	1	1.6
Above elbow	3	4.7
Finger	1	1.6
Toes	5	7.8

A total of 64 amputation surgeries were carried out on 59 male patients in this study. Below knee level of amputation, which made up 53.1% was the most frequent. Above knee amputation was the second most frequent (31.3%) and below elbow and finger were the least (1.6%) each as shown in Table 2.

The lower limbs and upper limb were affectation is as shown in Table II. 3(of the patients had initial below knee amputations, reviewed to above knee level due to necrosis of flap, ascending gangrene and infection. One patient had bilateral below knee amputations at various times for diabetic foot disease. Diabetic foot disease was the commonest indication for amputation, accounting for 26 (40.6% of cases) followed by trauma in 23(35.9%) as shown in Table 3.

Of the 64 amputation surgeries in male patients, 56.3% of cases healed primarily without complications. The remaining 43.7% developed complications ranging from wound infection in 34.4% of cases to death in 4 cases accounted for 6.3% mortality rate as shown in Table 4. Two of the patients died from septicaemia attributable to delay in giving consent for surgery, one patient died from cerebrovascular accident and another from renal failure.

The average length of hospital stay of the male amputees was 39.2 days. The longest staying patient stayed for 120 days. He had other complications of diabetes mellitus, septicaemia, renal and wound complications. The shortest staying patient was a case of traumatic finger amputation, a day case that stayed for three hours.

Table 3. Outcome of Amputation Surgeries in Male Patients

Outcome	No	Percentages
Primary wound healing	36	56.3
Wound infection	24	37.5
Wound dehiscence	4	6.3
Ascending gangrene/infection requiring Proximal Re-amputation BKA to AKA	3	4.7
Post - op depression	2	3.1
Death	4	6.3

Table 4. Indications for Amputations in Male Patients

Indication	No. of Patients	Percentage
DM limb gangrene	26	40.6
Trauma	23	35.9
Peripheral vascular disease	5	7.8
Limb gangrene complicating TBS treatment of trauma	4	6.3
Malignancies	4	6.3
Chronic leg ulcers	2	3.1

Discussion

Extremity amputations represent a major disability and it is compounded by the difficulty in obtaining prosthesis in developing nations. The consequences of loss of earning abilities, particularly when the patient is the only wage earner in a large extended family are high¹⁹. Males are more aggressive, predisposing them to more injuries that may result in amputations.^{1, 20, 23 - 25}. Male predominance has been the norm in many previous studies on limb amputations.^{13, 14, 15, 16, 19, 20, 26}

Fifty-nine (65.5%) of the 90 patients that had extremity amputations in this centre during the study period were males. This is of great socio-economic importance. Males are the bread winners in most families, hence their high level of involvement in amputations would impact negatively on their families, society as well as the economy. The median age in this study was 49 years. This is similar to 48.7 years reported by Odatuwa – Omagbemi D.O²⁷ for the male sex alone and 47.5 years reported by Jawaid et al¹⁹ for both sexes. It is however lower than the median of 53 years observed by Edomwonyi et al¹³ and 54.4 years recorded by Ofaeli²⁷, but higher than 35 years and 39.7 years reported by Olasinde et al⁸ and Hamzy et al¹⁶ respectively for both sexes.

51 – 60 years (25%) and 31 – 40 years (21.9%) were the peak age groups for amputations in male patients in this study; the 31 – 40 years age group represents the most active and productive group in any society. These males are aggressive and vulnerable to trauma and related problems and complications. The 51 – 60 years is a middle age group that is also fairly active but this is the age where majority of patients are diagnosed with metabolic problems like diabetes mellitus type II. In the absence of robust rehabilitative and prosthetic facilities and little or no social support system, the family and society suffers immensely.

The commonest indication for amputation among male patients was Diabetic foot disease which accounted for 40.6% of cases. Several recent reports^{13, 14, 19, 21} also support this fact and other authors^{14, 19} reported higher percentages of 54.7% and 45% for both sexes. This may be attributed to ignorance, poverty, self medication, seeking alternative medical care, increase prevalence of uncontrolled diabetes mellitus complicated by retinopathy and vasculopathy¹⁷ and delay in presentation to the hospital for medical care.

Trauma and complications of Traditional bone-setters treatment accounted for 35.9% and 6.3% respectively. Older reports show that gangrene arising from trauma as well as traditional bone-setter’s intervention was leading indications for limb amputations in Nigeria in 60 – 70% of cases^{5, 12, 28}. The rising level of awareness among our people about the challenges and poor outcome of traditional setter’s intervention, advantages of early presentation to the hospital following injury and the availability of some trauma centres may explain the drop in the incidence of amputations resulting from trauma and traditional bone-setter’s intervention.

Lower limb amputation was commoner than upper limb. This is not surprising. The lower limbs are injured more often than the upper limbs and diabetic gangrene is commoner in the foot than elsewhere in the body.^{29,30} About 53.1% of amputations in this study were below knee level amputation surgery, making it the most frequent level of amputation done among male patients in our centre. This agrees with findings from several previous studies on sexes^{12, 14, 15, 20, 29}. In contrast, another study reported above knee amputations as the most common procedure performed²⁶. Of particular note is that the latter study, trauma and lower limb gangrene resulting from the activities of traditional bone setters were the commonest indications for amputation while in ours it was diabetic foot disease. It would appear, trauma and gangrene resulting from traditional bone-setter's treatment of limb injuries cause relatively more extensive tissue damage and thus require more proximal level of amputations in order to save lives compared with other indications for amputation.

Wound infection was the commonest post-operative complication occurring in 34.4% wounds. This wound infection rate is lower than 68.3% and 72.5% observed by Olasinde et al⁸ and Akiode et al²⁶, but higher than figures quoted by other authors^{13, 17, 19}, which ranged from 23% to 32%. Diabetic foot gangrene with ascending sepsis, preoperative conditions of the limb, gangrene with sepsis resulting from traditional bone setter's treatment of limb injuries are some of the factors that may explain this relatively high wound infection rate. Generally these tissues are either poorly vascularized or severely traumatized, increasing the risk of complications.

Three of our patients who initially had below knee level amputations ended up with proximal re-amputation level above the knees. Four of the patients died in the post-operative period in this study giving a post-operative mortality rate of 6.3%. Some authors^{20, 26} reported a similar finding. In contrast, Ofaeli²⁷ recorded 11% while Dada and Awoyomi¹⁴ reported 16.2% post-operative mortalities. Better peri-operative care and control of co-morbid conditions might have accounted for the relatively low post-operative mortality rate in this study.

Conclusion

Male involvement in extremity amputations has again been shown, with many of them, in the active age group and bread winners in their families. Better social support system, establishment of well equipped and functional rehabilitative and prosthetic centres for amputees in our hospital would go a long way towards empowerment and speedy reintegration of these male amputees back to the society. Widespread education of diabetics on foot care and glycaemic control including regular blood sugar screening for the aging population cannot be over emphasised. Public enlightenment on road safety precautions and regulation of the activities of traditional bone-setters by the relevant authorities is re-emphasised. It is our hope that in a resource poor nation like ours, good and affordable healthcare plans and advocacy on the prevention of complications of diabetic mellitus and trauma will reduce the costs and burdens of amputation surgeries in our setting.

References

1. Paudel B, Shrestha BK, Banskota AK. Two faces of major amputations. Kathmaudu Univ. Med. J. (KUMJ). 20053(3): 212 - 6
2. Ziegler - Graham K, Mackenzie EJ, Ephraim P.L, Travison T.G, Brook Meyer R. Estimating the prevalence of limb loss in the United States: 2005 to 2050. Arch. Phys. Med. Rehabil. 2008; 89(3): 422 -9.
3. Robert K, Heck JR. General principles of amputations. In: Canale ST, Beaty JH, Editor(s). Campbell's Operative Orthopaedics. 11th ed. Pennsylvania, Philadelphia; 2008. P. 561 - 78.

4. Maysidis T, Nowack T, Eickmeyer F, Waldhasusen P, Brunken A, Hochlenert D et al, Trends in amputation in people with hospital admissions for peripheral arterial disease in Germany. *Vasa*. 2011; 40(4): 289 – 95.
5. Thanni LO, Tade AO. Extremity amputations in Nigeria – a review of indications and mortality. *Surgeon* 2007 Aug; 5 (4): 213 – 7.
6. Masood J, Irfan A, Ghulam M: Current indications for major limb amputation. *Pakistan J. Surg* 2008; 24(4): 228 – 231.
7. Abou – Zamzam AM, Teruya TH, Killeen JD: Major lower extremity amputation in an academic vascular centre. *Ann Vasc. Surg* 2003, 17: 86 – 90.
8. Olasinde AA, Oginni IM, Bankole JO: Indications for amputations in Ile-Ife, Nigeria. *Niger. J. Med.* 2002, 11: 118 – 21.
9. Greive AC, Lankhorst GJ: Functional outcome of lower limb amputees: a prospective descriptive study in a general hospital. *Prosthet Orthot. Int.* 1996, 20: 79 – 87.
10. Pernot HF, Winnubst GM, Cluitmans JJ, De Witte LP: Amputees in limburg; Incidence, morbidity and mortality, prosthetic supply, care utilization and functional level after one year. *Prosthet Orthot. Int.* 2000, 24: 90 -6.
11. Rommers GM, Vos LD, Groothoff JW, Schuiling CH, Eisma WH: Epidemiology of lower limb amputees in the north of the Netherlands aetiology, discharge destination and prosthetic use. *Prosthet Orthot. Int.* 1997, 21(2): 92 – 9.
12. Onuminya JE, Obekpa PO, Ihezue HC, Ukegbu ND, Onabowale BO. Major amputations in Nigeria: a plea to educate traditional bone-setters. *Tropical Doctor*, 2000, 30, 133 – 135.
13. Edomwonyi EO, Onuminya JE, Ogbemudia AO, Nwokike OC, Olomu DO. Amputation in Nigeria. The Irrua experience. *Journal of applied and Basic Sciences* Vol. 7, (1) Dec. 31, 2013.
14. Dada AA, Awoyomi BO. Is the trend of amputation in Nigeria changing? A review of 51 Consecutive Cases seen at FMC Ebutte – metta, Lagos, Nigeria. *Niger J. Med.* 2010; 51(4): 167 – 169.
15. Abbas AD, Musa, AM. Changing Pattern of extremity amputations in University of Maiduguri Teaching Hospital, Nigeria. *Niger J. Med.* 2007: 16(4). 330 – 333.
16. Hamzy W, Muhammed M, Ashikin N. Jamilah S. Yee LE, Shong HK, Major limb Amputations in a Serebian Hospital: A Review of 204 cases from 1997 – 1999. *Med. J. Malaysia.* 2001; 56(Suppl): 3 – 7.
17. Obalum DC, Okeke G.C, lower limb Amputations at a Nigerian private Hospital. *West Afr. J. Med.* 2009; 28(1): 24 – 27.
18. Ekere AU. The Scope of Extremity Amputations in a Private Hospital in South – South Region of Nigeria. *Niger. J. Med.* 2003. Oct – Dec; 14(4): 24 – 27.
19. Jawaid M, Ali I, Kaim Kanni GM, Current Indications for lower limb Amputations of Civil Hospital, Karachi, Pakistan, *Journal of Surgery* 2008; 24(4): 228 – 231.
20. Odatuwa – Omagbemi DO, Adiki OT. Extremity Amputations in Warri, South-South Nigeria. *J. West Afri. Coll. Surg.* 2012; 2(1): 14 – 24.
21. Essoh JB, Bamba I, Dje Bi Dje V, Traore A, Lambin Y: Limb amputations in adults in an Ivorian Teaching Hospital, *Niger J. Ortho. & Trauma* 2007; 6(2): 61 – 63.
22. Nwankwo OE, Katchy AU: Surgical limb amputation: a five year experience at Hill top Orthopaedic Hospital, Enugu, Nigeria. *Nig.J. Ortho. and Trauma* 2004; 3: 139 – 149.
23. Onuba O. Udoidiok E. The Scope of amputation in the developing Countries. *Postgraduate Doctor* , 1989; 11(5): 118 – 21.
24. Grillis L. Amputations. New York Grune and Stratton Inc. 1954.
25. Edomwonyi EO, Onuminya JE, Ogbemudia AO, Nwokike OC, Kesieme EB, HIV Quadruple Limb gangrene; An unusual presentation and review of literature. *Surgical Science*, 2013; 4, 411 – 14.



26. Akiode A, Shonubi AMO, Musa A, Sule G. Major limb Amputations: An audit of indications in a sub-urban Surgical practice. J. Nat. Med. Association, 2005; 97: 74 – 78.
27. Ofaeli R.O. Indications, levels and outcome of lower Extremity Amputations in Newwi, Nigeria. JOMI P. 2001; 2(5): 18 – 21.
28. Onuminya J.E, A review of lower, limb amputations in Nigeria. Journal of applied and basic Science 2004; 2(1&2): 1 – 4.
29. Olaolorun D.A. Amputations in general practice. Niger Postgrad. Med. J. 2001; 8(3): 133 – 5.
30. Chalya PL, Mabula JB, Dass RM, Kabangila R, Jaka H, Mc Hembe MD et al. Surgical Management of diabetic foot ulcers: A Tanzanian University Teaching Hospital Experience. BMC Res. Notes. 2011; 4: 365.