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Physical Therapy Emphasizing Progressive Weight Bearing and Gait Training Following Chopart Amputation in a Patient with Diabetes: A Case Report

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HIPAA Compliance: The patient in this case report has been de-identified and all protected health information has been removed in accordance with the Health Insurance Portability and Accountability Act (HIPAA) and UNE policies. This includes patient names, specific geographic locations, dates, identifiable numbers, and photos containing recognizable features.

Key Words: amputation, Chopart joint, midtarsal, diabetes, physical therapy

ABSTRACT

Background and Purpose: A Chopart amputation occurs at the Chopart joint that separates the midfoot from the hindfoot and often results from infection secondary to diabetic neuropathy and peripheral vascular disease. Previous studies have examined the associated complications, including the development of equinovarus foot contracture and the corresponding mortality risk. However, little research has been done to establish optimal rehabilitation protocols following surgery. The purpose of this case report was to describe a successful initial outpatient physical therapy intervention program that focuses on progressive weight bearing and gait training for a patient with diabetes who underwent Chopart amputation. **Case Description:** The patient was a 63-year-old male with Type II Diabetes Mellitus who underwent right Chopart amputation following a workplace accident. He desired to return to work as a commercial plumber, but he was non-ambulatory and weight-bearing through the residual limb was minimal at the time of the initial examination. The patient was seen twice per week for an initial eight-week outpatient physical therapy rehabilitation program. Interventions focused on progressive weight bearing, as well as manual therapy, resistive exercises, balance activities, and gait training. **Outcomes:** At the conclusion of the eight-week program, the patient's residual limb weight-bearing had improved from 30 percent to 100 percent, and he was ambulating independently with a rolling walker. Progress was slowed by incomplete closure of the surgical wound that prevented prosthetic fitting, leaving the patient lacking a functional forefoot lever. **Discussion:** Progressive weight-bearing and manual therapy appeared effective at normalizing functional mobility and ankle range of motion. Delayed prosthetic fitting presented a significant barrier to rehabilitation, so further study is needed to examine potential temporary orthosis options.

Full Text Word Count: 3,499

INTRODUCTION/BACKGROUND AND PURPOSE

Chopart amputation occurs at the Chopart joint that separates the midfoot from the hindfoot.[1,2] All of the bones of the foot are removed except for the talus and the calcaneus.[2] A thorough review of the literature regarding Chopart amputation reveals numerous articles studying the medical efficacy, complications, outcomes, and prosthetic considerations involved with the procedure. Schade et al[2] conducted a systematic review to assess the durability of Chopart amputation for ambulatory patients with diabetes, particularly to determine if functionality of the residual limb could be maintained for an extended timeframe. The authors of this review determined that the residual limb would remain functional for at least twelve months, given fitting of an optimal prosthesis.[2] In a separate article, Kaib et al[3] designed a study to determine which common prosthesis is best at imitating normal forefoot function following Chopart amputation. This study suggested that while the rigid clamshell prosthesis is optimal for replicating the ground reaction forces of a normal forefoot lever, an articulated prosthesis encourages physiologic ankle motion during gait for patients who maintain normal ankle range of motion (ROM) post-amputation.[3] In a retrospective study, Faglia et al[1] followed 83 patients who underwent a Chopart amputation secondary to diabetes for a post-operative duration of at least one year. The mean time for complete skin closure of the surgical incision was 164 days. During the follow up timeframe, 27.7 percent of patients required a major proximal amputation and 45.8 percent died.[1] While the durability, prosthetic options, and outcomes have been well documented, physical therapy (PT) rehabilitation protocols are lacking. Therefore, the purpose of this case report was to describe a successful PT intervention program that focuses on progressive weight bearing (WB) and gait training for patients with diabetes who undergo Chopart amputation.

PATIENT HISTORY AND SYSTEMS REVIEW

Informed consent was obtained from the patient for participation in this report. The patient was a 63-year-old male who reported for outpatient PT services following Chopart amputation of his right foot seven weeks prior. The initial injury was a result of a workplace accident where acid was spilled on his toes while employed as a commercial plumber. He continued to work for one month while attempting to treat the injury himself, but gangrene developed, and the foot was amputated. The patient was unmarried and lived alone in a one-story home, but his girlfriend visited frequently, as did his numerous nearby supportive family members. He had over two decades of experience working as a commercial plumber and enjoyed dancing for recreation.

The patient arrived for his first PT appointment in a manual wheelchair and a MaxTrax supportive walking boot (DJO Global, Vista CA) provided by the referring physician. He reported being unable to walk since surgery due to residual limb pain with WB, although he was able to hop short distances on his sound leg using a rolling walker (RW). He expressed concern about his inability to perform occupational duties and generate income. A thorough history and systems review was conducted, and results can be found in Table 1.

The patient's medications included: amoxicillin, heparin, hydralazine, Levemir, losartan, polyethylene, and Tylenol. His medical history included Type II Diabetes Mellitus (T2DM), hypertension, and peripheral neuropathy. He consumed alcohol but did not smoke or have a prior smoking history. Following the Chopart Amputation, the patient received skilled PT services daily in the acute care setting for six days. He was then discharged to inpatient rehab for three weeks, followed by home PT for an unknown duration. These interventions were successful in educating him in wheelchair mobility, safe independent transfers, and a home exercise program

for maintaining strength of the upper and lower extremities. However, ambulation or stair negotiation had not been attempted.

While his cognition was determined to be grossly intact, the patient demonstrated self-limiting behavior. He was resistant and had difficulty independently completing the intake paperwork, and he consistently referred simple questions regarding his past care to his case manager. He also described a home situation where family members assisted with many of his activities of daily living (ADLs), especially those involving mobility (e.g. shower transfers). He repeatedly expressed frustration about having his foot amputated because of a workplace accident, and he wanted his employer to take care of all his medical needs. Despite these self-limiting behaviors, the patient did not perceive his amputation to be prohibitive for eventually returning to work as a plumber.

The primary concerns following Chopart amputation in diabetic patients are healing time and the development of equinovarus ankle contracture.[1,2] The risk of equinovarus contracture can often be mitigated by Achilles tendon tenotomy and relocation of the tibialis anterior insertion.[4] Both of these procedures had been performed on the patient. WB intolerance and functional ambulation impairment are additional concerns that need to be addressed following Chopart amputation.[1,5] The plan for examination included inspection of the residual limb and wound to assess healing, lower extremity strength and ROM testing, assessment of standing tolerance and balance, and observation of ambulation capabilities.

The patient was appropriate for a case report due to the lack of evidence examining the effectiveness of PT for the rehabilitation of patients with Chopart amputations, as well as the unique history and mechanism of injury. Given his post-operative status, his case also offered an opportunity for a reliable, long-duration intervention.

EXAMINATION – TESTS AND MEASURES

Two patient-reported outcome measures, the Locomotor Capabilities Index (LCI-5) and the Örebro Musculoskeletal Screening Questionnaire 12-Item Short Form (ÖMSQ-12), were administered. The LCI-5 uses a five-point ordinal scale to assess locomotor abilities in patients with lower extremity amputations.[6] The ÖMSQ-12 is a validated measure for identifying work-injured patients who are at risk of persistent musculoskeletal problems that could interfere with their ability to return to work.[7] Pain was assessed using the Numeric Pain Rating Scale (NPRS), which rates pain from zero (no pain) to ten (worst possible pain) and has been shown to be both reliable and valid for use in clinical practice.[8]

The patient's intake paperwork was reviewed, and follow-up questions were asked to assess for the presence of red flags. The patient denied any recent disturbances or changes in status other than some swelling in his lower extremities, which he reported was not present prior to the amputation. Given this finding, as well as his recent hospitalization and decline in mobility, the patient was assessed for the presence of deep vein thrombosis (DVT) using the Well's DVT Criteria.[9] The results of the assessment were negative with a calculated Wells Score of minus-one. In a recent study, Modi et al[9] determined the Wells DVT Criteria to be a reliable tool for assessing DVT risk in trauma patients, reporting a sensitivity of 100 percent for scores below one.

The patient declined inspection of the surgical wound, citing instructions from his physician not to remove the wound dressing. A visual assessment of lower extremity active ROM was performed and estimated to be within normal values as documented by Norkin and White.[10] Lower extremity strength was assessed using the Kendall grading system.[11] However, neither ROM nor strength of the right ankle were assessed at this time due to uncertainty regarding

wound healing and a lack of surgical details. The patient was then asked to don his walking boot, which he was unable to perform independently. He was able to complete a sit-to-stand transfer without assistance but leaned heavily towards his left side and required a RW for upper extremity support when standing. His standing tolerance was less than two minutes due to increased residual limb pain and fatigue. He was unable to achieve symmetrical WB or attempt ambulation. A full description of initial examination procedures and results can be found in Table 2.

CLINCIAL IMPRESSION: EVALUATION, DIAGNOSIS, PROGNOSIS

The patient presented with substantial mobility limitations, deconditioning, and pain, all of which contributed to his inability to independently perform his ADLs and return to work. The objective examination findings both confirmed and refuted the initial clinical impression that, due to self-limiting behavior and length of time using a manual wheelchair for mobility, the patient would be deconditioned with significant lower extremity weakness. This impression proved to be partly true, as the patient became short of breath and fatigued easily when transferring. However, he demonstrated good lower extremity strength, likely from his substantial inpatient and home health rehabilitation, as well as his decades of physical work as a commercial plumber.

Examination findings identified no red flags that would indicate the patient was inappropriate for PT treatment or participation in this case report. There was no presence of equinovarus foot contracture or any other indication for further surgical intervention. Referral from the patient's surgeon specified a WB as tolerated status, and it was determined that the patient was appropriate for participation in a gait training and return to employment rehabilitative program.

The patient's referring medical diagnosis was an acquired absence of the right foot (ICD-10

Code: Z89.431) caused by local infection of the skin and subcutaneous tissue (ICD-10 Code: L08.9), gas gangrene (ICD-10 Code: A48.0), and T2DM with other skin complications (ICD-10 Code: E11.628). His PT diagnosis was impaired balance, aerobic endurance, gait mechanics, and activity tolerance, resulting in limited performance of ADLs and occupational requirements. The patient's prognosis for improvement with PT was determined to be fair. Positive considerations for this prognosis were his strong family support, expressed desire to return to his former employment, and high pre-amputation functional status. Negative factors and barriers to PT included age greater than 60; presence of co-morbid conditions, including T2DM and hypertension; signs of self-limiting behavior; and evidence suggesting a high rate of negative outcomes for patients with diabetes who undergo Chopart amputation.[1]

Consultation with the patient's surgeon was deemed necessary to gain insight into the healing status of the surgical incision and for planning PT involvement to promote optimal healing. Consultation with his case manager was planned to coordinate transportation to and from the PT clinic, and for ordering necessary durable medical equipment. The patient was initially authorized to participate in PT twice per week for six weeks with re-evaluation of outcomes to occur every six visits. Planned interventions included progressive WB on the affected limb, gait training with assistive devices and eventual prosthesis, manual therapy to maintain proper length of the Achilles tendon and ankle ROM, resistive exercise to prevent atrophy of the lower limb musculature, and aerobic endurance training to reverse deconditioning. Short- and long-term goals were created for the six-week duration of the patient's authorized visits and are listed in Table 3. However, it was expected that additional authorized visits would be necessary to achieve the patient's desired outcome of return to work activities.

INTERVENTION AND PLAN OF CARE

Coordination of the patient's care occurred via written progress notes sent to the referring physician, who approved the plan of care and authorized additional visits as needed. Email communication with the patient's workers compensation case manager occurred throughout his care, while all communication with the patient occurred directly in the clinic. All communication, patient interactions, and procedural interventions were documented in his electronic medical record.

The patient received initial outpatient PT twice per week for eight weeks. His care extended beyond, but this report focused on the initial eight weeks since the author was only involved during this timeframe. A progressive WB program was implemented for the first two weeks to improve the patient's standing tolerance and promote independence with ADLs. A randomized controlled trial by Mueller et al[12] suggested that rehabilitation emphasizing WB can improve functional mobility and activity tolerance in patients with diabetes and peripheral neuropathy. The patient was instructed on how to self-don his protective walking boot and initial WB activities were performed using platform parallel bars (Dynatronics Corporation, Salt Lake City UT) for upper extremity support. The physical therapist first worked to establish symmetrical standing, followed by weight shifting side-to-side, then weight shifting front-to-back in tandem stance. A standing upper body ergometer (UBE) (SCIFIT Systems, Tulsa OK) was used to reverse cardiovascular deconditioning while also promoting WB tolerance. The UBE encouraged the patient to tolerate equal WB on each limb while replicating real-world object manipulation. Duration of standing was determined by patient tolerance. A two-minutes-on two-minutes-seated approach was used initially and was progressed to ten minutes of continuous standing while alternating UBE direction every two minutes. By the conclusion of the fourth visit, the patient

was able to perform standing marching in the parallel bars with minimal upper extremity support. This indicated he was able to tolerate 100 percent of his weight through the residual limb and gait training could be initiated.

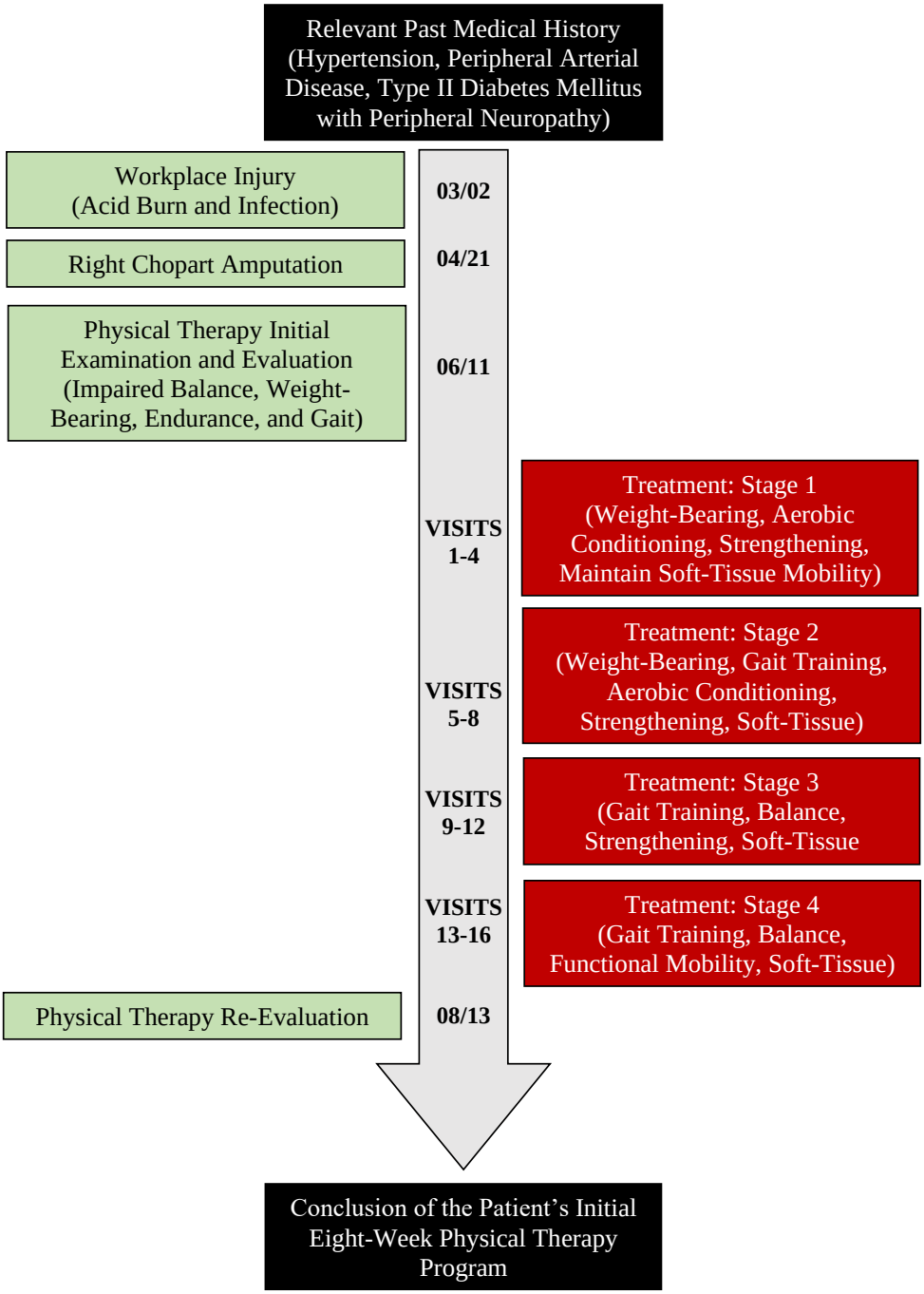
Gait training was initiated within the parallel bars but was quickly progressed after one session to level surface ambulation with a RW. Highsmith et al[13] suggested that skilled gait training interventions are effective at reducing gait asymmetries and altered biomechanics, as well as preventing secondary consequences associated with lower extremity amputations. Verbal and tactile cues from the therapist were used to promote even stepping, maintenance of an erect trunk posture, and proper use of the assistive device. A ProCare EvenUp ShoeLift (DJO Global, Vista CA) was used on the left foot to obtain a level pelvis when walking with the supportive boot on the residual limb. Gait training using a narrow-base quad cane was attempted during week five but was discontinued after two sessions due to increased residual limb pain and concerns from the patient's physician regarding the healing status of the surgical incision.

Maintaining strength, ROM, balance, and mobility were also priorities of the patient's PT plan of care. Manual therapy techniques, including soft tissue mobilization and passive stretching, were used as needed to maintain normal right ankle ROM. Potential shortening of the Achilles tendon and plantar flexor musculature was of particular concern because the patient lacked a functional forefoot lever that would have otherwise promoted stretching during gait. A custom prosthetic or orthosis would have solved this problem, but slow healing and incomplete closure of the surgical wound delayed device fitting. Resistive exercises including leg press, hamstring curl, side lying clams, and resisted ankle isotonic exercises were performed to improve lower extremity strength and prevent muscle atrophy of the right lower leg. Sit-to-stand exercises, cone walking using a RW, and stair training were also utilized to improve the patient's

dynamic balance and functional mobility. All resistive and functional exercises were prescribed intermittently and to patient tolerance throughout the 16 visits. During therapy sessions, he was encouraged to push himself, but to keep his pain rating below 5/10. The patient was instructed on a home exercise program focused on these priorities, which was progressed appropriately throughout his care. He reported compliance with his prescribed home exercise program and was able to demonstrate correct technique of the exercises when requested.

The patient received wound care at an outside facility once per week throughout the duration of his care. Conservative sharp debridement was performed by the operating physician to remove callus, and dressings were applied to minimize the risk of infection. The debridement procedures often resulted in prolonged residual foot pain, which occasionally prevented the patient's full participation in PT sessions. Photos and updates regarding wound healing were relayed by the patient's case manager, who also scheduled his PT appointments and arranged his transportation. This helped ensure patient compliance with his scheduled PT appointments.

TIMELINE


Relevant Past Medical History (Hypertension, Peripheral Arterial Disease, Type II Diabetes Mellitus with Peripheral Neuropathy)
Workplace Injury (Acid Burn and Infection)
03/02
Right Chopart Amputation
04/21
Physical Therapy Initial Examination and Evaluation (Impaired Balance, Weight-Bearing, Endurance, and Gait)
06/11
VISITS 1-4
Treatment: Stage 1 (Weight-Bearing, Aerobic Conditioning, Strengthening, Maintain Soft-Tissue Mobility)
VISITS 5-8
Treatment: Stage 2 (Weight-Bearing, Gait Training, Aerobic Conditioning, Strengthening, Soft-Tissue)
VISITS 9-12
Treatment: Stage 3 (Gait Training, Balance, Strengthening, Soft-Tissue
VISITS 13-16
Treatment: Stage 4 (Gait Training, Balance, Functional Mobility, Soft-Tissue)
Physical Therapy Re-Evaluation
08/13
Conclusion of the Patient's Initial Eight-Week Physical Therapy Program

OUTCOMES

The patient's progress was assessed every three weeks using a combination of patient-reported and performance-based measures. The patient's LCI-5 score improved from 8/56 at initial examination to 24/56 at the final visit. The Minimal Detectable Change for the LCI-5 is reported to be 10.6, so this represented a statistically significant improvement in his locomotor capabilities.[6] This outcome was consistent with the performance-based measures and clinical observations. The patient's ÖMSQ-12 score decreased from 59 to 32 over the course of his care, indicating an improvement from medium to low risk of not returning to work.

Objective measurements suggested that the PT interventions had been successful at improving lower extremity strength, maintaining ROM, increasing WB and activity tolerance, and normalizing gait. Strength testing of the lower extremities at the final visit was 5/5 bilaterally for all major muscle groups and visual estimations of joint ROM remained within normal limits. Weakness and loss of ROM had been a concern given the patient's prolonged work absence and use of a manual wheelchair, so this result was considered a positive outcome. However, a visible decrease in right lower leg muscle tone was noted at the final visit, indicating atrophy of the gastrocnemius, soleus, and tibialis anterior. This observation was attributed to the patient lacking a functional forefoot lever and suggested that resistive band exercises to the residual limb may not be sufficient to maintain lower leg muscle mass while awaiting prosthesis fitting.

Improving WB tolerance was a high priority of the patient's initial PT program. Given he was unable to achieve symmetrical standing and required upper extremity support, his tolerance to right leg WB at the time of initial examination was estimated to be 30 percent. This improved to 100 percent by the final visit, as he demonstrated right single leg balance with arms at his sides. However, he was unable to maintain right single leg balance for more than two seconds

due to apprehension and loss of ankle strategies from the lack of a functional forefoot lever. The patient also demonstrated an improved ability to perform functional and occupational tasks like walking, crawling, and climbing stairs. Much of the initial PT program focused on gait training. The patient's ambulation abilities improved from non-ambulatory at initial examination to being able to perform five minutes of continuous walking with distant supervision while using a RW. A comprehensive list of final visit examination results can be found in Table 4.

The patient tolerated each therapy session with minimal to moderate complaints of pain, assessed using the NPRS. At initial examination the patient reported the pain in his residual limb to be 4/10 at worst. This improved to 1/10 at worst at the final visit, although he did report some continued intermittent phantom pain in his absent toes. Reports from the patient and photos from his case manager showed incomplete closure of the surgical wound at the conclusion of the eight-week initial PT program. While this was not unexpected given the patient's propensity for slow wound healing, continued weekly wound care and consistent monitoring was deemed necessary. No adverse events or complications requiring surgical revision occurred during this timeframe.

DISCUSSION

The purpose of this case report was to examine the effectiveness of an initial eight-week PT program for a patient with diabetes who underwent Chopart amputation, as the evidence in this area is lacking. Studies have documented high rates of subsequent proximal amputations and mortality in this patient population,[1] but none were found examining if post-operative outpatient PT can improve outcomes. This case report utilized a comprehensive PT approach that focused on progressive WB and gait training to regain functional mobility as quickly as tolerated in a patient with diabetes who had undergone right Chopart amputation seven weeks prior. The

outcomes of this case were positive as the patient went from a non-ambulatory initial examination status to modified-independent household ambulation in eight weeks. Consistent manual therapy intervention also proved effective at maintaining a functional ankle joint and preventing equinovarus contracture, which is a common complication of Chopart amputation.[2] While the outcomes were encouraging, the eight-week PT intervention described in this report is only a snap-shot of the patient's total rehabilitation journey. PT interventions that the patient received in the inpatient and home-health settings, which likely contributed to his positive initial outcome, are unknown. In addition, the patient's progress with therapy past the eight-week program and his long-term outcome are also unknown.

While the patient demonstrated significant improvement, slow wound healing stalled his progress and prevented further progression of gait training interventions. In this case, it was the operating physician's decision to not have the patient fitted for a prosthesis until full epithelialization of the surgical wound had occurred. This takes 23 weeks on average for patients with diabetes,[1] which means that wasting of lower leg musculature and ankle joint contracture may occur with such a prolonged duration without a viable functional forefoot lever. The patient had been prescribed a generic walking boot that served well to protect the wound but was cumbersome and did not adequately replicate normal ankle mechanics during gait. Further study and interprofessional collaboration are needed to determine if a temporary orthosis would be a safe and effective alternative for similar patients. Further studies would also be beneficial to examine if PT and exercise can improve peripheral blood flow and decrease healing time in this population.

The primary implications of this case report are: PT may be effective at improving functional mobility and reducing the risk of equinovarus contracture; progressive WB can be safely

implemented as soon as seven weeks post-Chopart amputation, even in patients with compromised wound healing; and a functional forefoot lever orthosis could be provided prior to prosthesis fitting to optimize gait training and potentially improve PT outcomes.

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TABLES AND FIGURES

Table 1: Systems Review

Cardiovascular/Pulmonary	Impaired. Evident deconditioning. Moderate dyspnea noted with functional mobility. Posterior tibial artery pulses detected bilaterally.
Musculoskeletal	Impaired. Presence of right Chopart amputation.
Neuromuscular	Impaired. Visible atrophy and poor activation of tibialis anterior and gastrocnemius muscles of the affected limb.
Integumentary	Impaired. Bandage to residual limb intact. Wound not visualized.
Communication	Not impaired. No hearing or verbal impairments noted.
Affect, Cognition, Language, Learning Style	Flat affect with mild difficulty recalling history of present condition. Demonstrates self-limiting behavior. No language difficulty. Visual learner.

Table 2: Initial Examination

Tests & Measures	**Initial Examination Results**	
Visual inspection of the residual limb and wound	Right ankle and wound obscured by bandage and ace wrap. Patient declined removal of the protective dressing citing instruction not to remove the bandage from the surgeon providing wound care. Plan to confirm instructions from referring physician.	
Locomotor Capabilities Index	8/56	
Örebro Musculoskeletal Screening Questionnaire 12-Item Short Form	59 – Medium Risk	
Numeric Pain Rating Scale	0/10 - Current Pain 4/10 - Worst Pain in Past Two Days	
Occupational Functional Tests		
Standing	PWB on right; does not meet job demands	
Walking	Unable to perform; does not meet job demands	
Crawling	Unable to perform	
Kneeling	Unable to perform	
Climbing Stairs	Unable to perform	
Ladder Climbing	Unable to perform	
Muscle Testing of Lower Extremities[11]	**Left**	**Right**
Hip Flexion	5/5	4+/5
Hip External Rotation	5/5	5/5
Hip Internal Rotation	5/5	5/5
Knee Extension	5/5	5/5
Knee Flexion	5/5	4+/5
Range of Motion[10]		
Hip	WNL	WNL
Knee	WNL	WNL
Ankle	WNL	Unable to perform
Single Leg Balance[14]		
Left Leg, Eyes Open, Firm Surface	Good: >10 seconds	
Right Leg, Eyes Open, Firm Surface	Unable to perform	

WNL = Within Normal Limits PWB = Partial-Weight Bearing

Table 3: Plan of Care: Goals

Short Term Goals (Three Weeks)	
1	The patient will be able to ambulate a household distance of 30 meters with a reciprocal pattern and use of a rolling walker to help normalize gait.
2	The patient will be able to stand with upper extremity support for ten minutes to promote independence with simple meal preparation.
3	The patient will be independent with his initial ankle stretching/strengthening home exercise program to help maintain functional of his right ankle.
Long Term Goals (Six Weeks)	
1	The patient will be able to ambulate a household distance of 30 meters with a reciprocal pattern and use of a narrow-base quad cane to help normalize gait.
2	The patient will be able to balance on his right single leg for greater than three seconds while wearing a supportive walking boot to promote safe mobility.
3	The patient will be able to ascend and descend three steps with a step-to pattern and one railing assist to promote community accessibility.

Table 4: Final Visit Examination

Tests & Measures	**Final Examination Results**	
Locomotor Capabilities Index	24/56	
Örebro Musculoskeletal Screening Questionnaire 12-Item Short Form	32 – Low Risk	
Numeric Pain Rating Scale	0/10 - Current Pain 1/10 - Worst Pain in Past Two Days	
Occupational Functional Tests		
Standing	Can stand up to 10 minutes with light upper extremity support and can achieve 100 percent weight-bearing on right leg; does not meet job demands	
Walking	Can walk up to 5 minutes with use of rolling walker; does not meet job demands	
Crawling	Does not meet job demands	
Kneeling	Does not meet job demands	
Climbing Stairs	Can ascend/descend one flight of stairs with railing assist and step-to pattern; does not meet job demands	
Ladder Climbing	Unable to perform	
Muscle Testing of Lower Extremities[11]	**Left**	**Right**
Hip Flexion	5/5	5/5
Hip External Rotation	5/5	5/5
Hip Internal Rotation	5/5	5/5
Knee Extension	5/5	5/5
Knee Flexion	5/5	5/5
Range of Motion[10]		
Hip	WNL	WNL
Knee	WNL	WNL
Ankle	WNL	WNL
Single Leg Balance[14]		
Left Leg, Eyes Open, Firm Surface	Good: >10 seconds	
Right Leg, Eyes Open, Firm Surface	Poor < 3 seconds	

WNL = Within Normal Limits

CARE CHECKLIST

CARE Content Area	Page
1. **Title** – The area of focus and "case report" should appear in the title	i
2. **Key Words** – Two to five key words that identify topics in this case report	i
3. **Abstract** – (structure or unstructured) a. Introduction – What is unique and why is it important? b. The patient's main concerns and important clinical findings. c. The main diagnoses, interventions, and outcomes. d. Conclusion—What are one or more "take-away" lessons?	ii
4. **Introduction** – Briefly summarize why this case is unique with medical literature references.	1
5. **Patient Information** a. De-identified demographic and other patient information. b. Main concerns and symptoms of the patient. c. Medical, family, and psychosocial history including genetic information. d. Relevant past interventions and their outcomes.	2,3
6. **Clinical Findings** – Relevant physical examination (PE) and other clinical findings	4,5
7. **Timeline** – Relevant data from this episode of care organized as a timeline (figure or table).	10
8. **Diagnostic Assessment** a. Diagnostic methods (PE, laboratory testing, imaging, surveys). b. Diagnostic challenges. c. Diagnostic reasoning including differential diagnosis. d. Prognostic characteristics when applicable.	5,6
9. **Therapeutic Intervention** a. Types of intervention (pharmacologic, surgical, preventive). b. Administration of intervention (dosage, strength, duration). c. Changes in the interventions with explanations.	7,8,9
10. **Follow-up and Outcomes** a. Clinician and patient-assessed outcomes when appropriate. b. Important follow-up diagnostic and other test results. c. Intervention adherence and tolerability (how was this assessed)? d. Adverse and unanticipated events.	11,12
11. **Discussion** a. Strengths and limitations in your approach to this case. b. Discussion of the relevant medical literature. c. The rationale for your conclusions. d. The primary "take-away" lessons from this case report.	12,13,14
12. **Patient Perspective** – The patient can share their perspective on their case.	N/A

13. **Informed Consent** – The patient should give informed consent.	2