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Who: 42-year-old runner and college tennis coach s/p 2 brainstem Cerebrovascular accidents (CVA's).

What: Closed kinetic chain exercises and gait training performed in the AlterG Anti-Gravity Treadmill™ helped carryover to overground situations and functional activities, allowing patient to discharge use of assistive devices, normalize gait pattern, and return to job as a tennis coach.

Why: Weightbearing exercises caused medial tibiofemoral joint line pain and swelling. Patient was unsuccessful with stationary bike and elliptical trainer. AlterG allowed for more controlled loading progression for returning to Full Weight Bearing.

Introduction

Patient is a 42 year old male presenting s/p two brainstem cerebrovascular accidents (CVA). His first CVA occurred in March 2013, causing right sided weakness and significant balance deficits. His second CVA occurred later in March 2013. His second CVA was more significant, and he suffered almost complete paralysis on his left side for the 8 days following his CVA. His right side is slightly weaker than it was prior to his first CVA, but it does not limit him and his balance greatly improved after his second CVA. He received 4 weeks of inpatient therapy where he was receiving 3 hours of therapy daily, including speech, OT, and PT. He was discharged in April 2013, and since then he has been receiving PT and OT 3 times a week, and speech once a week. Prior to his CVA, he was an avid runner and a college tennis coach.

Goals

In 4 weeks:

- The patient will ambulate 500 ft with AD with no rest breaks
- The patient will demo 3/5 strength in L hamstring and 4/5 strength in left hip flexor
- The patient will be able to ambulate on uneven surfaces with AD with no LOB Progression

In 8 weeks:

- The patient will ambulate 30 minutes without an AD with no rest breaks
- The patient will demo 4-/5 strength in L hamstring and 4+/5 strength in left hip flexor
- The patient will be able to ambulate on uneven surfaces without an AD with no LOB
- The patient will be able to stand and hit a tennis ball with no LOB
- The patient will be able to look around while ambulating with no LOB
- The patient will score 21/24 on DGI to reduce risk of falling

History

Prior to AlterG Anti-Gravity Treadmill Training:

- Ambulating wearing AFO on left ankle due to weakness in peroneals and using SPC
- Wide BOS with decreased stride length
- Circumduction of L LE during swing phase
- Ambulates 30 feet before requiring rest break of 15 seconds before he can resume ambulating
- The patient has fallen 3 times since returning home from hospital
- Dynamic Gait Index – 11/24
- Initiated used of AlterG Anti-Gravity Treadmill 13 weeks after second CVA (See progression table for details)
- Physical Therapy treatment for this patient also included gait training, dynamic balance activities, and other therapeutic exercises for back, lower extremities and core



Results

After AlterG Anti-Gravity Treadmill Training:

- Patient is able to ambulate independently without an AD on even and uneven surfaces, continues to wear AFO
- Normal BOS with ambulation and steps are symmetrical
- Minimal circumduction of L LE during swing phase due to increased strength in hip and increased hamstring activation
- No limitations with distance patient is able to walk, no longer limited by fatigue
- Patient is now able to step over objects, change direction quickly, and turn head with no LOB or change in gait speed
- Score of Dynamic Gait Index improved from 11/24 to 21/24

The AlterG Anti-Gravity Treadmill Training was an excellent rehabilitation tool for this patient, who was extremely motivated to progress during each visit. He has benefited greatly from the addition of the AlterG to his rehabilitation program. At discharge, he is able to ambulate without an assistive device with a normalised gait pattern. His endurance is also significantly increased. He showed improvements in his dynamic balance and he has not fallen since initiating treatment, and is able to navigate uneven surfaces with no difficulty. He was able to return to his job as a tennis coach, and is able to stand and hit a tennis ball with no loss of balance. In addition, ambulating in the Alter G also allowed him to ambulate without his AFO and still achieve toe clearance and maintain a normal gait pattern.

In summary, the addition of the AlterG, combined with conventional physical therapy methods, allowed the patient to improve his endurance, normalise his gait pattern, and improve his balance.

Week	Initial Weight Bearing %	Speed / Time	Incline	Frequency
13	60%, 55%, 55%	2.0 x 10, 10, 5	None	Once a week
14	55%, 55%, 57%, 55%, 57%, 60%	2.0 x 15, 10, 10, 2-2.2 x 15, 10, 15	None	Once a week
16	57%, 60%, 65%, 55-60%, 60-65%, 65-70%	2.0 x 14, 14, 13, 2-2.2 x 14, 14, 12	None	Once a week
17	45-50%*, 65-70%, 70-75%	1.2-1.5 x 14*, 2.0-2.3 x 13, 13	None*, 3%	Once a week
18	55-58%*, 65-70%, 70-75%	1.0-1.5 x 12*, 2.0-2.6 x 13, 15	None*, 3%	Once a week
20	60-65%*, 68-73%, 73-80%	1.2-1.5 x 12*, 2.5-2.6 x 13, 15	None*, 3%	Once a week