

V O Olorunfoba H Dip. Ortho (SA)  
Department of Orthopaedic Surgery  
Nelson Mandela School of Medicine  
University of Natal,  
Private Bag X7, Congella 4013,  
SOUTH AFRICA.

Thirty male patients with an average age of 54.9 years responded to questionnaires, interviews and clinical examination. Variables evaluated included mobility, self-care, work, recreation, relationship with family members, and mechanism of injury. Among those working prior to amputation, 70% returned to work within 12 months with 44.8% returning to their previous jobs.

Seventy eight percent (78%) of respondents were completely independent at work, 92.4% felt there was no constraint to their mobility and two thirds of patients were satisfied with their adjustment. Traumatic amputees underwent successful physical rehabilitation. Vocational rehabilitation was less successful. However, factors that were positively associated with successful vocational rehabilitation included young age, strong family and social support.

## INTRODUCTION

Amputations are a major source of permanent and functional limitation among persons of all ages. Although traumatic amputations are less frequent than dysvascular amputations, they result in functional impairment and vocational disability. Limb preservation following severe trauma requires multiple operations and

prolonged hospitalisation. There is also the risk of non-union and sepsis. The problems of a poorly functional limb from pain, deformity, shortening and stiffness have been highlighted by various authors<sup>1,2,3,4</sup>.

The option of primary amputation is particularly endearing as it is inferred that young individuals do well enough following primary amputation and should not necessarily be subjected to limb salvage and a long rehabilitative period<sup>5</sup>. Primary amputation may allow return to near normal function within a few weeks to months<sup>2,3,6,7</sup>. The aim of this study was to assess the reintegration of the traumatic lower limb amputees into their environment and collaborate the previously stated hypothesis.

## Material and methods

Thirty male manual workers with an average age of 54.9 years participated in the study which was conducted at the Durban Amputee Club and King Edward VIII Hospital 1 to 40 years post amputation (average 20 years). All the patients had traumatic lower limb amputation and subsequently fitted with prosthesis. A postal questionnaire was sent to each patient and this was augmented by interviews and assessments. Variables evaluated included mobility, self-care, work, recreation, relationship with the family and perception of self.

## **Results**

### ***Demographic Characteristics***

The patients' current age at interview ranged between 41 and 77 with a mean age of 54.9 years. Ages at the time of the accident ranged between 9 and 74 and averaged 35.2 years.

### ***Mechanism of injury***

Sixteen patients (53.3%) had amputations following motor vehicles accidents while twelve (40%) were work related (industrial accidents). The others were as a result of leisure activities. Half of the patients had isolated injuries while the other half had associated injuries, head injuries being the most common.

### ***Level of amputation***

There were 12 transfemoral and 17 transtibial amputations. One patient had a bilateral transfemoral amputation.

### ***Mobility***

All patients had a prosthesis and used it the whole day or most of the day. By their own assessment, 13.2% felt they had excellent mobility based on their needs. Overall, 46.2% considered their mobility good, 33% fair and 7.6% poor.

### ***Limitation of Activity (short form 36 musculoskeletal survey)***

Of the respondents, 12.5% of them considered themselves to be severely disabled, 12.5% quiet disabled, 36% slightly disabled while 39% did not consider themselves disabled at all. A total of 78% of respondents were completely independent at work while 12% required assistance in one form or the other. None required help with personal hygiene.

Prior to their injury, 22 patients (72%) had full time occupation. Of the 22 patients who were employed, 70% were able to return to work following the amputation. The time taken to return to work following the injury varied between 4 and 36 months with a mean of 12 months.

### ***Self-perception/adjustment ( Measure of motivation)***

Thirty four percent (34%) of the patients felt satisfied with the amputation, 33% were fairly satisfied while 33% were not satisfied.

### ***Relationship with family members***

A total of 35% of the respondents indicated that their relationships with family members were worse following amputation, 25% felt that the relationships had improved while another 35% felt no effect on their relationship.

### ***Health problems***

Associated morbidities were recorded in 55% of the respondents and they included diabetes, hypertension glaucoma, and ischemic heart disease. Eighteen (60%) of the amputees had appreciable weight gain following amputation, which they attributed to a decrease in physical activity.

There was a general dissatisfaction among all those injured on duty with the compensation they received.

### ***Stump Complications***

The majority (62.5%) had no complications while phantom pain accounted for 20% of complications. The rest were accounted for by wound breakdown and sepsis.

## **Discussion**

The care of the amputee is an ongoing process, from treatment of the traumatic event to the amputee's return to as normal a life style as possible. The vocational rehabilitation is particularly important as these patients are predominantly young and the need to return to productive employment is paramount. Vocational outcomes have been studied in the traumatic amputee population and generally reflect a high vocational disability<sup>8</sup>. Millstein<sup>6</sup> showed that 75% of traumatic amputees surveyed required a change of occupation although there was 88% re-employment rate with 21% returning to their

previous jobs. Kishbaugh et al<sup>9</sup> reported that only 33% of soldiers undergoing a traumatic amputation while on active duty remained on active duty post amputation. Purry and Hanon<sup>1</sup> reported that 96% of below knee amputees returned to the work force an average of 10 months after injury. One third of our patients underwent job retraining, while 45% returned to their previous jobs. This was attributed to poor or non-existent retraining programmes. Severe socio-economic constraints on the part of the amputees and limitation of choices in terms of jobs ensured they went back to their former jobs. The timing of the return to work is similar to our study but associated co-morbidity is the main factor identified as being responsible for the delay in returning to work. Narang<sup>10</sup> showed that patients with more proximal amputation returned to work at a lower rate than the more distal amputees. This was not demonstrated in our study.

Post amputation complications occurred in 37.5% of our patients and resulted in interference with rehabilitation, prolonged the time needed for permanent prosthesis fitting and also delayed the eventual employment. Although most of the patients in this study at the time of amputation were young with an average age of 35 years, age has been shown to be a significant factor in the rehabilitation of traumatic amputees<sup>8</sup>. In our study, the older patients with chronic diseases like diabetes, hypertension, and ischemic heart disease formed the bulk of those who were not working.

A poor economic status and financial gain have been correlated with recovery, with patients with high salaries returning to work at a greater rate than those with low incomes<sup>11</sup>. This could not be collaborated in our study as most of our patients were from the lower income bracket. Gerhads<sup>8</sup> reported family support as one of the factors positively associated with return to work. Thirty five percent (35%) of our study patients stated that their relationships with close family

members (wives, children, siblings) deteriorated following the amputation. A lack of empathy and understanding was the main reason given. However we have not been able to correlate this with return to work. Physical rehabilitation of traumatic amputees has been shown to be generally successful, however rehabilitation should not be limited to physical therapy alone. Re-integration into the family, work and the community is equally important.

## Conclusion

Traumatic amputees underwent successful physical rehabilitation but vocational rehabilitation was not as successful. Programs such as job re-training and re-education must be put in place so that amputees can adapt themselves to new conditions. Involvement with support groups cannot be over emphasized. Amputees usually find commonalities in such groups and can easily relate with the group cannot be over emphasized. Amputees usually find commonalities in such groups and can easily relate with the group.

## References

1. Purry NA, Hannon MA. How successful is below knee amputation for injury? *Injury* 1989; 20:32-36.
2. Livingston D M et al. Extent of disability following traumatic extremity amputation. *J Trauma* 1994; 37: 495-499.
3. Hansen S T. Editorial: Type IIIc tibial fracture. *J. Bone Joint Surg.* 1987; 69A, 799-800.
4. Lange R H, Hansen S T. Open Tibial fractures with associated vascular injuries. *J Trauma* 1985; 25:203.
5. Pozo et al. The timing of amputation for lower limb trauma. *J Bone Joint Surg.* 1990; 72B: 288.
6. Millstein et al. A review of employment pattern of industrial amputees. *Prosthet Orthot Int.* 1985; 9:69-78.
7. Dillingham et al. Incidence, acute core length of stay, and discharge to rehabilitation of traumatic amputees. *Arch Phy S Med Rehabil.* 1998; 79: 279-287.
8. Gerhads F et al. The impact of medical re-education and psychological variables on rehabilitation outcome in amputees. *Int. J Rehab Res.* 1984; 7: 379.
9. Kishbough et al. Amputee soldiers and their return to active duty. *Mil Med* 1995; 160: 82-84.
10. Narang I C et al. Functional capabilities of lower limb amputees. *Prosthet Orthot Int* 8: 43, 1989.
11. Mackenzie E J et al. Factors influencing return to work following hospitalisation or trauma. *Am J Public Health* 1987; 77: 329.
12. Walker C R et al. Lower limb amputation following injury: A survey of long-term functional outcome. *Injury.* 1994, 25: 387-92.