SINAI HOSPITAL
A LifeBridge Health Center
Rehabilitation Institute
ABBEL - Anil Bhave Biomechanics & Engineering Labs Research Division
CARE BRAVELY

Gluteus Medius Weakness Masquerading as Perceived Shortened Prosthesis

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History & Initial Intake

- A 32-year-old male with right transtibial amputation presented to our interdisciplinary limb loss clinic (Figure 1).
- His primary complaint was feeling lopsided while walking, which he perceived to be caused by a shortened prosthesis; this impacted his daily activity.
- As a K4 ambulator, the patient used a prosthesis for his construction job.
- He previously had adjustments made to his prosthesis due to perceived shortening and misfit which did not result in symptomatic improvement.
- History intake revealed a remote motor vehicle accident that resulted in pelvic injury and "nerve damage".

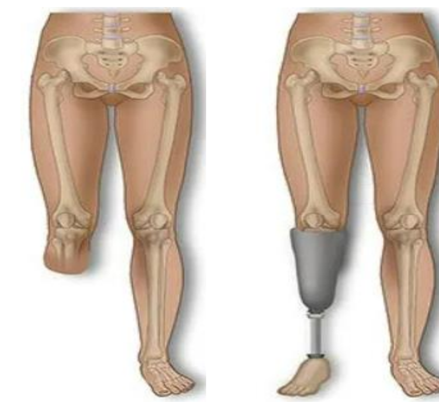


Figure 1. Right-sided transtibial amputation

Purpose

The aim of this case report is to demonstrate the utility of a physiatry-led interdisciplinary team in addressing underlying causes of gait abnormalities in persons with lower limb prostheses.

Physical Exam

Inspection

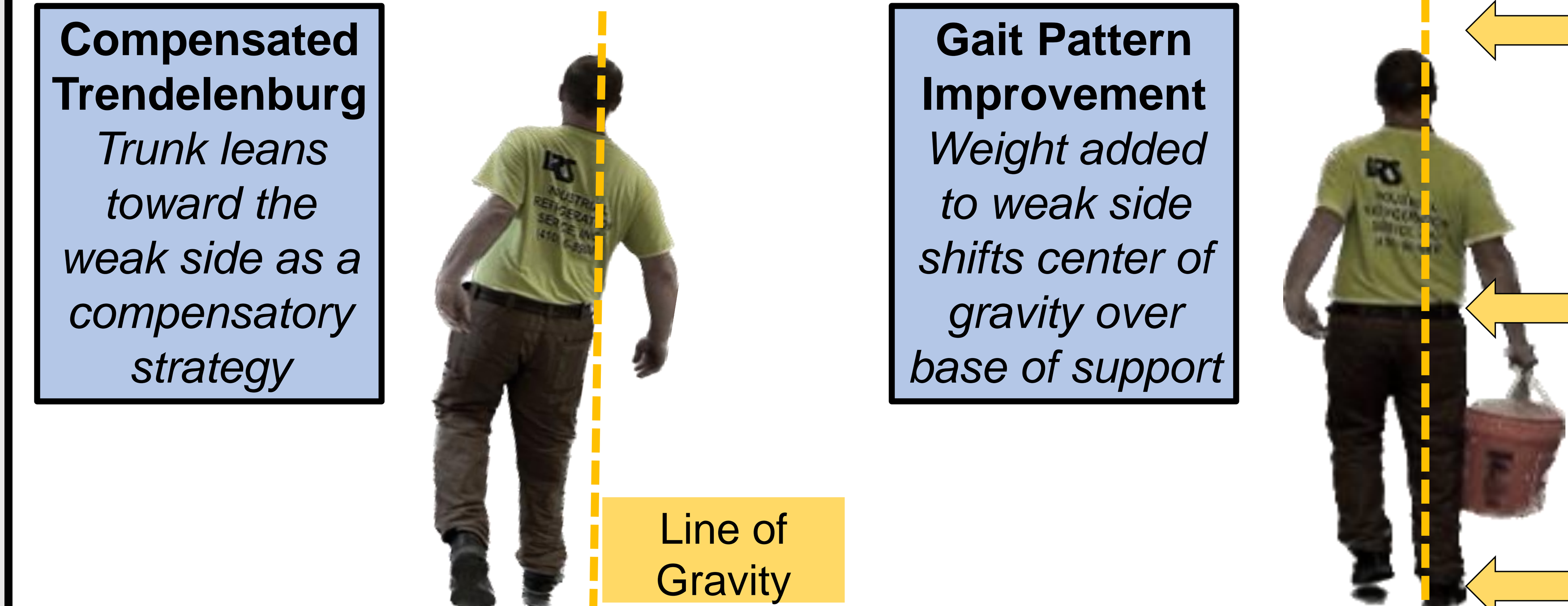
- Limb length was determined to be equal during standing.
- Patient was well-situated in the prosthesis statically and dynamically; no malalignment was noted.
- Sound limb had full active and passive range of motion, and sensation was intact to light touch in all dermatomes.
- Residual limb had no indicators of swelling, deformity, or tenderness of the distal end.

Strength Testing

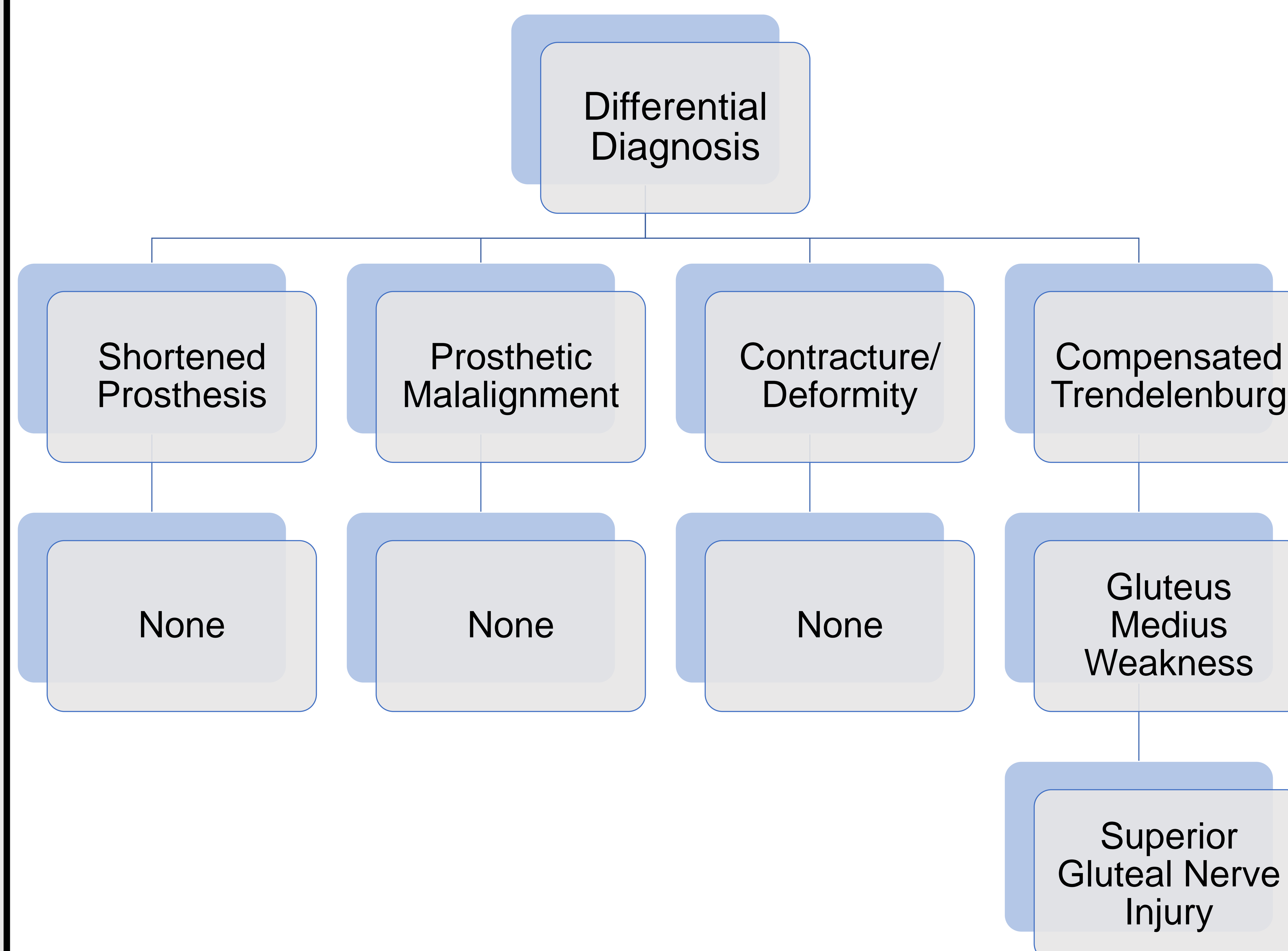
Muscle Groups	Sound Limb	Residual Limb
Hip flexors	5/5	5/5
Knee flexors	5/5	4/5
Knee extensors	5/5	5/5
Plantarflexors	-	-
Dorsiflexors	-	-
Gluteus medius	4/5	4/5

Gait Evaluation

- Upon examination, a compensated Trendelenburg gait pattern was observed during the right stance phase of the gait cycle.
- Patient reported right-sided lean was corrected when carrying weighted object on ipsilateral side, which was confirmed in our clinic.
- Added weight to the right side shifted the center of gravity onto the stance limb, compensating for the weakness of the hip abductors.



Interdisciplinary Assessment



Diagnosis & Outcomes

- The patient's etiology of symptoms aligned with gluteus medius weakness, which was likely secondary to his remote history of traumatic pelvic injury and associated complications (Figure 2).
- Records revealed history of multiple extensive pelvic traumas with right femoral intramedullary rod placement, left pubic fracture, wiring of right iliac bone followed by traumatic proximal right nondisplaced femur fracture requiring osteotomy, and placement of new intraosseous rod.
- "Nerve damage" was likely a misdiagnosed traumatic superior gluteal nerve injury.
- Patient was given a home exercise strength program for bilateral gluteus medius.
- Follow-up revealed lack of compliance, resulting in no gait-related improvements.

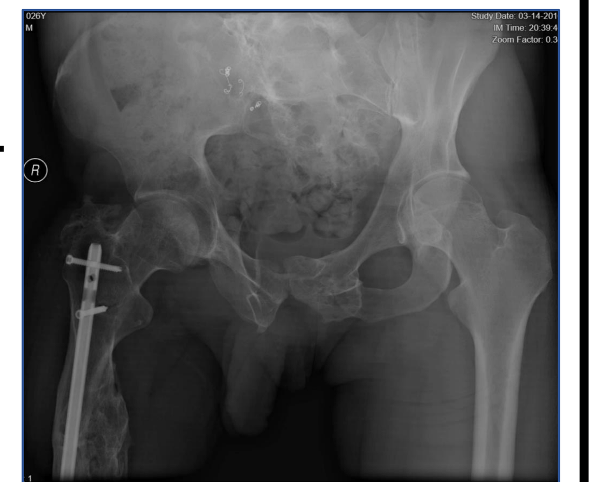


Figure 2. Pelvis X-Ray

Primary Finding

The interdisciplinary team determined that gluteus medius weakness, rather than the prosthesis, was the cause of the patient's compensated Trendelenburg gait.

Discussion

- Utilizing both medical and prosthetic expertise, we identified a neuromuscular cause for what was initially a prosthesis-related complaint.
- Compensated Trendelenburg gait secondary to neuromuscular pathology may present secondary to L5 radiculopathy or superior gluteal nerve damage.[1,2]
- If a structural leg length discrepancy had been the cause, added weight would not have helped gait.
- Neuromuscular imbalance should be considered in a differential diagnosis when evaluating perceived prosthetic length differences.
- Physiatrist-led interdisciplinary team is ideal for assessing and treating people with limb loss to lead to more accurate diagnoses and better patient outcomes.[3,4]

References