

# Comparative Analysis of Endoscopic Endonasal Versus Open Transcranial Microsurgery for Resection of Craniopharyngiomas: A Single Institution 20-Year Experience



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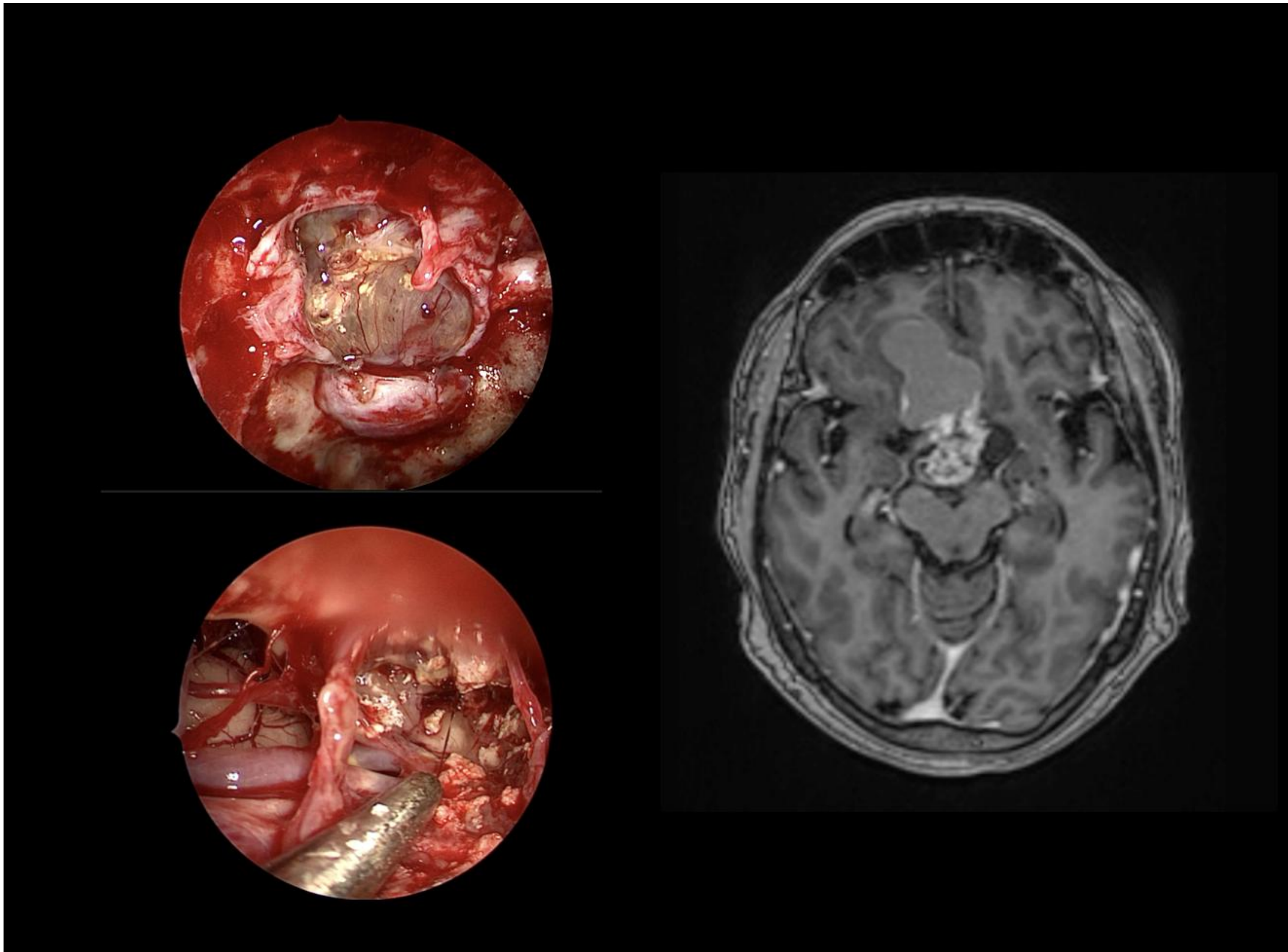
## Abstract

Craniopharyngioma is a rare, benign tumor, originating from remnants of the craniopharyngeal duct. It has historically been treated via the open transcranial surgical approach (OTC) and more recently, the endoscopic endonasal approach (EEA). In this study, we analyzed 61 patients who underwent resection through either approach between 2000 and 2022 at Emory University. Our findings show that the EEA group had significantly higher rates of gross total resection compared to the OTC group ( $p<.001$ ); however, rates of endocrine function, recurrence, and mortality were not significantly different ( $p>.05$ ). Our preliminary results indicate that EEA is better at achieving GTR, but not necessarily better for overall patient outcomes. Further studies with a larger sample size and longer follow-up periods are needed to confirm these findings.

## Introduction

Craniopharyngioma is a rare, benign tumor, originating from the remnants of the craniopharyngeal duct. Historically treated via the open transcranial approach (OTC), the endoscopic endonasal approach (EEA) has been adopted in recent years as the preferred method. However, consensus on clinical or radiographic features to guide approach selection is lacking.

The purpose of this study was to identify differences in surgical outcomes for patients undergoing OTC or EEA for primary resection of craniopharyngioma at a single institution over 20 years.



**Figure 1.** Expanded endonasal resection of adamantinomatous craniopharyngioma in a 77-year-old female originally presenting with visual field deficits.

## Methods and Materials

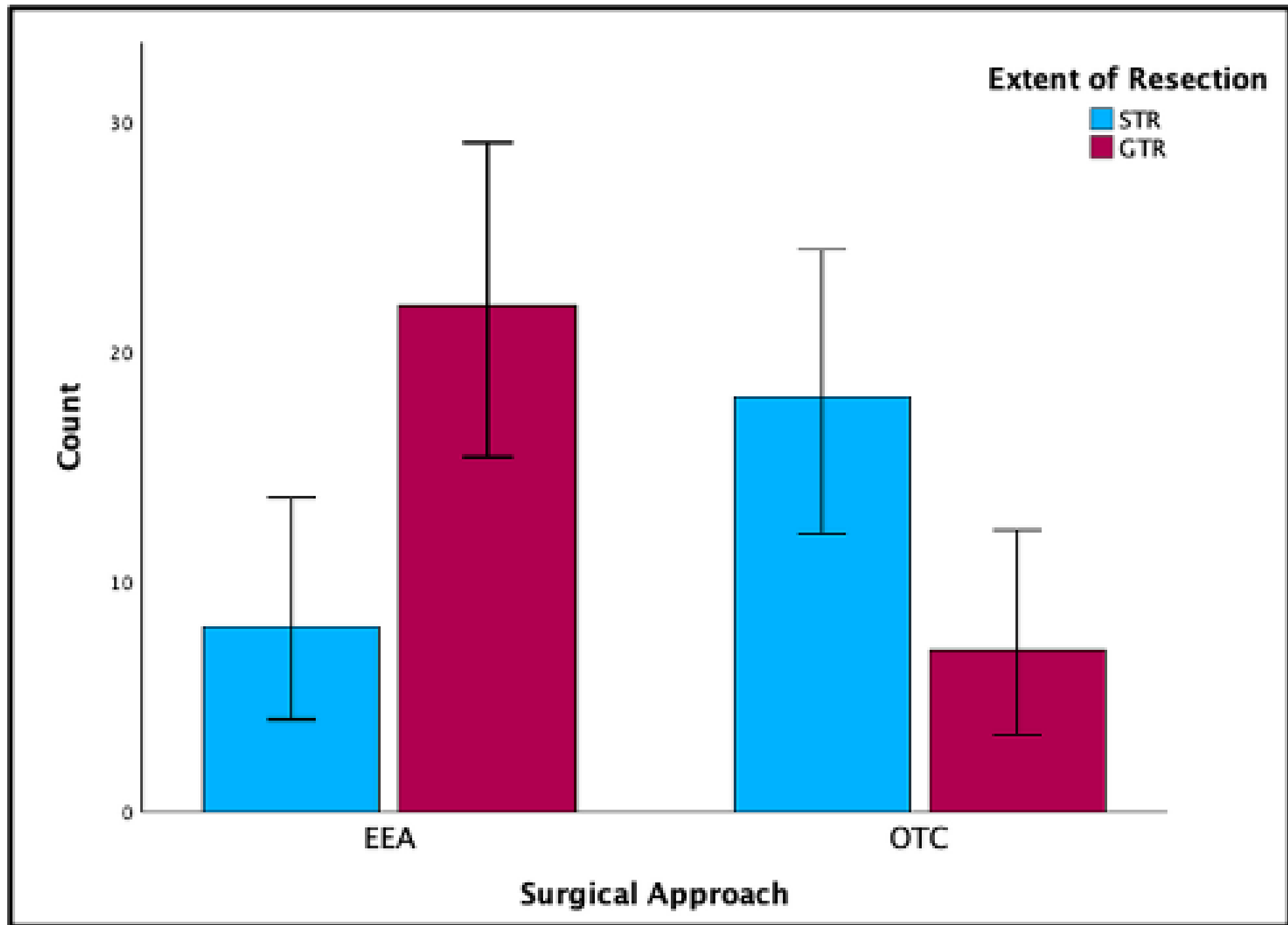
A retrospective review of all patients who underwent OTC or EEA for histopathologically confirmed craniopharyngioma at our institution between 2000 and 2022 was performed. Recurrent cases and non-surgical patients were excluded. Pre-operative patient demographics, endocrine status, presenting symptoms, and tumor volume and consistency were collected. Extent of resection, histopathological subtype, and postoperative complications were recorded. Chi-squared tests of independence were performed.

## Results

A total of 232 patients were identified, of which 62 were included for preliminary analysis with fully available data. Thirty-five (56.5%) patients underwent EEA, whereas 27 (43.5%) underwent OTC. Most craniopharyngiomas were adamantinomatous ( $n=33$ , 53.2%) and primarily cystic ( $n=24$ , 38.7%). The stalk was sacrificed in 17.7% ( $n=11$ ) of cases. The EEA group had significantly higher rates of gross total resection compared to the OTC group (73.3% vs 28.0%) ( $p<.001$ ). However, rates of postoperative diabetes insipidus (81.8% vs 76.0%), panhypopituitarism (71.9% vs 76.2%), recurrence (20.6% vs 25.0%), and mortality (2.9% vs 15.4%) did not differ significantly between the EEA and OTC groups, respectively ( $p>.05$ ).

	EEA	OTC	p-value
GTR	73.3%	28.0%	$p<.001$
Postoperative DI	81.8%	76.0%	$p>.05$
Panhypopituitarism	71.9%	76.2%	$p>.05$
Recurrence	20.6%	25.0%	$p>.05$
Mortality	2.9%	15.4%	$p>.05$

**Table 1.** Surgical and endocrinologic outcomes by surgical approach. GTR, gross total resection; DI, diabetes insipidus



**Figure 2.** Extent of resection between the OTC and EEA surgical approaches.

## Discussion

Craniopharyngioma has traditionally been treated via an OTC, however, the EEA has emerged as the preferred operative approach. In this study, we found that EEA resulted in a significantly higher rate of gross total resection (73.3% vs 28.0%;  $p<0.01$ ). However, there was no significant difference between postoperative diabetes insipidus, panhypopituitarism, recurrence, or mortality ( $p>.05$ ). Other studies have also found better visual outcomes, lower recurrence, and fewer neurological injuries with EEA, despite a greater risk of CSF leaks [1,2,3]. Craniotomy may still be preferred for large tumors or tumors with extension. Limitations of our study include the retrospective study design and a small sample size for this preliminary analysis. We plan to expand our sample size for more conclusive findings in future studies.

## Conclusions

Our preliminary results indicate that the EEA is better for achieving GTR, but this does not translate to superior endocrinological and survival outcomes when compared to the OTC.

## Contact

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