

Outcomes of the endoscopic endonasal approach for tumors of the sellar and suprasellar region: 7 years of experience at a single institute

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Abstract

Objective: This study presents a comprehensive analysis of the outcomes associated with the application of the endoscopic endonasal approach in the management of tumors situated within the sellar and suprasellar region.

Methods: Between 2018 and 2024, a total of 87 cases were performed, including 78 cases of simple transsphenoidal approach (TSA), 6 cases of extended TSA, and 3 transclival cases. The mean patient age was 54 years, with a male-to-female ratio of 53:33. Pituitary adenomas were the most common pathology, accounting for 62 cases.

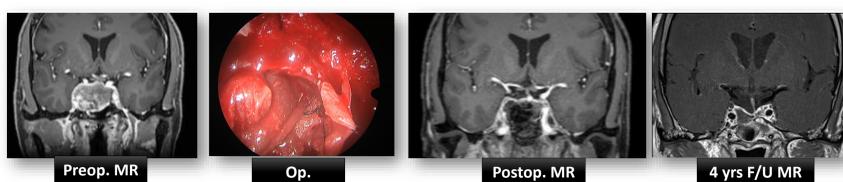
Results: Drawing upon five years of institutional experience, we assessed surgical efficacy, postoperative complications, and long-term patient outcomes. When comparing two periods, 2018–2020 and 2021–2024, a gradual decrease in operative time was observed. Gross total resection (GTR) was achieved in 72% and 74% of cases in the respective periods. No significant differences were observed between the two periods in terms of GTR rates or complication rates, including cerebrospinal fluid (CSF) leakage. Analysis of risk factors for incomplete resection revealed that cavernous sinus invasion was statistically significant ($p = 0.007$).

Conclusion: Our findings confirm that the endoscopic endonasal approach is an effective and safe technique for managing sellar and suprasellar tumors. The results provide practical guidance on surgical planning, tumor resection, hormonal preservation, and complication management, while highlighting areas for further research and refinement of surgical strategies.

Introduction

- Endoscopic endonasal approach to sellar/suprasellar tumors
 - Advantages:
 - Improved panoramic vision
 - Better surgeon orientation
 - Enhanced close-up view of tumor-gland interface and anatomical landmarks
 - Limitations:
 - Loss of three-dimensional vision
 - Longer learning curve for surgeons unfamiliar with endoscopy

Figure 1. Illustrative case of Pituitary adenoma treated with EEA



Methods and Materials

- Between 2018 and 2024, a total of 87 cases were performed, including 78 cases of simple transsphenoidal approach (TSA), 6 cases of extended TSA, and 3 transclival cases.
- The mean patient age was 54 years, with a male-to-female ratio of 53:33.
- Pituitary adenomas were the most common pathology, accounting for 62 cases.
- The Mean follow-up duration was 21.7 months.

Table 1. Histopathology of the cases treated with EEA

Pathology	No.	Pathology	No.
NFPA	62	Firbour dysplasia	1
GHPA	5	Multiple myeloma	1
Prolactinoma	1	Nasopharyngeal cancer	1
Craniopharyngioma	5	Spindle cell oncocytoma	1
RCC	2	Skull base chordoma	3
		Lymphocytic hypophysitis	1
		Other (CSF leakage, hematoma)	3

Results

- Drawing upon five years of institutional experience, we assessed surgical efficacy, postoperative complications, and long-term patient outcomes.
- When comparing two periods, 2018–2020 and 2021–2024, a gradual decrease in operative time was observed.
- Gross total resection (GTR) was achieved in 72% and 74% of cases in the respective periods.
- No significant differences were observed between the two periods in terms of GTR rates or complication rates, including cerebrospinal fluid (CSF) leakage.
- Analysis of risk factors for incomplete resection revealed that cavernous sinus invasion was statistically significant ($p = 0.007$).

Table 2. Comparison of clinical characteristics between different study periods

	Period 1 (2018-2020)	Period 2 (2021-2023)	p-value
No.	29	38	
Female	10	17	0.397
Age	51	57	0.095
Pituitary tumor type			0.048
NFPA	25	35	
GHPA	3	3	
Prolactinoma	1	0	
Previous operation	1	3	0.628
Knosp classification			
Grade 0	2	0	0.526
Grade 1	7	11	
Grade 2	10	13	
Grade 3	7	7	
Grade 4	3	7	
Tumor size	22.9	25.1	0.227
Duration of surgery, min, mean	195.9	161.1	0.008
Duration of hospital stay, day, mean	12.5	9.7	0.073
Duration of MR F/U, months, mean	34.3	12.2	0.000

Table 3. Comparison of surgical outcome between different study periods

	Period 1 (2018-2020)	Period 2 (2021-2023)	p-value
No.	29	38	
Visual Sx. improvement	19 of 19	25 of 26	0.981
EOR			0.402
GTR	21 (72%)	28 (74%)	
STR	6	10	
PR	2	0	
Postop. Hypopituitarism	4 (14%)	11 (29%)	0.236
Permanent DI	0	2	n/s
Complication	2	3	1.000
Hematoma	1	1	
Meningitis	1	2	
Intraoperative CSF leakage	3	7	0.495
Postoperative CSF leakage	1	2	1.000
Recurrence	4	0	0.031

Table 4. Predictors for incomplete tumor removal

Variable	p-value	OR (95% CI)
Period	0.718	1.256 (0.365-4.323)
Tumor type	0.326	3.258 (0.309-34.338)
Tumor size	0.851	1.009 (0.918-1.109)
CS invasion	0.007	0.147 (0.037-0.585)
Previous surgery	0.747	0.694 (0.075-6.414)

Conclusions

- The EEA appears to be a safe and effective treatment modality for tumors of the sellar/suprasellar region.
- We divided the subjects into two groups based on the timing of the surgery for comparison. Apart from the difference in surgery time, there were no differences in other complications between the two groups.
- Like other methods, the EEA requires a learning curve.
- For institutions with fewer cases, implementing this new approach necessitates a relatively long learning curve period.
- To shorten this, I believe that continuous participation in conferences and skill acquisition through cadaver dissection would be beneficial.

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