NEUROOTOLOGICAL FINDINGS IN PATIENTS WITH ACOUSTIC NEURINOMAS

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SUMMARY

The early diagnosis of acoustic neurinomas and their localisation is very important. As neuro otological tests may help in this respect, neuro otological findings of twenty patients with histologically proven acoustic neurinoma were analysed retrospectively. The importance of neuro otological examinations in the early diagnosis, differentiation and localization of acoustic neurinoma was discussed.

KEY WORDS :

Acoustic neurinoma, Neuro otological findings.

INTRODUCTION

Acoustic neurinoma accounts for 10 % of all intracranial tumors, so is of paramount importance to diagnose the disease early. Generally the combination of contrast cisternography and CT for diagnosis is proposed (1), it is an intervention demanding strict indications and is rather expensive. Therefore prior to CT neuro otological tests may give valuable information. To determine the value of otoneurological findings in the diagnosis of acoustic neurinoma, surgically proven acoustic neurinoma cases were analysed retrospectively.

MATERIAL AND METHODS

Twenty patients with proven acoustic neurinoma seen between the years 1978 and 1988 were examined retrospettively. The neuro otological examinations were clinical investigation with Frenzel glasses for spontaneous, positional and positioning nystagmus. Examinations of optokinetic nystagmus, pursuit eye movements, gaze nystagmus and vestibulospinal reactions were completed by ENG recording with caloric tests. Conventional standart X-rays and CTs were taken of the temporal bone.

RESULTS

The neuro otological findings of twenty patients with histologically proven acoustic neurinoma are presented in Table 1 and 2.

Table 1 : Summary of symptoms and neuro otological findings in 20 patients with proven acoustic neurinoma.

	Number of patients	Percentage of patients %
History 1 year	8	40
Gradual hearing impairment as first symptom	13	65
High tone impairment	3	15
Low discrimination score (beneath 50 % or inconsistent with hearing loss)	18	90
Reflex decay	6	30
Decreased caloric response	17	85
Decreased seventh nerve function	1	5
Unsteadiness when walking in darkness on uneven surface	9	45
Vertigo	1	5
Decreased corneal sensibility	5	25
Decreased facial sensibility	3	15
Positive Romberg test	6	30
Lateralization when walking	8	40
Dysdiadokinesia	6	30
Choked discs	3	15
Abnormal plain X-rays	10	50
Abnormal tomogram or angiogram	20	100

Table 2 : ENG recording correlated with the surgical findings of 20 patients with acoustic neurinoma.

		Compression or involvement of brain stem	Compression or involvement of cerebellum
Bil gaze nystagmus	10 (50 %)	10 (100 %)	5 (50 %)
Unilateral gaze nystagmus	1 (5 %)	1 (5 %)	–
Upbeat nystagmus	3 (15 %)	3 (100 %)	3 (100 %)
Downbeat nystagmus	1 (5 %)	1 (100 %)	1 (100 %)
Rebound nystagmus	5 (25 %)	5 (100 %)	5 (100 %)
Ocular dysmetria	4 (20 %)	4 (100 %)	4 (100 %)
Saccadic slowing	3 (15 %)	3 (100 %)	1 (33 %)
Saccadic pursuit	3 (15 %)	3 (100 %)	2 (66 %)
Disorganized pursuit	4 (20 %)	4 (100 %)	4 (100 %)
Positional nystagmus	11 (55 %)	6 (54 %)	2 (18 %)
Deranged optokinetic nyst.	1 (5 %)	1 (100 %)	1 (100 %)
Abolition with eyes closed	11 (55 %)	11 (100 %)	6 (54 %)
Abolition in darkness	4 (20 %)	4 (100 %)	–

DISCUSSION

In earlier studies concerned with the diagnosis of acoustic neuromas, many symptoms and signs have been described as important features. These have great value in the diagnosis, but the important thing is whether we consider them an early symptom or a sign of invasion or compression of a neigbouring organ.

According to our results the earliest symptoms are unilateral hearing impairment or a low speech discrimination score inconsistent with the hearing level. Although Canty (2) gives more importance to high frequency hearing loss associated with a low speech discrimination score, our findings show that unilateral hearing loss whether low or high frequency or flat type, is important in the diagnosis. A discrimination score of less than 50 % or inconsistent with the hearing level has an important meaning and these patients should be examined in detail, because all our patients showed very low discrimination scores. It should be mentioned here that one of our patients was diagnosed only from the low speech discrimination score with a normal pure tone audiogram.

According to our results unsteadiness when walking in darkness on uneven ground is an early symptom and should be asked of every patient suspected of acoustic neurinoma. The cause of this is lack of visual information in darkness and irritation of the proprioceptive system due to uneven ground, because stabilization is achieved by compensation and additional information from the visual and proprioceptive system after functional impairment of one labyrinth(1).

Severe vertigo does not appear frequently due to a compensatory mechanism in slow growing tumours(1). Generally thermal stimulation has a very important place in the diagnosis of acoustic neurinoma and Haid(3) accepts it as one of the most reliable diagnostic tests. Therefore a decreased caloric response in a patient without severe vertigo is of paramount importance. Moreover an 85 % hypoactive caloric response in our patients stresses the importance of bithermal caloric tests.

Some authors (3) think that positional nystagmus is frequently seen and is the most sensitive examination in the early diagnosis of acoustic neuromas yielding a higher incidence than thermic tests, 95 % of the patients with a neuroma showed pathological findings in the positional test. Our results do not support this, because only 55 % of the patients with neuroma showed pathological findings in the positional test. Moreover, spontaneous nystagmus very often presents some difficulties in the evaluation of positional nystagmus. For this reason it should be evaluated carefully and it may also have value in patients without gaze nystagmus.

ENG may help in differentiating central lesions from peripheral ones especially in small acoustic neuromas. It is interesting that the effects of closing the eyes are more profound than those of darkness. This may be due to the level of the lesion or the intervention of certain reticular mechanisms associated with sleep and activated by eye closure. All the cases presenting with spontaneous nystagmus were found to have large tumours pressing upon the brain stem. Disturbances of oculomotor function, such as gaze nystagmus or impaired pursuit eye movements do not occur without pressure of the tumour on the cerebellar or brain stem structures.

Vertical nystagmus on gaze upward or downward denotes posterior fossa disease (4) and is consistent with our findings. Rebound nystagmus, ocular dysmetria and impaired pursuit eye movements strongly suggest cerebellar involvement or compression, which was 86 % correletad by operative findings. Impairment of optokinetic nystagmus is a sign of an outgrowing tumour in the cerebelopontine angle with compression of the cerebellar flocculus (4). This was confirmed by our surgical findings.

Abnormal plain X-rays of the temporal bone were seen in only 50 % of the patients. Normal plain

X-rays do not rule the existence of an acoustic tumour but should be taken in suspected cases before CT and gas cisternography are performed.

CONCLUSION

In the light of these findings the following suggestions can be made :

1 – Unilateral hearing loss, combined with or without a disproportionately low discrimination score should be accepted as acoustic neuroma unless proven otherwise.

2 – A symptom, often neglected, but which should always be asked is if there is unsteadiness when walking in darkness on an uneven surface.

3 – Unilateral decreased caloric response without severe subjective vertigo is a strong sign of an acoustic neuroma.

4 – ENG may help in differentiating central from peripheral lesions and may localize the central lesion.

5 – Severe oculomotor disturbances do not occur without pressure of the tumour on the cerebellar or brain stem structures.

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