

Balance and Gait Training to Reduce Fall Risk in a Patient with Bilateral Foot and Hand Deformities Secondary to Rheumatoid Arthritis: A Case Report



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Background

- Each year, one out of three adults over the age of 65 sustains a fall. Although the risk of suffering a fall increases with age, falls are not an unavoidable aspect of the aging process.¹
- Fall risk can be heightened in patients with medical comorbidities that impact the physiological senses which help maintain balance.
- Rheumatoid arthritis (RA) is a chronic inflammatory disorder that affects the lining of the joints and causes painful swelling that can eventually result in bone erosion and joint deformity.²
- The fall incidence rate in individuals with RA is 0.62 falls per person per year as compared to a fall incidence rate of 0.45 falls per person per year in healthy elderly individuals.³

Purpose

- To provide an overview of the physical therapy plan of care for a patient at high risk for falls.
- Procedural interventions focused on balance and gait training while accommodating for the patient's bilateral foot and hand deformities secondary to RA.

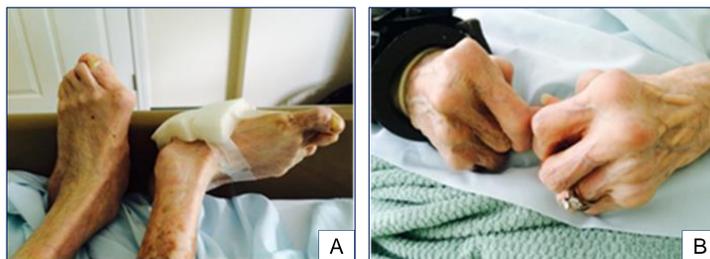


Figure A and B: Resting position of the patient's bilateral foot and hand deformities secondary to rheumatoid arthritis. She presented with grossly 25% of AROM in bilateral feet and hands.

Case Description

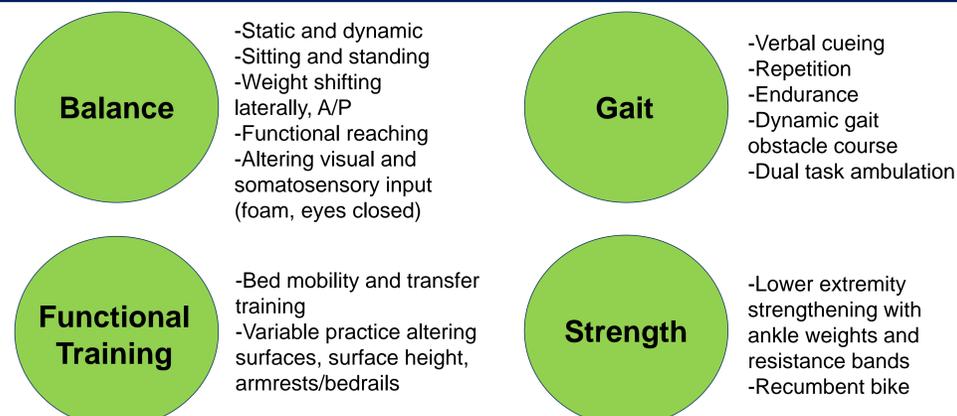
- 84 year old female who suffered a fall likely due to structural deformities secondary to RA that impaired her balance and ability to safely ambulate.
- Fall resulted in a right olecranon fracture and subsequent open reduction internal fixation for surgical repair.
- Transferred to a skilled facility for continued care. She presented with deficits in strength, endurance, balance, coordination and overall functional mobility which heightened her fall risk.

Examination

Tests & Measures	Initial Evaluation Results	Discharge Results
Bed Mobility		
Sit to Supine	MinA to lift trunk from supine position	Independent
Supine to Sit	MinA for upper body and trunk	Independent
Transfers		
Sit to Stand	MinA with hemi-walker, used L UE to push from surface	SBA with hemi-walker, used L UE to push from surface
Stand to Sit	MinA for controlled descent, verbal cues to reach back for surface with L UE after feeling the surface on the back of her legs	Modified Independent with hemi-walker
Ambulation		
With hemi-walker	1x20ft with hemi-walker and CGA	2x200ft with hemi-walker and distant supervision
Gait Analysis With hemi-walker		
	Unsteady gait, foot-flat contact, decreased step length, decreased cadence, forward trunk lean, out-toeing bilaterally.	Unsteady gait at times, improved step length, improved cadence, continuous stepping, slight forward trunk lean, out-toeing bilaterally.
Balance		
	Sitting	Standing
Static	Good	Fair+
Dynamic	Good-	Fair
Activity Tolerance /Endurance		
	Minimal limitations, sustained ordinary activities cause fatigue	Age appropriate activities do not cause increased fatigue
Timed Up and Go		
	73 seconds with hemi-walker and MinA for sit<->stand	48 seconds with hemi-walker and SBA for sit<->stand
Tinetti Performance Oriented Mobility Assessment		
	10/28	18/28
Falls Efficacy Scale		
	70/100	37/100

L = left, UE = upper extremity, MinA = minimal assist, sit<->stand = to and from sit to stand, SBA = stand-by assist

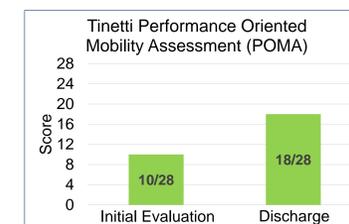
Interventions



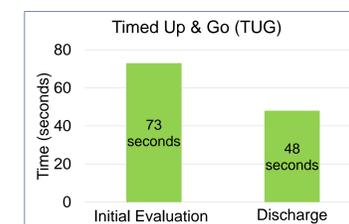
- Coordination, communication and documentation as well as patient-client related instruction were also interventions utilized throughout the episode of care.
- Interventions were progressed based on patient tolerance and improvements as to continue progressing towards her short term and long term goals.

Outcomes

- After 3 weeks of interventions, the patient achieved higher levels of independence on all mobility tasks.
- The patient ambulated with a hemi-walker on indoor surfaces 2x200ft with distant supervision.
- The patient decreased her fall risk as demonstrated by improved TUG, POMA and FES scores.



A higher score on the POMA indicates a better outcome.



A decreased time to perform the TUG indicates a better outcome.

Discussion

- The patient demonstrated improved endurance, strength, balance, bed mobility, transfers and gait.
- The positive outcomes of patient-centered balance and gait training reflected upon the patient's improved TUG, POMA and FES scores.
- Patient-centered PT with a focus on balance and gait training appeared to make significant improvements in this patient's overall function and decrease her fall risk.
- Future research studies analyzing the efficacy of particular gait training and neuromuscular re-education interventions targeting fall risk in a population of individuals experiencing instability secondary to RA related structural changes are necessary in order to generalize the results to different patients.

Acknowledgements

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References

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3. Smulders et al. Fall incidence and fall risk factors in people with rheumatoid arthritis. *Ann Rheum Dis*. 2009 Nov;68(11):1795-6.