

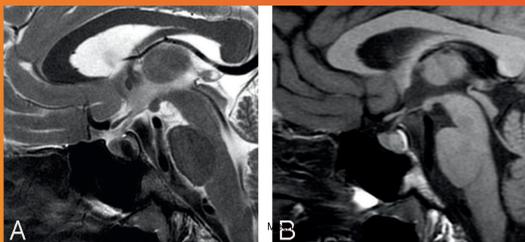
Khushal Gupta, MBBS¹, David Altschul MD¹,
Vijay Agarwal, MD¹, Michael Karsy, MD PHD²

¹Department of Neurosurgery, Albert Einstein Institute of Medicine
²Department of Neurosurgery, University of Michigan

Endoscopic transsphenoidal surgery for Rathke's cleft cysts is safe and effective, but recurrence and endocrine trade-offs demand tailored surgery and long-term follow-up

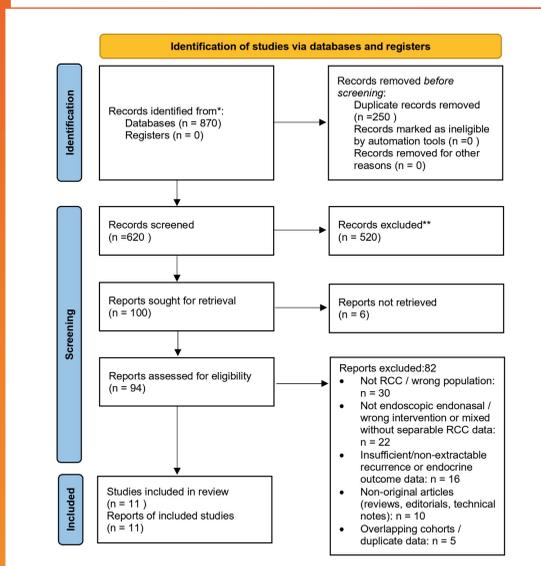
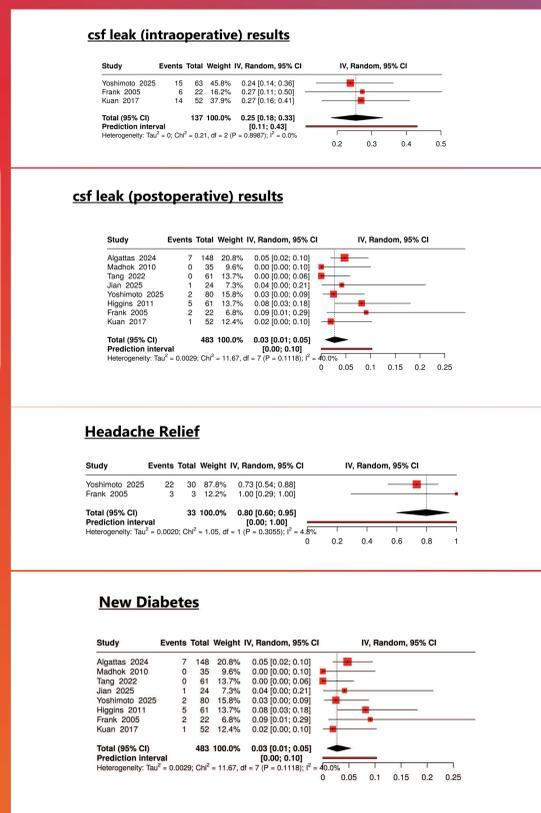
Introduction

- Rathke's cleft cysts (RCCs) are benign sellar lesions causing headache, visual deficits, and endocrinopathies
- Endoscopic transsphenoidal surgery (ETS) is the preferred treatment for symptomatic RCCs
- Ongoing concerns: recurrence risk vs postoperative endocrine dysfunction
- Aim: single-arm meta-analysis to clarify long-term safety + effectiveness of ETS for RCCs



Methods

- PRISMA-guided systematic review/meta-analysis
- Databases: PubMed, Embase, Scopus (through 2025)
- Inclusion: studies with ≥ 5 patients undergoing endoscopic surgery for RCCs
- Dual-reviewer workflow: screening + independent extraction
- Extracted outcomes: presentation, surgical strategy, complications, recurrence
- Statistics: random-effects, inverse-variance weighting + Freeman-Tukey transformation
- Reporting: pooled proportions with 95% CIs; heterogeneity via χ^2 and I^2



Results

- Included: 11 studies
- Follow-up range: 12–96 months
- Intraoperative CSF leak: 25% (95% CI 18–33%)
- Postoperative CSF leak: 3% (95% CI 2–5%)
- Headache improvement/relief: 76% (95% CI 60–95%)
- New endocrinopathy:
 - Arginine vasopressin deficiency: 7% (95% CI 0–23%)
 - Hypothyroidism: 6% (95% CI 2–11%)
- Recurrence:
 - Radiographic recurrence: 8% (95% CI 4–13%)
 - Symptomatic recurrence: 5% (95% CI 2–8%)
- No perioperative mortality; lasting morbidity low
- Moderate–high heterogeneity → likely due to surgical aggressiveness + imaging surveillance differences

Discussion

- ETS for symptomatic RCCs is safe and effective, with durable headache benefit
- Low postoperative CSF leak despite higher intraoperative leak frequency
- Recurrence is uncommon, but varies by extent of cyst wall resection and follow-up intensity
- Trade-off: more aggressive wall resection may reduce recurrence but may increase new endocrine deficits
- Need: prospective registries + standardized outcome reporting to optimize strategy and pituitary preservation

References:

- Menéndez-Torre EL, Gutiérrez-Hurtado A, Ollero MD, Irigaray E, Martín I, Parra A, et al. Natural history and surgical outcomes of Rathke's cleft cysts: a Spanish multicenter study. *Front Endocrinol (Lausanne)*. 2024;15:1413810.
- Qian A, Zhou J, Yu J, Huo G, Wang X. Incidence and risk factors of delayed postoperative hyponatremia after endoscopic endonasal surgery for Rathke's cleft cyst: a single-center study. *Front Surg*. 2022;9:953802.
- Solari D, Cavallo LM, Somma T, Chiaramonte C, Esposito F, Del Basso De Caro M, et al. Endoscopic endonasal approach in the management of Rathke's cleft cysts. *PLoS One*. 2015;10(10):e0139609.
- Tang C, Wang P, Liu J, Jiang H, Zhang G, Wu N. Endoscopic endonasal transsphenoidal approach for symptomatic Rathke cleft cyst: a case series. *Exp Ther Med*. 2022;24(6):713.
- Algattas HN, Gersey ZC, Fernandes Cabral D, Alattar AA, Abdallah H, Muthiah N, et al. Endoscopic endonasal resection of Rathke cleft cysts: a single-institution analysis of 148 consecutive patients. *J Neurosurg*. 2024;141(5):1352–1362.
- Frank G, Sciarretta V, Mazzatenta D, Farneti G, Modugno GC, Pasquini E. Transsphenoidal endoscopic approach in the treatment of Rathke's cleft cyst. *Neurosurgery*. 2005;56(1):124–128.
- Higgins DM, Van Gompel JJ, Nippoldt TB, Meyer FB. Symptomatic Rathke cleft cysts: extent of resection and surgical complications. *Neurosurg Focus*. 2011;31(1):E2.
- Jian A, Wang YY, Goldschlager T, Castle-Kirsbaum M, Kam J, Zhao YC, et al. Headache relief following endoscopic drainage of Rathke's cleft cyst. *Pituitary*. 2025;28(2):40.
- Madhok R, Prevedello DM, Gardner P, Carrau RL, Snyderman CH, Kassam AB. Endoscopic endonasal resection of Rathke cleft cysts: clinical outcomes and surgical nuances. *J Neurosurg*. 2010;112(6):1333–1339.
- Zhang X, Yang J, Huang Y, Liu Y, Chen L, Chen F, et al. Endoscopic endonasal resection of symptomatic Rathke cleft cysts: total resection or partial resection. *Front Neurol*. 2021;12:701177.
- Yoshimoto H, Kato M, Ishida A, Shiramizu H, Matsuoka G, Tanabe N, et al. Recovery of pituitary and visual function after Rathke's cleft cyst decompression: an 80-case institutional experience. *J Endocr Soc*. 2025;9(8):bvaf093