

Endoscopic-assisted resection of BSCMs achieves high gross total resection with acceptable complication rates and durable short-term disease control.

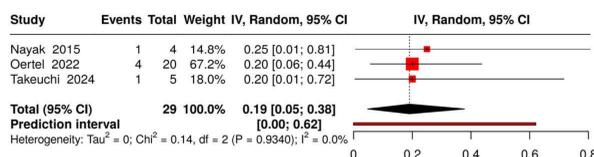
Introduction

- Skull base epidermoid cysts: rare, benign, but technically challenging lesions
- Morbidity arises from cranial nerve and brainstem compression
- Gross total resection (GTR) desired, often limited by adherence to critical neurovascular structures
- Outcomes vary across centers → need pooled evidence to guide practice

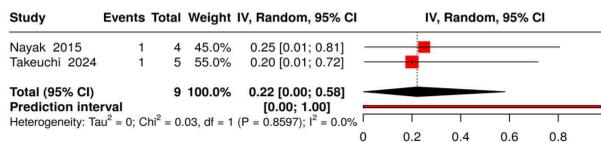
Methods

- PRISMA-guided systematic review (PubMed, Embase, Scopus) through July 2025
- Included clinical studies reporting endoscopic assisted BSCM resection outcomes
- Excluded case reports/series with <5 patients
- Dual-reviewer screening + data extraction using a structured database
- Outcomes: GTR, new/worsened cranial nerve deficits, CSF leak, recurrence/rebleed, neurologic improvement, functional independence
- Random-effects meta-analysis; pooled proportions using Freeman–Tukey double arcsine transformation
- Heterogeneity assessed with I^2 and τ^2

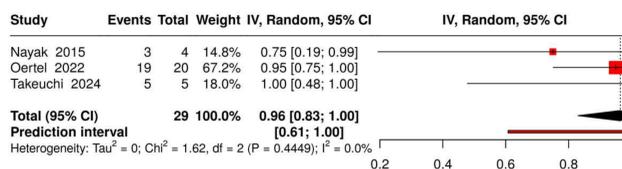
CN deficit results



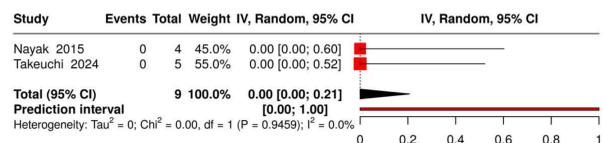
CSF Leak



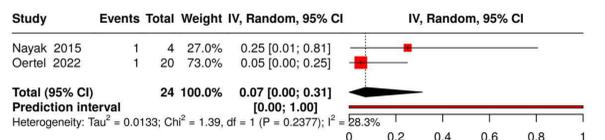
GTR results



Rebleed Recurrence



STR results



Results

1. 3 studies, 29 patients; mean follow-up 28.4 months
2. GTR: 96% (95% CI 83–100)
3. Subtotal resection: 7%
4. New/worsened CN deficits: 19% (95% CI 5–38)
5. Postoperative CSF leak: 22% (95% CI 0–58)
6. Recurrence/rebleed: 0 cases reported during follow-up
7. Perioperative mortality: low through last follow-up
8. Most patients demonstrated neurologic improvement and retained functional independence
9. Minimal heterogeneity across outcomes (consistent reporting despite small sample)

Discussion

1. Endoscopic-assisted BSCM surgery shows high resection rates and durable disease control in limited available data
2. Main postoperative concerns: CN deficits and CSF leak → emphasizes careful selection + meticulous reconstruction
3. Findings are consistent across studies, but evidence base remains small
4. Larger multicenter prospective series needed to:
 1. refine patient selection
 2. standardize functional outcome measures
 3. validate long-term benefit of endoscopic assistance

References

1. Takeuchi K, Nagata Y, Sasagawa Y, et al. Endoscopic transsphenoidal approach for pontine cavernous malformations with direct cortical stimulation. *J Neurosurg.* 2024;140:469–477.
2. Nayak NR, Thawani JP, Sanborn MR, et al. Endoscopic approaches to brainstem cavernous malformations. *Surg Neurol Int.* 2015;6:68.Oertel J,
3. Fischer G, Linsler S, et al. Endoscope-assisted resection of brainstem cavernous malformations. *Neurosurg Rev.* 2022;45:2823–2836.

