Outpatient Vestibular Rehabilitation for a Patient Three Months Post Acoustic Neuroma Resection: A Case Report

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Background

An acoustic neuroma is a benign and slow growing intracranial tumor that originates from cells of the vestibular nerve within the inner ear.1 Acoustic neuromas are estimated to occur in 10-20 individuals per 1,000,000 in the US.2 The tumor and subsequent surgery frequently lead to vestibular impairment.3

The vestibular system functions to:

- Coordinate head and eye movement through the vestibulo-ocular reflex (VOR)
- Provide input for spatial orientation
- Maintain postural stability
- Distinguish between reality and illusion

Common signs and symptoms of vestibular dysfunction include:

- Dizziness
- Headaches
- Unsteadiness
- Facial numbness
- Oscillopsia
- Dizziness on feet
- Unsteadiness
- Occasional or facial numbness

Case Description and Examination

The patient was a 51 year old male who was completely independent prior to diagnosis with chief complaints of:

- Headaches
- Oscillopsia
- Vertigo
- Facial numbness

Figure 1. Injury Timeline

Patient began experiencing severe headaches 8 months prior to IE Diagnosed with right sided acoustic neuroma 8 months prior to IE Resection surgery performed 3 months prior to IE PT initial examination (IE) 1E

Tests and Measures

<table>
<thead>
<tr>
<th>Tests and Measures</th>
<th>Initial Examination Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaze fixation in all directions</td>
<td>Normal</td>
</tr>
<tr>
<td>Visual tracking in all directions</td>
<td>Smooth</td>
</tr>
<tr>
<td>VOR x:1</td>
<td>Blurry at slow speeds</td>
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<tr>
<td>Dynamic Visual Acuity Test</td>
<td>6 line disparity</td>
</tr>
<tr>
<td>Rapid Head Thrust Test</td>
<td>Unable to maintain visual focus to the right demonstrating corrective saccade</td>
</tr>
<tr>
<td>Modified Clinical Test of Sensory Interaction on Balance</td>
<td>&gt; 30 seconds in all conditions</td>
</tr>
<tr>
<td>Dix-Hallpike Test</td>
<td>Negative bilaterally</td>
</tr>
<tr>
<td>Dizziness Handicap Inventory</td>
<td>44 indicating moderate handicap due to perceived dizziness</td>
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Initial Examination Results

Proscribed plan of care for 30-45 minute sessions twice a week for eight weeks. A home exercise program was also to be completed daily.

Interventions

Interventions focused on VOR adaptation and postural stability. Patient was educated on Symptom Management Guideline:

- The patient was to expect minimal symptom provocation in order to challenge vestibular function, however, there was a strong emphasis on not over-provoking symptoms.
- Exercise intensity was set to achieve no more than 1-2 minutes of symptoms immediately following completion of exercise.

Outcomes

- After 4 weeks of treatment the patient demonstrated improvements with VOR and postural stability exercises with decreased symptom provocation.
- Upon re-evaluation he demonstrated minimal improvements in all outcome measures.
- During his fifth week of treatment he cancelled two appointments due to severe headaches.
- The following week, his referring physician reported the patient needed a hold from PT due to the increase in his headache severity and frequency.

Discussion and Conclusion

This case study was limited in demonstrating its purpose as the patient was unable to complete the full eight weeks of his intended plan of care.

- Minimal improvements in VOR function after four weeks may support the use of vestibular rehabilitation for this patient with chronic symptoms of UVH.
- This case may suggest the importance of direct communication between the therapist and referring physician as continued treatment for symptom management was recommended despite the physicians recommended hold from PT services.
- Future research may focus on expected outcomes for patients with chronic UVH with delayed vestibular rehabilitation following acoustic neuroma resection.

Acknowledgements and References

The author acknowledges Amy Litterini, PT, DPT, for assistance with the development of this case report, Melissa Lanoie, DPT, for assistance with the development of the plan of care, and the patient for his willingness to participate.

References


Figure 2. VOR Exercises

A. Horizontal head turns performed at a speed allowing the patient to maintain visual focus of a letter placed on an index card held at arm’s length distance
B. Vertical head turns performed at a speed allowing the patient to maintain visual focus of a letter placed on an index card held at arm’s length distance

Figure 3. Postural Stability Exercises

A. Slow forward marches for 25 feet while holding a 10 pound ActivMotion Bar with gaze fixation
B. Forward gait for 25 feet with self-toss and catch with 2 pound medicine ball
C. Walking on a treadmill at 1.3 mph while identifying letters on a white board as called by the therapist

Figure 4. Acoustic Neuroma

Outcomes