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.

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

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<th>Discharge Results</th>
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<td>Independent</td>
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<td>Sit to Supine</td>
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<td>Sitting: Good, Standing: Good</td>
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<td>Tinetti Performance</td>
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<td>Falls Efficacy Scale</td>
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<td>77/100</td>
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Interventions
- Balance
  - Static and dynamic
  - Sitting and standing
  - Weight shifting laterally, A/P
  - Functional reaching
  - Altering visual and somatosensory input (foam, eyes closed)

- Gait
  - Verbal cuing
  - Repetition
  - Endurance
  - Dynamic gait obstacle course
  - Dual task ambulation

- Functional Training
  - Bed mobility and transfer training
  - Variable practice altering surfaces, surface height, armrests/bedrails

- Strength
  - Lower extremity strengthening with ankle weights and resistance bands
  - Recumbent bike

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.

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.

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References