HENRY FORD HEALTH

Vestibular Testing and Length of Stay after **Translabyrinthine Resection of Vestibular Schwannoma**



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Introduction

- •The true incidence of vestibular dysfunction in patients with vestibular Schwannomas is unknown, with some reports suggesting 50-60% or more^{1,2}
- •Vestibular symptoms have been shown to have the most detriment to quality of life in patients with VS³
- Translabyrinthine resection of these tumors causes complete vestibular ablation, with a significant improvement in quality of life in those with vertigo symptoms ⁴
- Recovery following translabyrinthine surgery often requires a hospital stay of several days, with length of stay (LOS) influenced by factors like vestibular compensation, cerebrospinal fluid (CSF) leaks, and facial nerve function.⁵
- •Vestibular compensation, the brain's adaptation to the loss of vestibular input, is critical to recovery speed.⁶
- Preoperative vestibular function, assessed using videonystagmography (VNG), provides insights into a patient's baseline status and recovery trajectory.⁷

Linear Regression

- No correlation between age and LOS (R²=0.01, *p*=0.19)
- No correlation between BMI and LOS (R²=0.00, *p*=0.61)
- No correlation between tumor volume and LOS (R²=0.02, *p*=0.11)
- Positive correlation between tumor volume and VNG weakness (R²=0.04, *p*=0.017)
 - For every 1 cm³ increase in tumor volume, VNG weakness increased by 1.2%
- No correlation between VNG UW and LOS (R²=0.00, p=0.77)

Preoperative Dizziness

• Ninety-five (58.2%) had subjective dizziness preoperatively

Table 2. Subjective Preoperative Dizziness	Table 2	No Preoperative Dizziness	Preoperative Dizziness	p-value
	VNG (%)	50.1	61.6	0.027
	LOS (days)	4.19	4.44	0.033
	No minor complications (n=123)			
	VNG (%)	49.2	58	0.143
	LOS (days)	4.14	4.6	<0.001

•The purpose of this study is to evaluate if subjective or objective findings of vestibular dysfunction correlates with postoperative hospital LOS

Materials & Methods

This retrospective cohort study reviewed 200 consecutive patients who underwent translabyrinthine resection of vestibular schwannomas between 2013 and 2018.

Inclusion Criteria

• Preoperative videonystagmography (VNG) assessment available

Exclusion Criteria

- Lack of preoperative VNG testing
- Postoperative complications directly affecting length of stay

Data Collection

Patient demographics (age, gender, BMI), preoperative comorbidities, vestibular symptoms, surgical characteristics and VNG results were retrospectively collected. Subjective preoperative dizziness was collected based on preoperative office notes. Postoperative complications such as cerebrospinal fluid (CSF) leaks, facial nerve weakness, and other hospital problems were noted. If complications significantly increased LOS (postoperative hemorrhage, hydrocephalus, pulmonary embolism) they were excluded. Complications that were not thought to have a significant increase on LOS, such as facial palsy, electrolyte abnormalities, mild arrythmias, were initially included.

- Those with subjective preoperative dizziness had a significant increase in VNG UW and longer LOS by 0.25 days (p=0.027, p=0.033)
- When minor complications were removed, those with preoperative dizziness had a larger increase in LOS, to 0.46 days compared to those without subjective dizziness (p<0.001)

Discussion

- •It was initially thought that those with better vestibular function preoperatively would have more difficulty with postoperative dizziness after complete ablation of their vestibular system via a translabyrinthine resection of their tumor
- •There was no correlation with objective testing via VNG and hospital LOS •Several factors may explain this lack of correlation:
- •The translabyrinthine approach leads to total vestibular loss, which may standardize recovery across all patients, regardless of preoperative vestibular function
- •Additionally, central compensatory mechanisms in the brain may mitigate the impact of preoperative vestibular deficits on recovery

Statistics

Linear regressions, along with appropriate parametric (t-test) and non-parametric (Mann-Whitney) testing was completed to evaluate effect of different variables on vestibular weakness based on VNG and hospital LOS

Results

Gender

Table 1	
	Mean
Age (years)	54.6
BMI	29.7
Tumor Volume (mm^3)	3744
VNG (%)	56.4
	#

Demographic Data

- A total of 163 patients met inclusion criteria
- Demographic and mean data can be seen in Table 1.
- Thirty-seven (22.7%) had 100% UW on the affected side

- Postoperative LOS is influenced by multiple factors, including comorbidities, age, and perioperative complications, which may have had a greater effect on LOS than vestibular function.
- Patients with preoperative subjective dizziness had longer hospital LOS compared to those without by almost half a day, independent of VNG findings

Conclusions

- Preoperative vestibular deficits did not significantly impact hospital length of stay (LOS) following translabyrinthine resection of vestibular schwannomas
- Those with preoperative subjective dizziness (58.2%) had longer LOS compared to those without
- A limitation of this study includes the evaluation of only the immediate postoperative period and does not look at the long-term vestibular recovery of patients
- This study highlights the need for ongoing refinement of perioperative care, recognizing the multifactorial nature of recovery

Future Directions

• While VNG may not predict LOS, it may play an important role in long term recovery. Future studies could explore other forms of vestibular testing such

Male	78
Female	85
Ear	
Right	89
Left	74
Preop Dizziness	95
Prehab	2
Rehab	20

Table1. Demographic data

- Fifteen (9.2%) had 0% UW on the affected side
- Only 2 patients underwent vestibular rehabilitation prior to surgery
- Twenty patients had postoperative vestibular rehabilitation

as head impulse testing or evoked myogenic potentials.

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