A 6 Week Balance and Gait Training Program Using the AlterG for a Patient With Cervical Myelopathy After Spinal Decompression Surgery: A Case Report

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Background & Purpose

- Spinal stenosis is the narrowing of the spinal canal which can cause radiculopathy or myelopathy symptoms due to compression of the spinal cord.1
- About 80% of patients over 70 years old have some level of stenosis.1
- There is limited research on prognosis for patients with cervical myelopathy and subsequent spinal decompression surgery.
- AlterG treadmill (AlterG Anti-Gravity Treadmill M320/ F320, Fremont, CA) is an antigravity treadmill that is considered a body weight support system used in progressive gait retraining.
- The purpose of this case report is to assess the effectiveness of balance and gait training on the AlterG in a geriatric patient with severe cervical myelopathy who underwent spinal decompression surgery.

Case Description

- 83-year-old male, retired farmer and lives with his wife in a ranch style home
- Left total hip replacement
- Right total hip replacement
- Multiple medical complications: kidney infection, Implantable cardioverter-defibrillator, blood clots, Chronic Obstructive Pulmonary Disease and progression of decreased functional mobility
- Diagnosed: Cervical Stenosis with Myelopathy
- Surgery: C4 corpectomy with C3-C5 anterior fusion and posterior cervical laminectomy and instrumented fusion
- The patient started Physical Therapy and Occupational Therapy services
- Patient plateaued in physical therapy
- July 2018 patient's re-evaluation
- AlterG balance and gait training program initiated

Interventions

- AlterG Ambulation: Patient ambulated in the AlterG. The Alter G has multiple settings which are adjustable to patient needs and progress.
- Dual tasking: Patient ambulated in the AlterG and reached across midline for the rings and placed them on the opposite side.
- Static Perturbation: Patient stands with feet together while a therapist is guarding and another therapist rolling on resistive band in various directions.
- Dynamic Perturbation: Patient ambulated in the parallel bars without holding on and perturbations were given with a resistive band.
- Perturbation: Patient ambulated in the rings and placed them on the opposite side.
- Dual tasking: Patient ambulated in the AlterG and reached across midline for the rings and placed them on the opposite side.

Outcomes

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Week 1</th>
<th>Week 6</th>
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</thead>
<tbody>
<tr>
<td>6 Minute Walk Test</td>
<td>Contact Guard Assist/Minimal</td>
<td>Contact Guard Assist with rolling</td>
</tr>
<tr>
<td></td>
<td>Assistance with rolling walker</td>
<td>walker</td>
</tr>
<tr>
<td></td>
<td>1 seated rest break</td>
<td>2 standing rest breaks</td>
</tr>
<tr>
<td></td>
<td>Total distance: 185.62 meters</td>
<td>Total distance: 264.26 meters</td>
</tr>
<tr>
<td>Berg Balance Test</td>
<td>28/56 (High fall risk)</td>
<td>35/56 (High fall risk)</td>
</tr>
<tr>
<td>30 Second Chair Stand Test</td>
<td>6 total stands</td>
<td>8 total stands</td>
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</tbody>
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Discussion & Conclusion

- The patient demonstrated improvement in balance, gait and overall functional mobility.
- The patient improved on transfers where he only required close supervision which translated to increase independence in his own home.
- He continued physical therapy after the six-week program, to continue to address gait and balance training with the use of the AlterG.
- There is limited research on the efficacy of gait and balance training with the use of the AlterG for patients with cervical myelopathy.
- Future research should consider exploring the use of AlterG and its effects on gait and balance for geriatric patients with cervical myelopathy secondary to cervical stenosis.

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References