

Management of acoustic neuromas in the elderly: Retrospective study

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Abstract

The wide availability of gadolinium-enhanced magnetic resonance imaging (MRI-Gd) has led to the discovery of an increasing number of small and less symptomatic acoustic neuromas in elderly patients. We conducted a retrospective study in order to obtain data on outcomes and complications associated with different management strategies that would be useful in establishing a management guideline. We identified 44 patients aged 65 to 77 years with acoustic neuromas who had been managed with either surgery or simple observation with MRI-Gd imaging. Of the entire group, 36 patients had tumors larger than 1 cm, and they underwent surgery (most via the translabyrinthine approach). Complete removal of the tumor was achieved in 34 of these patients (94.4%). At the 1-year follow-up, grade VI facial nerve paralysis was evident in only two of 35 evaluable patients (5.7%). Postsurgical complications occurred in five patients (13.9%), including one death. The remaining eight patients had tumors 1 cm or smaller, and they were managed with periodic MRI-Gd scanning. At the 5-year follow-up, no tumor growth was seen in six of these patients. The other two patients exhibited a tumor growth rate of less than 2 mm per year. No patient in the observation group required surgical intervention.

Introduction

In 1992, Tos et al published the results of their epidemiologic study in which they found that the incidence of small

acoustic neuromas was increasing.¹ Since then, a number of factors has contributed to the discovery of a corresponding increase in the number of small and less symptomatic acoustic neuromas in elderly patients (age: 65 yr).^{2,3} Among these factors are the wide availability of gadolinium-enhanced magnetic resonance imaging (MRI-Gd), a higher index of suspicion among physicians, the increasing interest in geriatric medicine, and a better informed patient population.^{2,3} Even so, data specific to older patients are sparse because few epidemiologic studies limit their populations to this age group.

Several recent developments have markedly reduced the rate of complications of neurotologic surgery for small acoustic neuromas, including progress in microsurgical and neuroanesthesiologic techniques and the greater availability of monitoring equipment.^{4,5} Because the incidence of mortality and morbidity is higher in patients with large tumors—especially in the elderly and infirm—surgical removal of an acoustic neuroma is not always the management option of choice at the point of diagnosis.⁶⁻⁸ Indeed, some acoustic neuromas remain stable over the expected lifespan of the patient.⁹ Therefore, in selected patients, it is reasonable to simply monitor acoustic neuromas with MRI-Gd (“watch and scan”).¹⁰

The primary factors that affect the management of acoustic neuromas in elderly patients are (1) the tumor’s size, (2) the tumor’s growth rate, (3) the patient’s age, (4) the patient’s general health, (5) the pretreatment status of the patient’s hearing in the affected and contralateral ears, and (6) the patient’s preference.^{11,12} In this article, we describe our retrospective study of the management of elderly patients with acoustic neuromas, and we discuss our findings with respect to outcomes and complications associated with different management strategies.

Patients and methods

Between July 23, 1975, and May 21, 1996, the ENT department at the University of Parma admitted 416

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Table. Pre- and postoperative incidence and type of facial nerve function according to the House-Brackmann grading system¹³

	Grade I n (%)	Grade II n (%)	Grade III n (%)	Grade IV n (%)	Grade V n (%)	Grade VI n (%)
Preop (n = 36)	33 (91.7)	1 (2.8)	0	1 (2.8)	1 (2.8)	0
Immediate postop (n = 36)	13 (36.1)	4 (11.1)	2 (5.6)	3 (8.3)	1 (2.8)	13 (36.1)
10 days postop (n = 35*)	9 (25.7)	3 (8.6)	2 (5.7)	3 (8.6)	1 (2.9)	17 (48.6)
1 year postop (n = 35*)	13 (37.1)	4 (11.4)	11 (31.4)	5 (14.3)	0	2 (5.7)

* One patient died 3 days after surgery.

patients who had an acoustic neuroma. Of this group, we identified 44 elderly patients—23 women and 21 men, aged 65 to 77 years (mean: 70)—who had not undergone any previous treatment for their tumors. According to the University of Parma's policy for treating acoustic neuromas in the elderly, surgery is indicated for tumors that protrude more than 1 cm into the cerebellopontine angle, while simple observation is indicated for tumors that are 1 cm or smaller. Tumor size is determined by measuring the largest diameter observed on MRI-Gd. In accordance with these criteria, 34 patients were initially scheduled for surgery and 10 for conservative management. However, two patients in the latter group exhibited a progression of symptoms and radiologic signs of tumor growth (>2 mm) at the 1-year follow-up, and they were then switched to the surgical group.

Among the 36 patients in the surgical group, the translabyrinthine approach was used to treat 32 (88.9%), the retrosigmoid approach was used in three (8.3%), and a combined approach was used in one (2.8%). Follow-up MRI-Gd scans were recommended at 1 and 5 years for patients who underwent a complete excision of their tumor and at 1, 3, and 5 years for those who underwent an incomplete removal. In the nonsurgical group, MRI-Gd was performed every 6 months during the first year and yearly thereafter.

Results

Surgical results. Complete excision was achieved in 34 of the 36 surgical patients (94.4%); in the remaining two patients (5.6%), a near-total removal was achieved.

Facial paralysis. Immediately following surgery, 13 patients (36.1%) exhibited grade VI facial nerve paralysis according to the House-Brackmann grading system (table).¹³ Grade VI paralysis was seen in 17 of 35 evaluable patients (48.6%) at the 10-day follow-up (one patient died 3 days following surgery), but in only 2 of the 35 evaluable patients (5.7%) at the 1-year follow-up.

Hearing preservation. Hearing preservation was attempted in three surgical patients, but was successful in

only one. Preoperatively, the successful patient's pre-treatment pure-tone average was 45 dB and his speech discrimination score was 50% (hearing class B, according to guidelines published by the American Academy of Otolaryngology–Head and Neck Surgery [AAO–HNS]¹⁴); the corresponding postoperative values in this patient were 45 dB and 46% (hearing class D).

Complications. Postoperative complications occurred in five of the 36 patients (13.9%), including the one death, which had been caused by acute pulmonary edema and renal hemorrhagic infarction. Another patient was rushed back to surgery for treatment of postoperative hemorrhage into the cerebellopontine angle, and her subsequent postoperative course was uneventful. Cerebrospinal fluid leak occurred in three patients, two of whom developed associated meningitis.

Recurrence. At the 5-year follow-up, MRI-Gd detected no sign of recurrence in any of the 34 surgical patients whose tumors were removed completely. In the two patients whose acoustic neuromas had been incompletely removed, no growth of residual tumor was seen at the 5-year follow-up.

Nonsurgical results. At the 5-year follow-up, no tumor growth was seen in six of the eight patients in the observation group. The other two patients exhibited a tumor growth rate of less than 2 mm per year, and their tumors still protruded less than 1 cm into the cerebellopontine angle. Therefore, neither of these patients required surgical intervention.

Discussion

Current management options for acoustic neuroma in the geriatric population include surgery, radiosurgery, and observation (figure).^{9,15,16} Patient preference is a major consideration in selecting a strategy, but surgical intervention is clearly indicated for patients who exhibit ataxia, cranial nerve dysfunction, or hydrocephalus.

The ideal treatment for an elderly patient with a large acoustic neuroma is total excision of the tumor with a minimum of morbidity.¹⁷⁻²¹ Total excision via the trans-

labyrinthine approach is appropriate for most patients, and in our series, this approach was used in almost 90% of cases. However, it is not always easy to completely remove large tumors without complications. According to Glasscock et al, surgery in a geriatric population is associated with a 5% mortality and a 15% risk of hydrocephalus.⁶ Therefore, a near- or subtotal removal has been proposed for older patients with large tumors.²² The decision to perform a near-total removal can be made intraoperatively after the surgeon has assessed the relationships between the tumor and the brainstem or the facial nerve. Also, an incomplete resection can

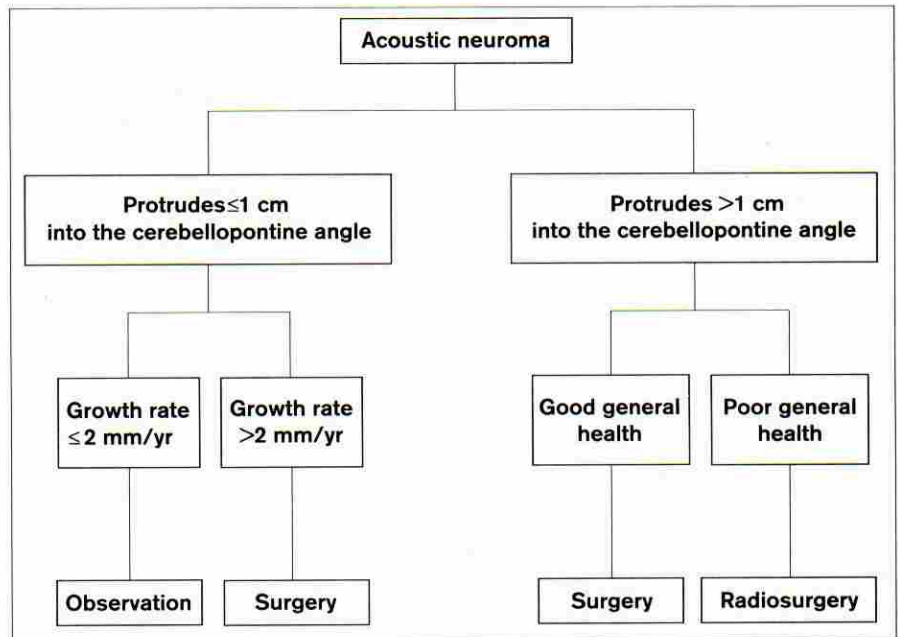
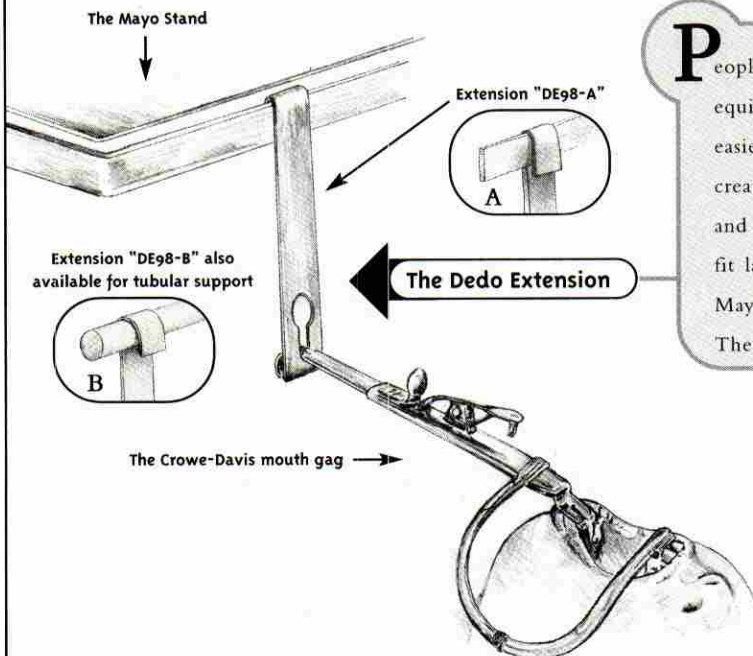


Figure. Algorithm for the management of acoustic neuromas in the elderly.

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Applicable Procedures

- T&A's
- Uvuloplasty
- Palatoplasty
- All oropharyngeal procedures using a Crowe-Davis mouth gag

be undertaken if intraoperative changes in a patient's vital signs indicate that the patient's condition has deteriorated and might become life-threatening. In cases of incomplete removal, MRI-Gd scans should be obtained 1, 3, and 5 years postoperatively, as we did in our study. If growth of the residual tumor is noted, more frequent MRI-Gd evaluations are necessary.

The introduction of MRI-Gd has enabled physicians to offer conservative management to patients who have small tumors that protrude 1 cm or less into the cerebellopontine angle and whose symptoms are minimal. Conservative management helps preserve—or at least does not diminish—quality of life in these patients during their expected lifespan.¹² For patients whose acoustic neuromas remain stable, we advocate repeat MRI-Gd scanning every 6 months during the first postoperative year and once a year thereafter. For those whose acoustic neuromas continue to grow, surgery might or might not be necessary, depending on the rate of growth. A growth rate of more than 2 mm per year is an indication for surgery.¹⁰

Hearing is rarely preserved in patients whose tumors protrude more than 1.5 cm into the cerebellopontine angle. In our series, no patient's postoperative hearing was in AAO-HNS class A or B.¹⁴

In the case of an acoustic neuroma in an only hearing ear, we prefer to monitor the patient with serial MRI-Gd evaluations. Depending on the tumor's size, its growth rate, and the patient's preference, radiosurgery might be a good option. Radiosurgery can also be offered to candidates for traditional surgery whose poor general health puts them at risk during prolonged general anesthesia and to patients who are simply unwilling to undergo traditional surgery.^{19,23-25} In our series, no patient underwent radiosurgery.

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