Long-term Visual Field Outcomes Following Endoscopic Transsphenoidal Surgery for Pituitary Adenomas

Rishi Katragadda BS[1]; Ross Rosen MD[2]; John Richter Jr. MD[2]; Daniel Karasik BS[2]; Claudia I. Cabrera, MD, MS[2]; Kenneth Rodriguez MD[2]; Sanjeet V. Rangarajan MD FARS[2]; Brian D. D'Anza MD FACS[2]

[1]Case Western Reserve University School of Medicine, Cleveland, Ohio, USA
[2]Department of Otolaryngology-Head and Neck Surgery, University Hospitals Cleveland Medical Center, Cleveland, Ohio, USA

Introduction

- Visual field outcomes are critical for assessing the efficacy of endoscopic transsphenoidal surgery (ETS) for pituitary adenomas and their impact on quality of life.
- Immediate postoperative improvements are well-documented, but long-term (>1 year) outcomes are underreported.[1,2]
- Recent studies suggest visual field changes can occur up to five years post-surgery, highlighting the need for extended follow-up. [3,4]
- **Objective:** This review aims to evaluate this gap by compiling available evidence on long-term visual field outcomes (>1 year) after ETS for pituitary adenomas.

Methods and Materials

- A literature search adhering to PRISMA-ScR guidelines was conducted on July 22, 2024, in PubMed, Embase, and Scopus.
- Inclusion Terms: “pituitary neoplasms,” “visual fields,” and “treatment outcomes.”
- Exclusion Criteria: Studies on “pituitary apoplexy,” “case reports”, and “reviews”.
- Limited to studies published after 2004 to reflect modern surgical techniques.

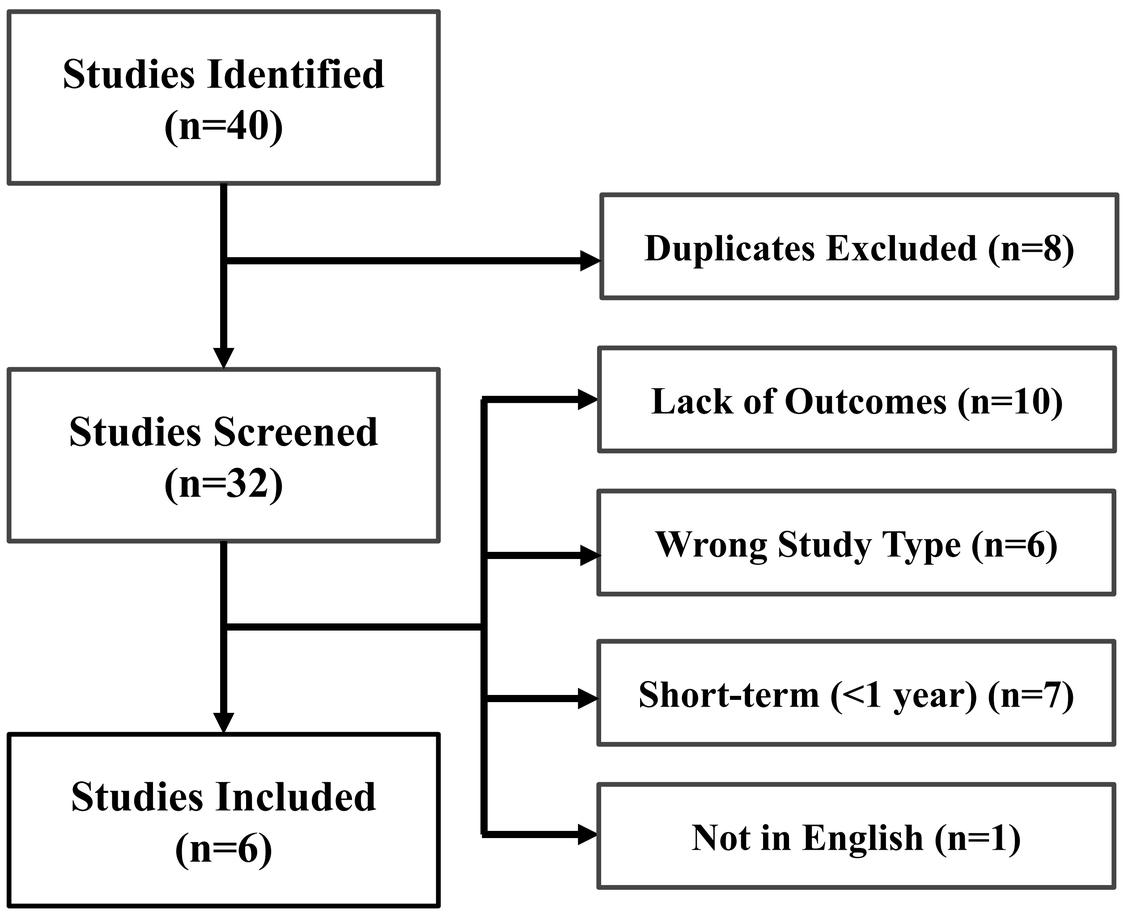

Figure 1 - Study Selection Flow Chart:
The initial search identified 40 articles, which were screened yielding 6 studies for analysis.

Results

- **Study Sample Sizes (n=6 studies):** Ranged from 26 to 237 patients, with an average of 97 patients per study.
- **Follow-Up Duration (n=6 studies):** Mean follow-up of 38.4 months (range: 17–52 months).
- **Visual Acuity Studies (n=2 studies):** Mean follow-up of 34.6 months.

Table 1: Long Term Visual Field Outcomes

Outcome	Studies (n)	Pooled Prevalence (%)	95% CI (%)
Visual Improvement	6	91.6	89.5–93.7
Visual Deterioration	2	2.1	0.5-3.6
Stable/No Change	2	18.1	13.9–22.2
Visual Acuity Improvement	2	39.7	21.0–48.3

Discussion

- Overall, the data shows high rates of visual improvement (>90%), but small subsets experience deterioration (~2%).
- **Need for Long-Term Data:** There is a significant lack of detailed long-term data on visual field outcomes following ETS, particularly beyond the immediate postoperative period.
- **Challenges in Standardization:** Only two of six studies included both visual acuity and general visual field data, highlighting inconsistent outcome reporting.
- **Ambiguity in Reporting:** Current studies generalize outcomes, relying on early recovery data without distinguishing immediate vs. sustained improvements.
- **Future Directions:** Granular, standardized data on visual field outcomes beyond one year are crucial for improving understanding of recovery and guiding long-term management. ENT surgeons could consider collaborating with ophthalmologists/neuro-ophthalmologists to ensure proper follow-up.

References

1. Tagoe NN, Essuman VA, Bankah P, Dakurah T, Hewlett VK, Akpalu J, Ndanu TA. Visual Outcome of Patients with Pituitary Adenomas Following Surgery and Its Contributory Factors at a Tertiary Hospital in Ghana. Ethiop J Health Sci. 2019 Jan;29(1):895-902. doi: 10.4314/ejhs.v29i1.11. PMID: 30700957; PMCID: PMC6341437.
2. Parikh, D., Robins, J.M.W., Garretty, T. et al. Quantitative and functional visual field outcomes after endoscopic trans-sphenoidal pituitary adenectomy. Acta Neurochir 164, 1605–1614 (2022). https://doi.org/10.1007/s00701-022-05198-7
3. Giammaria S, Hutchison DM, Rafuse PE, Shuba LM, LeBlanc RP, Nicolela MT, Chauhan BC. Rates of Visual Field Change in Patients With Glaucoma and Healthy Individuals: Findings From a Median 25-Year Follow-up. JAMA Ophthalmol. 2022 May 1;140(5):504-511. doi: 10.1001/jamaophthalmol.2022.0671. PMID: 35389449; PMCID: PMC8990362.
4. Chung YS, Na M, Yoo J, Kim W, Jung IH, Moon JH, Lee J, Kim SH, Kim EH. Optical Coherent Tomography Predicts Long-Term Visual Outcome of Pituitary Adenoma Surgery: New Perspectives From a 5-Year Follow-up Study. Neurosurgery. 2020 Dec 15;88(1):106-112. doi: 10.1093/neuros/nyaa318. PMID: 32735666.

CASE WESTERN RESERVE UNIVERSITY

University Hospitals
Cleveland | Ohio