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Posterior fossa vestibular neurectomy

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Abstract

Many procedures have been devised to deal with intractable vertigo and conserve hearing, but despite this selective vestibular nerve section remains by far the most effective treatment.

A series of 14 patients who underwent posterior fossa vestibular neurectomy is reported. The results are reported for vertigo control, hearing and tinnitus. All of the patients achieved vertigo control according to the AAOO (1972) reporting system. A simple and reliable system for the classification of the disability in these patients has yet to be devised. This problem is addressed and a disability grading system proposed, and discussed.

Introduction

Division of the eighth cranial nerve for intractable vertigo was first described by Parry in 1904. McKenzie, in 1932, was the first to perform a selective vestibular nerve section. The commonest diagnosis in these cases is Menière's disease, and because the pathogenesis remains elusive the treatment is therefore only symptomatic. The disabling symptom is vertigo and the consistently effective methods of controlling this is either a neurectomy or total labyrinthectomy. Many of these patients will have functionally useful hearing, therefore almost a century after Parry's original description of neurectomy, it continues to be the most effective management.

Materials and methods

All 14 patients who had vestibular nerve section performed in the Department of Otoneurosurgery at Addenbrookes Hospital during the three year period from March 1987 to February 1990 were studied. Of these 12 were diagnosed as Menière's disease after completion of a Menière's investigation protocol. This included full audiological assessment, glycerol dehydration testing, auditory evoked brainstem responses, transtympanic electrocochleography, and metabolic studies. Cranial imaging (MRI or CT air meatography) was employed to exclude the diagnosis of acoustic neuroma. In two patients, the Menière's was documented as bilateral with fluctuation of hearing and tinnitus bilaterally. The two non-Menière's patients had suffered sudden sensorineural hearing loss.

All patients had trials of standard medical therapy, commonly betahistine and cinnarizine which failed to control the vertigo. Six patients had also had endolymphatic sac surgery which again failed to achieve control of the vertigo, and in two patients the sac surgery had been revised. The surgery was performed via a retrolabyrinthine approach in seven patients and a retrosigmoid approach in the other five Menière patients. The two patients who had dead ears pre-operatively underwent a translabyrinthine approach. After confirmation of the anatomy, the superior and inferior vestibular nerves were divided. Patients were returned to the neurosurgical intensive care unit for 24 hours in the immediate post-operative period. The median length of stay post-operatively was nine days (range 6 to 30 days).

Results

Vertigo control

All patients had a marked improvement in their vertigo, the AAOO classification (Alford, 1972) of the results, which is a combined vertigo/hearing assessment, is shown in Table I.

In terms of vertigo control all patients had a successful outcome A–C, there were no class D results. The two patients with bilateral disease continue to have mild vertiginous episodes. This is presumably from the non-operated ear, but in any case was not of sufficient severity or frequency to become a class D result. The two non-Menière's patients with dead ears pre-operatively were considered as class C results.

Hearing

Two patients had no useful hearing pre-operatively therefore the hearing evaluation is confined to the remaining 12 patients. In 10 patients the PTA was unchanged post-operatively i.e. within 10 db of the pre-operative level. In one patient the hearing improved post-operatively and in one became worse.

TABLE I
RESULTS—AAOO CLASSIFICATION

Class	A	B	C	D
No. of Patients	1	10	3	0

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TABLE II
DISABILITY GRADING SYSTEM

Grade	No. of Patients
A_1	9
A_o	4
B	1
C	0
D	0

Aural Fullness

Twelve patients (i.e. all of the Menière's patients) continued to experience episodic aural fullness post-operatively, confirming that the disease remains active but the labyrinth has been effectively denervated.

Tinnitus

Eleven patients had tinnitus pre-operatively, of these three experienced a change post-operatively. In two the intensity increased, the other one the tinnitus decreased in intensity.

Complications

One patient had a CSF leak, this required surgical closure. Another patient developed a facial nerve paralysis which resolved spontaneously to a House Grade II. This was thought to have been caused by vascular compromise to the nerve during delineation of the anatomy. There were no other complications.

Disability assessment

The assessment of disability due to vertigo remains a vexed issue. No simple, universally applicable system, has yet been devised. This has hampered both the comparison of results between reported series of a particular technique and the evaluation of the relative merits of different techniques.

A similar difficulty existed with the evaluation of facial nerve function but has now been resolved with the general adoption of the House-Brackmann grading system (1985). We have attempted to resolve the problem of disability assessment, and the simple disability grading system outlined below may provide a solution.

Disability grading system

A_1 No vertigo or dysequilibrium. Excellent quality of life. No restriction of activities.
A_o No vertigo. Mild dysequilibrium only on rapid movements. Very good quality of life. No restriction of activities.
B Mild transient vertigo or dysequilibrium. Good quality of life. No restriction of activities.
C Episodic debilitating vertigo. Improved but quality of life only fair. Restriction of activities, time off work required.
D Disabling vertigo. No improvement and poor quality of life. Activities markedly restricted, off work regularly or not working.

This is a simple practical patient orientated disability grading system which should enable reliable comparison of results from the patient's perspective.

The distinction between A_1 and A_o is clinically important since the A_o patients may be completely denervated but incompletely compensated, and therefore still have mild dysequilibrium in stress situations.

The results of this series analysed using this disability index is detailed in Table II. Since this procedure is a major otoneurosurgical one only indicated for severe debilitating vertigo, all of the patients were Grade D pre-operatively. Post-operatively all the patients were either A_1 or A_o, except one of the two patients with bilateral disease who was a grade B.

Conclusions

In this series the twin goals of vertigo control and hearing preservation have been achieved for the majority of patients. The quality of life as indicated by the disability index was greatly improved. Vestibular neurectomy is a major surgical procedure and not without complications. However the only alternative technique which produces equivalent vertigo control is osseous labyrinthectomy. This option is unacceptable in patients with serviceable hearing in a disease which has a significant bilateral incidence; therefore vestibular neurectomy remains the operation of choice in patients with debilitating vertigo.

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