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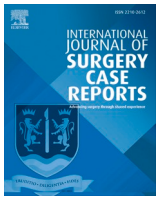

Case report

A case report on surgical management of glomus tympanicum and literature review

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ABSTRACT

Introduction: Glomus tympanicum is a benign tumor classified under the group glomus tumors, and is also known as paragangliomas.
Case presentation: A 52 years old woman presented with unilateral pulsatile tinnitus and hearing loss. She had a visible reddish mass behind the eardrum; Temporal bone CT scans suggested middle ear mass secondary to Glomus Tympanicum tumors. With the diagnosis of Modified Fisch-Mattox class A2 middle ear paragangliomas the tumors was surgically removed (7 mm × 5 mm on the right) using post-aural approaches. Histopathology confirmed the diagnosis of paraganglioma. The patient was discharged and being monitored regularly. This report follows the SCARE criteria guidelines.
Clinical discussion: Glomus Tympanicum, a slow-growing, benign tumor originating from paraganglia, is a rare occurrence. It typically presents with pulsatile tinnitus and hearing loss, often unilateral. Early diagnosis and surgical intervention are crucial for optimal outcomes.
Conclusion: Glomus tympanicum is a rare condition. There are three treatment options for this condition observation, surgical excision, and radiotherapy. The primary therapeutic option for paragangliomas is complete surgical excision, it is performed under microscopic observation or an endoscopic approach. A timely diagnosis makes surgical treatment more straightforward.

1. Introduction

Glomus tympanicum tumors are benign primary tumors of the middle ear classified under the group glomus tumors arise from neural crest cells located on the promontory [1,2]. It is the most common primary neoplasm of the middle ear and the second most common tumor of the temporal bone after acoustic neuroma [3,4]. Common symptoms are hearing loss and pulsatile tinnituts [2,4]. Diagnosis of glomus tympanicum made based on clinical, audiological, and radiological findings [5]. Radiological diagnostic modalities including computed tomography (CT) and magnetic resonance play a significant role in making an early diagnosis [5]. On imaging, paragangliomas appear as highly vascular tumors showing intense postcontrast enhancement [7]. Two different classification systems of glomus tympanicum are commonly used, one proposed by Fisch and Mattox, and the other by Glasscock and Jackson [2,5]. Modified Fisch classification is most frequently used (Table 1) [2]. There are three treatment options for this condition: observation, surgical excision, and radiotherapy [10]. The primary therapeutic option for paragangliomas is complete excision via a transcanal or a postauricular approach under microscope or using endoscope [2]. We present here a case of Glomus Tympanicum Tumor who treated surgically via postauricular approach under microscope. A review of the relevant literature is also performed. This case report adheres to SCARE criteria [16].

2. Case report

A 52 old female patient with compliant right side pulsatile tinnitus of 01 year duration which was persistent associated with this had bilateral hearing decrement but no history of ear discharge. On otomicroscopic examination, the left ear was unremarkable. On the right ear, a reddish mass was seen behind tympanic membrane, which was pulsatile (Fig. 1). No ear discharge seen, and the TM otherwise appeared healthy. The external auditory canal appeared normal. Pure tone audiometry

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Table 1
Tympanomastoid paragangliomas classification.

Modified Fisch-Mattox classification	
A1	Tumor limited to the middle ear cavity and completely visible on otoscopic examination
A2	Tumor limited to the middle ear cavity but the margins are not visible on otoscopy may extend to the Eustachian tube and/or to the posterior mesotympanum
B1	Tumor filling the middle ear cavity with extension into the hypotympanum and tympanic sinus
B2	Tumor filling the middle ear cavity, extending into the mastoid and medially to the mastoid segment of the facial nerve
B3	Tumor filling the middle ear cavity, extending into the mastoid with erosion of carotid canal

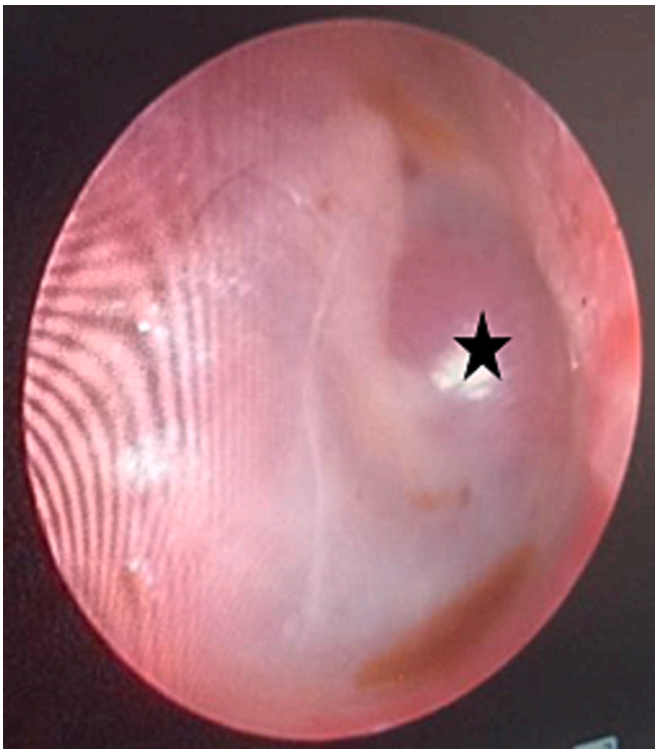

Fig. 1. On the right ear, a reddish mass was seen behind tympanic membrane anterior to the malleus (black star indicates).

revealed bilateral sensory neural hearing loss Right side 39 dB and Left side 42 dB (Fig. 2). Temporal bone CT scan with contrast showed right side 7 mm* 5 mm soft tissue density homogeneously enhancing mass just behind the tympanic membrane on the promontory (Fig. 3). With the diagnosis of Modified Fisch-Mattox class A2 middle ear paragangliomas excision of the tumor done under microscope through postaural route. The tumor was on the promontory just behind the malleus and it was totally excised, intraoperatively there was estimated 10 ml of bleeding ossicles were intact and mobile. There were no post-operative completions (Fig. 4). The mass was sent for pathological examination shows well circumscribed tissue consisting of zellballen of ovoid to spindle cells having stippled chromatin and granular eosinophilic cytoplasm supported by vascular stroma, which confirmed the diagnosis of paraganglioma (Fig. 5). The woman was discharged and is present in regular follow up.

3. Discussion

Glomus tympanicum tumors are benign, primary middle ear neoplasms of vascular origin, arising from neural crest cells on the promontory [1,2]. Histologically benign, these slow-growing tumors are locally destructive, spreading along paths of least resistance [15], and rarely cause hormonal symptoms due to their parasympathetic paraganglial origin [9]. Sporadic or hereditary occurrences, particularly in multiple endocrine neoplasia type II (MEN II), are noted [10]. They are the most common primary middle ear neoplasm and the second most common temporal bone tumor after acoustic neuroma [3,6], primarily supplied by the inferior tympanic artery [5]. Common symptoms include hearing loss and pulsatile tinnitus, with pain and cranial neuropathies possible in advanced stages [2,4,9]. Facial paralysis, a late-stage presentation, indicates a poor prognosis [8].

Diagnosis of glomus tympanicum made based on clinical, audiological, and radiological findings [7]. Radiological diagnostic modalities including computed tomography (CT) and magnetic resonance play a significant role in making an early diagnosis [5]. On imaging, paragangliomas appear as highly vascular tumors showing intense post-contrast enhancement [7]. Two different classification systems of glomus tympanicum are commonly used, one proposed by Fisch and Mattox, and the other by Glasscock and Jackson [2,5]. Modified Fisch classification is most frequently used (Table 1) [2]. Imaging can be effective for monitoring glomus tumors within the middle ear. Although CT scans of the temporal bone commonly used to monitor growth of tumor, Doppler ultrasound or MRI are the imaging modalities of choice as both can find lesions as small as 2 mm [13].

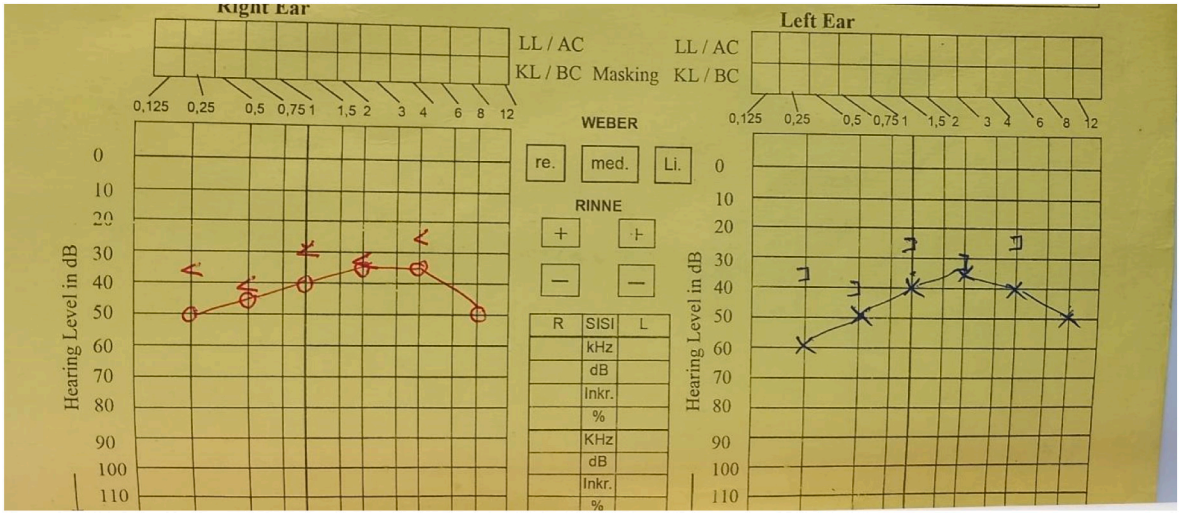

Fig. 2. Pure tone audiometry revealed bilateral sensory neural hearing loss Right side 39 dB and Left side 42 dB.

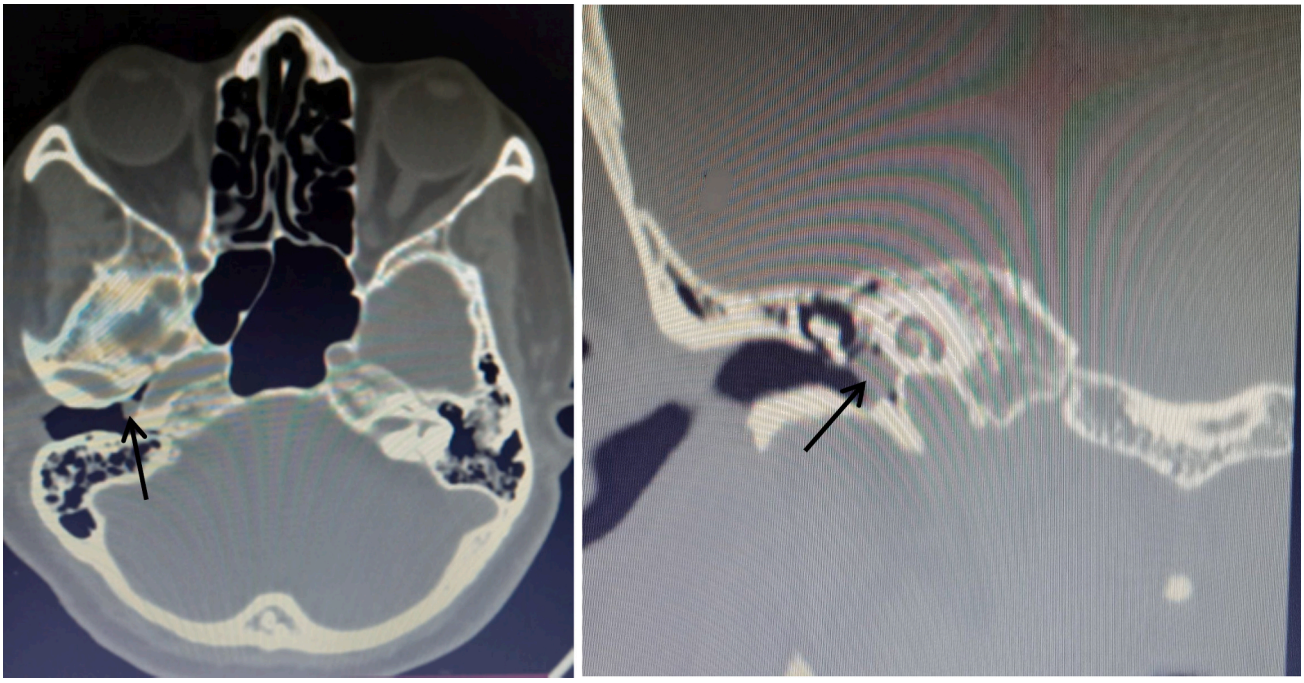

Fig. 3. Temporal bone CT scan with contrast showed right side 7 mm * 5 mm soft tissue density homogeneously enhancing mass just behind the tympanic membrane on the promontory with small extension to Eustachian tube area (solid arrows).

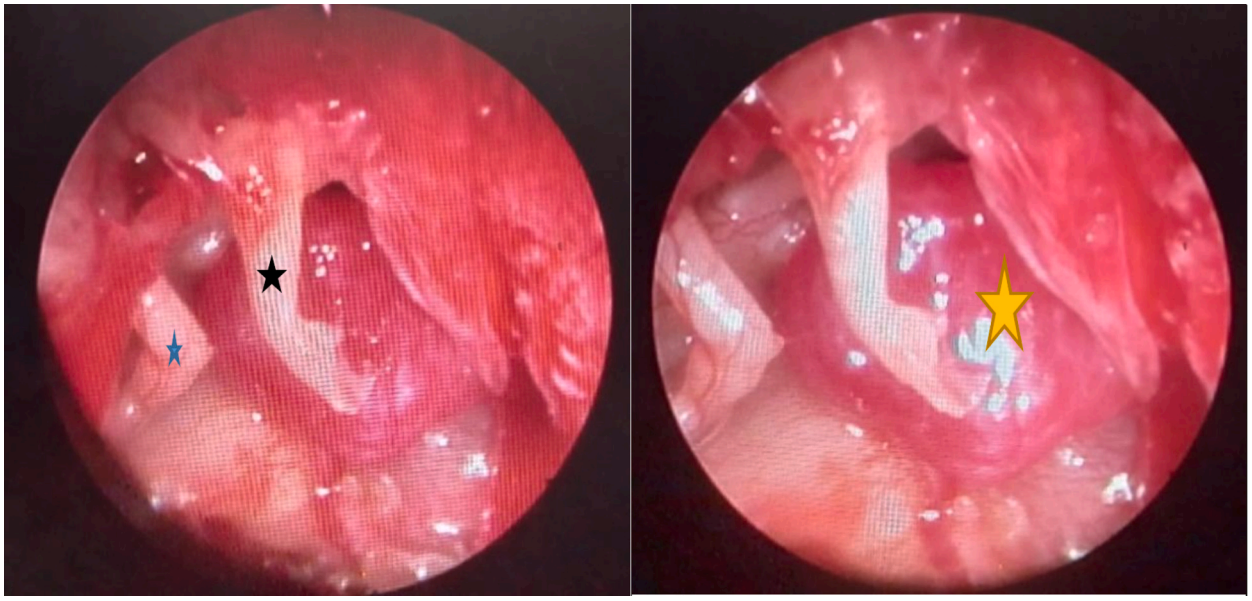

Fig. 4. The tumor was on the promontory just behind the malleus (malleus (black star), incudostapidial joint (blue star), and middle ear mass extend to Eustachian tube area (yellow star)).

There are three treatment options for this condition: observation, surgical excision, and radiotherapy [12]. The primary therapeutic option for paragangliomas is complete excision via a transcanal or a postauricular approach under microscope or using endoscope [2,13]. However, resection should be balanced against a more conservative "wait and scan" policy or palliative treatments such as radiotherapy [7]. It is commonly a highly vascular soft tissue lesion which may require pre-operative embolization [14]. Embolization following an angiographic study helps to identify the feeding arteries with subsequent blocking of the same, thus helping in the reduction of intraoperative hemorrhage [8]. The tumors are not encapsulated, and it is possible to have tumor recurrence if not completely excised [11].

Our patients presented with a classical combination of features, pulsatile tinnitus and a red bilging mass behind an intact tympanic membrane. Temporal bone CT scan with contrast showed soft tissue density homogeneously enhancing mass just behind the tympanic membrane on the promontory. The patient underwent surgical excision during which the tumor was found exclusively in the middle ear, over the promontory Modified Fisch-Mattox class A1. Excision was total under the microscope using endaural and postauricular approach respectively.

4. Conclusion

In conclusion Glomus tumors or paragangliomas are rare tumors arising from paraganglionic tissue. Glomus tympanicum tumors are soft

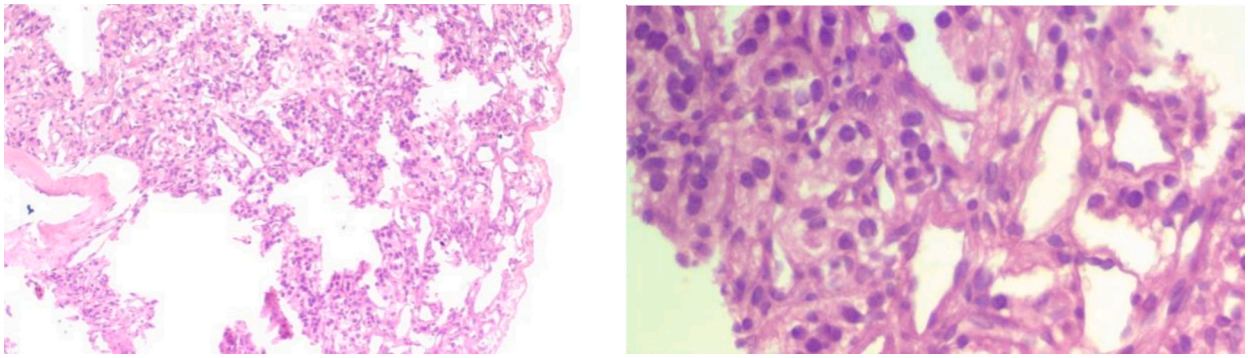

Fig. 5. Histopathological examination shows well circumscribed tissue consisting of zellballen of ovoid to spindle cells having stippled chromatin and granular eosinophilic cytoplasm supported by vascular stroma, which confirmed the diagnosis of paraganglioma which confirmed the diagnosis of paraganglioma.

tissue tumor of the middle ear these lesions typically present with pulsatile tinnitus and hearing loss. Diagnosis of glomus tympanicum made based on clinical, audiological, and radiological findings. There are three treatment options for this condition observation, surgical excision, and radiotherapy. The primary therapeutic option for paragangliomas is complete surgical excision.

Informed consent

Informed consent was obtained from the patient for their anonymized information to be published in this article.

Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Guarantor

1. Hailemariam Kassaye Alebie
2. Mezigebu Yaregal Hailu.

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Declaration of competing interest

The authors have no financial conflicts of interest.

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