



Surgical Outcomes in Papillary Craniopharyngiomas Following Endoscopic Endonasal Approach

Sharath Kumar Anand MD¹, Brock Gjesdal BS¹, Robert Dambrino MD², Anthony Tang BS¹, Garrett Choby MD³, Eric Wang MD³, S. Tonya Stefko MD⁴, Carl Snyderman MD, MBA³, Georgios Zenonos MD², Paul Gardner MD^{2,5}

¹University of Pittsburgh School of Medicine, Departments of ²Neurological Surgery, ³Otolaryngology and ⁴Ophthalmology, University of Pittsburgh Medical Center, ⁵NYU Langone Health

Introduction

- BRAF V600E-positive papillary craniopharyngiomas represent a distinct clinical and pathological entity, possessing unique radiographic features and predilection for adult patients .
- BRAF/MEK inhibitor therapy has demonstrated dramatic tumor shrinkage and high response rates.
- This raises questions about relative risks and benefits of modern surgery versus targeted therapy.

Objective: Describe outcomes following EEA for BRAF V600E-positive craniopharyngiomas.

Methods and Materials

Study Design: Single-institution retrospective cohort (2008-2024) consecutive adult patients with papillary craniopharyngiomas undergoing EEA.

Definitions:

- GTR: 100% volume resection confirmed on postoperative imaging
- NTR: >95% volume resection confirmed on postoperative imaging

Variables Assessed: Demographics, Prior treatments (SRS, surgeries/approaches), tumor volume/location, extent of resection, pre/post-operative visual (visual field and visual acuity exam when reported)/endocrine status, complication, recurrence, adjuvant therapy

Descriptive Analyses

- Frequencies and proportions for categorical outcomes
- Mean \pm SD for continuous variables
- Median (IQR) for follow-up time

Results

Table 1. Demographics and Baseline Characteristics (N=15)

Characteristic	Value
Demographics	
Age, years (mean \pm SD)	55.3 \pm 14.1
Male	8 (53.3%)
Preoperative Status	
Visual deficit	9 (60%)
Follow-up	
Follow-up time, months (median, IQR)	42 (14-90)

Table 2. Surgical Outcomes Summary

Outcome	N	%
Extent of Resection (N=15)		
GTR	8	53.3%
NTR	6	40.0%
STR	1	6.7%
Vision Outcomes (N=6)		
Complete normalization	3	50%
Partial improvement	3	50%
Overall improvement	6	100%
Endocrinologic Outcomes		
New permanent DI	12	85.7%
New panhypopituitarism	6	50%
Complications		
CSF leak	2	11.8%
Recurrence/Progression		
Recurrence at median 42-month follow up	2	13.3%

Results

Figure 1. Pre and postoperative MRIs of patients with gross-total, near-total, and sub-total resection

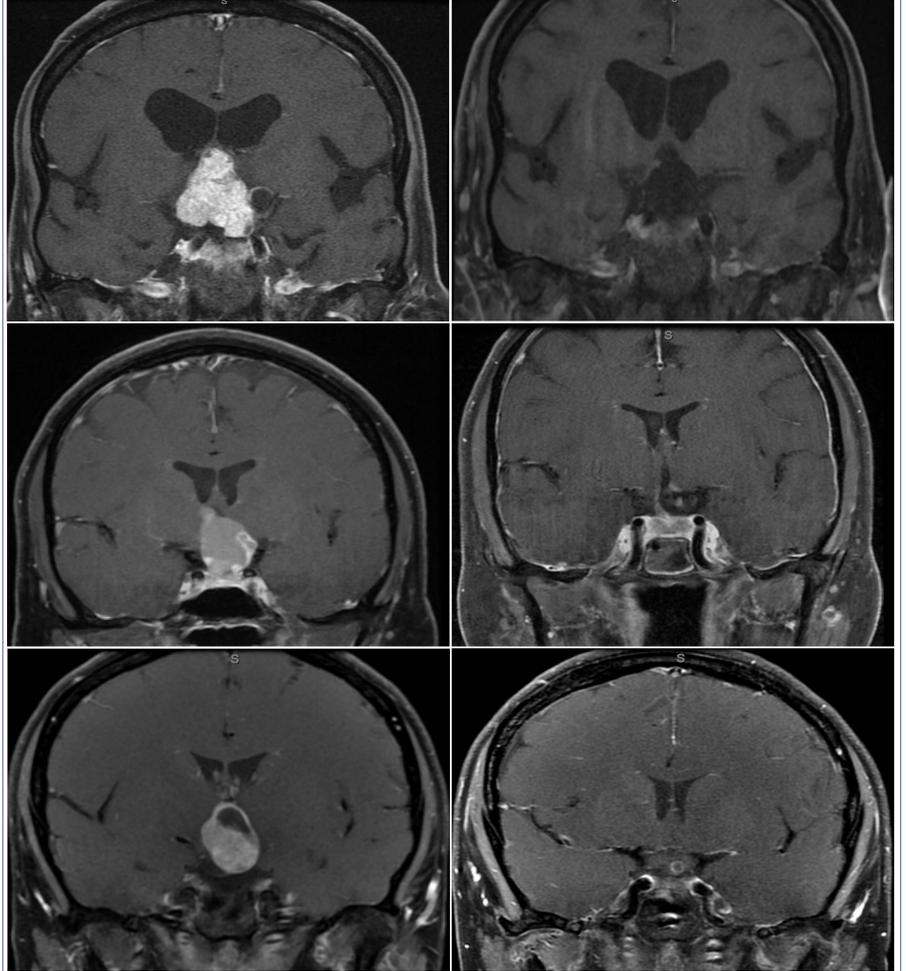


Table 3. Endocrine Morbidities

Morbidity	EOR	Preoperative		Postoperative
		Deficit present	At risk	New deficit / at-risk
Diabetes Insipidus	GTR	1	7	6/7 (86%)
	NTR	0	6	5/6 (83%)
	STR	0	1	1/1 (100%)
Adrenal Insufficiency	GTR	4	4	4/4 (100%)
	NTR	1	5	3/5 (60%)
	STR	0	1	1/1 (100%)
Panhypopituitarism (\geq 3 axes)	GTR	2	6	4/6 (67%)
	NTR	0	6	2/6 (33%)
	STR	1	0	NA (0%)

Discussion

Consideration of Medical Management: Brastianos et al. (NEJM 2023): vemurafenib + cobimetinib achieved 94% response rate with median 91% tumor volume reduction in 16 newly diagnosed patients. Medical therapy may preserve endocrine function that surgery compromises. However, targeted therapy requires indefinite treatment with unknown long-term durability.

Surgical Outcomes in Context: Our 100% visual improvement rate is excellent, though limited to 6/9 patients with both pre- and postoperative assessments. High endocrine morbidity (85.7% new DI, 50.0% new panhyppo) reflects aggressive resection near pituitary stalk. Low recurrence (13.3%) at median 42-month follow-up demonstrates durable tumor control.

Emerging Treatment Paradigm: Neoadjuvant BRAF/MEK inhibitors may reduce tumor burden before surgery. Combination approaches could optimize visual outcomes while minimizing endocrine morbidity. Patient selection based on visual symptoms, tumor location, and goals of care.

Conclusions

EEA for papillary craniopharyngioma provides reliable visual decompression (100% improvement) and durable tumor control (13.3% recurrence), but at the cost of significant endocrine morbidity that targeted therapy or a combined approach may avoid.

Contact

Paul Gardner MD
NYU Langone Health
530 1st Avenue, Silverstein Suite 8R, New York, NY 10016
Email: Paul.Gardner@nyulangone.org
Phone: 929-573-1200

References

1. Brastianos PK, et al. BRAF-MEK Inhibition in Newly Diagnosed Papillary Craniopharyngiomas. N Engl J Med. 2023;389(2):118-126.
2. Brastianos PK, et al. Exome sequencing identifies BRAF mutations in papillary craniopharyngiomas. Nat Genet. 2014;46(2):161-165.
3. Prieto R, et al. Craniopharyngioma treatment: an updated summary. J Clin Med. 2020;9(4):1177.