



## RESEARCH ARTICLE

### MAJOR LOWER LIMB AMPUTATION: A TERTIARY HOSPITAL EXPERIENCE

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#### ABSTRACT

**Aims and Objective:** The objective of this study was to review our 3 years of experience of most common age and cause of amputation, co-morbidities, patient survival, mortality and morbidity associated with amputation.

**Materials and Methods:** This retrospective study includes cases that underwent Major lower extremity amputation between Sept-2015 to Sept-2012 in R.L.J. Hospital.

**Results:** A total of 100 patients underwent major limb amputations during the study period. The patients were aged 24–68 years (mean  $42.30 \pm 13.72$  days). 70 patients were males and females were 30. Complication of diabetes mellitus was the main indication for the major lower limb amputations. Above knee amputation was done in 26 patients and that of below knee is 74 patients. Post-operative complications occurred in 41 patients. There were a total of 6 deaths giving a mortality rate of 6%.

**Conclusion:** Diabetic foot, peripheral vascular disease, trauma and gangrene are the leading indications for amputation in our environment. These are preventable conditions. There is need for government to increase public enlightenment on road safety precautions, establish and equip more trauma centres and specialized diabetic foot clinics. Widespread education of diabetics on foot care and glycaemic controls including regular blood sugar screening for the aging population will reduce the incidence of lower limb amputation.

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## INTRODUCTION

Amputation is derived from Latin word "amputate" (to excise, to cut out). (Marcovitch, 1955) Amputation is defined as surgical procedure where the whole or part of the limb is removed through one or more bone or some other outgrowth of the body that is no longer useful and is causing great pain or threatens health because of extensive infection amputation is an acquired condition that result in loss of a limb from injury, diseases or surgery. (Kulkarni et al., 1999) The incidence of amputation is higher in smokers, rises steeply in smokers, rises steeply with age, with most of amputation occurring in patient's age between 30-60 years and higher in men than women. People with Diabetics, PVD, Skin diseases, cancer bone and trauma constitute 50% of our major lower limb amputee. (Edmonds et al., 2000) The potential cause of lower limb amputation, these include Trauma, Infection, Tumors, Congenital anomalies, Peripheral vascular diseases. An addition cause that should be considered is faulty wound

healing, Cutaneous ulceration and Ischemia, etc... (Thomas J Moore, 1993)

### Aims and Objectives

The objective of this study was to review our 3 years of experience of most common age and cause of amputation, co-morbidities, patient survival, mortality and morbidity associated with amputation.

## MATERIALS AND METHODS

### Study design

This is a retrospective database query and medical record review of patients who underwent major limb amputations at R.L.J.Hospital between Sept-2015 to Sept-2012.

### Study population

The study population included all patients of all age group and gender who underwent major limb amputations at R.L.J.Hospital within the period of study.

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## Selection criteria

All patients of all age group and gender who underwent major limb amputation who consented for the study were included in the study. Patients who declined consent and those who were previously operated in other institutions, but required stump revision were excluded from the study.

## Data collection and analysis

Data were collected using a pre-tested, coded questionnaire. Data included in the questionnaire were: demographic data like age, gender, and clinical data (e.g. indications, level of amputation, post-operative complications, morbidity, mortality etc.).

## Ethical consideration

The study was carried out after the approval by the department of surgery and University ethics review board. All patients who met the inclusion criteria were requested to sign a written informed consent for the study.

## RESULTS

A total of 100 patients underwent major limb amputations during the study period. The patients were aged 24–68 years (mean  $42.30 \pm 13.72$  days). 70 patients (70%) were males and females were 30 (30%) with a male to female ratio of 2:1. The modal age group was 41–50 years (Table 1).

### Age group distribution

Table 1.

Age group (years)	Number of patients	Percentage
20-30	8	8%
31-40	25	25%
41-50	50	50%
51-60	12	12%
60-70	5	5%

### Indications for amputations

Complication of diabetes mellitus (majority were Wagner's classification stage 4 & 5) was the main indication for the major lower limb amputations in 56 (56%) patients followed peripheral vascular disease in 29 (29%) and gangrene in 13 (13%) patients respectively (Table 2).

Table 2.

Indication	Frequency	Percentage
Diabetic foot	56	56%
Peripheral vascular disease	29	29%
Gangrene	13	13%
Trauma	2	2%

## Levels of amputations

Above knee amputation was done in 26 patients and that of below knee is 74 patients. There was no bilateral limb amputation. The most common additional procedures performed were wound debridement, secondary suture and skin grafting in 42.3%, 34.5% and 23.2% respectively. Two-stage operation (e.g. initial guillotine amputation and later stump revision or change of amputation level from below to above) was required in 28.4% of patients.

Table 3.

Level of amputation	Frequency	Percentage
Below knee amputation	74	74%
Above knee amputation	26	26%
Total	100	100%

## Co-morbidities

Co-morbidities were seen in 41 patients out of which hypertension was noted in 11 patients, COPD in 8 patients and sepsis in 6 cases. Cardiac pathology is seen in 12 cases (2 cases of LVH, 3 cases of IHD, 3 dilated cardiomyopathy and 4 known case of MI) Table 5

Table 4.

Co-morbidities	Frequency	Percentage (n=100)
Hypertension	11	11%
COPD	8	8%
Sepsis	6	6%
Cardiac pathology	12	12%
Chronic renal failure	3	3%
Jaundice	1	1%

## Post-operative complications

Post-operative complications occurred in 41 patients. Surgical site infection (SSI) was the most common post-operative complication accounting for 46.3% of cases followed by Revision amputation 26.8%, Phantom pain - 14.6%, Wound hematoma - 7.3% respectively. Details of post-operative complication are shown in Table 6.

Table 5.

Complications	Frequency	Percentage
Surgical site infection	19	46.3%
Revision amputation	11	26.8%
Phantom pain	6	14.6%
Wound hematoma	3	7.3%
Wound dehiscence	1	2.4%
Stump gangrene	1	2.4%

Hospital stay of patients ranged from 9 to 58 days with the mean duration of 22.4 days. The majority of patients (66%) had good recovery. There were a total of 6 deaths giving a mortality rate of -6%. The main causes of deaths were complications of diabetes and wound sepsis.

## DISCUSSION

Lower-extremity amputation is one of the oldest known surgically performed procedures, dating back to prehistoric times. (Murdoch and Wilson, 1996; Tooms, 1987) Neolithic humans are known to have survived traumatic, ritualistic, and punitive rather than therapeutic amputations. Cave-wall hand imprints have been found that demonstrate the loss of digits. Unearthed mummies have been found buried with cosmetic replacements for amputated extremities. Amputation is still often viewed as a failure of treatment. The responsibility for performing an amputation may even fall on the most junior member of the surgical team. Whatever the reason for performing an extremity amputation, it should not be viewed as a failure of treatment. Amputation can be the treatment of choice for severe trauma, vascular disease, and tumors. Patients and family members must be aware of their options and have realistic expectations of surgical outcomes in order to make informed decisions regarding amputation. (Eardley *et al.*, 2010; Higgins *et al.*, 2010) One of the greatest difficulties for a person undergoing amputation surgery is overcoming the psychological stigma that society associates with the loss of a limb. Persons who have undergone amputations are often viewed as incomplete individuals. After the removal of a diseased limb and the application of an appropriate prosthesis, the patient can resume being an active member of society and maintaining an independent lifestyle. Although a diseased limb can be removed quite readily, resolving the problem of the extremity, the care does not end there. The surgery must be performed well to ensure that the patient is able to wear a prosthesis comfortably. Knee joint salvage enhances rehabilitative efforts and decreases the energy expenditure required for ambulation. (Waters *et al.*, 1976) The patient must learn to walk with a prosthesis, apply and remove the prosthesis, care for the prosthesis, monitor the skin and the presence of any pressure points, ambulate on difficult terrain, and use the commode at night. Because of the complexity of these issues, the treatment team should include the surgeon, the primary care physician, a physical therapist, a prosthetist, and a social worker. (Matsen *et al.*, 2000; Pandian and Kowalske, 1999)

## Conclusion

Complications of diabetic foot ulcers and PVD were the most common indications for major limb amputation in India. The majority of these indications are potentially preventable through provision of health education, early presentations and adequate treatment of these conditions.

Good diabetic control and early recognition and management of risk factors for foot complications and community health education to encourage early presentation to hospital will reduce the number of patients undergoing major limb amputations in this region and subsequently reduce the number of amputee.

## Conflict of interest

None.

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## Author contribution

All authors contributed to the paper.

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