

# Trigeminal Schwannomas Treated via a Lateral Orbitotomy Approach: **Outcomes and Limitations**





Trigeminal Schwannomas (TSs) are rare, mostly benign tumors that exhibit an indolent clinical course. The microscopic lateral orbitotomy approach (LOA) with or without endoscopic assistance has emerged as a novel skull base corridor; however, its indications for the treatment of TSs have not been elucidated thus far. Herein we sought to evaluate the technical feasibility and the challenges encountered with the LOA in the surgical management of TSs.

## **Methods and Materials**

All TS cases that underwent LOA through a lateral canthal incision the last decade in our department were retrospectively reviewed. Clinical outcomes are analyzed, and the surgical technique explained (Figures 1,2).











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Figure 2. A-C. Surgical incision, D-E. Surgical exposure, F-H. Heatmap of all lesions.

Case no.	LOS (d)	LOF (mos)	CSF diversion	Endoscopic assistance	Orbital/ neurological outcomes	Other complications	GOR	Recurrence/ TTR (yrs)/ TOR
1	3	51	LD	-	Intermittent right V1 and V2 neuralgia, V2 numbness		GTR	-
2	4	87	LD	+	V2 numbness -		NTR	+/6/SRS
3	4	58	LD	+	Persistent V1 neuralgia and numbness, no diplopia	Temporal lobe oedema, delirium/ improved after rehabilitation.	NTR	-
4	2	54	LD	+	Stable V1 and V3 numbness, V2 anaesthesia.	Other symptoms were attributed to secondary NF2 lesions	GTR	+/-/-
5	2	32	-	+	Intermittent V1-V2 (V3) neuralgia, V1-V2 numbness		GTR	-
6	2	9	LD	-	Persistent V2, (V1) neuralgia, Improved VI palsy, V2 numbness	2, (V1) neuralgia, 1 VI palsy, V2 - mbness		-
7	4	1	LD	+	Remaining V1, V2 numbness, slight difficulty chewing on the left side		GTR	-

**Table 2.** Treatment outcomes of 7 TS cases operated using LOA through a lateral canthotomy, GOR=grade of resection, GTR=gross total resection, NTR=near total resection, TTR=time to retreatment, TOR=type of retreatment.















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TD FD



Figure 1. LOA in steps.

## Results

Seven patients (4 females) with an average age of 34 years underwent LOA for TSs. Mean maximum tumor diameter was 2.8 cm (range: 1.8-3.7). Six were primary, one was recurrent and one patient had neurofibromatosis type 2. All tumors were predominantly in middle cranial fossa, with four having either a small or medium posterior fossa component (5 Samii Grade A, 2 Grade C) (Table1, Figures 3,4). Presenting symptoms included trigeminal neuralgia (n=6), facial hypoesthesia (n=5), headache (n=4) and double vision (n=2). All patients underwent gross (n=5) or near total (n=2) resection. Neuralgia, while not exacerbated, reappeared in 4 patients after surgery and was ameliorated with medication. Two patients sustained new trigeminal hypoesthesia, and preoperative abducens palsy improved in 2 patients. No orbital complications, stroke, cerebrospinal fluid leak or mortalities occurred. Two lesions had minor recurrence during a mean follow-up of 42 months. The first underwent radiosurgery 6 yrs postoperatively and the second is being followed (Table 2).

Case no.	Age (yrs) / Sex	Side	Primary vs. recurrent	Sporadic vs. syndromic	Grade/ size	Trigeminal symptoms				
						Pain	Hypesthesia	Motor	Other symptoms	
1	F/ 39	R	Primary	Sporadic	A/2.3	V1, V2 (V3)	V1, V2, V3	V3 wasting	HA HA HA, CN VI palsy Ptosis, proptosis, LT vision impairement, bilat. CN VII, VIII palsies	
2	M/ 30	R	Primary	Sporadic	A/3.7	V2 (V1, V3)	V2	-		
3	F/ 70	R	Primary	Sporadic	C/3.4	V1	V1, V2	-		
4	M/ 25	L	Recurrent	NF2	A/2.7	-	V2, V2, V3	-		
5	F/ 24	R	Primary	Sporadic	A/2.1	V1, V2 (V3)	-	-	-	
6	F/ 23	L	Primary	Sporadic	A/1.8	V1-2	-	-	CN VI palsy	
7	M/ 29	L	Primary	Sporadic	C/3.5	V1 (V2, V3)	V1, V2	-	Intermittent HA	



Figure 3. Illustrative case 1.

### Conclusions

Minimally invasive LOA stands as a plausible surgical corridor for addressing TSs of the middle cranial fossa, even with posterior fossa extension. Additional study is required, as the approach may be limited for tumors with significant posterior or infratemporal fossa involvement.

**Table 1.** Demographic and clinical characteristics of 7 patients with TSs treated via LOA, yrs=years, HA=headache.

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