

Physical Therapy Management of the Obese Dysvascular Patient with an Amputation: A Case Report

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Introduction

- The rising number of obese and overweight Americans, along with the rising incidence of Diabetes Mellitus (DM) type II, is causing an increase in the prevalence of dysvascular amputation in the United States¹.
- Dysvascular amputation presents different clinical and administrative challenges for healthcare practitioners as we contend with rehabilitation of the residual limb and management of the underlying disease.
- As the primary contributor to the discharge destination and the primary provider of mobility training to patients, a physical therapist should be able to intelligently advocate for and deliver appropriate physical therapy early in the dysvascular amputation patient's plan of care to maximize rehabilitation potential.

Case Description

- The patient was a 57-year-old male with an anthropomorphic profile of 72 inches of height and body weight of 145 kg (BMI 43.3).
- He was admitted to the hospital for a non-healing wound the plantar aspect of his right foot and diagnosed with sepsis of the right foot.
- The patient's past medical history was significant for DM Type 2, progressive 2 year hx of Charot foot on the R LE, hypertension, and a 30 pack-year history of smoking.
- The patient underwent a staged BKA of the R LE to allow to resolution of the sepsis.
 - BKA completed 7 days s/p R ankle guillotine
 - Anterior incision 14 cm below tibial tuberosity
 - Skin incision extended 10 cm distally for posterior flap

Clinical Impression I

- The patient was an ideal candidate for physical therapy intervention after the initial ankle disarticulation and after the BKA closure.
- Early physical therapy intervention may increase single limb balance on the unaffected limb, increase activity tolerance, and prevent known sequelae of LE amputation.
- DM was identified as the patient's greatest barrier to rehabilitation and no mention of body weight status or functional level was made at the initial post operative evaluation

Outcomes

- Patient was discharged to his home one month after BKA with a wheelchair, rear-wheeled walker, and APOPP.
- Patient's sustained ambulation in Acute/Subacute care peaked at 80' with rear-wheeled walker.
- Patient discharge to home was justified with FIM: Locomotion: Walk (Household Exception) score of 5/7 and demonstrated use of assistive devices.
- He was readmitted to the hospital one day after discharge home due to a fall on his residual limb and incision.
- Patient recovery for remainder of wound closure was slow but uneventful.
- Timeline from BKA to Outpatient PT for prosthetic training was approximately 6 months.
 - Patient was discharged from OP PT after 1 month able to ambulate 450 feet with a cane at a K2 Level.

Subacute Physical Therapy and Mobility Progression

Plan of Care Day	Physical Therapy Progression	Mobility Progression
Day 16	Patient issued bariatric walker for home use. Gait, transfer, and curb training initiated.	Bed Mobility – Mod Independent FIM: Transfers 6/7 FIM: Locomotion: Wheelchair 6/7 FIM: Locomotion: Walk 4/7
Day 18	Ambulation in parallel bars, bridging over bolster x 15 x 2, R LE Ext in sidelying x 15 x 2, L LE Ext in sidelying w/ 4lbs x 15 x 3, Bilat Hamstring Curls w/ green band x 15 x 2, R hip abd/add x 15 x 2, balance, abdominal bracing, ambulation in RW 40', w/c pushups x 12 x 2. PT lasting 60 mins	Bed Mobility – Mod Independent FIM: Transfers 6/7 FIM: Locomotion: Wheelchair 6/7 FIM: Locomotion: Walk 4/7
Day 22	Ambulation in parallel bars, bridging over bolster x 20 x 2, R LE Ext in sidelying x 20 x 2, L LE Ext in sidelying w/ 4lbs x 20 x 3, Bilat Hamstring Curls w/ green band x 20 x 2, R hip abd/add x 20 x 2, balance, abdominal bracing, ambulation in RW 40', w/c pushups x 15 x 2. PT lasting 60 mins	Bed Mobility – Mod Independent FIM: Transfers 6/7 FIM: Locomotion: Wheelchair 6/7 FIM: Locomotion: Walk 4/7
Day 24 (Discharge Evaluation)	Patient indep with transfers, able to ambulate household distances, able to maintain static standing for 10 secs, able to navigate curbs, able tolerate 10 mins of physical activity.	Bed Mobility –Independent FIM: Transfers 6/7 FIM: Locomotion: Wheelchair 6/7 FIM: Locomotion: Walk 5/7 (Household Exception) Distance of 80' in rear-wheeled walker

Clinical Impression II-III

- Acute and Subacute
 - Acute and Subacute physical therapy intervention did not carry over to increased ambulation distance or safety upon discharge to home.
 - Due to comorbidities and low ambulatory status, the patient would have benefitted from hospital discharge to a more aggressive therapeutic environment, preferably inpatient rehab to address modifiable risk factors in life such as diet, APOPP compliance, and assistive device compliance.
- Outpatient
 - Due difficulty with changes in speed, difficulty in ambulation with variable surfaces, the exertion level with ambulation, and BMI status the patient could not be subjectively classified as a K3 ambulator upon outpatient discharge.

Discussion

- Admission to inpatient physical therapy (rehab) from acute care requires the ability to tolerate three hours of rehabilitation every other day. However, the case patient was discharged from hospital to home as his tolerance increased to one hour.
- The patient recovery timeline was extended due to fall on limb and DM².
- There is conflicting evidence in recent rehabilitation literature as to whether BMI status, specifically overweight and obese status, can be used to predict rehab potential³⁻⁶.
- There is evidence that patients with a dysvascular amputation who are discharged to home after acute care suffer greater mortality and morbidity due to a combination of poorer medical management of underlying disease processes and all cause re-hospitalization⁷.
- A stay in a "rehab" setting at any time during the first year is consistently tied with increased mobility and decreased mortality⁸.
- Low BMI, <18.5, is the only weight status consistently tied to increased mortality and decreased mobility because low BMI is more common in old age and debility⁹⁻¹¹.
- There are more consistent prognostic indicators for rehabilitation potential in normal weight, overweight, and obese patients: amputation level and discharge destination¹²⁻¹⁵.

Conclusions

- The case patient outcomes most closely matched the Rosenberg et al. (2013) analysis of BMI and dysvascular LE amputation based on the findings below.
 - Admission BMI and functional level were identified as a barriers to rehab in the acute and outpatient setting.
 - The patient was ambulating with cane and prosthetic limb at 7 months post operative date.
 - The patient may have benefitted from targeted weight loss program.
- Amputation should be seen as a time to change modifiable risk factors such as diet and lifestyle.
- Modifiable risk factors are best controlled in a multidisciplinary setting, especially for patients with a lack of social support.
- Rehabilitation decisions made immediately post hospitalization, and up to one-year post amputation, may determine the ceiling of a patient's rehabilitation and help determine long-term mortality.
- Current research on discharge destination and mortality/morbidity for patients with a dysvascular amputation should be considered when recommending the most appropriate discharge destination.