ISSN 2470-4059

OTOLARYNGOLOGY
OpenJournal

Openventio
PUBLISHERS

Case Report

A Case of Glomus Tympanicum During Stapedotomy Surgery for Otosclerosis

Leonardo Ordoñez-Ordoñez, MD[1*]; Fabio Leon, MD[2]; Juanita Beltran, MD[1]

[1]*Department of Otolaryngology, Hospital Militar Central, Bogota, Colombia*
[2]*Department of Pathology, Clinica Universitaria Colombia, Bogota, Colombia*

[*]***Corresponding author***
Leonardo Ordoñez-Ordoñez, MD
Department of Otolaryngology. Hospital Militar Central. Bogota, Colombia; E-mail: otoleor@gmail.com

Article information
Received: December 1st, 2020; **Accepted:** February 6th, 2021; **Published:** February 16th, 2021

Cite this article
Ordoñez-Ordoñez L, Leon F, Beltran J. A case of glomus tympanicum during stapedotomy surgery for otosclerosis. *Otolaryngol Open J.* 2021; 7(1): 1-3. doi: 10.17140/OTLOJ-7-162

ABSTRACT

Glomus tympanicum is a tumor classified as a paraganglioma. We report a case of a 66-year-old female with two middle ear pathologies: an incidental finding of a glomus tympanicum during stapedotomy surgery for otosclerosis.

Keywords
Glomus tympanicum; Otosclerosis; Paraganglioma; Stapedotomy.

INTRODUCTION

Paragangliomas are benign tumors of neural crest origin arising from paraganglia (glomus body) cells and occur most often in the temporal bone and neck. They are referred to according to their site of origin in the glomus jugular, tympanicum, carotid body, or vagale. Glomus tympanicum (GT) is highly vascular tumor and arises from the paraganglia of the middle ear usually originating along the tympanic (Jacobson's) or auricular (Arnold's) nerves. Glomus that arise from the Jacobson nerve originate at the cochlear promontory and surgical treatment is the treatment of choice. It is the most common primary neoplasm of the middle ear, and the second most common tumor of the temporal bone.[1]

Early stage paragangliomas present with symptoms related to the involvement of the middle ear. Unilateral pulsatile tinnitus and conductive hearing loss due to its highly vascular nature and mass effect in the middle ear are usually present. Glomus tympanicum is seen as a retrotympanic red mass on the promontory.[2]

On high resolution computed tomography of the temporal bone, glomus tympanicum are seen as a soft tissue mass confined to the middle ear centered either over the promontory, the hypotympanum, or both,[2] and there may be bony destruction and erosion. Magnetic resonance imaging (MRI) is usually better than computerized tomography (CT) for delineating tumor edges and intracranial extent.[3]

The management involves a particular challenge because of the hypervascular nature. The therapeutic goal is to control the disease with minimal resulting morbility.[2]

CASE REPORT

The following case report description was authorized by the patient. We present the case of a 66-year-old female patient presented to us with a history of progressive, diminished, left-sided hearing of more than 20-years. There was no history of ear discharge, ear pain, or any other symptoms.

Clinical examination revealed a normal external ear canal and healthy tympanic membrane bilaterally. Turning fork test revealed a conductive hearing loss of the left ear. Pure tone audiometry revealed a mild to severe mixed hearing loss pattern mainly conductive, in the left ear (Figure 1).

The patient was sent for CT of the temporal bone in which initially no abnormalities where found. The original diagnosis that was made was otosclerosis *versus* ossicular chain disruption based upon history and pure tone audiometry. The patient

Openventio PUBLISHERS

Figure 1. *Pure Tone Audiometry. Mild to Severe Mixed Hearing Loss*

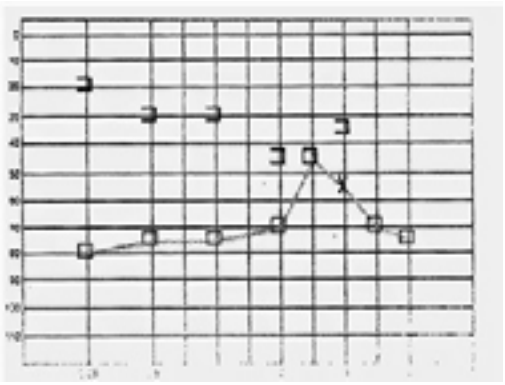
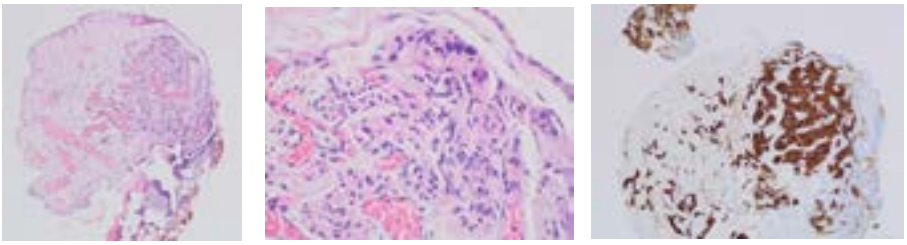


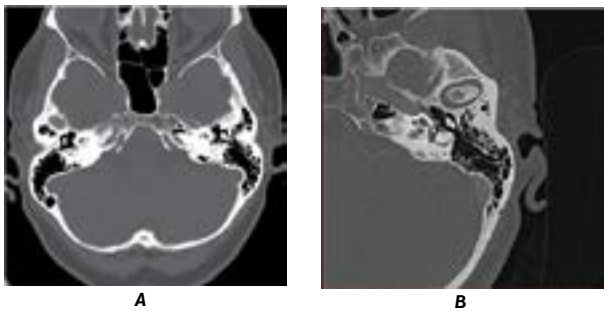
Figure 2. *Tumor Composed of Ccuboidal Cells with Minimal Salt and Pepper Chromatid Atypia. The Tumor Nests are Separated by Thin Wall Blood Vessels. The Chief Cells are Small with Basophilic Cytoplasm and have Round, Granular Nuclei. A and B: Hematoxylin Eosin Stain 10x and 40x respectively, C: Chromogranin 40x*



A B C

was considered candidate for stapedotomy. During the procedure, we found a highly vascular mass originating from the promontory with a size of 6 mm. The stapedotomy was paused, and we began the resection using blue laser (2.0 VAT). The mass was completely removed and was sent to pathology to assess the histological nature. The pathology report confirmed a glomus tympanicum (Figure 2). The initial CT scan was then revised and demonstrated a soft tissue density mass occupying the middle ear originating from the promontory (Figure 3). One-year CT follow-up shows absence of the glomus tympanicum recurrence, with prothesis in adequate position and with an improvement on air conduction hearing thresholds.

Figure 3. *Temporal CT Scan Showing (A) The Left Middle Ear Space Partially Accupied by a Soft Tissue Density Mass Originating from the Promontory (red arrow) and (B) The Abscense of this Mass after Laser Resection One -Year after with Adequate Prothesis Position (red arrorw)*



A B

Figure 2 shows tumor composed of cuboidal cells with minimal salt and pepper chromatid atypia. The tumor nests are separated by thin wall blood vessels. The chief cells are small with basophilic cytoplasm and have round, granular nuclei. A and B: hematoxylin eosin stain 10× and 40× respectively, C: chromogranin 40×.

DISCUSSION AND CONCLUSION

Paragangliomas in the head and neck can be differentiated into cervical paragangliomas a temporal bone paragangliomas. The cervical group includes carotid body tumors and glomus vagale tumors, while the jugulo tympanic comprises glomus jugulare and glomus tympanicum tumors. Glomus tympanicum tumors are more common than glomus jugulare tumors.[4]

Patients present with complaints of pulsatile tinnitus (81.4%), subjective hearing loss (77.1%), and aural fullness (70.2%), otalgia is uncommon.[5]

A histologic analysis of glomus tympanicum tumors reveals many similarities to paragangliomas that occur elsewhere in the body. Tumors are solid and encapsulated, and microscopically there are conglomerations of chief cells surrounded by sustentacular cells and an extensive capillary network that creates a reticular appearance. Chief cells are characterized by a polyhedral shape, roundnuclei, and eosinophilic cytoplasm that can contain granular structures.[6]

Surgery remains the only option for definitive tumor management. Tumor diagnosis begins clinically with the visualization of a red mass behind the intact ear drum, but computed tomography and MRI have become essential for identifying the tumor origin and defining the extent of the disease.[7]

Neurosecretory function in glomus tympanicum tumors is rare, but screening for functional tumors remains an important part of tumor management.[8] Despite being prone to locally aggressive behavior, they are benign histologically. Malignancy is identified in 5% of temporal bone paragangliomas.[9] The evident association of some glomus tumors to a genetic origin may also have implications on its malignant potential.[10]

The surgical approach should be chosen according to the extension to surrounding structures and the size of the glomus.[11] Surgery has side effects and risks like changes in taste, dizziness, and tinnitus. Stereotactic radiation has also been described as a palliative measure for GT tumors.[7]

Cases of two middle ear pathologies in one symptomatic patient are not common. Even though in this particular case, hearing loss was due to the stapes fixation, if the tumor continues growing as usual, a progressive hearing loss could have been diagnosed posteriorly, with a completely different causal pathology.

CONSENT

The authors have received written informed consent from the patient.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

1. Hinerman RW, Amdur RJ, Morris CG, Kirwan J, Mendenhall WM. Definitive radiotherapy in the management of paragangliomas arising in the head and neck: A 35-year experience. *Head Neck*. 2008; 30(11): l431-1438. doi: 10.1002/hed.20885

2. Semaan MT, Megerian CA. Current assessment and management of glomus tumors. *Curr Opin Otolaryngol Head Neck Surg*. 2008; 16(5): 420-426. doi: 10.1097/MOO.0b013e32830c4595

3. Vogl TJ, Mack MG, Juergens M, Bergman C, Grevers G, Jacobsen TF, et al. Skull base tumours gadodiamide injection-enhanced MR imaging. *Radiology*. 1993; 188: 339-346. doi: 10.1148/radiology.188.2.8327675

4. O'Leary MJ, Shelton C, Giddings NA, Kwartler J, Brackmann DE. Glomus tympanicum tumours: A clinical perspective. *Laryngoscope*. 1991; 101: 1038-1043. doi: 10.1288/00005537-199110000-00002

5. Carlson ML, Sweeney AD, Pelosi S, Wanna GB, Glasscock ME, Haynes DS. Surgical management of glomus tympanicum: a review of 115 cases over four decades. *Otolaryngol Head Neck Surg*. 2015; 152: 136-1342. doi: 10.1177/0194599814555849

6. Sennaroglu L, Sungur A. Histopathology of paragangliomas. *Otol Neurotol*. 2002; 23: 104-105. doi: 10.1097/00129492-200201000-00023

7. Sweeney A, Carlson M, Wanna G, Bennett M. Glomus tympanicum tumors. *Otolaryngol Clin North Am*. 2015; 48(2): 293-304. doi: 10.1016/j.otc.2014.12.004

8. Kouzaki H, Fukui J, Shimizu T. Management of a catecholamine-secreting tympanicum glomus tumour: Case report. *J Laryngol Otol*. 2008; 122: 1377-1380. doi: 10.1017/S0022215108001801

9. Manolidis S, Shohet JA, Jackson CG, Glasscock ME. Malignant glomus tumors. *Laryngoscope*. 1999; 109: 30-34. doi: 10.1097/00005537-199901000-00007

10. Martin TP, Irving RM, Maher ER. The genetics of paragangliomas: A review. *Clin Otolaryngol*. 2007; 32(1): 7-11. doi: 10.1111/j.1365-2273.2007.01378.x

11. Carlson M, Sweeney A, Pelosi S, Wanna G, Glasscock M, Haynes D. Glomus tympanicum: A review of 115 cases over 4 decades. *Otolaryngology–Head and Neck Surgery*. 2014; 152(1): 136-142. doi: 10.1177/0194599814555849