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A Study to Observe the Incidence of Flexion Contracture at Knee Joint After Below Knee Amputation

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A B S T R A C T

Background: Amputation is the surgical removal of limb or other appendage of the body; generally, amputations are performed for life threatening disease or pain, when all other treatments failed. The goal of the amputation is to preserve life and improve function and general health. Having a limb amputated is a life changing episode with potentially devastating consequences for every aspect of life, not only physical functioning but also psychosocial.

Objective: To observe the incidence of flexion contracture at knee joint after below knee amputation.

Methodology: This study was cross-sectional study and data of 87 sample size was collected through convenience sampling technique, by using self-made questionnaire, from PIPOS Peshawar and Helping Hand Rehabilitation Center Mansehra. The data was collected from participants in the mentioned institutes from March 2015 to October 2015. Data was analyzed by descriptive statistic using SPSS version 23.

Results: Out of total, 69 were male and the rest were female. The mean age was 44.5 years. About 66 (75.86%) patients had normal ROM at knee joint, 21 (24.13%) patients had contracture at knee joint. About 6 (6.89%) patients out of 21 knee contracture patients had fixed flexion contracture of more than 20 degrees at knee joint even after regular physiotherapy.

Conclusion: The study shows that a considerable percentage (24.13%) of patients has developed flexion contracture at knee joint after below knee amputation. Contractures after amputation generally develop as a result muscle imbalance, fascial tightness, from protective withdrawal reflex into knee flexion or as a result of faulty positioning such as prolonged sitting with flexed knee or placing the residual limb over pillow.

Introduction

Disability can affect a one's personality, altering relationship and body image, sometime challenging the family unit and can also affect the earning potential and ambitions as well. Various causes of amputation include diseases, trauma and congenital disorders.[1, 2] Levels of the below knee amputations are Long Transtibial amputation in which more than 50% of the length is remained intact, Transtibial amputations having 20 to 50% Tibial length and Short Transtibial amputations in which less than 20% of Tibial length is preserved.[1, 3] The earlier the onset of rehabilitation, the greater the potential for the success of treatment. The longer the delay, the more likely the development of complications such as joint contractions, general debilitation and a depressed psychological state. The post amputation rehabilitation program can be divided in two phase i-e. Post Surgical Phase: It is the phase between surgery and fitting of definitive prosthesis or until a decision is made not to fit the patient. Prosthetic phase: prosthetic phase of rehabilitation starts with the delivery of permanent replacement of limb.[4, 5]

A permanent loss of mobility of soft tissue that can't be reversed by non surgical interventions may occur when normal muscle tissue and organized connective tissue are replaced with a large amount of relatively non extensible, fibrotic adhesions and scar tissue or even

heterotrophic bone. These changes can occur after long intervals of immobilization of tissue in a shortened position after tissue trauma or subsequent inflammatory response.[6, 7]

The study performed on below knee amputation patients resulted in prevalence of post operative short and long term complications (34.4 %) including knee contracture between 2005 to 2008.[8] After below knee amputation there could be higher chances of incidence of contracture due to long period of immobilization in shortened position or due to subsequent inflammatory response. It is not usually the below knee amputation itself which generally disables a person because the modern treatment techniques and prosthesis available are so advanced that the patient can do most of the things he or she could do before the amputation.

Methodology

This study was cross-sectional study, which is structured questionnaire based and 87 subjects were selected through convenience sampling technique between periods of 1st august 2013 to 30th November 2013. Patients with below knee amputation visiting Pakistan Institute of prosthetic and orthotic sciences (PIPOS) and Helping Hand Mansehra were recruited in the study. Informed consent was taken from each participant of the study. Patients with amputations other than below knee amputation, who had flexion contracture at knee joint before the amputation and those who were not able to ambulate before the amputation were excluded from the study. The data analysis was done using descriptive statistics through Microsoft excel.

Results

Total of 87 patients with below knee amputation (BKA) were surveyed. The mean age was 44.5 years. In this study 69 (82%) patients were male and 16 (18%) were female. (Table I) Total 66 (75.86%) patients had normal ROM at knee joint, 21 (24.13%) patients had contracture at knee joint. (Table II)

Table I: Gender Distribution of Participants

Gender		
Male	69	82 %
Female	18	16 %

Table II: Status of Participants

Participant/Condition	Frequency	Percentage
Normal ROM	66	75.9 %
Knee Joint Contracture	21	24.1 %

Total 6 (6.89%) patients had fixed flexion contracture of more than 20 degrees at knee joint even after regular physiotherapy. These patients can't be fitted with prosthesis due to their flexion contracture at knee joint after the amputation. The male gender was more involved in the study as compared to female. In this study 14 male were having knee contracture and 7 female were having knee contracture shown in the Figure 1.

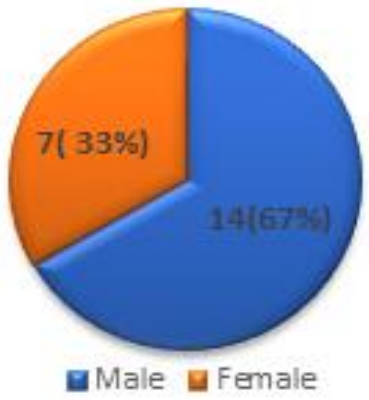

Figure 1. Gender Distribution of Knee Contracture

Discussion

The findings of our study revealed that one third of the selected population were having contracture at knee joint. Among the same population six were having fixed contracture of more than 20 degree.

The previous studies have shown that flexion contracture at knee joint is one of the major hindrances to functional prosthetic rehabilitation after below knee amputation. The motivation behind this study was to explore the incidence of flexion contracture at knee joint secondary to below knee amputation irrespective of gender, age, cause of amputation and surgical techniques used during the amputation, a group that has not been targeted in Pakistan before.[9, 10]

The result of this study shows that 24.13% of patients develop flexion contracture after below knee amputation. An amputation itself, especially at any level below the knee joint does not usually presents a particularly disabling condition. It is the secondary complications

which imposes serious challenges for the complete post amputation rehabilitation of the patients.

This study reflects that 6 (6.89%) patients were unable to be fitted with prosthesis and 15 (17.2%) had to visit Physiotherapy department for several weeks to be able to use the prosthesis for their ambulation; this finding is consistent with studies by Sarmiento A. et. al. and Aulivola B. et.al.[2, 11] With modern rehabilitation techniques and prosthesis, below knee amputees who have no complicating medical problems can do most of the things he or she could do before the amputation.[12]

Conclusion

The study shows that considerable patients have developed flexion contracture at knee joint after below knee amputation. Contractures after amputation generally develop as a result muscle imbalance, facial tightness, from protective withdrawal reflex into knee flexion or as a result of faulty positioning such as prolonged sitting with flexed knee or placing the residual limb over pillow.

Limitation of this study: Due to lack of time and finances a small sample size was chosen for this study. In this study a large number of amputees from only two rehabilitation centers were included, if the incidence of flexion contracture at knee joint after below knee amputation is investigated on a national level it will be more better. The socio-economic status of the subjects were not asked which does not give us idea that contractures at knee joint after below knee amputation is more common in upper class or middle class or lower class.

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