

Subject Demographic

Patient was a 64-year old male who presented to physical therapy s/p right Transcranial Laminotomy right acoustic neuroma (2.78cm) resection surgery after 6 days. The patient was 6'7", 195lbs with no concerning past medical conditions. The patient's chief complaint was mild dizziness, imbalance, and nausea. Dizziness symptoms were reported as feeling imbalance, disequilibrium, and unsteadiness. The patient's impairments were contributing to oscillopsia, static/dynamic imbalance, and mild dizziness with quick head and bodily movements. Due to his functional limitations, the patient was unable to drive or work per physician's recommendation.

Examination

Oculomotor screen show consistency with right vestibular hypofunction post-surgery as evidenced by patient corrective saccade during positive right head thrust, positive dynamic visual acuity test (DVAT), head shake, and L gaze evoked nystagmus (GEN) with right vestibular hypofunction following surgery.

Interventions:

Category	Interventions	Measurement/Outcome
Balance/Postural Control	<ul style="list-style-type: none"> • Gen Thrust on an 8° tilted against a wall then performed VIG x 3 that consisted of head movement from side to side and up and down. • Gen Thrust on an 8° then performed with x 2 that consisted of head movement from side to side combined with moving a synchronous to opening side in. Head is rotated right then a second head to the left with knee in a rhythmic manner. 	<ul style="list-style-type: none"> • Fluctuating to standing from standing on even surface to uneven surface or stairs, from walking on the floor to walking on the treadmill. • 20sec chart 3 taps side to side and up and down. • Increasing tempo, duration of exercise
Dynamic Balance	<ul style="list-style-type: none"> • Horizontal and vertical x viewing 8 against for 30sec while walking • Walking in a straight line with therapist walking behind him, who would then randomly call out right or left while holding 10 finger ring. Record any gestures to walk from those fingers are there. • Patient would be hunched away and then therapist would randomly call out right or left and walk back onto in that direction. 	<ul style="list-style-type: none"> • Increasing tempo, walking speed • Progress from ball onto to catch
Visual/ Vestibular Function	<ul style="list-style-type: none"> • Romberg, eyes open/closed • Half Tactile • Tandem • Single leg 	<ul style="list-style-type: none"> • Even ground to uneven ground • Progress to tandem walking, some walking • Progress to perturbation exercises to maintain balance for stepping strategies

The parameters (frequency, intensity, time, type) of VR exercises were dependent upon the patient's subjective reported symptoms (dizziness, imbalance, fatigue).² If the patient was able to tolerate the load, then the patient was progressed. This method reduced the likelihood of prolonging the patient's response to VRT. Each week, this patient progressed with higher frequency with a decrease in symptoms per exercise.

Conclusions:

Early vestibular rehabilitation therapy (VRT) guidelines for UVH were effective to apply on an older patient with UVH secondary to a transcranial laminotomy.

Clinical Implications:

While this study confirmed the effectiveness of applying early VRT clinical guidelines for a patient with UVH secondary to a transcranial laminotomy, there are a couple of limitations to this study. Were the outcomes due to natural recovery or VRT intervention? Since the patient was seen 6 days post operation, he was in the 2nd stage of tissue healing. However, the VRT interventions were primarily designed to decrease symptoms and increase function which were seen in the above graphs. Another area of research that should be considered include comparing a critical period for optimal VRT intervention in the acute and chronic vestibular patient. This would minimize the confusion on when to treat patients with UVH.

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References:

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Early Application of Vestibular Rehabilitation Therapy (VRT) results in positive outcomes in a Patient with a Unilateral Vestibular Hypofunction (UVH) Secondary to a Transcranial Laminotomy

Vestibular Rehabilitation Following Acoustic Neuroma Resection Surgery in a Patient with a Unilateral Vestibular Hypofunction (UVH) Secondary to a Transcranial Laminotomy: A Retrospective Case Report

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Objective:

To see the effectiveness of applying early physical therapy clinical guidelines of vestibular rehabilitation for a patient with unilateral vestibular hypofunction (UVH) secondary to a transcranial laminotomy.

Literature Search:

Authors Trato J and Johnson EG found that a thorough physical therapy examination that include an oculomotor screen was necessary to better determine a working diagnosis between central and peripheral etiology.¹ Authors Rosahl S et al also suggested that extensive vestibular diagnostics play a crucial role in order to make the best therapeutic decision.² They found that VRT should be introduced very early on in the postoperative phase so patients can participate in as many physical activities as possible that occupy the vestibular system to challenge their sensory neuro-feedback in order to achieve rapid central compensation of postoperative vertigo.² As a result, the patient's re-integration into daily living can not only be achieved rapidly but early on, and patients are free of complaints after 6-9 months.² Authors Hall CD et al investigated and discovered that among patients with a peripheral diagnosis, UVH, there is moderate to strong evidence in support of VRT to improve function and reduce symptoms.³ VRT focused on decreasing motion sensitivity (principles of habituation), head movements to improve gaze stability (adaptation and substitution), reduction of symptoms of dizziness, improvement in static and dynamic balance and increase in function.³

Participants:

One-person study.

Methods:

Single subject retrospective case report for an older adult who underwent a transcranial laminotomy. Patient was evaluated with oculomotor examination and completed Activities-Specific Balance Confidence (ABC), Dizziness Handicap inventory (DHI), Modified Clinical Test of Sensory Interaction on Balance (mCTSIB), and Dynamic Gait Index-4 item (DGI) outcomes on first session as well as last session, which included Functional Gait Assessment (FGA). Patient was instructed to practice the vestibular training program.

Results:

The patient was treated in an outpatient setting for a total of 8 sessions. The patient saw significant improvements in his vestibulocolar reflex (VOR), balance, and gait stability each week. After 8 sessions of receiving VRT services, the patient demonstrated improved DGI, FGA, modified CTSIB, DHI and ABC outcomes.

Health History	Right	Left
Postoperative Manipulation	Negative	
Smooth Pursuit/Step-Heading	Negative	
Head Thrust/ Head Impulse Test	Negative	Negative
Cover-Cover Cover	Negative	
Dynamic Visual Acuity Test (DVAT)	Negative	
Locomotor	Negative	
On-Behalf	N	
Expire Ball Test	N	
DGI - 6 sec	12/12	
GAIA	Condition 4 = 30 sec	
ABC	28/30	
Tandem	Negative	

