Annals of Otolaryngology Head and Neck Surgery
Case Series (ISSN 2835-7132)

A Novel Case Report of Transcanal Endoscopic Excision of Facial Nerve Schwannoma

Aishwarya JG, Satish Nair*, Sameema VV, Pradeepa Lakshmi S

Department of ENT-HNS, Apollo Hospitals, Bangalore, Karnataka, India

Citation: Aishwarya JG, Satish Nair, Sameema VV, Pradeepa Lakshmi S. A Novel Case Report of Transcanal Endoscopic Excision of Facial Nerve Schwannoma. Annal of Otol Head and Neck Surg. 2026;5(3):1-8.

Received Date: 20 April, 2026; **Accepted Date:** 24 Apil, 2026; **Published Date:** 26 April, 2026

***Corresponding author:** Satish Nair, Department of ENT-HNS, Apollo Hospitals, Bangalore, Karnataka, India

ABSTRACT

Facial nerve schwannomas are rare benign tumors and their management depends on site, extent and facial nerve functioning. Endoscope has been used extensively in otology in recent times due to its superior visualization of critical structures and minimally invasive technique along with better cosmesis, minimal post-operative pain and faster recovery as compared to traditional microscopic technique. Feasibility of transcanal endoscopic excision of middle ear tumors has been explored at present. We present the first case of totally endoscopic transcanal excision of facial nerve schwannoma with greater auricular nerve cable grafting in the literature.

Keywords: Facial nerve schwannoma; Endoscopic; Transcanal; Schwannoma; TEES; Endoscope; Minimally invasive; Facial nerve

INTRODUCTION

Facial nerve schwannomas are benign and slow growing temporal bone with 0.8% incidence [1]. The management of these tumors depend on site, extent and facial nerve functioning [2]. Traditionally facial nerve schwannomas are resected using post-aural microscopic technique that requires skin incision, mastoidectomy and Ossicular chain disruption. The endoscopic ear surgeries are becoming the new standard of care for various ear pathologies like chronic otitis media or cholesteatoma [7], but the use of endoscopes in middle ear tumors is still at experimental stage [5,10]. We report a case of facial nerve schwannoma that was completely resected with totally endoscopic transcanal approach and greater auricular nerve cable grafting with review of literature.

CASE REPORT

A 35-year-old female patient presented to us with complaints of right sided facial weakness of 2 years duration and decreased hearing in right ear of one year duration. On clinical examination patient had grade V (House-Brackmann grading) LMN facial palsy on right side. Otoendoscopic evaluation revealed pale pinkish non-pulsatile lesion in the postero-superior quadrant behind the intact tympanic membrane. She had moderate conductive hearing loss in pure tone audiometry with AC-52dB, BC-14dB and A-B gap-38dB. Contrast enhanced MRI of temporal bone reveal0ed

iso to hypo-intense lesion in the facial recess in T1 and hyperintense in T2 sequence. High resolution CT (HRCT) scan of temporal bone was done which showed lesion in the right facial recess eroding the inferior tympanic segment and posterior genu of the facial nerve and encasing the long process of incus suggestive of schwannoma (Figure 1).

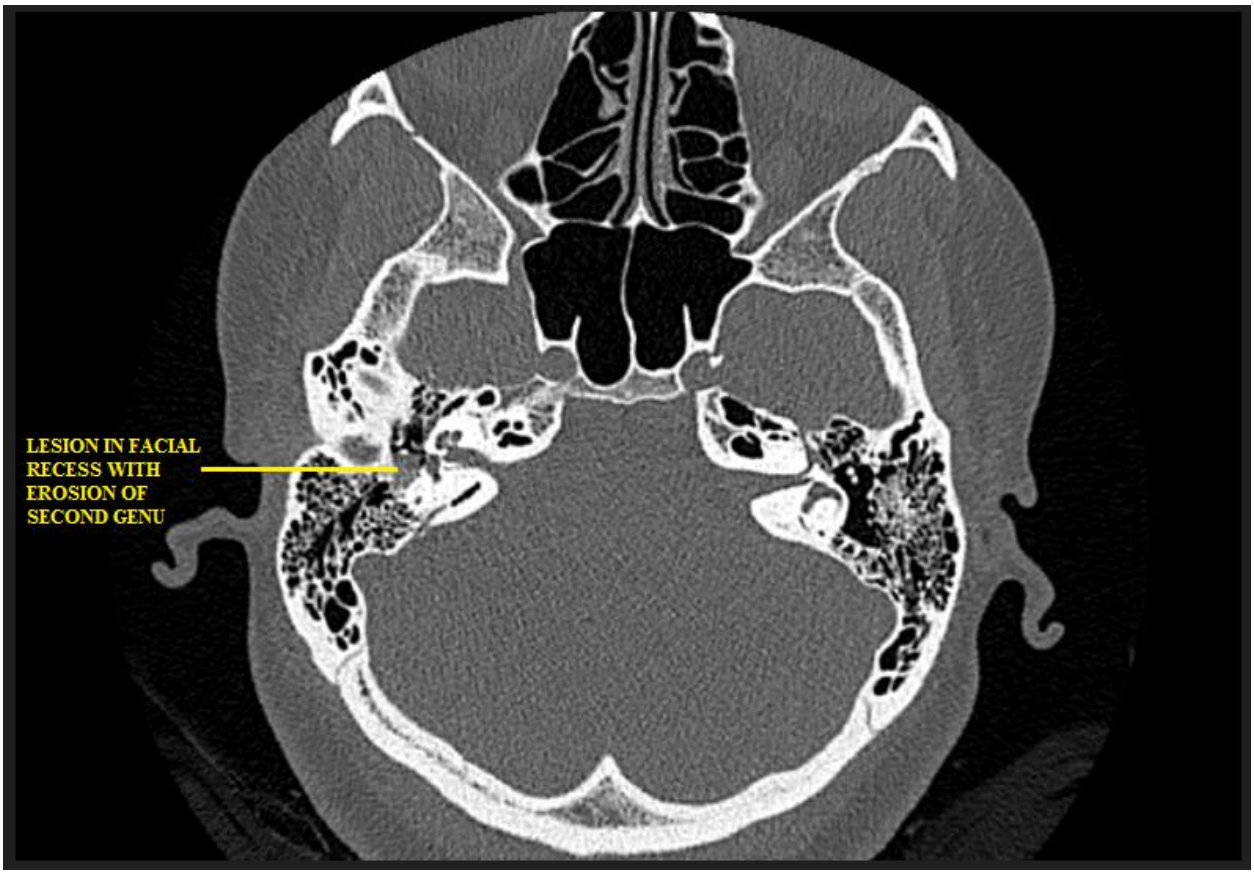

Figure 1: HRCT image depicting soft tissue opacity in the facial recess eroding the second genu

Patient underwent endoscopic transcanal excision of facial nerve schwannoma using 0 degree 4mm endoscope. Intra-operatively there was a soft lobulated lesion involving the facial recess and lateral sinus of the right ear (Figure 2). The lesion was noted to engulf the incudo-stapedial joint and stapes suprastructure and was eroding part of tympanic segment, second genu and adjacent part of vertical segment of facial nerve canal (Figure 3). Canalplasty was performed and postero-superior aspect of tympanic sulcus was drilled to visualize the entire lesion (Figure 4). The lesion was dissected out without using any cauterization due to proximity to the nerve. Mass engulfing the incudo-stapedial joint and stapes suprastructure was removed and dislocation of incudo-stapedial joint was noted (Figure 5). The lesion was completely engulfing the facial nerve without any plane of dissection from the level of just lateral to first genu till the level of second genu. Complete resection of the lesion along with the facial nerve from the tympanic to the proximal half of vertical segment was done (Figure 6-8). The dislocated incudo-stapedial joint was repositioned. Greater auricular nerve graft was harvested through a 3cm incision in the neck and cable grafting was performed (Figure 9).

Post-operative period was uneventful and she was discharged on first post-op day. Final histopathology was reported as facial nerve schwannoma. Her post-operative pure tone audiometry at one month revealed normal hearing (AC-22dB, BC-12dB and A-B gap-10dB). The facial palsy grading improved to grade III after 6 months and the patient is on regular follow-up for past 48 months without any residual or recurrence.

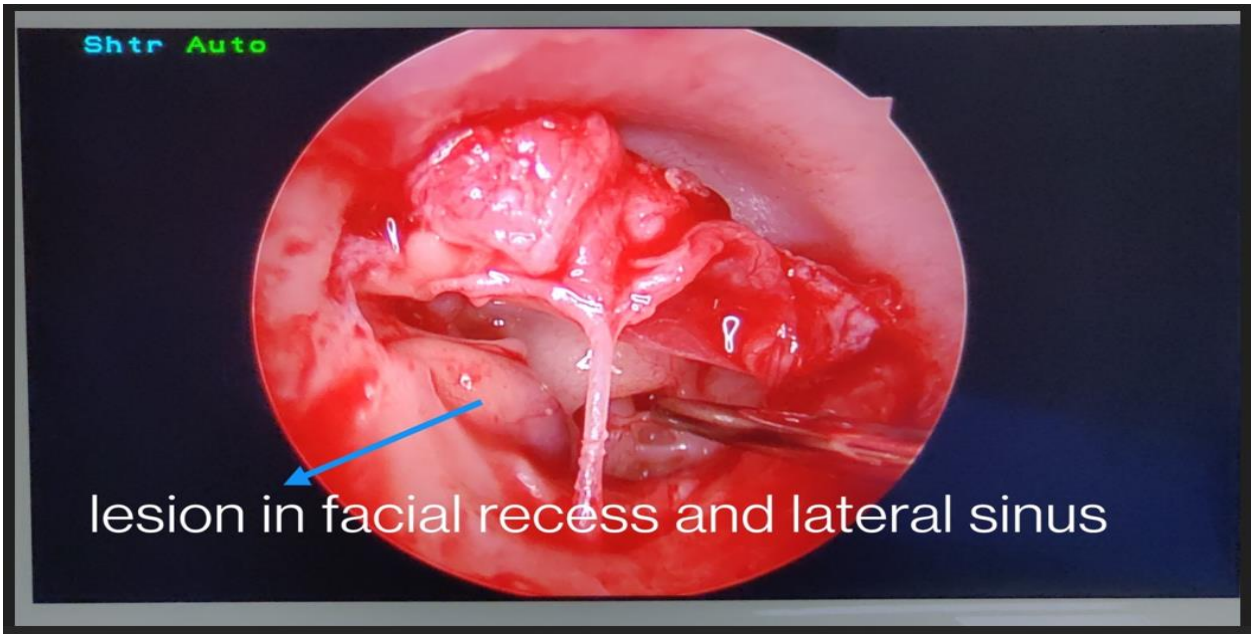

Figure 2: Intra-operative image showing lesion in the facial recess.

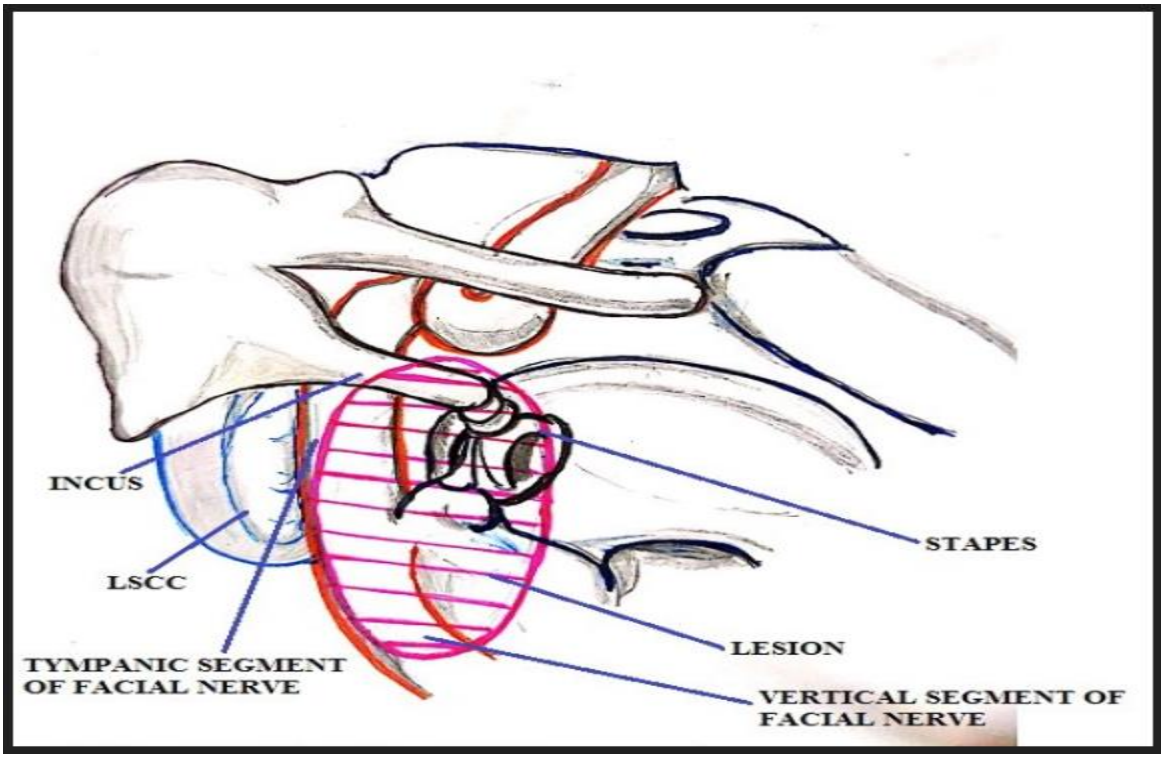

Figure 3: Pictorial representation of extent of lesion in our case

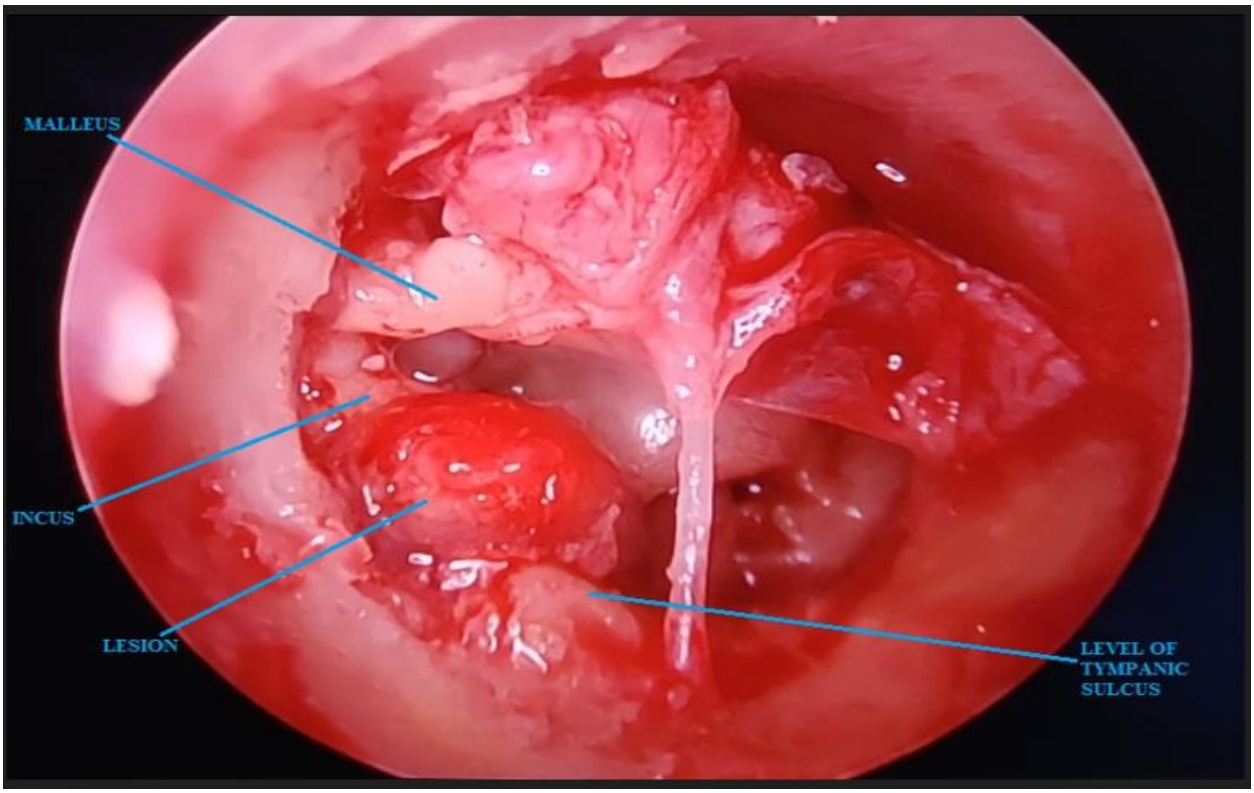

Figure 4: Tympanic sulcus and postero-superior canal wall drilled to expose the lesion

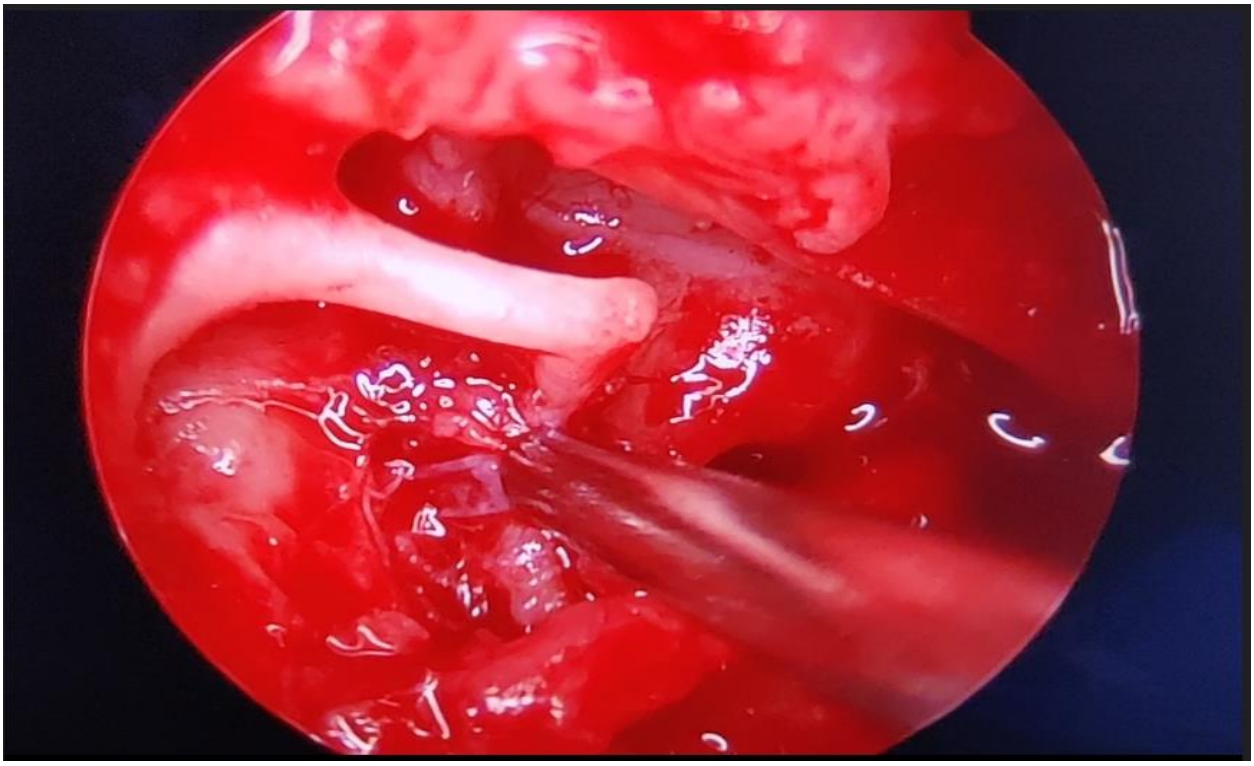

Figure 5: Intra-operative image showing removal of lesion around the stapes

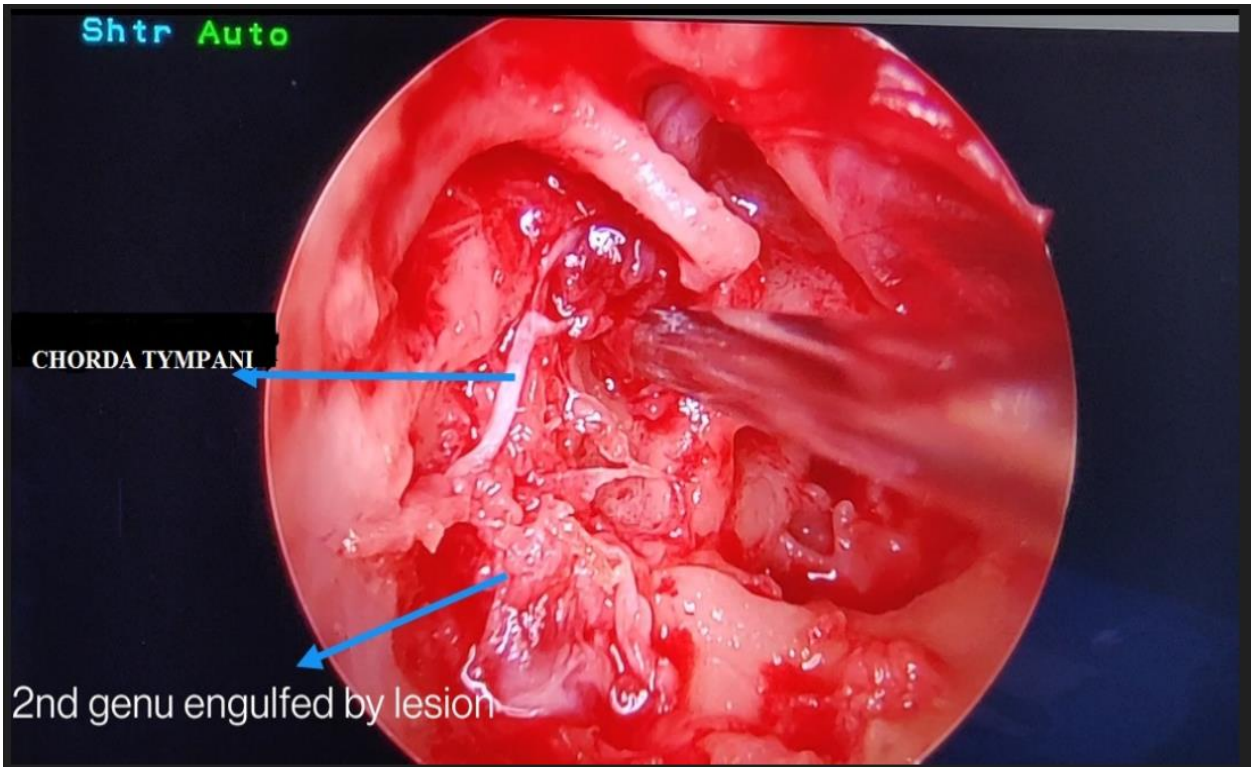

Figure 6: Intra-operative image showing lesion engulfing the second genu

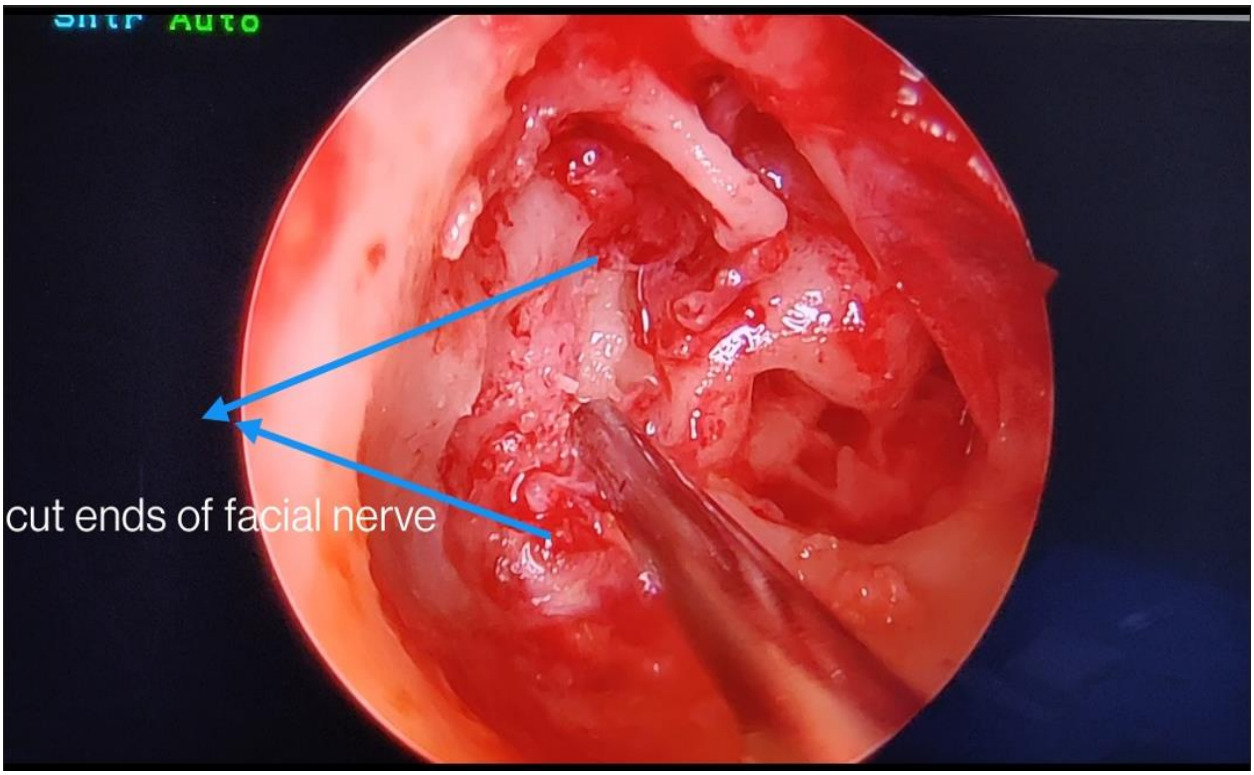

Figure 7: Intra-operative image showing cut ends of facial nerve

Figure 8: Intra-operative image showing complete excision of the lesion

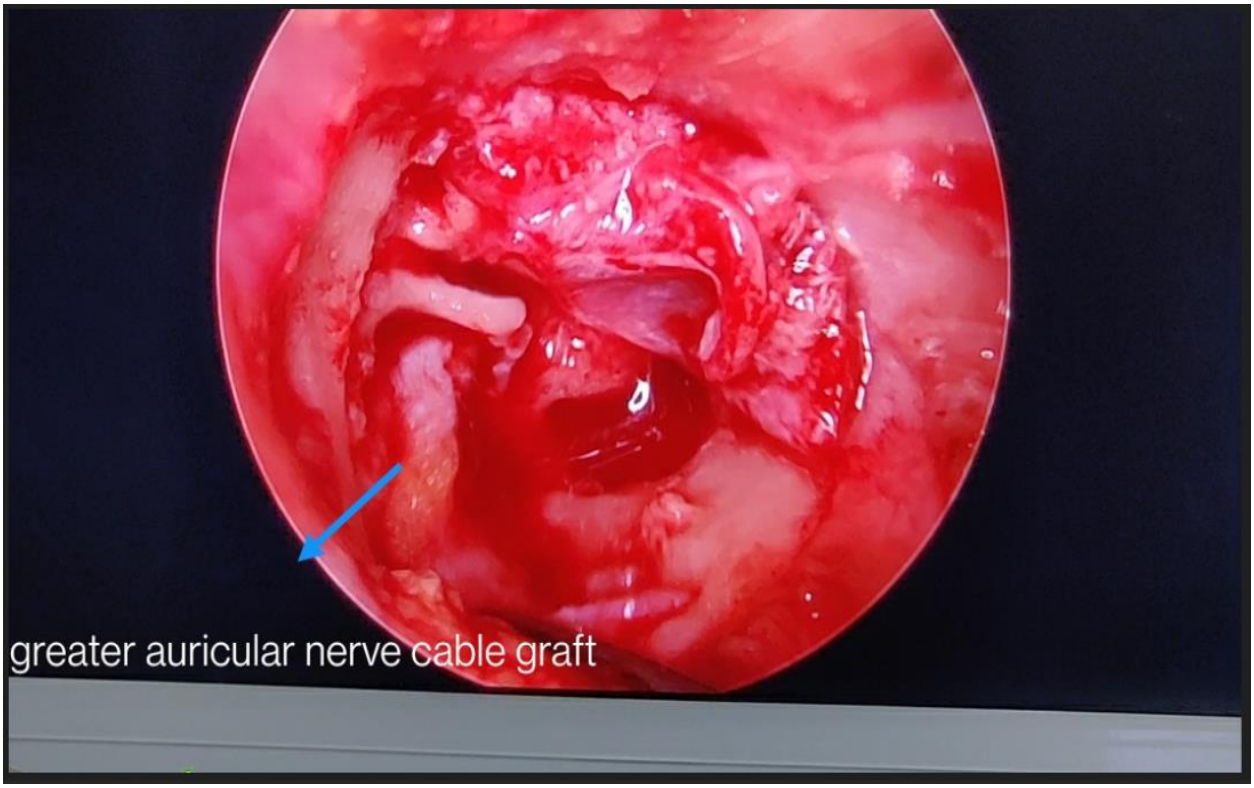

Figure 9: Intra-operative image showing greater auricular nerve cable grafting

DISCUSSION

Schwannomas are rare benign tumors arising from the schwann cells. Facial nerve schwannomas are rare with incidence of 0.8% [1,2]. These benign and slow growing tumors can arise from any segment of facial nerve with geniculate ganglion (68.2%) and labyrinthine segment (52.3) being the common sites of origin [2]. There is no gender predisposition and they occur in age group of 40 - 60 years. The presentations of facial nerve schwannoma are varied and it depends on the site and extent of the lesion. Facial palsy (50-67%) is the most common symptom while hearing difficulty (33-60%), ear discharge (13-26%) and giddiness (19-27%) can also be present [1]. Our patient presented with Grade V LMN facial palsy and hearing loss.

Site, extent, facial nerve functioning and hearing status are the crucial factors in the decision making regarding the mode of treatment. Observation, surgery and stereotactic radiosurgery are the available treatment options [2]. Surgery is reserved for lesions with poor facial function and hearing loss. Various surgical approaches in practice are trans-mastoid, trans-petrosal, trans-labyrinthine, trans-cochlear and middle cranial fossa approach. We performed transcanal endoscopic excision of facial nerve schwannoma with greater auricular nerve cable grafting.

Totally endoscopic approach to middle ear tumors like tympanic paraganglioma, osteoma, hemangioma and other vascular malformations have been documented [3-11]. The application of endoscope in middle ear tumors and facial nerve decompression has been evolving and the surgical techniques and landmarks are being explored [3-5]. The use of endoscope in facial nerve decompression of tympanic segment has been tried and the feasibility of decompressing vertical segment is still at experimental stage [11,12]. To our knowledge this is the first reported case of facial nerve schwannoma being excised by totally endoscopic transcanal approach.

The endoscopic ear surgery has been gaining importance in the past two decades due to its minimally invasive technique and better visualization of the critical structures and hidden spaces than the microscopic view. This concept has led to improvisation in the anatomical knowledge with respect to endoscopic view [4]. The transcanal approach uses EAC as natural corridor that avoids post-aural incision and violation of normal mastoid cells due to drilling. The endoscopic technique facilitates in removing the lesion without disrupting the ossicular chain. Audiological improvement is better in endoscopic technique due to preservation of ossicular chain and avoidance of mastoid cavity that can further lead to conductive loss [4]. The quality-of-life outcomes like post-operative pain, cosmesis and faster recovery are added advantages of the endoscopic approach. The endoscopic anatomy requires a different perspective to the middle ear structures and it mandates higher surgical expertise in addition to longer learning curve [4,7].

CONCLUSION

Adoption of endoscopic techniques to middle ear tumor excision is being explored and to our knowledge this is the first case of totally endoscopic transcanal excision of facial nerve schwannoma in English literature. This report can add to the emerging evidence of feasibility of endoscopic techniques for different middle ear lesions.

CONFLICTS OF INTEREST: NIL

ACKNOWLEDGEMENTS: NIL

FUNDING: NIL

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