

Taste Disturbance and Its Recovery after Middle Ear Surgery

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Key words: cholesteatoma, chorda tympani nerve, chronic otitis media, electrogustometry, middle ear surgery, otosclerosis, taste function

Introduction

The chorda tympani nerve (CTN) controls taste in the anterior two-thirds of the tongue on each side; it runs close to the annulus of the tympanic membrane, crossing the tympanic cavity between the incus and the malleus. The CTN is initially encountered at this location when elevating the annulus and it is frequently damaged by traction, stretching and cutting during surgical procedures (Figure 1). Because many surgeons consider hearing improvement to be the most important postoperative result, taste disturbance has rarely been focused on in the last four decades. In the present study, we examined the changes of CTN function before and after the middle ear surgery using electrogustometry (EGM).

Relationship between taste recovery and patients' age after preservation of CTN

We analysed 163 ears of 156 patients who underwent middle ear surgery from April 1997 through December 1999. The patients' taste functions were examined 2 days before surgery and 2 weeks and 6 months after surgery.

Two weeks after surgery, the mean EGM threshold was elevated in all groups regardless of preservation or section of the CTN. Numbness in the tongue and taste disturbance were more frequently found in patients with preservation of CTN than in those with section of the CTN ($P = 0.008$ and $P = 0.001$, respectively). In patients with preservation of the CTN, 6 months after surgery, the recovery rate of EGM threshold was 83% in those aged 20 years or younger ($P = 0.0008$ compared with two older groups), 53% in the those aged 21–40 years and 44% in those aged 41–60 years (Sone *et al.*, 2001).

Age is an important factor for recovery of taste function after middle ear surgery, which is useful information when explaining complications to patients.

Recovery rate of taste function in different types of diseases after preservation of CTN

Seventy-nine patients (83 ears) were selected with the criteria of having a normal EGM threshold before surgery and preservation of the CTN during surgery from April 1997 to September 2000. They were examined by EGM every 2 days during hospitalization and at 6 months after surgery.

For symptoms such as tongue numbness and taste disturbance, patients with non-inflammatory (NI) diseases (13/20 or 65%) showed significantly higher rate of symptoms than did the patients with chronic otitis media (COM; 13/35 or 37.1%) at 2 weeks after surgery ($P = 0.0032$). The patients with NI diseases (5/20 or 25.0%) tended to show a higher rate of symptoms than did the COM patients (2/35 or 5.7%) or cholesteatoma patients (2/28 or 7.1%) at 6 months after surgery. The rate of recovery of the EGM threshold to normal at 2 weeks after surgery was significantly lower in NI diseases patients (6/20 or 30.0%) than in COM patients (23/35, 62%) or cholesteatoma patients (19/28 or 67.9%; $P = 0.00015$ and 0.008 , respectively) (Sakagami *et al.*, 2003).

Thus, the patients with NI diseases had postoperative symptoms and elevation of EGM threshold more frequently than did the patients with inflammatory diseases.

Taste function in elderly patients with unilateral disease

The taste functions of the chorda tympani nerve on the healthy and diseased sides were examined before and after surgery using EGM in 79 patients aged >60 years old and these findings were compared with those of 228 young and middle-aged patients.

The threshold of EGM on the healthy side increased significantly with the increase of age ($P < 0.0001$). The rate of 'scaled out' cases was the highest in the >70 years group. The preoperative threshold increased significantly with the increase of age in chronic otitis media ($P = 0.00029$) and in cholesteatoma ($P < 0.0001$). In patients with chronic otitis media, the postoperative threshold of the >60 years group tended to be higher than that of <60 years group.

These findings suggested that the taste function of CTN deteriorated on the diseased side as much as the healthy side in elderly patients and that we do not have to pay as much attention to the CTN during surgery on elderly patients as on young and middle-aged patients.

Taste function after section of CTN

Thirty-five patients underwent surgery with unilateral ($n = 32$) or bilateral ($n = 3$) section of CTN from January 2000 to April 2002.

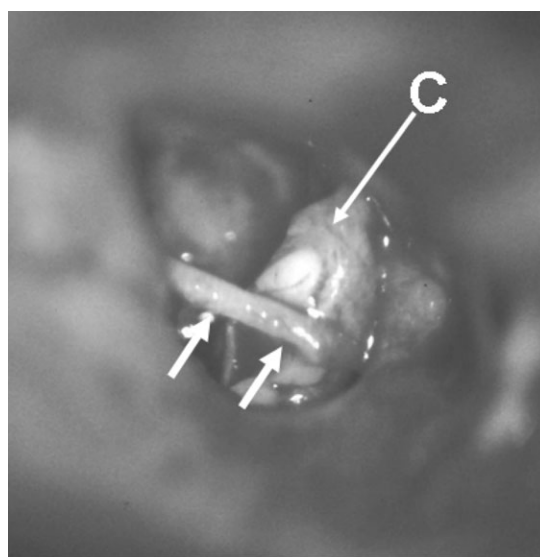


Figure 1 CTN (arrows) supports cartilage columella (C), which means the CTN is stretched with tension.

The patients were asked about taste symptoms before surgery and 2 weeks and 2 years after surgery. CTN function was also measured with EGM at the same time as above.

In unilateral section of CTN, 19/32 (59.4%) complained of taste disorder and 11/32 (34.4%) tongue numbness. Most of taste symptoms ceased in 2 years, although EGM threshold was not recovered. The patients who cook every day had little difficulty except for one who was a professional cook. In bilateral section of CTN, the patients had no taste problems 2 years after surgery, either.

These findings help explain the potential complications to the patients before surgery and lead to the idea that surgeons do not have to pay much attention to taste disturbance after section of CTN except in case of a professional cook.

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