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*Case Report*

# Diagnosis and Management of a Geniculate Ganglion Hemangioma: Case-Based Literature Review

**Naanani O*, El Mourabit F, Lahjaouj M, Loudghiri M, Bijou W, Oukessou Y, Rouadi S, Abada R, Roubal M and Mahtar M**

Department of Otolaryngology Head and Neck Surgery, University hospital Ibn Rochd, Casablanca, Morocco

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***Corresponding author:** Naanani O, Department of Otolaryngology Head and Neck Surgerya, University hospital Ibn Rochd, Casablanca, Morocco



## ABSTRACT

**Introduction:** Geniculate ganglion hemangiomas are rare benign vascular tumors of the facial nerve, typically presenting with slowly progressive facial palsy. Due to their anatomical location and non-specific clinical signs, diagnosis is often delayed.

**Case presentation:** We report the case of a 46-year-old man with no significant past medical history who presented with non-progressive right-sided facial paralysis. He denied hearing loss, vertigo, otorrhea, otalgia or tinnitus. Otoscopic examination was unremarkable. A high-resolution temporal bone CT scan revealed an osteolytic lesion centered on the geniculate ganglion, measuring 12 × 8 × 8 mm, with widening of the labyrinthine segment of the facial nerve canal. These findings were consistent with a geniculate ganglion hemangioma.

**Discussion:** This case highlights the diagnostic challenge of geniculate ganglion hemangiomas, which may present with isolated facial palsy in the absence of auditory or vestibular symptoms. Imaging-particularly CT and MRI-is crucial for diagnosis and surgical planning. Management depends on the severity of facial dysfunction and radiological extension.

**Conclusion:** In patients with unexplained facial palsy and normal otoscopic findings, clinicians should consider rare etiologies such as geniculate ganglion hemangioma. Early radiologic evaluation is key to accurate diagnosis and timely intervention.

**Keywords:** Geniculate ganglion hemangiomas; Tinnitus; Etiologies

## Introduction

Facial nerve hemangiomas are rare benign vascular tumors, most commonly located at the geniculate ganglion, due to its rich capillary network and anatomic vulnerability. They account for less than 1% of all intratemporal tumors and fewer than 100 cases have been reported in the literature to date[1,2]. These lesions typically present with progressive or fluctuating facial palsy, often mimicking Bell's palsy or other more common causes of facial nerve dysfunction[3].

Unlike schwannomas, hemangiomas tend to infiltrate the perineurium and surrounding bone, making surgical excision more complex and increasing the risk of postoperative sequelae[4]. High-resolution computed tomography (CT) often shows a well-defined osteolytic lesion with a characteristic "honeycomb" appearance at the geniculate ganglion, while magnetic resonance imaging (MRI) reveals intense enhancement after gadolinium administration[5].

Because of the rarity and often subtle clinical presentation-especially in the absence of hearing loss or vestibular symptoms-diagnosis is frequently delayed. Surgical resection is the treatment of choice in symptomatic cases, particularly when facial nerve function worsens. The choice of approach depends on the tumor's extension and the patient's hearing status[6].

We report a case of a geniculate ganglion hemangioma in a 46-year-old man presenting with isolated, non-progressive facial palsy and normal otoscopic and audiological findings, underlining the importance of early imaging in atypical facial paralysis.

## Case Report

A 46-year-old man with no significant medical history presented to our department with right-sided facial palsy that had remained stable over several weeks. The onset was spontaneous and not associated with systemic symptoms or otologic complaints. He denied hearing loss, vertigo, tinnitus, otorrhea or otalgia.

On physical examination, he had a House-Brackmann grade III facial palsy on the right side. Otoscopic examination was normal, with an intact tympanic membrane and no signs of middle ear pathology. Neurological examination was otherwise unremarkable.

Audiological evaluation revealed normal hearing thresholds bilaterally on pure-tone audiometry. Tympanometry was type A, indicating normal middle ear function **(Figure 1)**.

High-resolution computed tomography (CT) of the temporal bones revealed a well-defined osteolytic lesion centered on the geniculate ganglion, measuring 12 × 8 × 8 mm, with widening of the labyrinthine segment of the facial nerve canal. Magnetic resonance imaging (MRI) of the facial nerve demonstrated a lesion that was hyperintense on T2-weighted sequences and showed intense enhancement after gadolinium administration, with a typical "honeycomb" appearance. These findings were consistent with a geniculate ganglion hemangioma.

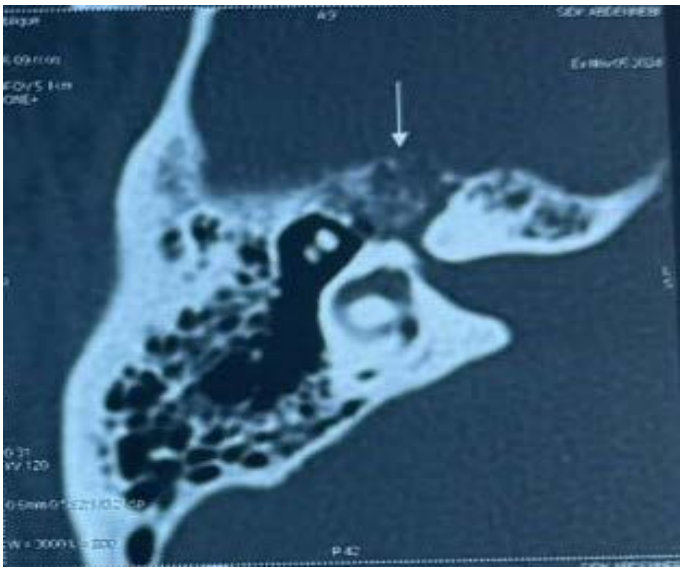

**Figure 1:** Axial high-resolution CT of the right temporal bone showing an osteolytic lesion centered on the geniculate ganglion (white arrow), with erosion of the adjacent facial nerve canal and widening of the labyrinthine segment. These radiological features are suggestive of a geniculate ganglion hemangioma

Surgical excision was performed under general anesthesia via a transmastoid approach. Intraoperatively, a reddish, vascular soft-tissue mass infiltrating the geniculate region of the facial nerve was identified. A subtotal resection was achieved with careful dissection to preserve facial nerve continuity.

The postoperative course was uneventful. The patient maintained stable facial nerve function (House-Brackmann grade III) at one-month follow-up, with no new neurological deficits. Definitive histopathological examination confirmed the diagnosis of a facial nerve hemangioma.

## Discussion

Facial nerve hemangiomas are rare, benign vascular tumors that most commonly originate from the geniculate ganglion, due to its rich capillary network and vulnerable location within the facial canal[7,8]. They account for less than 1% of all intratemporal lesions, yet remain an important differential diagnosis in cases of atypical facial nerve dysfunction[9].

The clinical presentation typically involves progressive or recurrent facial palsy, often misdiagnosed as idiopathic Bell's palsy, especially when auditory or vestibular symptoms are absent[10]. In our case, the patient presented with a stable, isolated facial weakness, without hearing loss, vertigo or otologic complaints. This pattern, although reported in the literature, may delay diagnosis. Hearing-related symptoms are present in approximately 40-60% of cases, but their absence does not rule out the diagnosis[11].

High-resolution CT and MRI are essential for diagnosis and preoperative evaluation. CT generally shows a lytic lesion involving the geniculate ganglion, with canal widening and trabeculated bone destruction-findings that were evident in our patient[12]. MRI adds specificity, typically demonstrating a hyperintense lesion on T2-weighted images with intense gadolinium enhancement. The classic "honeycomb" appearance reflects the tumor's vascular channels and internal septations[13,14].

The differential diagnosis includes facial nerve schwannomas, meningiomas and cholesteatomas. Schwannomas tend to cause fusiform enlargement of the nerve without bone erosion, while meningiomas exhibit homogeneous enhancement with potential dural involvement. In contrast, hemangiomas often show irregular erosion of the facial canal and heterogeneous internal architecture[15].

Surgical management remains the treatment of choice in symptomatic patients or in cases of radiological progression. The transmastoid approach, as employed in our case, is particularly suitable for lesions limited to the geniculate region, allowing adequate exposure with minimal cochlear trauma[16]. However, due to the tumor's infiltrative nature, complete resection often requires facial nerve sacrifice. A subtotal resection with nerve preservation, as performed here, may be considered to maintain facial function, especially in patients with moderate, non-progressive paralysis.

Histopathological examination confirms the diagnosis, with characteristic features including vascular proliferation-capillary or cavernous-surrounded by fibrous stroma. While these tumors are benign, their proximity to critical neurovascular structures mandates close long-term follow-up to monitor for recurrence, particularly after incomplete resection[17].

This case highlights the need to consider geniculate ganglion hemangiomas in the differential diagnosis of facial palsy, especially when clinical features are atypical. Early imaging and a multidisciplinary strategy are essential to optimize diagnosis, preserve function and guide therapeutic decisions.

Another key point discussed in the literature is the timing of surgical intervention in relation to facial nerve function. Several authors advocate for early surgery in patients with incomplete but progressive facial palsy, arguing that intervention before complete paralysis may improve the chances of functional recovery[18]. However, others support a more conservative approach in stable cases with preserved nerve function, especially given the risk of iatrogenic facial nerve injury during resection[19]. In our case, the decision to proceed with surgery was guided by imaging findings and the absence of clinical progression, with the goal of minimizing future deterioration. Intraoperative facial nerve monitoring, meticulous microsurgical technique and the possibility of nerve grafting in selected cases are essential components of contemporary management strategies[20]. These elements underscore the need for individualized care, weighing radiologic progression, functional status and surgical risk to determine the optimal timing for intervention.

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