CASE REPORT

Intracanalicular and Intratemporal Facial Nerve Schwannomas

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Abstract—Facial nerve schwannomas can mimic acoustic neuromas. We report herein two cases: a purely intracanalicular and an intratemporal facial nerve tumor extending into the internal auditory canal and the cerebellopontine angle. These tumors have to be suspected in patient with small-size tumors presenting with facial paralysis. We advocate translabyrinthine or middle fossa approach to facilitate nerve anastomosis. The establishment of the correct preoperative diagnosis is difficult, but the patient must be warned about the impossibility of preserving the facial nerve in these tumors. (*Skull Base Surgery*, 6(2):129–132, 1996)

Two problems are associated with purely intracanalicular neuromas. The first is that these tumors are often regarded as the earliest stage of vestibular schwannomas. It is therefore expected that the facial and cochlear nerves may be preserved during surgery. This hypothesis has been discussed recently and is controversial.¹ The second problem involves thinking that all intracanalicular tumors with acoustic neuromas¹ MR features are vestibular schwannomas. Twenty percent of all intracanalicular tumors are not acoustic neuromas.² Some of them are facial nerve schwannomas.

We report herein two cases in which tumors arising in the internal auditory canal were not vestibular schwannomas. The preoperative diagnosis was acoustic neuroma. The first was a purely intracanalicular facial nerve schwannoma and the second a tumor arising from facial canal and extending into the cerebellopontine angle. In both cases, the first and principal symptom was hearing loss. The facial deficit was secondary. These two cases illustrate the dilemma involved in choosing an approach to these small tumors: does one use the suboccipital, middle fossa, or transpetrous approach? We will discuss these different possibilities.

CASE PRESENTATION

Case 1

A 40-year-old woman complained of a 1-year history of tinnitus, vertigo, and partial hearing loss associated with slight right facial dysesthesia and fasciculations. Electromyography revealed right facial neurogenic atrophy. CT-scan and MRI (Fig. 1) demonstrated a typical intracanalicular neuroma. The transmeatal suboccipital approach was chosen to attempt to preserve social hearing. The vestibular and cochlear nerves were not encased by the facial neuroma, which was purely intracanalicular. Complete tumor removal was achieved, but preservation of the facial nerve was impossible. Immediate end-to-end anastomosis was then performed using stitches and fibrine glue. This was difficult because the approach we chose provided poor exposure of the distal stump of the nerve after section. The quality of recovery falls in Grade 4 according to the House and Brackman grading system.

Figure 1. Case 1: intracanalicular schwannoma, T1-weighted MR images after gadolinium infusion.

Case 2

A 63-year-old man was referred for a progressive right partial facial paralysis. Complete right deafness had been present for 7 years. CT scan revealed widening of the internal acoustic canal and the horizontal portion of the facial canal. MRI demonstrated the exact limits of the tumor which extended from the cerebellopontine angle to the labyrinthine portion of the facial canal. Using an enlarged translabyrinthine approach, complete tumor resection was performed without preservation of the facial nerve. An end-to-end anastomosis was performed. Be-

cause of poor results, a spinofacial anastomosis was required, leading to a moderate facial dysfunction.

DISCUSSION

About 37% of patients with vestibular schwannoma present with facial nerve damage at the time of tumor diagnosis.³ It seems that in cases in which a preoperative lesion is discovered only at electromyography, the postoperative results are poor compared with patients without facial nerve damage.⁴ On the other hand, facial neuromas

Figure 2. Case 2: temporal bone erosion on CT scan with enlargement of the internal auditory canal, labyrinthine (white star) and geniculate portion (wide arrow) of the facial canal. The erosion extends to the tympanic portion of the facial nerve.

Figure 3. Case 2: T1-weighted images after gadolinium infusion; portion of the facial schwannoma extending into the cerebellopontine angle at the inferior part of the porus.

do not always lead to progressive paralysis.⁵ The following clinical signs and symptoms may lead to the diagnosis of such tumors: twitches, fasciculations, long-standing pain in patients with facial paralysis, a parotid or ear mass, unilateral recurrence, or long-standing paralysis. We have to remember that the clinical signs in these two different diagnoses are sometimes overlapping.

In our patients, especially in Case 1, the facial symptoms were secondary. In this first case, the correct diagnosis could not be evoked on radiologic features which were typical of a vestibular schwannoma. Perhaps, in the future, the addition of thin gradient-echo images to a gadolinium-enhanced T1-weighted one, should allow us to distinguish a purely intracanalicular facial neuroma from a stage 1 vestibular schwannoma.

In Case 2, the preoperative diagnosis of facial neuroma should have been done on CT scan (Fig. 2) and MRI (Figs. 3, 4). However, some vestibular schwannomas invade the temporal bone in an atypical fashion.⁶ Therefore,

MRI could also serve as the preoperative diagnosis. MRI also shows a dural enhancement after contrast infusion which is not characteristic of schwannomas (Figs. 3, 4).

The most common localization of these tumors is at the geniculate ganglion,⁷ but they also arise between the cerebellopontine angle and the smallest branches of the facial nerve. Intracanalicular tumors are rare (2/12 in Sterkers' series) but must be kept in mind.

Small intracanalicular tumors can be removed completely by the translabyrinthine or middle fossa approach.^{8,9} If the tumor does not reach the fundus of the internal acoustic canal, the transmeatal suboccipital route is also useful and has been recommended by several authors.^{10,11} The middle fossa or suboccipital approach is mandatory if preservation of serviceable hearing is attempted. In the case of deafness or significant deterioration of hearing, the translabyrinthine approach is probably the safest route that can be proposed.¹²

In our experience, end-to-end anastomosis or graft

Figure 4. Case 2: T1-weighted images after gadolinium infusion, intracanalicular and geniculate portion of the tumor. Take note of the "dural tail" due to abnormal vascularization of the dura at the posterior part of the porus (black arrow).

of the facial nerve is difficult to perform via the suboccipital approach in cases of facial schwannoma, and can only be performed with satisfying results by an enlarged translabyrinthine or middle fossa approach. Indeed, the former does not allow exposure of the labyrinthine portion or the tympanic portion of the facial nerve, which is often required to avoid tension. Primary suture is the procedure of choice for nerves divided at operation. Nerve graft should be carried out as one-stage surgery whenever suture following segmental nerve resection is unfeasible.

CONCLUSION

Intracanalicular facial nerve schwannomas must be suspected whenever there is the possibility of facial paralysis in patients with small tumors. Translabyrinthine or the preferred middle fossa approach is then recommended to facilitate nerve anastomosis or graft. Clinical features, electromyography, and a careful evaluation of both CT scan and MRI help in making a correct diagnosis. The preoperative identification of these tumors allows a surgeon to warn the patient that it is impossible to preserve the facial nerve in these tumors.

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