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Slow Healing Post-Amputation: Insights from a Case Study of an Elderly Diabetic Patient

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ABSTRACT: Case study of an older adult with Diabetes who presents with a Left Below Knee Amputation, complicated by slow healing, poor endurance, cardiac issues, foot ulcer on the opposite heel, cognitive impairments, and a home that is very difficult to access. This patient requires the attention of the multidisciplinary team to address the issue of home accessibility, as well as a lot of time for a successful rehabilitation post-amputation.

KEY WORDS: Diabetic; slow-healing; accessible; weakness; ucler; trans-tibial

I. PATIENT CHARACTERISTICS

This patient is 84 years of age, male, married. He lives with his wife in a condo with 14 stairs to enter, no elevator. He has a daughter who lives about 4 hours' drive away and had a son who passed away in 1989. He has 5 grandchildren. He is a retired factory foreman. He previously walked independently but was getting to the point where he needed crutches to walk as he had a wound on his Left foot that would not heal. Also, he had a Right Total Hip Arthroplasty in 2007, so prior to this amputation his Left leg was the strong leg. He originally had just toe amputation but that did not heal, so they amputated his lower leg.

This patient also has a cardiac condition (A-fib) and is a Type II diabetic-this was poorly controlled for the past 10 years but he has been much more attentive to his sugars in the past few months. He has a wound on his Right heel-this is a black ulcer and really has not changed at all in the past few weeks. He is a pleasant fellow with a supportive wife but his slow wound healing is really affecting his rehab.

II. EXAMINATION FINDINGS

The amputation was caused by a slow-healing and necrotic wound. He has diabetes and peripheral vascular disease-these contributed to his amputation and also to his slow healing of the stump wound and also slow healing of the heel ulcer on the Right (non-amputated) leg[1]. As well, this muscular endurance is poor on the Right leg from these co-morbidities.

Pt's main goal is to walk with a walker and to return home. Previously a home physiotherapist suggested a stair glide up the stairs; apparently - the patient had difficulty climbing the stairs when his Left leg was the good leg. The home is not very wheelchair accessible and the family are resistant to getting a wheelchair.

Current physical findings are a Left knee flexion contracture of 5 degrees, L U/E has general weakness from a previous shoulder injury- flexion: 90 degrees and abduction: 60 degrees. L/E generally grade 4/5 muscle strength and quick to fatigue. Glutes on L leg grade 3/5. Standing tolerance is limited to 40 seconds on Right leg in parallel bars. Cannot hop due to an ulcer on RT. heel. Pt can low pivot transfer with supervision as does not remember correct set-up each time. Pt gets SOB with rolling over onto side. Pt had angina with bed mobility directly after surgery. Pt spends time in his w/c but constantly forgets proper positioning of both the amputated leg and the remaining limb. He gets wounds easily and is constantly cutting himself; he is always covered in bandages.

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III. CLINICAL HYPOTHESIS

Main problems include slow healing, general weakness, and also barrier to discharge home because of the inaccessibility to enter the home (stairs) and of the home itself (not w/c accessible).

IV. INTERVENTION

Many members of the multidisciplinary team were involved in this patient's care. Wound care nursing, the surgeon and general practitioner and prosthetics as well as daily nursing and physiotherapy all paid very close attention to his stump wound as well as the heel ulcer. The team communicated daily and specialists were consulted when necessary.

Rehab was very slow once the patient was fitted with a prosthetic as he could only walk about 20m in the parallel bars before his stump wound started to ooze. For the general weakness, an intensive exercise program was put together including arm free weights, weighted pulleys, core work in sitting, hip and quadricep strengthening bed exercises, and prone lying. He was doing daily arm ergonomer, as well standing in the parallel bars and walking under careful monitoring with his prosthesis.

To build up his independence, he was encouraged to do as much of his clothing removal and self-care as possible during toileting, and he could don his own socks. His wife was able to supervise his transfers bed/wheelchair. Numerous family meetings with the multidisciplinary team, as well as intervention by the surgeon and all members of the team, took place to discuss the issue of the home accessibility.

V. OUTCOME

With regard to the stump wound, ultimately he developed an infection in the wound and was on antibiotics. He spent some time in convalescent care while his wounds where healing. The heel ulcer on the Right leg did not heal, and consequently this became a limiting factor when it came around time to try to weight-bear on this leg to get on with gait training.

The patient did gain in strength with the strengthening program, but because of the slow wound healing, progress was at a standstill. The issue of the inaccessible house became more to the forefront as time wore on and it became clear that this patient was not going to be able to meet their goal of being fully ambulatory in the home, let alone capable of walking up an entire flight of stairs. The patient and his wife did finally realize that he would not be able to return to his home. Once they accepted this situation, they were able to sell their house and move into an assisted living facility where at least they could be together. However, they were still very disappointed that the patient was not able to regain the ability to walk after the amputation.

VI. DISCUSSION

The outcome of diabetics as they age is grave-first off, they have a 15 fold higher risk of having a Lower extremity amputation in the first place, and within five years they have over 50% change of an amputation on the contra lateral side[2]. They often have compromised cognition, their intact limb fatigues quickly, they have slow healing, and they have a high falls risk.

My patient presented with generally weakness, especially in the glutes and a knee flexion contracture, typical for the post below knee amputations[3]. However, even with a vigorous exercise regime and the entire multidisciplinary team working alongside him, his co-morbidities were unsurpassable and he was unable to achieve his goal of returning to his home as an ambulatory person. However, it is possible that if the home was more accessible, he would have gone home sooner and not have had to spend so many months in the hospital. He and his family were urged many times throughout his rehabilitation to consider moving based on his current

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physical condition, co-morbidities, and likely future outcome, but they were not willing to consider their future with practicality.

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