Rev. Otorrinolaringol. Cir. Cabeza Cuello 2024; 84: 63-67

doi: 10.4067/S0718-48162024000100109

CLINICAL CASE

Middle ear lipoma as a mimicker of other diseases: a review of an unusual presentation

Lipoma en el oído medio como un imitador de otras enfermedades: una revisión de una presentación inusual

Joan Lorente-Piera[1], Francisco Javier Cervera-Paz[1], Natalia Díaz-Zufiaurre[1], Raquel Manrique-Huarte[1], Manuel Manrique-Rodríguez[1], Pablo Domínguez E.[2]

Abstract

The finding of a lipoma in the middle ear is much rarer than its occurrence in the external auditory canal or even the inner ear, with fewer than seven cases described in the literature and none of them in Spain or South America. Despite its benign nature, the location of the lipoma may compromise structures that play a significant role in auditory preservation or balance control, necessitating surgical removal as a curative treatment. The main objective of this article is to describe the presentation of lipomas in the middle ear as a possible, although rare, etiology to consider in patients presenting with hearing loss, instability, or both symptoms concurrently, seeking otorhinolaryngological evaluation.
Keywords: Lipoma, middle ear, otosclerosis, vertigo, hearing loss.

Resumen

El hallazgo de un lipoma en el oído medio es mucho más raro que su ocurrencia en el canal auditivo externo o incluso en el oído interno, con menos de siete casos descritos en la literatura y ninguno de ellos en España o Sudamérica. A pesar de su naturaleza benigna, la ubicación del lipoma puede comprometer estructuras que desempeñan un papel significativo en la preservación auditiva o en el control del equilibrio, lo que hace necesaria la extirpación quirúrgica como tratamiento curativo. El objetivo principal de este artículo es describir la presentación de los lipomas en el oído medio como una posible, aunque rara, etiología a considerar en pacientes que presentan pérdida de audición, inestabilidad o ambos síntomas simultáneamente, buscando evaluación otorrinolaringológica.
***Palabras clave:** Lipoma, oído medio, otosclerosis, vértigo, pérdida de audición.*

[1]Department of Otorhinolaryngology, Clínica Universidad de Navarra, Pamplona, Spain.
[2]Department of Radiology, Clínica Universidad de Navarra, Pamplona, Spain.

The authors declare that this case has not received any financial support.

Received 05 September 2023.
Accepted 19 November 2023.

Corresponding author:
Joan Lorente-Piera
Department of Otorhinolaryngology, Clínica Universidad de Navarra, Pamplona, Spain.
Email: jlorentep@unav.es

Introduction

Lipomas are one of the most common neoplasms of mesenchymal origin[1], along with liposarcomas. They consist of mature adipose tissue that tends to encapsulate within a fibrous covering, primarily in subcutaneous tissue. They usually have slow growth and little tendency to produce symptoms, which typically result from compression of adjacent tissue.

Around 13% of lipomas commonly appear in the head and neck area[2], with the posterior region being the most frequent location. Cases of these masses appearing within the temporal bone, especially at the cerebellopontine angle and internal auditory canal, have been described. Much less frequent, as in this case, is their involvement in the middle ear, with only seven cases previously described in the literature[3], none of which were previously reported in Spain.

Objective

To describe the presentation of lipomas

ISSN 0718-4816 versión en línea - ISSN 0716-4084 versión impresa
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in the middle ear as a possible, although rare, etiology to consider in patients presenting with hearing loss, instability, or both symptoms concurrently, seeking otorhinolaryngological evaluation.

Clinical Case

We present the case of a 55-year-old female patient who came to our department due to a progressive hearing loss of one year's duration, without any clear trigger. She also reported symptoms of instability, with episodes of vertiginous crises that even led to a work leave requiring up to 15 days of rest at home. She had received treatment in two stages, with Sulpiride 50mg as rescue medication during the acute phase and Betahistine 16mg for maintenance. Regarding her relevant medical history, the only notable condition was a well-controlled chronic migraine with aura, treated with Amitriptyline 10mg.

During the past year, she experienced two vertiginous crises that met the diagnostic criteria for acute vestibular syndrome. Each episode lasted approximately two hours and was accompanied by marked neurovegetative symptoms, including nausea and vomiting. She did not report any fluctuation in hearing during the episodes, nor did she experience ear fullness or tinnitus. There were no reported family history of Ménière's disease. Despite her history of migraines, she did not describe any photophobia or phonophobia during these episodes, nor did she experience aura or headache worsened by exercise. Therefore, there was initial uncertainty regarding the diagnosis of vestibular migraine, and she came to the Otorhinolaryngology department at our center to rule out other peripheral etiologies of her instability.

Otoscopic examination revealed only a grade II retraction in the postero-superior quadrant of the left ear, with myringo-incudopexy. Concurrently, various audiological tests were conducted, which revealed bilateral mixed hearing loss (**Figure 1**), moderate in the right ear (42.1 dB) and mild in the left ear (33.3 dB) according to the criteria of *the Bureau International d'Audiophonologie* (BIAP). The presence of a bone-air gap and the asymmetry between the two ears prompted the request for an imaging study to rule out otosclerosis. A temporal bone CT scan (**Figure 2**) was performed, which showed no abnormalities except

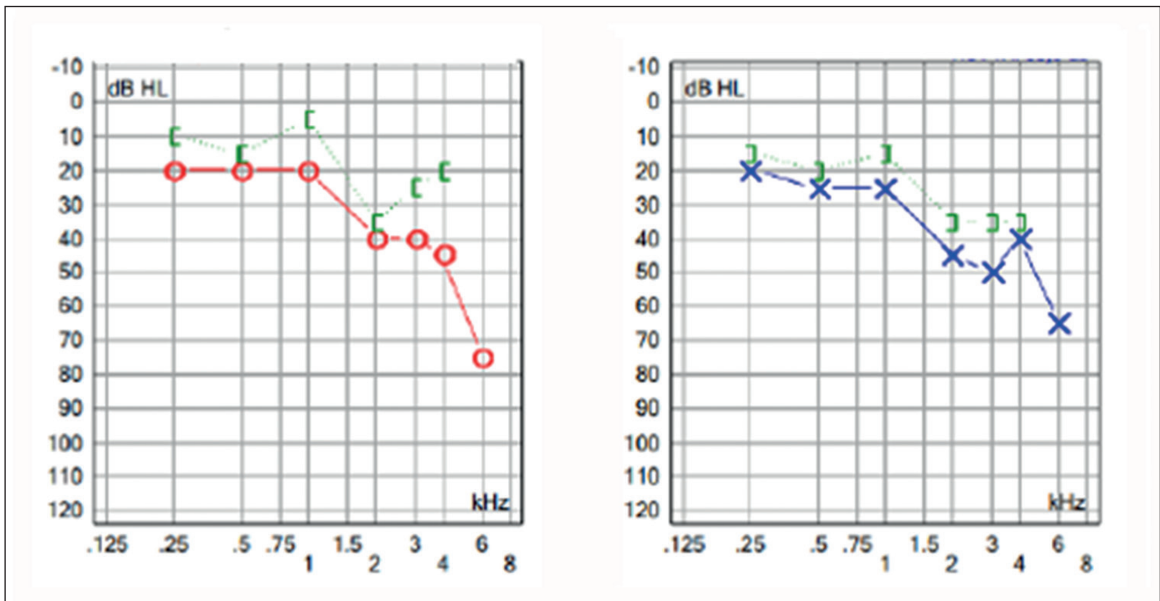

Figure 1. Bilateral pure tone audiometry showing bilateral mixed hearing loss, moderate in the right ear and mild in the left ear.

for a small lesion (0.5 cm x 0.4 cm) in the anterior epitimpanum recess, adjacent to the facial nerve, geniculate ganglion, and tensor tympani muscle. The lesion made minimal contact with the malleus and exhibited low density (mean of -32 Hounsfield units), suggestive of a fatty content consistent with lipoma. Due to the atypical finding, it was recommended to perform another complementary imaging study to provide further information about the suspected pathology in the contralateral ear.

Therefore, a brain magnetic resonance imaging (MRI) was done, including a T1-weighted sequence without fat saturation before intravenous contrast administration and a T1-weighted sequence with fat saturation (which selectively and exclusively nullifies the signal from adipose tissue) after intravenous paramagnetic contrast **(Figure 3).** The MRI confirmed the presence of a small nodular formation that behaved similarly to fat in all sequences, including signal loss with fat saturation, thus consistent with a lipoma. Any other non-adipose lesion, such as a cholesterol granuloma, would not show signal loss with fat saturation.

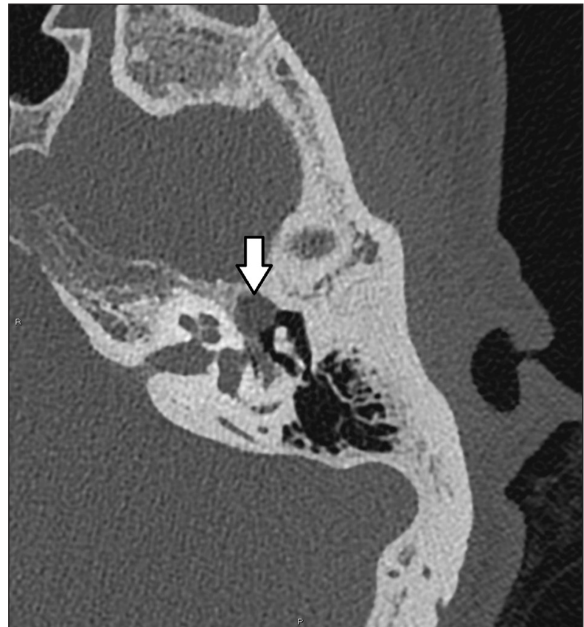

Figure 2. Axial CT image of the left petrous bone showing a nodular image of low density in the anterior epitympanic recess (arrow), without signs of aggressiveness.

Discussion

The clinical presentation of lipomas, as Stegehuis et al published, when they occur in the middle ear is highly variable, depending on the extent of the lesion and whether it contacts the structures within this region[4]. However, the most common presentation is asymptomatic, not requiring any treatment other than active surveillance to monitor for growth. However, in cases where symptoms are present, they have been reported as conductive hearing loss, likely due to the contact of the lesion with one of the ossicular chain elements, impeding the proper transmission of sound vibrations. Less commonly, but hypothetically in our case, chronic instability syndrome may occur due to compression of the lipoma in the round window area, thereby hindering the proper passage and processing of endolymph in the cochlea. Even more rarely, but with documented cases as the work of Kaskebar et al, facial palsy may result from direct contact with the facial nerve[5].

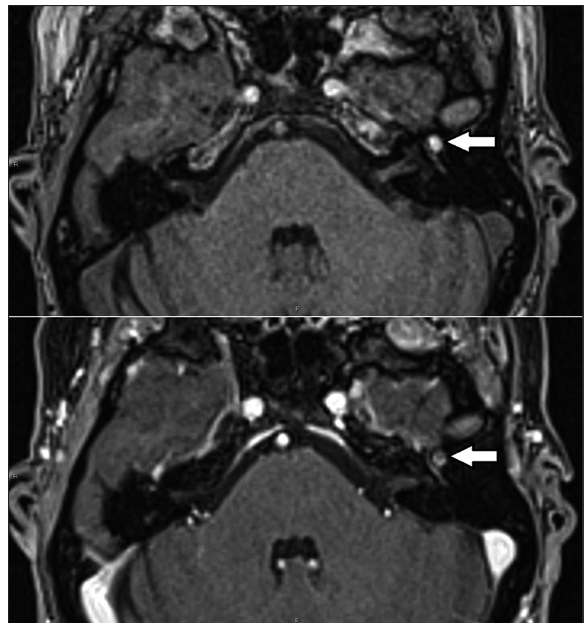

Figure 3. Axial magnetic resonance imaging (MRI) images. In the T1-weighted sequence without intravenous contrast and without fat saturation (upper image), the lesion shows hyperintensity of signal, similar to fat (arrow). In an identical T1-weighted sequence but after intravenous contrast and with fat saturation (lower image), the lesion loses signal (arrow), confirming the presence of fatty content and being consistent with a lipoma of the left middle ear.

It is also important to note that in some patients with a significant size of this lesion, it may have been misdiagnosed as serous otitis media due to the appearance of the lipoma on the tympanic membrane, resembling amber-like fluid collection in the middle ear. Furthermore, the presence of conductive hearing loss with an air-bone gap may cause confusion and hinder the differential diagnosis between these two entities.

However, in our case, it was ruled out that both the hearing loss and the sensation of instability, with recurrent episodes of acute vestibular syndrome, were due to the presence of the lipoma. The size and location of the lipoma, limited to the anterior epitympanic recess of the left ear, resulted in only minimal contact with the margins of the ossicular chain, not reaching the promontory or, much less, the round window. Therefore, the hearing loss was attributed to presbycusis, while the instability symptoms were considered a possible atypical presentation of vestibular migraine with incomplete control with a maintenance dose of 10mg of Amitriptyline.

Evenmore, one of the reasons for presenting this case is to emphasize the importance of diagnosis based on imaging tests. Initial findings in a complementary test such as a brain CT scan, showing a hypodense mass in the middle ear, require ruling out conditions such as cholesteatoma or schwannoma at that level. The "negative" density in CT is highly suggestive of fatty content. In MRI, there is a technique called "fat saturation" that selectively cancels out the signal from fat tissue without affecting the signal from other tissues. Identifying a hyperintense lesion in T1 that loses its signal after fat saturation confirms its fatty content. A cholesterol granuloma, which is also typically hyperintense in T1-weighted sequences without fat saturation, or a hyperproteinic fluid collection, would not lose its signal. Although histopathological examination provides a definitive diagnosis, in this case, the radiological findings are specific enough to determine the diagnosis with a high level of certainty.

Regarding therapeutic alternatives, since it was ruled out in our case that the lipoma was the cause of the patient's symptoms, it was decided to implement active monitoring. The patient was scheduled for a follow-up appointment in 6 months, with recommendations for adjusting the hearing aid in the right ear and the possibility of undergoing a new imaging test to monitor potential growth of the lesion. Regarding the sensation of instability, a consultation with the Neurology department was advised to readjust the migraine management plan.

Finally, it should be emphasized that if the lipoma were to grow and require resection, as has been reported in other cases described in the literature, a retroauricular approach is usually performed to access the tympanic cavity and completely remove the lesion, with or without the need for removal of the malleus or incus to achieve greater exposure and access.

Conclusion

Lipomas are relatively common mesenchymal tumors in the head and neck region, although their occurrence in the middle ear is extremely rare, with fewer than ten cases described in the literature. Diagnosis of lipomas often occurs incidentally while attempting to rule out other conditions in the middle or inner ear. The symptoms they may produce are highly variable, but lipomas typically remain asymptomatic, determining whether surgical treatment is necessary for resection. Performing a magnetic resonance imaging scan is essential to attempt to identify the origin of masses that may appear in the middle ear, although a definitive diagnosis must be confirmed through histopathological examination.

Informed consent

Written informed consent was obtained from the patient involved in this case.

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