Thrita. 2016 March; 5(1): e32143. doi: 10.5812/thrita.32143

Published online 2016 January 23. **Case Report**

Facial Nerve Neuroma in the Mastoid Segment of the Temporal Bone: A Case Report

Mahmood Shishehgar,[1] and Saeid Pourseirafi[1,*]

[1]Ear, Nose, Throat Department, Shiraz University of Medical Sciences, Shiraz, IR Iran

*Corresponding author: Saeid Pourseirafi, Ear, Nose, Throat Department, Shiraz University of Medical Sciences, Shiraz, IR Iran. Tel: +98-9120609390, Fax: +98-7136291478, E-mail: dr.s.pourseirafi@gmail.com

Received 2015 August 5; **Revised** 2015 August 17; **Accepted** 2015 August 25.

Abstract

Introduction: Facial nerve neuroma is a rare disease that comprises less than 1% of all intrapetrous mass lesions. Diagnosis of the lesions of the tumor is difficult, as these tumors have relationships with other structures of the lateral skull base, such as nerves. In addition, surgical treatment is difficult because the risk of injury after the intervention is high. In this case report, we describe the clinical findings, diagnosis, and treatment of a 55-year-old man with facial nerve neuroma in the mastoid portion, a rare type of neuroma who underwent surgical operation at Khalili Hospital, Shiraz, Iran.

Case Presentation: In this report, we describe a rare facial nerve neuroma in the mastoid portion in a 55-year-old man with a history of hypertension (HTN) and diabetes mellitus (DM). The patient also had otalgia related to the periauricular area, otorrhea, and tympanic membrane retraction on the left side. In addition, the patient had facial palsy (Brackmann grade V) and often suffered from headaches. Magnetic resonance imaging (MRI) with contrast, biopsy from the external ear canal region, and tympanometry were carried out. Then, the patient underwent surgical treatment, and the mass was successfully totally removed. The result of the patient's pathology test was margin free. At a recent follow-up, the patient was still symptom-free (otalgia and headache).

Conclusions: In surgery for facial nerve neuroma in the mastoid segment, it is better not to rely on imaging alone; all facial nerves from the geniculate ganglion to the styloid foramen become exposed for tumor removal.

Keywords: Facial Nerve Neuroma, Mastoid Segment, Temporal Bone

1. Introduction

Facial nerve neuroma is rare a disease that represents less than 1% of all intrapetrous mass lesions (1, 2). A review study found that, since the first reported case in 1931 described by Schmidt, approximately 500 cases of facial nerve neuroma have been published (3, 4). These tumors can present along the cerebellopontine angle to the extratemporal peripheral portion of the seventh cranial nerve (1, 4). The variety of sites affected by the tumor and the proximity of the tumor to the auditory apparatus can create diverse clinical situations (1). The geniculate ganglion and the labyrinthine or tympanic portions of the facial nerve are the most commonly involved segments (2). However, tumor in the mastoid segment of the temporal bone, as in our case, is very rare. It has been stated that clinical symptoms depend on the location of the tumor (3). Diagnosis and identification of the tumor lesions and the main trunk of the facial nerve is difficult, as these tumors have relationships with other structures of the lateral skull base (5, 6). Based on previous studies, surgical treatment is difficult because the risk of injury after the intervention is high and the results of facial nerve repair after surgery are rarely described (5). In addition, because this type of tumor is rare, its surgical management is challenging (7). In this case report, we describe the clinical findings, diagnosis, and treatment of a 55-year-old man with facial nerve neuroma in the mastoid portion who underwent a surgical operation at Khalili Hospital, Shiraz, Iran.

2. Case Presentation

A 55-year- old man with a history of hypertension (HTN) and diabetes mellitus (DM) presented to his physician with the complaint of otalgia in his left ear for more than one year. He had history of DM in his family. His education level was guidance school, and his socioeconomic level was the middle class. Initially, he underwent treatment for external otitis with administration of betamethasone and ciprofloxacin drops. After 2 months, he was referred to the hospital near his home because of otalgia and lack of improvement. Magnetic resonance imaging (MRI) with contrast, biopsy from external ear canal region, and tympanometry were carried out. The results of his tests were as follows: Tympanometry: Left ear: B type, right ear:

A type; Pure tone auditory (PTA): Left and right ear sensorineural hearing loss (SNHL) at high frequency; Biopsy from external ear canal region: Compatible with fibrous tissue and granulation tissue, suggesting fibroma (with suspicion of malignant external otitis); and MRI with contrast: Evidence of left sided bony filling defect in the mastoid; Middle ear hypotympanum with pathological soft tissue observed extending to the tympanic membrane, which was retracted and thickened; this opacity was found to be continuous with an expansive erosive process along the posterior wall facial recess, descending through the facial nerve canal down the stylomastoid foramen, and obliterating the retrostyloid fat plane; and High suggestion of facial nerve neuroma. This patient was then referred to our department at Khalili hospital, Shiraz, Iran (2014). On physical examination, he had otalgia in relation to the periauricular area, otorrhea, and tympanic membrane retraction on the left side. In addition, the patient had facial palsy (Brackmann grade V) and often suffered from headache. He had high fasting blood sugar (FBS; 175 mg/dl) and uncontrolled DM. Informed consent was obtained from the patient; he was scheduled for rollout facial nerve neuroma and underwent left tympanomastoidectomy and left facial nerve decompression. After microscopic otoscopy (MO), a retracted TM was seen. After postauricular incision, the tympanomeatal flap was elevated. The chain of ossicles and mucosa in the middle ear was normal. The mastoid cavity was opened and no granulation tissue or other pathological tissue was seen. The fallopian canal from the total mastoid segment to the styloid foramen was decompressed. A mass of about 15 × 5 mm in size in the mastoid segment of the fallopian canal was seen. Anterior and posterior atticotomy wass carried out. The mass was removed from the distal and proximal areas with a 1 mm margin and grafted with nerve harvested from the greater auricular nerve. Finally, the canal defect was reconstructed with cartilage that was harvested from left ear conchae. The mass was sent for pathology; the results showed that it was margin free. After the surgery, the patient was examined every 6 months. After one year, at a recent follow-up, it was found that the patient is still symptom-free (otalgia and headache). All procedures contributing to this work comply with the principles stated in the declaration of Helsinki ethical principles for medical research Involving Human Subjects, adopted by the 18th world medical assembly, Helsinki, Finland, June 1964, and as amended most recently by the 64th world medical assembly, Fontaleza, Brazil, October 2013. Before the surgery, informed consent was obtained from the patient.

3. Discussion

Facial nerve neuroma is extremely rare; it can occur at any age and has no particular gender predilection (4). Wilkinson and his colleagues reported that facial nerve tumors affected different parts of the anatomy, as follows: 65.8% in the geniculate ganglion, 53.2% in the tympanic segments, 50.6% in the labyrinthine portion, 48.1% in the internal auditory canal, 29.1% in the mastoidal segment, and 8.9% in the extratemporal segments (8). The most frequent presenting symptoms that occur with facial nerve neuromas are sensorineural hearing loss and facial palsy (1). Thus, the site of the tumor, extension of the tumor, and the way the tumor affects surrounding structures determine a variety of clinical symptoms and surgical challenges (1, 4). A common presenting complaint is slowly progressive or sudden facial weakness (1). It has been reported that facial nerve neuroma is the cause of Bell's palsy in 5% of patients (9). However, in 27% of patients, normal facial nerve function has been reported (10). Depending on the origin of the tumor, sensorineural or conductive impairment may occur (1). To obtain a diagnosis and decide on the most appropriate therapeutic method, MRI and computed tomography (CT) scans are mandatory (2). It has been reported that these encapsulated tumors sometimes attached to the nerve and can push the axons when they are growing (1). There are few reports on dissection of the tumor from the nerve and obtaining normal functional outcomes (1). According to the anatomical location of tumor and its extension, the surgical procedure should vary (2). Consequently, the first consideration in selecting a procedure is the type of hearing disturbance. As stated in previous studies, transmastoid operation with tympanoplasty, as in our case, is selected for the treatment of tumors on the mastoidal or tympanic parts of the nerve. The translabyrinthine route is preferred if the patient is deaf and the tumor affects segments near the cochleariform process (2). Surgical treatment of these tumors is challenging, as this tumor appears with different clinical features in each case. As mentioned above, diagnosis and identification the exact location of the tumor is difficult; we experienced this challenge in our surgery. It is important to state that we identified the exact location of facial nerve neuroma intraoperatively. Moreover, it is crucial to expose the entire facial nerve during surgery, from geniculate ganglion a common site of facial nerve neuroma to the styloid foramen. It is also important to examine facial nerve function and follow up after surgery, as we did, for at least one year. In surgery for facial nerve neuroma in the mastoid segment, it is better not to rely on imaging. Rather, the entire facial nerve from the geniculate ganglion to the styloid foramen should be exposed for tumor removal.

Footnote

Authors' Contribution: All authors of this article were involved in the investigation, approved the paper, and agreed to its submission and publication in this journal.

References

1. Kirazli T, Oner K, Bilgen C, Ovul I, Midilli R. Facial nerve neuroma: clinical, diagnostic, and surgical features. *Skull Base.*

2004;**14**(2):115–20. doi: 10.1055/s-2004-828707. [PubMed: 16145593]
2. Minovi A, Vosschulte R, Hofmann E, Draf W, Bockmuhl U. Facial nerve neuroma: surgical concept and functional results. *Skull Base.* 2004;**14**(4):195–200. doi: 10.1055/s-2004-860948. [PubMed: 16145605]
3. McClelland S, Dusenbery KE, Higgins PD, Hall WA. Treatment of a facial nerve neuroma with fractionated stereotactic radiotherapy. *Stereotact Funct Neurosurg.* 2007;**85**(6):299–302. doi: 10.1159/000107364. [PubMed: 17709984]
4. WRainsbury JW, Whiteside OJ, Bottrill ID. Traumatic facial nerve neuroma following mastoid surgery: a case report and literature review. *J Laryngol Otol.* 2007;**121**(6):601–5. doi: 10.1017/S0022215106004993. [PubMed: 17140460]
5. McRackan TR, Wilkinson EP, Rivas A. Primary Tumors of the Facial Nerve. *Pediatr Clin North Am.* 2015;**48**(3):491–500. doi: 10.1016/j.otc.2015.02.008.
6. Jaiswal A, Mridha AR, Nath D, Bhalla AS, Thakkar A. Intraparotid facial nerve schwannoma: A case report. *World J Clin Cases.* 2015;**3**(3):322–6. doi: 10.12998/wjcc.v3.i3.322. [PubMed: 25789306]
7. Rigante M, Petrelli L, De Corso E, Paludetti G. Intracapsular microenucleation technique in a case of intraparotid facial nerve schwannoma. Technical notes for a conservative approach. *Acta Otorhinolaryngol Ital.* 2015;**35**(1):49–52. [PubMed: 26015652]
8. Wilkinson EP, Hoa M, Slattery WH, Fayad JN, Friedman RA, Schwartz MS, et al. Evolution in the management of facial nerve schwannoma. *Laryngoscope.* 2011;**121**(10):2065–74. doi: 10.1002/lary.22141. [PubMed: 21898431]
9. Latack JT, Gabrielsen TO, Knake JE, Kemink JL, Graham MD, Gebarski SS, et al. Facial nerve neuromas: radiologic evaluation. *Radiology.* 1983;**149**(3):731–9. doi: 10.1148/radiology.149.3.6606188. [PubMed: 6606188]
10. Sataloff RT, Frattali MA, Myers DL. Intracranial facial neuromas: total tumor removal with facial nerve preservation: a new surgical technique. *Ear nose throat J.* 1995;**74**(4):244–6. [PubMed: 7758424]