ORIGINAL ARTICLE

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PHYSICAL THERAPY INTERVENTIONS IN 68 YEAR OLD MALE WITH TRANS-FEMORAL AMPUTATION: A CASE REPORT

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ABSTRACT:

Background: Peripheral vascular disease often goes un- reported in the rural areas due to lack of health practitioners and illiterate inhabitants; with causative factors contributing of smoking and tobacco chewing among the rural sectors. From the various reported symptoms of Peripheral vascular disease, the common is intermittent vascular claudication. If not treated at the right time, can lead to amputation at later stages. Amputation is a traumatic procedure, physically as well as emotionally. The role of physiotherapy becomes not only essential but of great importance to the rehabilitation and treatment of the patient. This justifies the importance of this article in correlating the treatment, post the trans-femoral amputation of an elderly male residing in rural area.

Material & methods: A single case study approach was adopted (ABA design). The subject was a 68yrold male patient with transfemoral amputation. With other musculoskeletal changes taking place simultaneously, the goals were set to restore complete functional independence of the patient. **Conclusion:** By the end of the two weeks protocol, the patient could ambulate independently, was emotionally stable and was further motivated to continue exercises.

Keywords*:* Elderly,Peripheral vascular disease, Transfemoral amputation, Physical therapy

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INTRODUCTION

The major cause of transfemoral amputation is peripheral vascular disease. Peripheral vascular disease (PVD) often goes un- reported in the rural areas due to lack of health practitioners and illiterate inhabitants; with causative factors consisting of smoking and tobacco chewing in the rural sectors. From the various symptoms of PVD, the common is intermittent vascular claudication.[1]If not treated at the right time, it can lead to amputation at later stages. Amputation is a traumatic procedure, when it affects the lower limbs leads to altered gait, balance and in their daily activities Although the increasing rate of amputations has been declined due to improved imaging techniques, more effective pharmacotherapy for wound healing. And despitel these factors if amputation occurs, the role of physiotherapy becomes not only essential but of great importance to the rehabilitation and treatment of the patient. For any amputation, the goals of physiotherapy are set to increase the patient's functional independence, encourage him physically and uplift him emotionally. [4]This case study has been undertaken based on these lines; about a 68 yr old man who underwent transfemoral amputation, because of a neglected peripheral vascular disease; coming from a rural background emphasizing the need for rehabilitation where there are almost nil resources and distressing life conditions.

The case presentation:

The patient came to the physiotherapy OPD as a case of right Transfemoral amputee; post-operative 12th day. Demographic data of the participant: the subject was a68 yr old male, non-smoker and non diabetic, with BMI 21.4, residing in the rural area undergone a Righttrans- femoral amputation& referred on post op day 12. The subject had an open amputation with a soft dressing. Self reported chief complaints of the patient were pain at the amputed site since 12 days and pain while standing and moving the stump since 5 days. There was wasting of other various muscles due to musculoskeletal changes occurring with advancing age. The subject had intermittent claudication 3 yrs back reported on the subjective questionnaire of Edinburgh clauducation Quesstionnaire[2,10]. The questionnaire has six questions based on the reported symptoms of the patient. The last question that allows the patient to mark the area is of maximum discomfort or pain. The definition of positive classification requires all of the responses as "yes". If these criteria are fulfilled, a definite claudicant is one who indicates pain in the calf. The subject got pricked by a thorn in his right great toe while working on the farms. The thorn was removed only superficially. After a few days the nail was removed and gradually the right toe was also removed. The wound was non- healing for almost 1 n half year. There was an immense foul odour from the toe after its removal. There was associated discoloration and blackening in and around the right great toe and which was spreading till the calf. Also there was increasing pedal edema in the right lower extremity due to hampered bed mobility and minimal ambulation for the rest of the daily activities. The investigations included an arteriogram done 3 months prior to the amputation, revealing increased claudication of the peripheral arteries in both Lower extremities. The subject underwent right Trans femoral ampuataion because of decreased vascularity & blood supply in the same limb. The subject was referred to the physical therapy dept after 12 days of amputation.

On observation, there was facial grimace present, the hollowness of the eyes and pallor over the face and Right Lower Extremity. He was using accessory muscles for respiration and there was intercostal in-drawing present. The nails were hypertrophic and presence of pedal edema over the L lower extremity. (over the dorsum aspect and ankle – upto the tibial shin). There was muscle wasting present over the subcostal muscles, diagastric muscles, intercostals, thenar& hypothnear , dorsal interrosie of bilateral Upper extremity, quadriceps , hamstrings &the calf muscles of the Left lower extremity. The shape of the stump was bulbous with an open wound and no signs of healing.

On plapation, the edema on the R ankle was pitting edema (grade 4).The circumferential measurement of the ankle edema was 54 cm. The stump was 32cm in length as measured from the GT(greater trochanter)and 41 cm in circumference when measured 5 cm below the GT. Severe spasm was present at the adductors and abductors around the stump site. The recorded peripheral pulses of the patient are mentioned (table 1) for femoral, popliteal, dorsalis pedis, posterior tibial& radial pulse, which showed that there were decreased pulsations in the left lower extremity. The peripheral pulses are of great significance, allowing a comparison between their characteristics on both extremities. The manual muscle testing was performed for the crutch muscles mainly for early ambulation of the patient (Table: 2)

Pulse	R	L
Femoral	Bounding 64b/ min	Bounding 64b / min
Popliteal		Normal 60b/min
Dorsalispedis		Weak 58b/min
Posterior tibial		Weak 54b/min
Radial	Normal 68b/ min	

Table 1: The peripheral pulses:

RANGE OF MOTION: all ranges of the stump and Right Lower extremity were within functional limits.

Table 2: MANUAL MUSCLE TESTING:

JOINT	MUSCLE	R	L
U.E	Shoulder depressors, extensors, adductors & abductors Elbow extensors, wrist extensors & finger flexors	3+	3+
L.E:			
HIP			
	SARTORIUS	4	4
	RECTUS	4	4
	VASTI	4	4
	GLUTEUS MEDIUS & MINIMUS	4	4
GRIP STRENGHT	66 KGS	Indicating poor strength	
TIGHTNESS			
	HAMSTRINGS	+	
	ILLIOPSOAS	+	+
	RECTUS FEMORIS	+	+

Table 3: HOME ENVIRONEMENT EVALUATION

TYPE OF HOUSE	Kaccha house
NO. OF ROOMS	2
WALLS CEMENTED	Un-cemented
FLOOR	Broken at places
ROOF	Asbestos sheet
NO. OF STEPS AT ENTRANCE	2
GRASPING BARS	Nil
PLACE FOR SLEEPING OF THE PATIENT	On the floor
TOILETS AND BATHROOMS	No toilets inside the house, uses Indian toilets

Table 4: OUTCOME MEASURES

GERIATRIC DEPRESSION SCALE	10(greatly depressed)
FIM & FAM SCORE	1)self care=44 2) sphincters=14 3) mobility=25 4)communication=35 5) psychosocial=27 6) cognition= 35
QUALITY OF LIFE SCALE	Total =4 (mixed)

TREATMENT GOALS:

The exercise program goals were derived by focusing on the flexibility, muscle strength & balance improvement of the patient. [1]

patient education

prevention of complications

reduction of pain at the amputation site

reduction of edema & strengthening of left lower extremity

to strengthen the bilateral Upper Extremity

prevent tightness of muscles

to improve balance & transfers

to re-educate walking

try restoring functional independence

INTERVENTIONS:

1)Educating the patient about the amputation, why it happened, how the other limb may get affected, taking good care of the wound and keeping it dry is important (wound care)

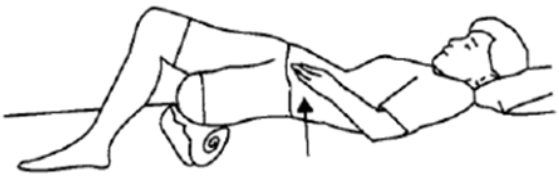
2) Reduction of pain at the stump was taken care with Transcutaneous electrical stimulation (TENS) at high frequency (80-150hz) under conventional mode for 10 minutes.

3)For left lower extremity pedal edema: active assisted ankle pumps and active heel slides with elevation (buergers exercise protocol)

4) Preventing contractures occurs mostly at the hip flexors & abductors in transfemoral amputation, so prone lying was encouraged, use of pillows in supine lying below the stump was discouraged and elevation beyond 10 deg was avoided. Stretching of hamstrings, illiopsoas& rectus: 3 reps x 15 seconds hold for each muscle (Thomas test stretch position) Figure 1.

5)Strengthening for stump with isometrics: for flexors, extensors, abductors & adductors were given with 10 reps x 10 holds. (Figure 2)

Figure 2: Isometrics for the stump in supine



6) Strengthening for L.E with De'lormes protocol for dynamic strengthening; 1 RM=1 kg; (25% of 1 kg= 250gm. Open and close chain therapeutic exercises.

7) Improving bed mobility & bed -to –chair transfers by training(pelvic bridging, sitting pushups,

8) Pre crutch training: strengthening of major crutch muscles: shoulder adductors, elbow extensors, writs, extensors,& grip strengthening.

9) Improving balance: practicing unilateral bridging, sit-to stand training. With mirror therapy (inside parallel bars) Dynamic upper extremity movements were added, within and outside the base of support for an advanced challenge.(which reduced the chances of phantom limb sensations)

10) Breathing exercise: use of Incentive Spirometer with sustained maximal Inspiration: 3 sets 5 reps & 5 seconds hold

10) Home environment modifications: placing of grab bars in the house and entrance, providing a proper place for the patient, modify stairs to 5% gradient ramp, avoid sleeping on the floor, build a toilet with western toilet modification and maintain nutritional levels of the patient by diet plan.

11) Psychological counselling included positive thoughts and encouragement to the patient.

RESULTS:

The treatment protocol was followed for 2 weeks and there was improvement quantitatively in the GDS, FIM & FAM & QOL SCALE's (table 5). The strength of the muscles improved when compared with the pre assessment. (Table 6)

Table: 5: GDS, FIM &FAM SCALE, QOL SCALE

GERIATRIC DEPRESSION SCALE	3(mild depressed)
FIM & FAM SCORE	1)self care=44 2) sphincters=14 3) mobility=35 4)communication=44 5) psychosocial=28 6) cognition= 37
QUALITY OF LIFE SCALE	Total =5 (mostly satisfied)

Table: 6: MUSCLE STRENGHT

JOINT	MUSCLE	R	L
U.E	Shoulder depressors, extensors, adductors & abductors Elbow extensors, wrist extensors & finger flexors	grade4	grade4
L.E:			
HIP			
	SARTORIUS	grade4+	grade4+
	RECTUS	4+	4+
	VASTI	grade4+	grade4+
	GLUTEUS MEDIUS & MINIMUS	grade4+	grade4+
GRIP STRENGHT	68 KGS	Indicating poor strength	

DISCUSSION

As far as the previous studies are concerned, have revolved around a single particular treatment plan for either stump management or phantom limb pain management, this case study revolved around a much larger aspect. Physical therapy treatment goals provide a comprehensive treatment to the patient, rather not depending on one improvement goal. The study intervention protocol was therefore derived from many studies and taken what was essential for this patient's rehab.

Pain may present in a body part that has been amputated (phantom pain) or at the site of amputation (stump pain), or both. Phantom pain and stump pain are complex conditions and affect up to 80% of amputees. The underlying causes are not fully understood. Drug therapy is the most common treatment yet the condition remains poorly managed. The need for non-drug interventions has been recognized and TENS may have an important role to play.

TENS is an inexpensive, safe and easy to use analgesic technique. TENS is administered using an electric-powered portable device, which generates electrical currents that are delivered to the skin to activate underlying nerves. The type of stimulation delivered by the TENS unit aims to excite (stimulate) the sensory nerves, and by so doing, activate specific natural pain relief mechanisms. There are two primary pain relief mechanisms which can be activated: the Pain Gate Mechanism and the Endogenous Opioid System, the variation in stimulation parameters can be used to activate these two systems for pain relief. [(11)]

The treatment protocol was given for 2 weeks and there was marked improvement in not only in the physical capabilities but also the patient was motivated to live a healthy life.

The subject being a 68 yr old was enthusiastic and motivated & also eager to undertake the prescribed intervention plan; there may be fewer advanced age subjects who may relate to get to back to a regular lifestyle this early.

The limitation of the study was that we could not provide a prosthetic training protocol, due to time limitations and also because prosthetic training requires achievement of muscle strength beyond grade 5 for subjects of advanced age. So as we trained his crutch muscles, we got him to use a walker first and then progressed to an axillary crutch, which was also financially compatible.

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