Impact of Pre-Operative Caloric Asymmetry on Length of Stay in Cerebellopontine Angle Tumor Resection

Areeb Shah, BS[1]; Ruben Ulloa Jr., MD[2]; Nedim Durakovic, MD[2]
[1]Saint Louis University School of Medicine, [2]Washington University in St. Louis School of Medicine

Introduction

- Cerebellopontine angle (CPA) tumor surgery can lead to transient or permanent vestibular nerve damage.[1]
  - Leads to debilitating vertigo, potentially prolonging hospital stay.
- We hypothesize that pre-operative vestibular loss may reduce post-operative symptoms and LOS.
  - Gentamycin therapy has shown shorter LOS.[2]
- Pre-operative vestibular testing isn't common practice, but may parse out which patients will need more post-operative care.
- **Study Aim:** investigate factors influencing LOS in CPA tumor resection, with a focus on pre-op vestibular function and in-patient medications.

Methods

- Retrospective cohort study 2020-2025*

Inclusion	Exclusion
Patients aged >=18 with CPA Tumors	NF2 (Neurofibromatosis Type 2)
Underwent Vestibular Testing	Previous Tumor Treatment
Completed charts available for review	Received Gamma Knife radiation

Table 1. Inclusion and Exclusions

- Includes n=23
  - Gamma knife radiation (n=1), NF2 (n=1), inaccessible chart (n=3)
- Independent variables:
  - Demographics: Age, Sex, Race, BMI class.
  - Surgery information: Discharge location, Tumor size, Surgery duration, in-patient antiemetics etc.
  - Surgery complications: CSF Leak, Facial palsy, etc.
  - Co-morbidities: ACE-27 Co-morbidity index, etc.
- Ran Univariate Analysis.
- Full Regression Model found significant variables but with VIF > 5, meaning high collinearity (i.e. when 2+ variables are high correlated, hiding individual variable effects on LOS).
- Ran **refined regression model** that removed weak predictors and split caloric asymmetry and vestibular loss categories to fix collinearity.

Results

- **Cohort:** Equal sex distribution, mean age 55 years, mild comorbidity burden (ACE-27 score of 1), medium to large tumors (1–4 cm), and an average surgery duration of 11.5 hours. **Mean LOS: 3.87 days.**

Variables	p-value	95% CI	R-value
Age	0.71	[-0.48 to 0.71]	
ACE-27	0.78	Post-hoc CI include 0	
Tumor size	0.58	Post-hoc CI include 0	
Vestibular Loss	0.45	[-1.14 to 2.30]	
Caloric Asymmetry	0.05	[-0.71 to 0.01]	-0.41
Surgery Duration	0.05	[0.01 to 0.71]	0.41
Discharge Location	0.003	[-4.91 to -1.12]	
BMI Class	0.01	Post-hoc CI include 0	
Dilaudid	0.004	[-3.05 to -0.65]	
Meclizine	0.01	[-4.93 to -0.74]	
Scopolamine Patch	0.01	[-3.33 to -0.45]	
Oxycodone	0.004	[-3.05 to -0.65]	

Table 2. Univariate Associations (red means significant)

Variable	p-value	95% CI	VIF
Caloric Asymmetry	0.04	[-0.05 to -0.001]	1.03
Discharge Location	0.006	[0.53 to 2.75]	1.16
Dilaudid	0.01	[0.34 to 2.62]	1.14

Table 3. Refined Regression Model - All Significant Multivariate Associations

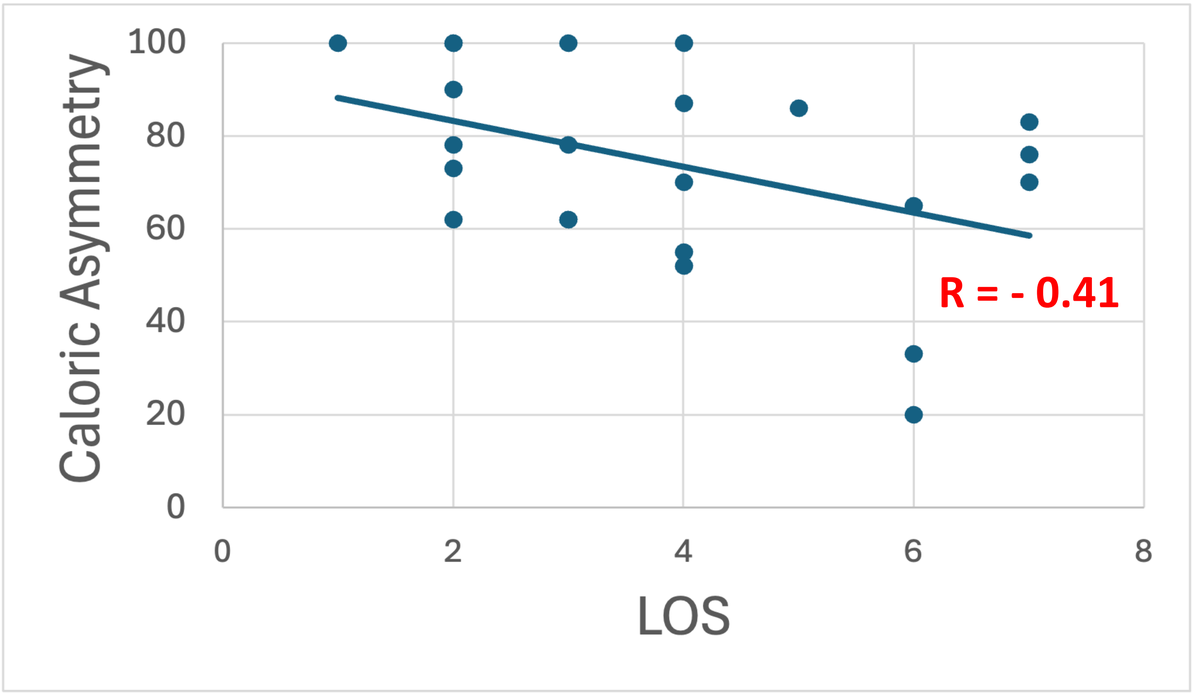

Figure 1. Association between Caloric Asymmetry and LOS

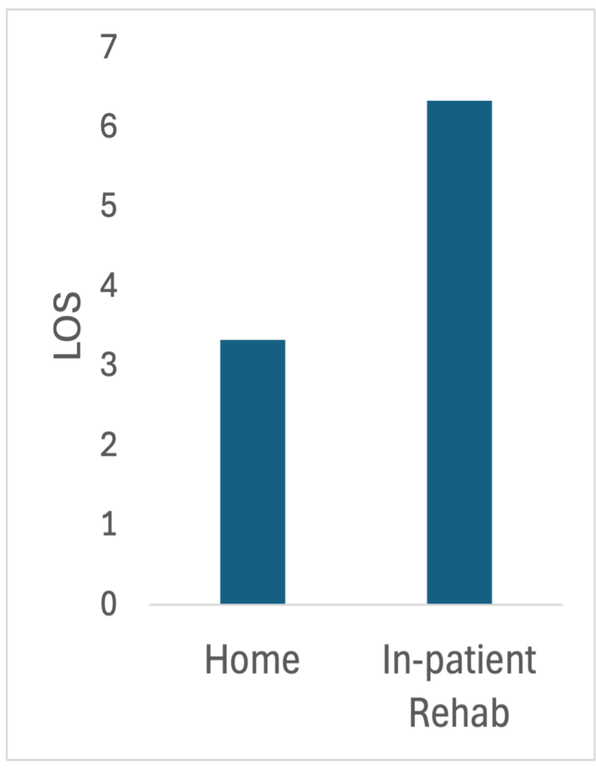

Figure 2. Discharge Location on LOS

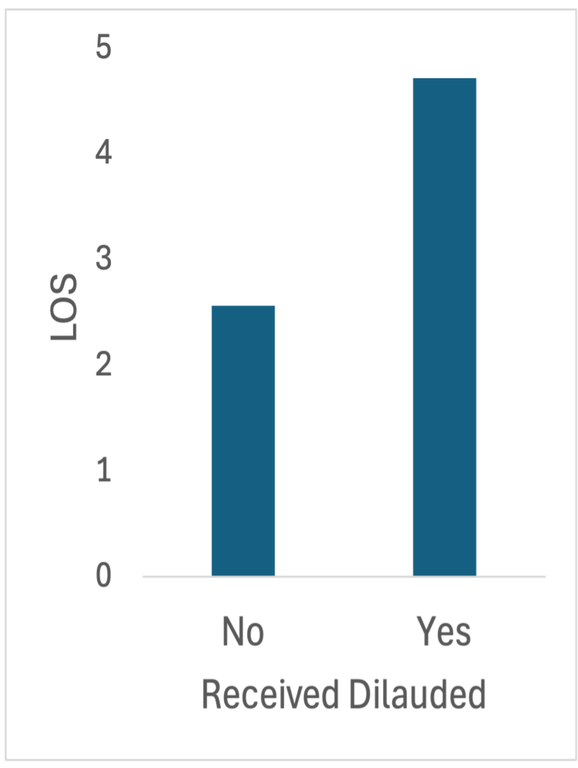

Figure 3. Dilaudid on LOS

Discussion

- Worse pre-op caloric asymmetry is associated with shorter LOS, likely due to preexisting vestibular compensation.
  - **Pre-operative vestibular assessment may help predict recovery trajectories**, supporting more personalized post-op management in CPA tumor resection.
  - While not statistically significant, moderate vs. severe vestibular loss had a LOS difference of one day, further supporting our data.
- **In-patient Dilaudid use was linked to longer LOS**, possibly due to its sedative effects delaying recovery.
  - **Careful selection of vestibular suppressants like Dilaudid may optimize early rehabilitation**, as prolonged use could hinder vestibular compensation and delay discharge.
- Discharge to home was associated with shorter LOS.

Conclusions

These findings highlight the role of **pre-operative vestibular function and medication use in predicting LOS**, aiding in discharge planning and post-op care strategies.

Contact

Areeb Shah, MS2
Saint Louis University School of Medicine
areeb.shah@health.slu.edu
314-800-8378

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Nedim Durakovic MD, Lauren English Aud, Ruben Ulloa MD, Jay Piccirillo MD, Dorina Kallogjeri MD, Adisa Kalkan, Amadi MuseMorris

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