

Infratemporal facial nerve schwannoma

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Abstract: Facial nerve schwannomas are infrequent benign neoplasms that present a challenge in diagnosis and management.

We report a case of a 61-year-old woman who presented with left-sided progressive facial nerve paralysis of one-year duration. Computed tomography of the temporal bone showed a tissue mass in relation with the tympanic segment of the facial nerve with destructive changes in the facial recessus region. Magnetic resonance images before and after gadolinium injection revealed a contrast-enhancing mass lesion in the tympanic cavity. The tumour was removed totally through an infratemporal approach; as the tumour could not be distinguished from the nerve a segment of facial nerve was sacrificed. Histopathological diagnosis was schwannoma arising from the facial nerve. At the end of two-year follow-up, the patient had a moderately severe facial nerve dysfunction.

Consensus recognises total resection with facial nerve sacrifice is the best treatment for these tumours. We discuss the currently accepted management approach as well as the treatment modalities for recovering facial function. (p105-107)

Introduction

Schwannomas arising from the facial nerve are considered to be rare.^{1,3,5,8,11} The tumour originates in the nerve sheath in a focal manner as a solitary and well-encapsulated mass. Because of the long complex course of the facial nerve, facial nerve schwannomas (FNS) may originate from any segment of the nerve and show various degrees of extension.^{5,7,9}

They have various manifestations, including facial palsy, hearing loss, vestibular weakness, a palpable parotid mass and even on occasions no symptoms, depending on size and site.^{4,6,10} The aim of surgery in FNS is complete tumour excision with preservation of the facial and hearing functions.

Case Report

A 61-year-old woman presented with history of progressive left facial paresis of one-year duration.

On neurological evaluation, she had total infranuclear facial palsy, associated with decreased tear secretion but without hearing disturbance.

Computed tomography (CT) of the temporal bone showed a soft tissue mass in relation with the tympanic segment of the facial nerve with destructive changes in the facial recessus region. Magnetic resonance images (MRI) before and after gadolinium injection revealed homogeneously contrast-enhancing mass lesion in the tympanic cavity, corresponding to the location of the geniculate ganglion without extension to the meatal portion of the facial nerve (Fig. 1).

She underwent left temporal craniotomy. The tumour was approached extradurally and dissected circumferentially and was excised completely. It was arising from the geniculate ganglion of the facial nerve. The adjoining cranial nerves were saved. The small bony defect in the petrous bone was repaired with temporalis fascia (Fig. 2).

Histopathological diagnosis was schwannoma arising from the facial nerve. At three-year follow-up, the patient showed moderate improvement in facial function.

Discussion

Neoplasms account for 5% of facial palsies and schwannomas comprise only a small fraction of these.^{2,6,7} Facial palsy is induced by various causes, with 50-80% of cases thought to be idiopathic.³ Since Schmidt first reported a case of FNS, many authors reported a 0.15-0.8% prevalence of FNS.^{1-3,7,8}

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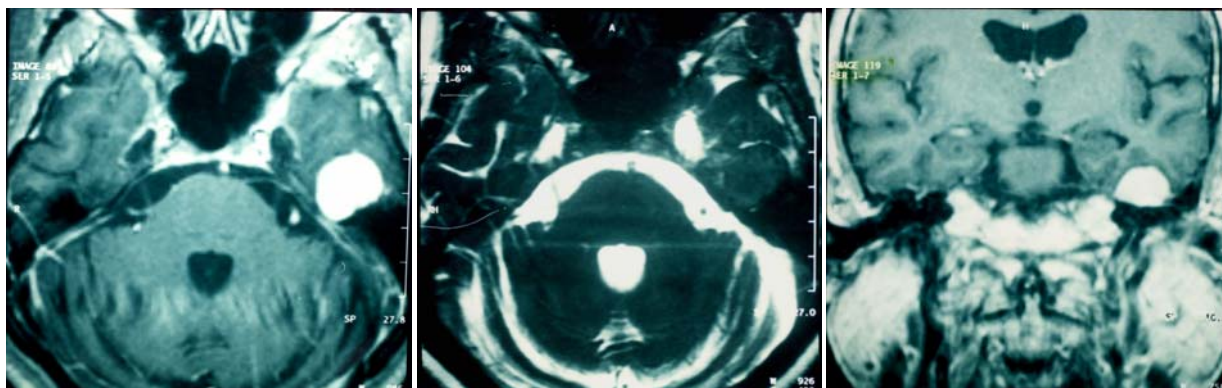


Figure 1 - Axial and coronal MRI showing a small 2 x 2.5 cm well-enhanced mass in the left infratemporal area

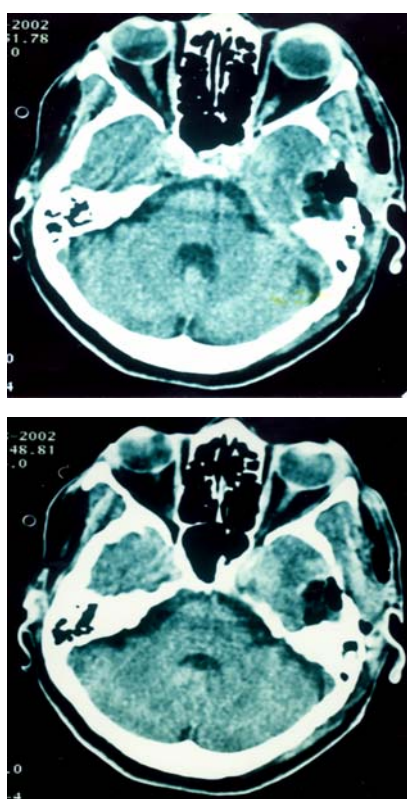


Figure 2 - Axial CT scans showed a total removal of the lesion

They may originate from any segment of the nerve and show various degree of extension. Among 238 cases reviewed by Lipkin, et al the tympanic segment was most frequently involved (58%), followed by the vertical (48%), the labyrinthine (including the geniculate ganglion) (42%) and the meatal segments (30%).^{1,2,6}

Recently, however, with the advancements in neuroradiological studies and neurosurgical practice, FNS may be

found to arise from the area of the geniculate ganglion more frequently. Approximately 30 cases of FNS presenting as middle cranial fossa lesions and originating from geniculate ganglion are reported in the literature.⁴

The clinical features depend upon the site of origin of the tumour of the facial nerve and the direction of its growth. Facial palsy is a distinctive and relatively common symptom, having an 84% incidence in middle fossa tumours and 34% in extratemporal tumours.^{3,4} Some authors have reported that hearing loss and tinnitus were the most common symptoms, and facial palsy was found in only 45% of 48 cases.¹ Radiologic tools for evaluating such lesions are high resolution CT and MRI. Delineation of the complex bony structures within the petrous bone is a key to the preoperative determination of tumour location and its extension. Radiologic demonstration of a mass that conforms to the bony facial canal should not be the only basis for the diagnosis of a facial schwannoma. Magnetic resonance imaging gadolinium-enhanced has made it possible to diagnose small FNS earlier and can differentiate them from haemangioma, cholesterol granuloma, meningioma and epidermoid cysts.^{4,6,7}

The management strategy for facial schwannoma consists of tumour removal and facial nerve reconstruction. The surgical approach to FNS is selected according to the location and extension of the tumour and state of hearing.^{5,8}

In these lesions, the facial nerve should be first identified in the fallopian canal and the nerve can be followed through the tumour while performing decompression and excision. This method shall probably enhance the chances of facial nerve preservation or re-animation.

Indication for surgery is a controversial problem because facial palsy is inevitable after surgical resection. King and Morrison eliminated young patients without facial palsy as surgical candidates and Lipkin, et al described that the best

results from facial nerve grafting are obtainable only when moderate dysfunction has developed.^{3,5,6}

To the contrary, Symon, et al proposed no delay in surgery, because of increased risk to hearing and better results of facial reconstruction with those having no facial palsy. There is no adequate data available to judge the best timing to perform an operation to obtain the best functional recovery of the facial nerve. Many authors have insisted that it is beneficial to operate as early as possible except in cases of poor general status or advanced age.^{5,7,8,10}

We agree with early operation to make the correct diagnosis of this tumour of rare incidence, and carry out anastomosis with the shortest distance possible before the tumour enlarges.

The greatest determinant of outcome is the duration of preoperative facial paralysis. The recovery to grade III in House-Brackmann, seems to be the best result we can expect at present.

Conclusion

Facial nerve schwannomas are extremely slow growing and frequently present without facial dysfunction. It is possible to surgically remove these tumours while sparing the nerve; as a result, postoperative function is correspondingly better. Finally, the decision on how to treat these patients should be individualised and based on initial facial function, growth rate, surgeon experience and informed patient consent.

References

1. Chung JW, Ahn JH, Kim JH, Nam SY, Kim CJ, Lee, KS: Facial nerve schwannomas: Different manifestations and outcomes. *Surg Neurol* 2004, 62: 245-52
2. Gancedo F, Lorenzo L, Salgado P, Hidalgo S: Facial nerve schwannomas. Report of a case. *An Otorrinolaringol Ibero Am* 2004, 31: 205-14
3. King TT, Morrison AW: Primary facial nerve tumors within the skull. *J Neurosurg* 1990, 72: 1-8
4. Kubota Y, Kawamata T, Kubo O, Kasuya H, Muragaki Y, Hori T: Large facial nerve schwannomas without facial palsy: Case reports and review of the literature. *Neurosurg Rev* 2005, 28 (3): 234-8
5. Lassaletta L, Castro A, Patron M, Sarria MJ, Gavilan J: Diagnosis of intracranial facial nerve schwannoma: Clinical, and radiological factors, and the value of immunohistochemistry. *Acta Otorrinolaringol Esp* 2004, 55: 399-403
6. Lipkin AF, Coker NJ, Jenkins HA, Alford BR: Intracranial and intratemporal facial neuroma. *Otolaryngol Head Neck Surg* 1987, 96: 71-9
7. Perez R, Chen JM, Nedzelski JM: Intratemporal facial nerve schwannoma: A management dilemma. *Otol Neurotol* 2005, 26: 121-6
8. Schmidt PH: Intratemporal neurinoma of the facial nerve. *Pract Otorhinolaryngol (Basel)* 1965, 27: 127-137
9. Shenoy SN, Munish GK, Raja A: Middle cranial fossa schwannoma of the facial nerve. *Neurol India* 2004, 52: 396-397
10. Symon L, Cheesman AD, Kawachi M, Bordt L: Neuromas of the facial nerve: A report of 12 cases. *Br J Neurosurg* 1993, 7:13-22
11. Ulku CH, Uyar Y, Acar O, Yaman H, Avunduk MC: Facial nerve schwannomas: A report of four cases and review of the literature. *Am J Otolaryngol* 2004, 25: 426-31
12. Yamaki T, Morimoto S, Ohtaki M, Sakatani K, et al: Intracranial facial nerve neurinoma: Surgical strategy of tumor removal and functional reconstruction. *Surg Neurol* 1998, 49: 538-46

GENTLE REMINDER

Imaging features of benign and malignant tumours of the skull

Benign features	Malignant features
<ul style="list-style-type: none"> • Single lesion • Sclerotic border • Smooth border • Well demarcated • Expansion of diploe and thinning of cortical bone • Intralesional bone remnants or trabeculations 	<ul style="list-style-type: none"> • Multiple lesions • Bone destruction • Periosteal reaction • Soft tissue mass • Poorly circumscribed (ragged undermined edges)