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Labyrinthitis in chronic otitis media

Labyrinthitis is the most frequent complication of chronic otitis media (COM). It is usually circumscribed, rarely diffuse, serous or purulent. Purulent diffuse labyrinthitis results in deaf ear. The aim of the study was to evaluate the incidence, course, and results of the treatment of labyrinthitis.

MATERIAL AND METHODS

In a group of 1,210 patients with COM operated on in our centre within 10 years, labyrinthitis was diagnosed in 208 (17.2%) patients with age range from 16 to 66 years. The group included 87 (41.8%) men and 121 (57.2%) women. Retrospective analysis of the patients was carried out basing on clinical documentation. We evaluated medical history, results of otolaryngological examination and audiometric tests, together with the information collected during operation and follow-up visits. To evaluate the effect of circumscribed labyrinthitis on bone conduction (BC) we measured BC threshold in a group of 140 patients with unilateral COM without labyrinthitis and in a group of 42 patients with unilateral COM with labyrinthitis.

RESULTS AND DISCUSSION

Labyrinthitis was diagnosed significantly more frequently in women than in men ($\chi^2 = 16.57$; $p<0.001$) comparing with the whole group of patients operated due to COM. The occurrence of labyrinthitis was not related with patients' profession or place of living.

All the patients with labyrinthitis reported vertigo for one week to 20 years. Two hundred patients complained of permanent or recurrent ear discharge for 2 months to 50 years. One hundred and twelve (53.8%) of 208 individuals with labyrinthitis had episodic nausea and 63 (30.3%) patients had earache and/or headache. Physical examination revealed spontaneous nystagmus in 30 (14.4%) patients, positive objective fistula test in 85 (40.9%) patients and positive subjective one in 42 (20.2%) patients. Audiometric tests showed profound hearing loss (>60 dB) in 92 patients, 78 individuals had moderate hearing loss (40-60 dB) and 38 patients had mild hearing loss (20-35 dB). Conductive hearing loss was diagnosed in 98, mixed hearing loss in 81 and deafness in 14 operated patients with labyrinthitis.

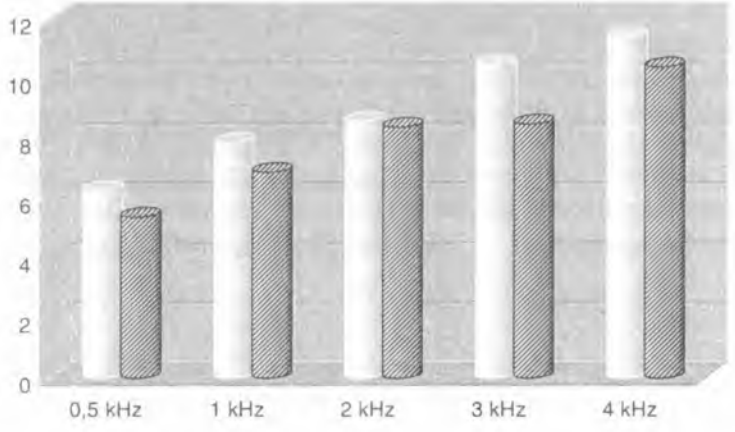

Fig. 1. Average BC threshold (after subtraction of the thresholds of the healthy ear) in patients with circumscribed labyrinthitis (striped columns) and those without labyrinthitis (plain columns)

To evaluate the effect of circumscribed labyrinthitis on bone conduction (BC) we compared BC thresholds of 42 individuals with unilateral circumscribed labyrinthitis with BC thresholds of patients with unilateral COM without labyrinthitis. To eliminate presbyacusis, BC threshold of the healthy ear was subtracted from the BC threshold of the affected ear in the same patient. There was a significant BC impairment in the ear with COM comparing to the healthy ear in both groups at the frequencies 0.5; 1; 2; 4 kHz. The mean impairment of BC in COM ranged from 5.4 to 11.4 dB when BC threshold of the healthy ear was subtracted. However, the mean BC threshold in patients with circumscribed labyrinthitis did not differ significantly from the threshold in COM patients without labyrinthitis.

On the basis of the course of the disease circumscribed labyrinthitis was diagnosed in 183 (15.1%) of 1,210 treated patients, diffuse serous inflammation in 11 (0.9%) patients and purulent labyrinthitis in 14 (1.2%) patients. In all the patients radical or radical

modified operation was carried out and in two patients with purulent labyrinthitis with cholesteatoma invading the labyrinth, labyrinthectomy was performed.

Granulation tissue in the tympanic cavity and mastoid process was found during surgery in 130 patients and cholesteatoma in 100 (48%) patients. Chronic otitis media with cholesteatoma was diagnosed in 33% of all operated patients. This means that labyrinthitis occurs significantly more frequently in COM with cholesteatoma than in COM without labyrinthitis ($\chi^2 = 17.74$, $p<0.001$). Labyrinthine fistula was found in 68 (32%) patients with labyrinthitis. In 61 individuals the fistula was located in lateral semicircular canal, in 3 patients, in lateral and superior semicircular canal. Two patients had the fistula in oval window and 5 patients had massive exposure of the labyrinth.

Patients with labyrinthitis had also other complications. Supradural abscess was found in 11 (5.3%), meningitis in 6 (2.1%), brain abscess in 3 (1.4%), facial nerve palsy in 8 (3.8%) and subperiosteal abscess of mastoid process in 7 (3.4%) of 208 patients with labyrinthitis. Our management of cholesteatoma covering the fistula was the following. In 2 patients with diffuse purulent labyrinthitis with cholesteatoma invading the labyrinth, labyrinthectomy was carried out. In 5 patients cholesteatoma capsule (matrix) was not removed because it was adherent to the membranous labyrinth and removal of the matrix was very risky. In the rest of the patients cholesteatoma capsule was removed by gentle elevating it using a sucker and an elevator. After the removal of the matrix, the bone defect was covered with bone dust, obtained during drilling, and with fascia or perichondrium flap. After surgery vertigo disappeared in 150 (72%) patients. 28 (13%) patients reported improvement, and in 10 (4%) patients vertigo did not improve after the operation. Data about 20 patients were not available.

Goździk-Żołnikiewicz et al. (3) found the labyrinthine fistula in 10% of operated patients. Sekuła et al. (5, 6) diagnosed circumscribed labyrinthitis in 4.2% and diffuse labyrinthitis in 2.6% of the operated individuals. It is hard to explain the higher incidence of labyrinthitis symptoms in women in our group. Perhaps chronic otitis media in women coexisted with other causes of labyrinth dysfunction like blood supply disorders connected with menopause or more common in women thyroid diseases. It is difficult to assess precisely the incidence of labyrinthitis in COM. The percentage of 17.2% in our group was determined only in operated patients, however many patients mostly with simple COM are treated conservatively, so the incidence of labyrinthitis in COM might be lower than we found in the operated patients. Moreover, other causes of labyrinth dysfunction, like blood supply disorders may occur in patients with COM and mimic labyrinthitis.

Diffuse labyrinthitis with total deafness occurs in 2.0-2.6% of operated patients (3, 6). Deterioration of bone conduction was reported in COM (2). An interesting observation in our study was that there was no significant difference between BC thresholds in the group of patients with circumscribed labyrinthitis and the group with COM without labyrinthitis. In Browning's (1) study BC in chronic otitis media with vertigo did not differ from BC in healthy individuals when Carhart's effect was subtracted. Helms (4) also did not find any changes in BC in patients with labyrinthine fistula.

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SUMMARY

Labyrinthitis is the most frequent complication of chronic otitis media (COM). Retrospective analysis of 1,210 patients operated due to COM was carried out. Circumscribed labyrinthitis was found in 17.2% and deafness in 1.2% of patients. To evaluate the effect of labyrinthitis on bone conduction (BC) we measured BC threshold in a group of 140 patients with unilateral COM without labyrinthitis and in a group of 42 patients with unilateral COM with labyrinthitis. BC threshold of the healthy ear was subtracted from the BC threshold of the affected ear in the same patient to eliminate presbyacusis. There was no significant difference in bone conduction threshold between the patients with circumscribed labyrinthitis and patients with COM without labyrinthitis. The incidence of labyrinthitis was higher in patients with cholesteatoma than in patients without cholesteatoma. Management of labyrinthine fistula is presented.

Zapalenie błędnika w przebiegu przewlekłego zapalenia ucha środkowego

Zapalenie błędnika rozpoznano u 17,2%, a głuchotę u 1,2% chorych operowanych z powodu przewlekłego zapalenia ucha środkowego (PZUŚ). Nie znaleziono różnicy w przewodnictwie kostnym pomiędzy chorymi z ograniczonym zapaleniem błędnika a chorymi na PZUŚ bez zapalenia błędnika. Stwierdzono częstsze występowanie zapalenia błędnika u chorych z perlakiem niż u chorych bez perlaka.