

Dynamic Two-Man Endoscopic Transorbital Approach: Early Experience in one institution

Ya-Jui Lin¹, Cheng-Chi Lee¹, Bo-Ru Lai², Ju-En Nien¹, Kuo-Chen Wei¹

¹ Department of Neurosurgery, Chang Gung Memorial Hospital, Linkou

² Division of Trauma Plastic Surgery, Department of Plastic and Reconstructive Surgery, Chang Gung Memorial Hospital, Linkou, and Craniofacial Research Center



長庚紀念醫院
Chang Gung Memorial Hospital

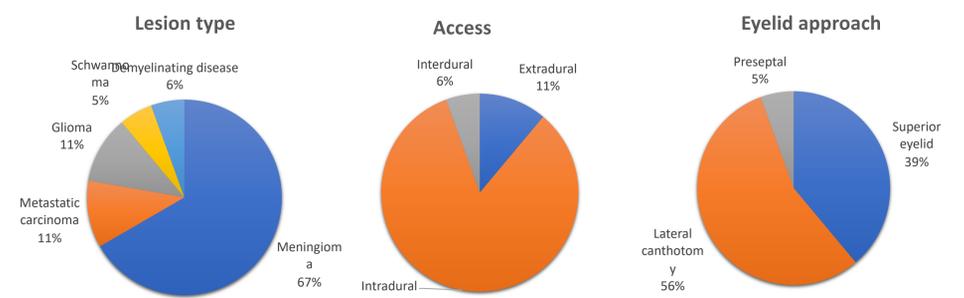
Background

The endoscopic transorbital approach (ETOA) provides a minimally invasive route to the anterior and middle cranial fossa. However, the narrow operative corridor can limit maneuverability when performed by a single surgeon. The two-man, four-handed technique—where one surgeon dynamically controls the endoscope while the other performs bimanual dissection—may overcome these limitations and enhance surgical safety.

Method

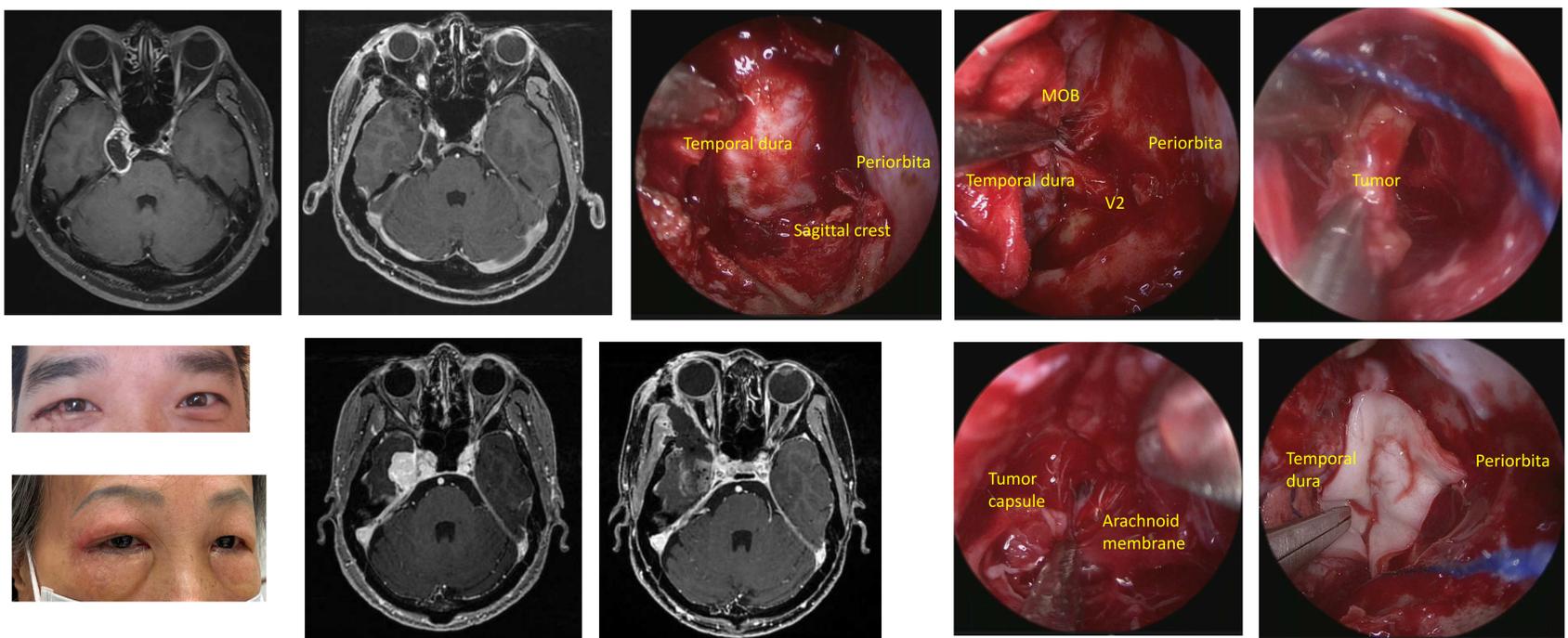
We retrospectively reviewed 18 patients who underwent two-man ETOA at Linkou Chang Gung Memorial Hospital between November 2024 and November 2025. Patient demographics, pathology, extent of resection, operative time, complications, and outcomes were analyzed.

Location	Lesion type	Lesion size (cm)	Laterality	Extent of Resection (GTR/NTR/STR/PS)	Access	Combine plasty	Eyelid approach	Complications
1	Temporal/Lateral orbital	4.5	Right	NTR	Extradural	Yes	Lateral canthotomy	
2	Temporal	8.9	Right	PR	Intradural	No	Superior eyelid	
3	Anterior clinoid process	1.7	Right	PR	Intradural	Yes	Lateral canthotomy	ICA injury
4	Medial sphenoid ridge	3	Right	NTR	Intradural	Yes	Superior eyelid	
5	Temporal	3.6	Right	GTR	Intradural	Yes	Lateral canthotomy	
6	Lateral orbital/Sphenoid wing/Cavernous	3.5	Left	STR	Intradural	Yes	Lateral canthotomy	
7	Sphenoid ridge	2.3	Right	GTR	Extradural	No	Superior eyelid	
8	Intraconal	2.1	Right	STR	Extradural	Yes	Preseptal	Enophthalmos/EOM limitation
9	Temporal tip/sphenoid ridge/cavernous	4	Right	PR	Intradural	No	Superior eyelid	
10	Temporal	9.5	Left	PR	Intradural	Yes	Lateral canthotomy	
11	Cavernous sinus	2.5	Right	PR	Intradural	Yes	Lateral canthotomy	
12	Intraconal/lateral orbital wall/roof	5	Right	PR	Intradural	Yes	Superior eyelid	Persistent proptosis with exposure keratopathy ptosis for 2 months, resolved 3months later
13	Tentorial	2.2	Right	GTR	Intradural	No	Superior eyelid	
14	Temporal, periventricular region	1.1	Left	PR	Intradural	No	Superior eyelid	
15	Cavernous sinus	2.8	Right	PR	Intradural	Yes	Lateral canthotomy	Ptosis, Diplopia (Oculomotor palsy)
16	Medial sphenoid ridge	1.9	Left	STR	Intradural	No	Lateral canthotomy	
17	Cavernous sinus	2.5	Right	PR	Intradural	Yes	Lateral canthotomy	
18	Middle fossa/Meckel's cave	2.8	Right	NTR	Interdural	No	Lateral canthotomy	



Result

Pathologies included 12 meningiomas, 2 metastatic tumors, 2 gliomas, 1 schwannoma, and 1 demyelinating disease. Extent of resection was gross total in 3 cases, near-total in 3 cases, subtotal in 7 cases, and biopsy in 5 cases. The two-man technique allowed continuous dynamic visualization and facilitated bimanual dissection with reduced need for endoscope repositioning. There was no mortality, no cerebrospinal fluid (CSF) leak, and no diplopia. All patients achieved good cosmetic outcomes.



Conclusion

The two-man endoscopic transorbital approach is a safe and effective option for selected anterior and middle cranial fossa tumors. By combining dynamic endoscopy with true bimanual dissection, this collaborative method enhances surgical ergonomics, facilitates maximal safe resection, and provides diagnostic access when complete removal is not feasible. Our early experience demonstrates excellent safety and cosmetic results; further studies are warranted to validate these findings.