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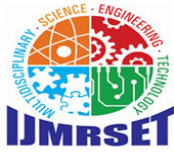
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Exploring Rehabilitation Strategies for a 79-Year-Old Below-Knee Amputee in a Geriatric Setting

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ABSTRACT: The patient arrived at our department 5 days after the amputation, he could not walk and needed major help in transfers, but was able to ambulate himself in a wheelchair. He needed major help in all ADLs except eating.

The treatment was aimed to improve physical impairments found in the examination, while the main purposes were functional - regaining as much independency as possible while focusing also on fall prevention.

At discharge, the patient has improved both physical impairments and functional disabilities, he and his family got an information about the follow up and future care.

I. CLIENT CHARACTERISTICS

Demographic information:

The patient was 79 years old at admission, married +1, before the amputation lived with his wife in an apartment on the 2nd floor, without an elevator, approximately 30 stairs with railing on the left side (when coming up). Recently (in the last few months) he has not left the apartment and could walk indoors with a two-wheeled walker independently, only for short distances (such as - from one room to another, to the bathroom, etc.). Also, he needed help in BADL (showering, getting dressed) and IADL (cleaning, cooking, general housekeeping), and got help partially from his wife (who was also in charge of all financial issues) and also for 4 hours each day from a caregiver.

Medical diagnosis:

Right BKA D/T ischemic foot

Co-morbidities:

Diabetes, Chronic Ischemic Heart Disease, Moderate Tricuspid Regurgitation, Pacemaker implantation, Right Carotid Endarterectomy D/T Symptomatic ICA Stenosis, Arterial Hypertension, Parkinson's, Benign Prostatic Hypertrophy, Obesity.

II. EXAMINATION FINDINGS

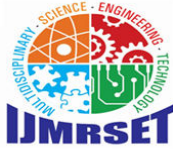
The patient arrived to our geriatric rehabilitation department 5 days after the amputation, he seemed sad (which is a normal part of dealing with a limb loss), and also very concerned about his future - both he and his wife had doubts about him becoming (eventually) strong and independent enough to go back home. Also, they both said they hoped he would get a prosthesis and with it relearn to walk again. He rates his pain (no phantom pain, only in the residual limb) 7 in VAS.

Activity

He could not walk at all, he needed major help in transfers and ambulated himself independently in a wheelchair. He needed major help in all ADLs except eating.

Passive range of motion

Upper extremities and left lower extremity, full ROM.



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Right lower extremity, restricted ROM: hip extension (-20 degrees), hip abduction (-5 degrees), knee flexion (-60 degrees), knee extension (-20 degrees).

Muscle strength (MMT) - 4/5 in upper extremities, 2-3/5 in left lower extremity, 2/5 in right lower extremity.

Sensation is normal in all extremities, higher than normal in the stitch area.

Muscle tone is normal in all of the extremities.

Balance Sitting position - good static and dynamic balance while sitting on the edge of the bed, both with the foot on the floor and with the foot in the air.

Standing position, impaired balance, high risk of falling backwards. Needs to hold a hydraulic arm walker and also a major help from PT to remain in a standing position. While standing - the left knee is flexed.

III. CLINICAL HYPOTHESIS

In terms of function, I think the patient's main problem is that he has lost his ability to walk, and to make transfers independently.

In terms of physical impairments, I think that the main issues are insufficient passive ROM of the residual knee and general muscle weakness.

The main purpose of the rehabilitation would be, in my opinion, getting independence in transfers and after the prosthesis fitting - hopefully the patient will be able to walk again, with a walker, for short distances (safely, with a focus on fall prevention).

IV. INTERVENTION

On his admission to our facility, the patient received a suitable amputee wheelchair, residual limb support and pressure cushion. He also was taught from the beginning to do push-ups while sitting (to prevent pressure ulcers). Wheelchair skills and safety were explained and trained (ambulating, using breaks before transfers).

In the first few weeks, we focused on 6 sets of exercises:

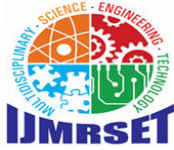
1. In bed - exercises for increasing passive and active ROM of both legs, while using slings and springs, and also manual stretching when needed. Also, prone lying to prevent hip flexion contracture.
2. Desensitization - we stopped after 3 weeks since he did not need it anymore.
3. Bed mobility and transfers - (rolling, sitting to lying, lying to sitting, chair to bed, bed to chair).
4. Balance while sitting on the edge of the bed (dynamic exercises such as reaching, throwing and catching a ball, etc.).
5. Standing on one leg supported by a walker, with help from PT.
6. General endurance exercises.

After his stitches were removed, we started to use elastic bandages to shape the stump, we also tried to teach the patient to do it by himself, but it was too difficult for him. After the patient got his prosthesis (uniaxial knee, SACH, type of socket - PTB SC SP), we added gait training exercises - first using parallel bars, and eventually walker. Also, we added standing balance exercises to prevent falls. We explained to the patient about prosthetic socks using, and taught him to don and doff the prosthesis.

V. OUTCOME

Functional outcomes - eventually, after 10 weeks of rehabilitation the patient learned how to:

- Don and doff the prosthesis, check the skin of the stump after the doffing, use prosthetic socks.
- Make transfers from wheelchair to bed, from bed to wheelchair (at this point, he still needs supervision)



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- Walk with his prosthesis, using walker, with supervision, about 15 meters (enough to get from one room to another at his apartment).
- Going up and down the stairs, he still needs a medium help, and at this point makes only about 8 stairs, after that needs a break.

Physical outcomes:

- Pain of the residual limb: 4 in VAS
- Passive ROM: hip extension (- 5 degrees), hip abduction full ROM, knee flexion (-30 degrees), knee extension (-5 degrees).
- Muscle strength (MMT) - 4/5 in the left lower extremity, 3-4/5 in the right lower extremity.
- Balance while standing on both legs, using his prosthesis - impaired, still needs a walker to prevent falls.

VI. DISCUSSION

The patient is an elderly amputee, who arrived at our facility 5 days after RT BKA amputation D/T ischemic foot. Treating him was challenging on one side (he has a lot of comorbidities), but satisfying on the other, since he was very motivated and devoted to the process.

The treatment was aimed to regain the best possible function, within safety limitations (at this age, fall prevention is crucial). During the rehabilitation process, he regained some of the abilities he lost to the amputation, and he improved in those he couldn't eventually do independently.

I choose exercises based on my clinical reasoning and professional experience, but thanks to the great amount of resources I got from this course - I also tried methods I haven't used earlier. I used a lot of the material from gait analysis and gait rehabilitation, which were very helpful.

At time of discharge all the members of the interdisciplinary team completed a summary and gave it to the family (for their physician). The PT team explained about the follow up services to the patient and his family. Also, we provided a list of exercises and a referral to a PT in the community.

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