Trunk Control and Standing Tolerance of a Patient with Paraparesis as a Result of Transverse Myelitis and Mycotic Aneurysm Rupture: A Case Report
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Background
Transverse myelitis is a condition where a segment of the spinal cord becomes inflamed. This results in impairments below the level of the inflammation, including paraparesis or paraplegia, autonomic dysfunction, and/or pain.1 Cerebral mycotic aneurysms are a form of brain injury where an artery bursts and diminishes blood supply to the brain.2 The resulting impairments vary depending on the area of the brain affected.

Case Description
The 28-year-old male patient had been seen for two years at an outpatient clinic with an accredited brain injury program. He had a history of transverse myelitis and multiple cerebral mycotic aneurysm rupture at eight years prior to this case report. The patient was reliant on bilateral KAFOs for standing and ambulation within the parallel bars, but encountered many barriers throughout his rehabilitation which resulted in a decrease in standing tolerance over time.

Purpose
The purpose of this case report was to describe the interventions provided to a patient with paraparesis as a result of transverse myelitis and multiple cerebral mycotic aneurysm ruptures to progress toward achieving his goals of standing and ambulating.

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Timeline of Rehabilitation and Barriers

Physical Therapy Interventions

Bed Mobility: rolling, resisted isometrics in sidelying, alternating isometrics in supine. Range of Motion: passive and active assist with bilateral lower extremity (BLE) straight leg raise, hip abduction and external rotation, knee flexion, and ankle dorsiflexion, WalkAide® for dorsiflexion range of motion. Lower Extremity Strengthening: BLE Russian electrical stimulation to quadrocles with active short arc quad over a bolster. Core Strengthening: crunches and diagonal crunches with a 3kg medicine ball, kayak motion with a 5lb dowel in sitting and supine, partial sit-up with Swiss ball behind patient in sitting. Static and Dynamic Sitting Balance at Edge of Mat: maintaining proper posture, reaching across the body, ball catch, balloon toss, D1 and D2 flexion and extension patterns with the Body Blade®. Standing and Ambulating: performed with bilateral KAFOs donned, bilateral upper extremity support within parallel bars, and moderate to maximum assist times one for transfers and weight shifting during ambulation within the parallel bars.

Outcomes
The patient received approximately 200 physical therapy treatment sessions since his start of care at MCIR two years ago. This case report highlights approximately 36 of those sessions over a period of 12 weeks. There was no change in his Brain Injury Assessment Tool (BIAT) mobility score from initial evaluation to the final session of this case report, which indicated that there was no improvement or regression in his mobility. There were minimal changes in his BLE strength from admission to the final session.

Discussion
The patient’s progress had been stagnant since his start of care at MCIR two years ago secondary to many barriers, such as his bilateral KAFOs breaking several times, throughout his rehabilitation. This result in multiple holds on standing and ambulation which ultimately impaired his ability to improve his standing tolerance as he was unable to stand in the parallel bars without his orthoses. His obesity was a significant co-morbidity that likely impacted his KAFOs breaking several times as well as his ability to stand for prolonged periods of time as he was heavily reliant on his bilateral upper extremities to hold himself upright in the parallel bars.

Conclusion
We are unable to definitively determine whether or not the typical approaches used to address common stroke-related impairments, such as trunk control and sitting balance activities, are effective to address the impairments related to transverse myelitis with subsequent multiple cerebral mycotic aneurysm ruptures. The chronicity of the patient’s condition, as well as the inconsistent opportunity to build standing and ambulation tolerance with his KAFOs, may also contribute to the lack of improvements throughout his care at MCIR. Further research is needed to determine options for effective PT treatment approaches for patients with impairments related to transverse myelitis and multiple cerebral mycotic aneurysm ruptures.

References

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Image of cerebral aneurysms
Image of spinal cord within vertebral canal

A. The patient performing a short arc quadriceps exercise over a bolster with Russian electrical stimulation.
B. The patient in his wheelchair which is in a slightly tilted position.
C. The patient performing sidelying flexion and extension on the edge of the mat with the Body Blade®.
D. The patient maintaining a proper upright position at the edge of the mat.
E. The patient’s custom KAFOs.
F. The patient standing in the parallel bars with the student physical therapist/author with bilateral KAFOs donned.