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Rehabilitation Strategies for Transfemoral Amputees: A Case Study in Elderly Prosthetic Training

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ABSTRACT: This case study reports the different stages of a transfemoral amputee journey in an outpatient multidisciplinary approach, including all the difficulties, medical problems and successes that occurred during the rehabilitation process and the importance of a group setting for encouragement and motivation in order to the patient to be successful.

KEY WORDS: Transfemoral, elderly, phantom limb pain, gait training

I. CLIENT CHARACTERISTICS

75 year old male, retired, with a transfemoral amputation secondary to fracture after a failed surgical tentative to maintain the limb. The past medical history indicated CAD, CABAG, DM2 and HTN. The rehabilitation program started in an inpatient unit but was suspended due to a residual limb wound.

The patient was discharged home with a referral to outpatient therapy to monitor wound and continue rehabilitation process. On discharge, all equipment was arranged, patient was independent with ADL, with a home exercise program and with mobility in a wheelchair. Patient was also able to walk with a walker for short distances. The fitting process was also initiated at that time and the patient arrived with a valve suction prosthesis with a microprocessor knee. The gait training was suspended due to ongoing blistering of residual limb and indicated to be resumed only with medical clearance in the outpatient rehabilitation.

II. EXAMINATION FINDINGS

Subjective: Complained of knee OA and intense phantom pain at night. No hearing, vision or cognition problems reported. Followed by Physiatrist and Family Doctor. Discussed emotional response/need for counseling. Supportive family, living in an accessible house (ramp, lift, bath seat, wall bars, RTS). No social-economic problems. Very motivated. For leisure, mostly watching TV and wheeling self in the neighbourhood. Family arranged transportation to therapy. Patient major goal was independence with prosthesis.

Self Report outcome measures: COPM (walk independent with prosthesis; be independent on stairs; return to drive, return to travel, return to make small family projects); FROP-Com screen (high risk for falls).

Physical Performance Measures: 2MWT[1]; 10MWT[1](completed only after walking).
Objective: Residual limb: wound healed; skin fragile, normal temperature; skin colour red, skin graft from previous surgery; moderate pitting edema; normal moisture; cylindrical shape; sensation increased with percussion on bottom; hip flexion contracture; phantom pain and sensation present. Not able to test strength due to graft/recent blister. Sound limb: normal color; warm; decreased sensation on foot; pitting edema; no ulcers; AROM and strength in normal levels. Independent with transfers and bed mobility; good sitting/standing balance; Upper extremities AROM and strength in normal levels; non-ambulatory; poor endurance; 235lbs.

III. CLINICAL HYPOTHESIS

75 year old male with transfemoral amputation, having healing problems on graft area of the residual limb and fluid retention due to cardiac issues delaying prosthetic training; poor endurance; independent with ADL and

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wheelchair mobility and very motivated. A longer prosthetic training was expected due to medical issues and complex healing process.

IV. INTERVENTION

Three times/week group program including upper, lower extremities and core strength, stretches, cardio, balance, pre-gait exercises in parallel bars, gait training indoors/outdoors, stairs training. Physiotherapist, Physiatrist and Prosthetist worked together on gait adjustments.

Patient decided no need for counselling and Recreation Therapy. Education provided to wear shrinker; weight management; care of prosthesis, residual limb and foot. Residual limb massage and percussion had a better result compared to mirror therapy for phantom pain.

Gradually started prosthetic training and was able to progress weight shift, balance, pre-gait exercises and learn prosthetic skills with microprocessor knee. Short distances gait training with a four wheeled walker indoors progressed to outdoors training on uneven terrain/ramps. After learned donning and doffing, started practicing at home following a wearing scheduled.

Due to co-morbidities and abilities client will need a four wheeled walker for independence and safety. Rehabilitation is now focused on COPM goals: increase walking tolerance, involving the Occupational Therapy in assessing the ability to return to driving, plan travelling and start small projects.

Rehabilitation process in outpatient clinic was planned to be completed in a six month period due to medical and skin issues. Discharge planning already started and patient will be assisted with final education, self management, and Prosthetist/Physiatrist follow ups.

V. OUTCOME

Patient is gradually becoming independent again but has limited community ambulation. The activity tolerance increased significantly with the treatment. The motivation continues to be very high and no emotional issues impacting progress. Now patient is able to wear the prosthesis 3x/day for at least two hours; to walk independent indoors with a four wheeled walker and prosthesis and with one person stand by assistance is able to walk outdoors on uneven terrain and small ramps.

The gait has minimal deviations mostly leaning forward due to hip flexion contracture[2] and also slow speed. Patient is independent on stairs using railings with proper use of microprocessor knee. When going out in the community he is still using a wheelchair but with time and practice he will be able to wear prosthesis for short distances. Now planning a trip with family for when discharged, the possibility of returning to drive and to initiate his home projects.

VI. DISCUSSION

Even though a longer rehabilitation process was required, this was a successful case of prosthetic training as the patient is achieving his major goal of becoming independent and walking again. The multiple medical issues and co-morbities impacted directly the progress of the rehabilitation but the patient's previous level of function and motivation had a positive impact in the course of the rehabilitation.

I need to reinforce also the importance of the group setting treatment as well as the multidisciplinary approach as a positive impact in the success. As mentioned in the literature[1], the rehabilitation of elderly is very complex because involves the impact of the previous abilities, the medical history and also the new problems that arise with the amputation and the new situation of reduced mobility. The most important consideration in providing

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independence is always having in mind the importance of safety and a special attention to the fall prevention education[3]

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