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Incidental finding of a lipoma of the internal auditory canal in a 12-year-old patient

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ABSTRACT

Internal auditory canal lipomas are rare benign tumors that account for 0.08% of all intracranial tumors and can be confused with other more common lesions in this location, such as vestibular schwannoma.

We present the case of a 12-year-old girl who was incidentally diagnosed with an internal auditory canal lipoma on magnetic resonance imaging (MRI) requested to study seizures. The patient was asymptomatic at the time of consultation. Periodic follow-up included MRI and auditory and vestibular evaluations.

Accurate imaging diagnosis is essential for proper patient treatment, as internal auditory canal lipomas grow slowly and infrequently. Surgery is only indicated in cases of intractable or progressive symptoms or tumor growth.

Keywords: *case reports; lipoma; pontocerebellar angle; internal auditory canal.*

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INTRODUCTION

Lipomas in the pontocerebellar angle (PCA) and internal auditory canal (IAC) are rare benign tumors that account for 0.08% of intracranial tumors and can be confused with vestibular schwannomas.[1] Common symptoms include sensorineural hearing loss, tinnitus, and dizziness. Unlike schwannomas, lipomas envelop the nerves rather than compress them, making complete surgical resection difficult and risky. For this reason, surgery is generally not recommended unless symptoms are severe or the tumor is growing.[1] The average age of presentation is approximately 40 years, and it affects men slightly more than women; sensorineural hearing loss is the most common presenting symptom.[1]

We describe the case of a 12-year-old female patient with a lipoma in the left internal auditory canal, found incidentally during an examination for seizures. The importance of this report lies in the unusual nature of the case, both because of the patient's young age and the tumor's uncommon location. This case report adheres to CARE guidelines.

CLINICAL CASE

A 12-year-old female patient with a history of ornithine carbamoyltransferase deficiency (OTCD) presented with a first episode of generalized tonic-clonic seizures. A brain magnetic resonance imaging (MRI) scan with intravenous contrast identified a 7 mm lesion in the left internal auditory canal, consistent with a lipoma, which was hyperintense on T1, T2 (mostly heterogeneous), and FLAIR (*Figure 1*). The patient had no previous brain MRIs.

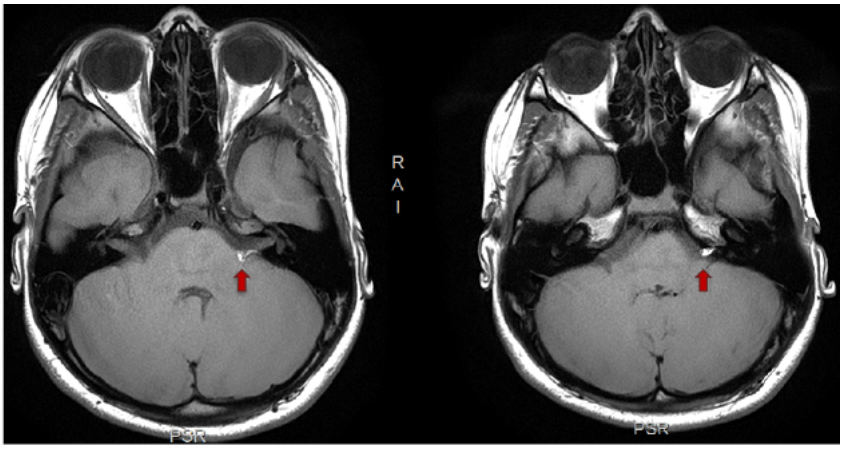
Due to the proximity of the injury to the acoustic-facial bundle, she was referred to Pediatric Otolaryngology. The patient had experienced short-lived dizziness and vertigo for months; the last episode had been a month before the consultation, but at the time of evaluation, she was asymptomatic. She did not report headache, motion sickness, falls, or vegetative symptoms. She also did not report hearing loss or tinnitus. When asked about family history, her mother reported suffering from migraine.

On physical examination, the patient had normal otomicroscopy. In vestibular tests, she did not present spontaneous nystagmus. The vestibulospinal pathway was evaluated using Romberg, Unterberger, and Barany index tests; no lateralization was observed. She was able to walk in tandem without difficulty. Upon examination of the vestibulo-ocular pathway, in slow pursuit, she presented few saccadic intrusions, and the clinical head impulse test was positive on the left. She did not present dysmetria or diadochokinesia.

Complementary studies were performed: tonal audiometry and speech audiometry with normal results; tympanometry showed a curve A in both ears.

The patient's vestibular system was evaluated by videonystagmography, during which no spontaneous nystagmus was observed in primary or extreme gaze. However, small accommodative movements were noted during oculomotor and

Figure 1. Nuclear magnetic resonance imaging of the brain with intravenous contrast



T1 hyperintense lesion (red arrow) consistent with lipoma in the left internal auditory canal.

tracking tests. (*Figure 2*). In the video head impulse test (VHIT), which measures the gain of the vestibulo-ocular reflex in the six semicircular canals, a decrease in gain was found in the left ear (horizontal semicircular canal) with a value of 0.74, below the normal range of 0.8-1.2. In contrast, the right ear showed a normal value of 0.91. The other canals were normal (*Figure 3*).

Checkups were scheduled every 6 months, including tonal and speech audiometry, tympanometry, VHIT, and an MRI every 2 years or if symptoms worsened. The patient remains asymptomatic six months after the first consultation.

DISCUSSION

Lipomas in PCA/IAC are very rare, accounting for only 0.08% of intracranial tumors and 0.1% of all PCA/IAC lesions. Their differential diagnosis includes vestibular schwannomas, epidermoid cysts, meningiomas, arachnoid cysts, dermoid cysts, and hemangiomas.[1]

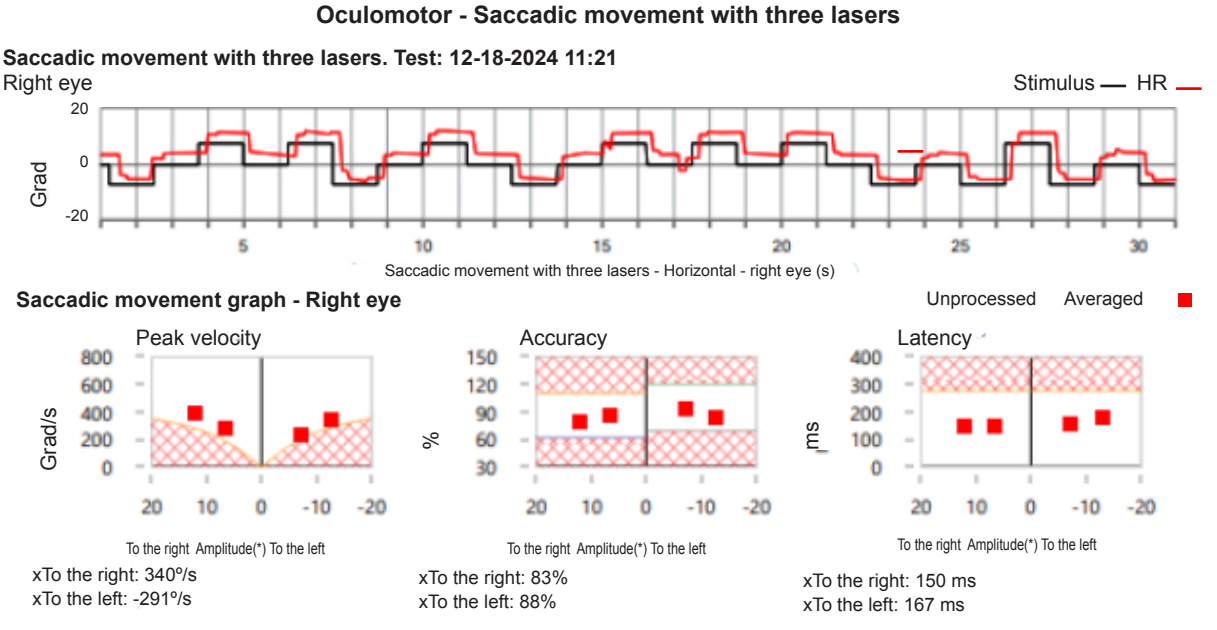
Regarding clinical presentation, the latest systematic review of 219 patients with PCA/IAC lipoma reported a median age at presentation of 42 years. It was slightly more common in males (53% vs. 47%). The most common symptoms were sensorineural hearing loss (69%), tinnitus (47%), and dizziness or instability (44%).[1] In our case, the age of presentation was lower (12 years), the diagnosis was incidental in the context of a study for a first seizure, and she was asymptomatic at the time of the first consultation in otolaryngology. However, she had a history of dizziness and vertigo, which had not been relevant or a reason for study until that time.

That episode of dizziness and vertigo could have been the first symptom of IAC lipoma or could also have been caused by other pathologies, which is why follow-up and a complete examination of vestibular symptoms are crucial.

In terms of imaging diagnosis, PCA/IAC lipomas are usually hypodense on computed axial tomography[2] and appear hyperintense on T1-weighted MRI, both before and after contrast. On T2-weighted MRI, they show high variability and do not enhance with contrast. Fat suppression helps to differentiate them from other lesions.[1,2]

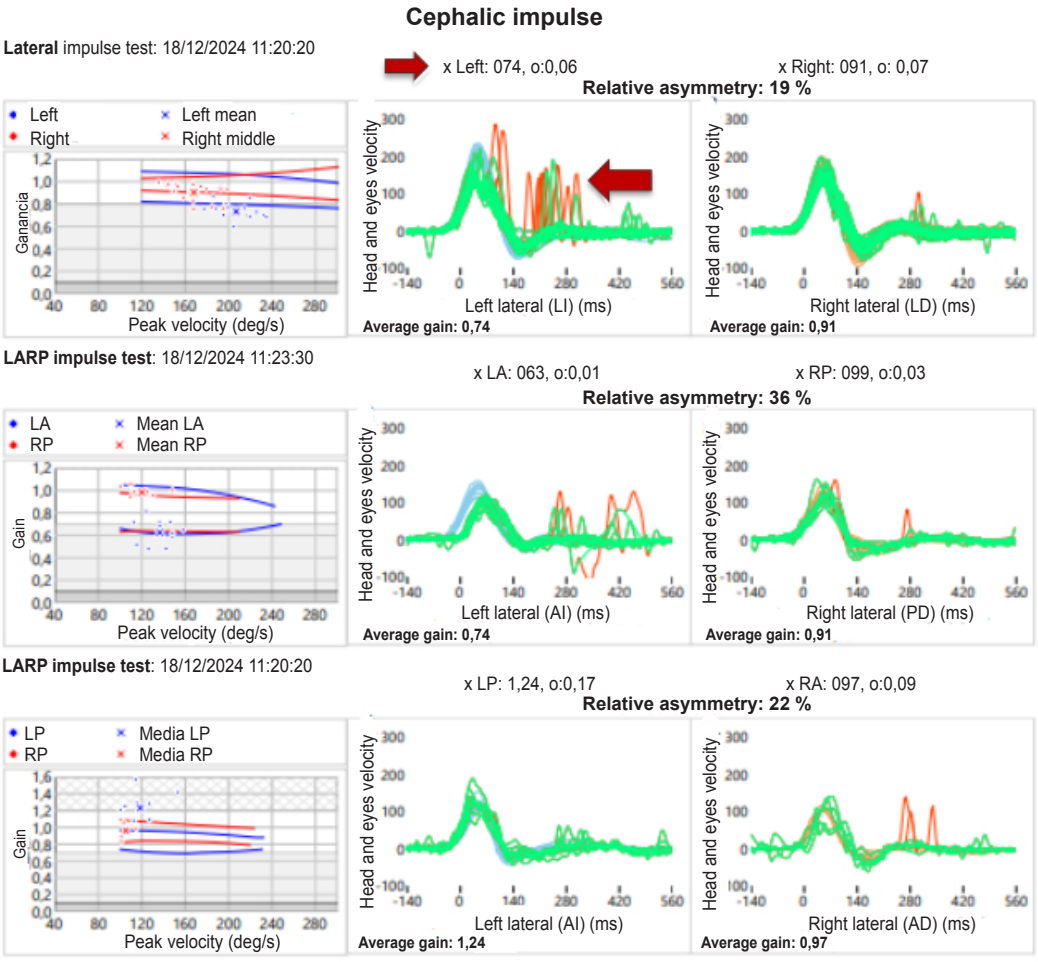
Historically, PCA/IAC lipomas required surgical biopsy for histopathological diagnosis. Due to advances in MRI, the need for these biopsies has decreased over time.[1] Many series highlight the poor outcomes of the surgical approach to this type of tumor, with increased morbidity, mortality, and costs. Advances in imaging techniques have enabled the incidental diagnosis of PCA/IAC lipomas, thereby reducing tumor size at the time

Figure 2. Random saccadic tracking, oculomotor assessment



Head and eyes velocity

Figure 3. Cephalic impulse test



LARP: left anterior, right posterior; RALP: right anterior, left posterior; LA. left anterior; RP: right posterior; LP: left posterior; RA: right anterior.
Decreased VOR (vestibulo-ocular reflex) gain in the left horizontal semicircular canal: Gain = 0.74. Normal value 0.8-1.2 with the presence of covert and overt saccades (red arrow).

of diagnosis. Currently, the average is 7 mm, according to recent studies (Totten et al., 2021; White et al., 2013),[1,3] compared with 11 mm in previous studies (Bigelow et al., 1998).[4]

The origin of lipomas in the context of PCA/IAC is uncertain. Some authors suggest that they arise from abnormal differentiation of primitive neural crest material, similar to other intracranial lipomas. This theory could explain their slow growth and their tendency to surround rather than compress neural structures.[1]

In the study by Totten et al., the growth of PCA/IAC lipomas was evaluated in 17 patients, and none showed growth during an average follow-up of 47 months. However, in their systematic review, three cases of slow growth of these lipomas were found, especially at an early age. Therefore, the authors recommend annual auditory and vestibular evaluations for 5 years in adults and 10 years in children, in addition to performing MRI every 2-3 years or when there are signs of worsening, as reported in previous studies.[1]

Surgery to treat severe vertigo is rare and generally does not improve symptoms; it may even worsen them, as it is associated with side effects such as hearing loss, headache, and facial paresis. Due to the proximity of tumors to neurovascular structures, total resection is difficult, and the approach may damage these structures. The translabyrinthine surgical approach, used in 25% of cases, results in

hearing loss on the affected side. Therefore, as it is unlikely that PCA/IAC will increase in size, most patients do not require surgery. Thus, it is crucial to perform a detailed evaluation of MRI images to establish the diagnosis and determine the appropriate treatment.[1]

This clinical case is relevant because, unlike most reports describing adults with audiological or vestibular symptoms,[1,5] it involves an asymptomatic pediatric patient with a history of dizziness and vertigo and an incidental diagnosis of internal auditory canal lipoma, with normal audiological tests and minimal vestibular findings.

The case presented in this article describes a 12-year-old asymptomatic girl with an incidentally diagnosed IAC lipoma; due to its low probability of growth, it was decided to follow up with periodic monitoring through hearing, vestibular, and imaging tests.

PCA/IAC lipomas grow slowly and rarely cause complications, so a wait-and-see approach is recommended unless they present with severe symptoms or significant growth. In pediatric patients, more rigorous and prolonged follow-up is suggested than in adults.

It is essential to take a detailed history focused on the tumor's presenting symptoms, as even asymptomatic patients may have relevant medical history, such as dizziness or vertigo. In addition to imaging and hearing tests, a complete vestibular evaluation is recommended, which may reveal subtle functional abnormalities that are not clinically evident. ■

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