Research Article

Complications and Outcome of Lower Extremity Amputations at Tertiary Care Hospital in Aurangabad District of Maharashtra: An Observational Study

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Abstract

Introduction: Although an ancient surgical procedure, amputation has retained its relevance in modern time to save life or remove a dead or useless limb. The physical disability associated with it has been partly overcome by sophisticated modern prosthetic technology, which unfortunately is poorly available and often non-affordable in the developing countries. Knowledge of indications and complications of amputation is helpful in instituting preventive strategies. Present study describes the complications and outcome of Lower Extremity Amputations in surgical cases at Government Medical College and Hospital (GMCH), Aurangabad which is a well known tertiary referral centre in Marathwada region of Maharashtra. **Methods:** This is a study of 174 patients who had visited GMCH, Aurangabad for treatment during the period of February 2004 to October 2006. The lower extremity amputation done in the patients was either elective or an emergency procedure. Complications and outcome of the cases was described. **Results and Conclusions:** Observations show that in our study primary closure was achieved in 53% cases whereas 47% underwent Guillotine Amputation. Total of 29 patients from our study required re-amputation. The most common complications were Infection and Phantom pain which were found in 17.2% and 16.09% cases respectively. Mortality was 11.4% in the study group. Crutches were used as the most form of rehabilitation method. Present study gives valuable information regarding the complications and outcome of patients undergoing lower limb amputations from the Marathwada region of Maharashtra.
Keywords: Lower limb amputation, Guillotine Amputation, Phantom pain

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INTRODUCTION

Lower extremities in human are evolutionally adapted for the bipedal gait and are exceptionally longer and powerful to bear the body weight and the locomotion. Loss of either or both profoundly affects the basic functions and results in manifold increase in energy expenditure with the prosthetic limb ambulation [1]. Although an ancient surgical procedure, amputation has retained its relevance in modern time to save life or remove a dead or useless limb. The physical disability associated with it has been partly overcome by sophisticated modern prosthetic technology, which unfortunately is poorly available and often non-affordable in the developing countries. Knowledge of indications and complications of amputation is helpful in instituting preventive strategies [2]. Data regarding epidemiology and clinical features of lower limb amputation during study period at our centre has been published separately [3].

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Present study describes the complications and outcome of Lower Extremity Amputations in surgical cases at Government Medical College and Hospital (GMCH), Aurangabad which is a well known tertiary referral centre in Marathwada region of Maharashtra.

METHODS

This was a cross-sectional descriptive study involving all patients who underwent major limb amputations at Government Medical College and Hospital, Aurangabad. The study was done in the surgical wards of the Government Medical College and Hospital which is a tertiary care centre as well as a teaching medical institution catering to Marathwada region of Maharashtra as well as adjoining areas. A total of 174 patients who had visited GMCH, Aurangabad for treatment and undergone lower limb amputation at the hospital during the period of February 2004 to October 2006 were included in the study. In the present study total 174 patients underwent 201 amputations of lower extremity at various levels. The lower extremity amputation done in the patients was either elective or an emergency procedure. Complications and outcome of the cases was described. Data regarding Ratio of Primary Closure to Guillotine Amputation, Pattern of healing after Primary Closure and Guillotine Amputation, etiology wise primary healing after first amputation, requirement of revision of amputation, Complications, organisms cultured in infected cases, mortality and rehabilitation method used was described.

OBSERVATIONS

Table 1: Ratio of Primary Closure to Guillotine Amputation

Aetiology	Primary Closure		Guillotine Amputation	
	Cases	Percentage	Cases	Percentage
Vascular (n = 106)	78	73.58	28	26.42
Trauma (n = 19)	05	35.71	14	64.29
Diabetes (n = 52)	15	28.85	37	71.15
Infection (n = 15)	01	06.67	14	93.33
Malignancy (n = 7)	06	85.71	01	14.29
Others (n = 2)	01	50	01	50

Most of the patients with vascular etiology underwent Primary Closure of stump whereas most diabetic patients were preferred Guillotine Amputation.

Table 2: Pattern of Healing after Primary Closure

Pattern of Healing	No. of Cases	Percentage
Primary	70	66
Secondary Suturing	05	4.72
Refashioning (Skin Graft)	06	5.66
Re-amputation	16	15.09
Secondary Intention (Fibrosis)	09	8.49
Total	**106**	**100**

Table 3: Pattern of Healing after Guillotine Amputation

Pattern of Healing	No. of Cases	Percentage
Secondary Suturing	23	24.21
Refashioning (Skin Graft)	35	36.84
Re-amputation	13	13.68
Secondary Intention (Fibrosis)	24	25.26
Total	**95**	**100**

Table 4: Etiology wise Primary Healing after First Amputation

Etiology	No. of Cases	Percentage
Vascular	84	56
Diabetes	34	22.67
Trauma	13	08.67
Infection	13	08.67
Malignancy	06	04
Total	**150**	**100**

Table 5: Patients with Re-Amputation

Etiology	No. of Cases	Percentage
Vascular	16	55.17
Diabetes	13	44.83
Total	**29**	**100**

Table 6: Complications

Complications	No. of Cases
Infection	30
Phantom Pain	28
Contracture	02
Septicaemia	20

Table 7: Organisms Cultured

Organisms	No. of Cases
Pseudomonas	30
Staphylococcus Aureus	12
E. Coli	12
Klebsiella	11
Proteus	04

Table 8: Mortality

Etiology (No. of Cases)	Deaths
Trauma (16)	04
Diabetes (45)	07
Infection (14)	02
Vascular (90)	07

Table 9: Rehabilitation

Rehabilitation	No. of Cases
Crutches	61
Prosthesis fitting	48
No walking aid	45

DISCUSSION

In the present study total 174 patients underwent 201 amputations of lower extremity at various levels. Most of the patients with vascular etiology underwent Primary Closure of stump whereas most diabetic patients were preferred Guillotine Amputation.

In our study primary healing was achieved in 66% cases. Maximum healing was achieved in vascular group. Skin grafting and secondary suturing were required as additional procedure in cases of Guillotine amputation in 36.84% cases and 24.21% cases respectively. 17% cases required re-amputation at higher level due to unsatisfactory healing. Barnes *et al* [4] had reported primary healing in 58% amputations, secondary healing in 25% and failure in 17% cases. Most common complication was wound infection in our study. Most common organisms cultured were Pseudomonas, Staph. aureus, E. Coli, Klebsiella and Proteus in that order.17% patients developed infection and most of them were diabetic, vascular or traumatic etiology cases. Berardi and Keonin [5] reported a wound infection rate of 27.6% cases in their study. Most common cultured organisms were Pseudomonas, Staph. aureus, Klebsiella, Enterobacter, Serratia, E. Coli, Proteus, Streptococcus in that order. Phantom phenomenon was observed in 28 cases. Phantom limb pain is a conscious feeling that a very painful limb is still present even after amputation. Phantom limb pain is described to be experienced in 3 to 5% of amputee population (Kegel *et al* [6]). Mortality was 14% in our study with maximum mortality among trauma cases. Huston *et al* [7] have reported 15% mortality in their study whereas Berardi and Keonin [5] reported 16% mortality rate in their study. Age is an important factor as far as rehabilitation is concerned. In major amputations like below knee and above knee amputation, walking aids like crutches and use of prosthesis play an important role. The final decision of use of prosthesis depends on socioeconomic status, age and general health of the patient. In this study rehabilitation and ambulation was done primarily with the help of crutches followed by Jaipur foot especially in those with below knee amputation. The study has its limitations which include an observational and descriptive study design. Also, the sample size is relatively small. However it gives valuable information regarding the complications and outcome of lower limb amputation patients from the Marathwada region of Maharashtra. Further research needs to be done to better understand the complications and outcome of lower limb amputations which may help in designing better prevention and management strategies towards the problem.

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