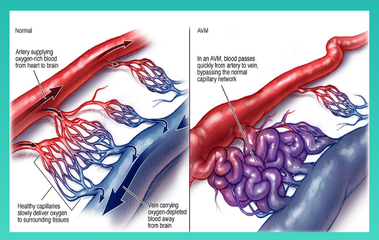
# UNIVERSITY OF ST. AUGUSTINE
## FOR HEALTH SCIENCES

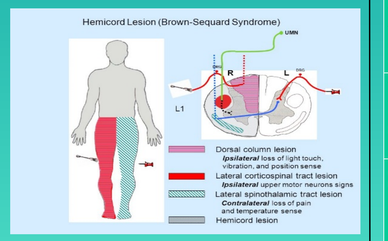
# Post-Surgical Resection of T7-10 AV Malformation Mimics Brown-Sequard: A Case Report

Lindsey Pauley, SPT and Lisa Chase PhD, PT, CEEAA

## BACKGROUND & PURPOSE:

- Congenital arterial-venous malformation(AVM) can present with debilitating and severe symptoms that are detrimental to a patient's quality of life. The best treatment currently available is surgical removal, typically with lasting neurological symptoms. [1] Due to the associated neurological damage, a resection of an AVM can mimic a spinal cord injury, depending on the location of the blood supply involved. [2] In this case the presentation mimicked Brown-Sequard Syndrome.




*The purpose of this case study is to describe the methods of treatment and outcomes for a patient with a thoracic AVM presenting with spinal cord symptoms mimicking Brown-Sequard syndrome, by focusing on the primary impairments and improving functional mobility.*

## CASE DESCRIPTION:

**Body Structure**
- Decreased Balance
- Decreased Coordination
- Lower Extremity Weakness
- Decreased Lower Extremity Sensation
- Cardiovascular Deconditioning

**Activity Limitations**
- Gait Deviations
- Decreased Sit to Stand
- Decreased Static and Dynamic Balance.

**Participation**
- Inability to Walk the Dog
- Inability to Sit Longer Than an Hour
- Inability to Grocery Shop

**Environmental Factors**
- Front Desk Administrator
- Single

**Personal Factors**
- 49 Year Old
- Female
- Congenital Thoracic AVM

## METHODS:

Physical Therapy Sessions: 1x/week for 8 weeks

| Activity | Weeks 1-4 | Weeks 5-8 |
|---|---|---|
| **TheraBand: Hip Abduction/Extension/Flexion/Knee Extension/Ankle Dorsiflexion* Yellow->Red->Green-> Blue** | X | |
| **Weight Machine: Hip Abduction/Extension/Flexion/Knee Extension ABD-10->30lbs, Hip Ext-10->40lbs, Flex- 20->50lbs, Knee Ext- 10-30lbs** | | X |
| **Mini Squats* High Surface 5reps->20reps, Lower Surface 10reps->30reps** | X | |
| **Pilates Reformer Squats One White Band->2 Red Bands** | | X |
| **Supine Bridges* 10reps->50reps** | X | X |
| **Clams* 20reps TheraBand Yellow->Red->Green-> Blue** | X | X |
| **Transverse Abdominus Contractions Supine* 10reps->50reps** | X | X |
| **Star Tracing* Level Surface 5reps->20reps** | X | |
| **Star Tracing Unlevel surface 10reps->30reps** | | X |
| **Single Leg Stance* To failure for 5 Minutes** | X | X |
| **Toe Taps to Steps* 5reps->20reps** | X | |
| **BOSU Step Ups 5reps->30reps** | | X |

- Criteria for the progression of exercises was correct performance of all repetitions consecutively with no compensation.

*Home Exercise Program – Patient performed these exercises 2x/day 30 repetitions on days she was not in physical therapy.

## RESULTS:

- All LE MMT's improved by ½ grade to at least 4+ - 4
- LE ROM improved anywhere from 2-20 degrees

| Outcome Measures | | Pre-Score | Post-Score |
|---|---|---|---|
| **LEFS** | | 50% Ability:40/80 Raw Score | 55% Ability :44/80 Raw Score |
| **30 Second Chair Rise** | | 6reps | 12reps |
| **6 Minute Walk** | Distance | 930ft | 1100ft |
| | Rest breaks | 5 in standing | 0 |
| | Loss of Balance | 4 episodes with self-recovery | 0 |
| **Single Leg Stance** | | Left= 2secs Right= 4secs | Left=10secs Right=12secs |
| **Berg Balance Scale** | | 40/56: indicating a fall risk | 44/56: indicating fall risk |

## CONCLUSION:

- The implementation of an adapted physical therapy approach for a spinal cord injury treatment resulted in notable improvements in the patient's function evidenced by positive outcome measure results.
- This case study provides a template for successful methods of treating neurological deficits similar to those of Brown-Sequard Syndrome due to resection of a thoracic AVM.
- A follow-up study of the patient at six months and a year into the future may also prove beneficial to determine long term effects of patient education and potential long-term outcomes of physical therapy.

## REFERENCES: