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ANALYSIS OF POST OPERATIVE TASTE DISTURBANCE FOLLOWING MASTOID SURGERY

Objectives:
To observe the type of peroperative pathology (cholesteatoma, granulation tissues or both) in patients with COM squamous type , to observe the frequency of damage to chorda tympani nerve (CTN) by cholesteatoma, granulation tissues or both and to observe the taste disturbance postoperatively in relation to peroperative status of the chorda tympani nerve.

Materials and methods:
A prospective, analytical of 113 patients who underwent mastoid surgery from 1st October 2007 to 30th March 2009 in Tribhuvan University Teaching Hospital was carried out. The peroperative pathology and peroperative status of CTN were noted. All patients were asked about the taste disturbance on 2nd and 10th day postoperative day (POD).

Results:
One hundred and thirteen (113) patients who underwent mastoidectomy were enrolled for this study and the mean age of patients was 23.76 years. The peroperative pathology identified was cholesteatoma in 9 (8%) patients (CTN was found in 6 and not found in 3), granulation tissue in 9 (8%) patients (CTN was found in 3 and not found in 6) and mixed pathologies (both cholesteatoma and granulation tissue) in 95 (84%) patients (CTN was found in 60 and not found in 35). One patient with peroperative pathology of cholesteatoma in whom chorda was identified but injured during surgery and 12 patients with mixed (both cholesteatoma and granulation) pathology (p=0.320) developed taste disturbance. Out of the 13 patients who developed postoperative taste disturbance, in 5 patients CTN was not found/not identified and in 8 patients CTN was identified but injured.

Conclusion:
Mixed type of pathology (both cholesteatoma and granulation) was the commonest pathology in 95(84%) patients . The chorda tympani nerve was not identified in 44 (39%) patients and this was most commonly seen in mixed type of pathology (cholesteatoma and granulation) as compared to other pathologies like cholesteatoma alone or granulation alone. However, this was not statistically significant (p=0.320). Functional recovery was early in all patients.

Keywords: Taste disturbance, Mastoid surgery, Chorda tympani nerve.

INTRODUCTION:

The CTN, a branch of facial nerve carries taste sensation from the anterior 2/3 of tongue. In chronic otitis media (COM) with cholesteatoma or granulation tissue, various inflammatory changes occur in the mucosa of middle ear and mastoid. The inflammatory changes may also damage the different middle ear structures like ossicles, nerve, etc.[2] Chronic otitis media causes various degenerative changes in the chorda tympani as well such as fibrous thickening of epineural and perineural connective tissue, proliferation of fibroblasts and connective tissue in the endoneurium, hypertrophy and proliferation of Schwann cells and moderate degree of disorganizations in the axons. All these changes may result in taste disturbances in patient with chronic otitis media.[3] The other reason could be that in chronic otitis media with cholesteatoma and/or granulation, the nerve may have been destroyed or has become hypofunctional preoperatively by the pathological changes within the nerve in comparison to other middle ear surgeries like in myringoplasty and stapedectomy.[2,1] Therefore, the true extent of post-operative taste dysfunction after mastoid surgery in chronic otitis media squamous type may not be recognized. This study has been conducted to assess the frequency of damage to chorda tympani nerve by disease pathology and to observe the postoperative taste disturbance after mastoid surgery.

MATERIALS AND METHODS:

This was a prospective, analytical and longitudinal study. The study was undertaken in the Department of Otorhinolaryngology and Head and Neck Surgery, Tribhuvan University Teaching Hospital, Institute of Medicine, Kathmandu, Nepal. The study was conducted for a period of 18 months starting from 1st October 2007 and ending on 30th March 2009. Patients of age more than 12 years undergoing mastoid surgery for COM squamous type were included and those patients with altered taste due to other medical conditions like diabetes mellitus, suffering from neurological and psychiatric diseases, who have had surgery on the tongue and salivary glands, having facial nerve palsy (preoperative and postoperative) and patients on drugs that may cause taste disturbances were excluded. During surgery, the peroperative pathology was noted as Cholesteatoma, granulation tissues and Mixed (both cholesteatoma and granulation tissues).

RESULTS AND OBSERVATIONS:

A total of 139 mastoid surgeries were done from 1st October 2007 to 30th March 2009. Out of the 139 patients, 113 patients were included while 26 patients were excluded. Therefore, a total of 113 patients were included for final analysis. These patients were followed up on 2nd postoperative day and 10th postoperative day. Among 113 patients who were included, 65 were males and 48 were females. Peroperative pathology noted during mastoid surgeries were as follows: cholesteatoma was present in 9 patients (8%), granulation tissue in 9 patients (8%) and mixed pathology (both cholesteatoma and granulation tissue) in 95 patients (84%).

Tab. 1. Correlation between type of pathology and peroperative status of CTN

Peroperative pathology finding	Peroperative status of CTN		Total
	Not found	Found	
Cholesteatoma	3	6	9
Granulation tissue	6	3	9
Mixed	35	60	95
Total	44	69	113

Among 113 patients in this study, only 13 patients developed postoperative taste disturbance while 100 patients did not develop any postoperative taste disturbance.

Thirteen out of 113 patients were symptomatic at the time of first and second assessments (2nd postoperative day and 10th postoperative day respectively). Among those 13 patients, one patient, where peroperative pathology was cholesteatoma, CTN was identified but injured during surgery. In 12 patients peroperative pathology was mixed type, in 3 patients CTN was not identified but in 9 patients it was injuried during surgery.

Tab. 2. Correlation between postoperative taste disturbances and types of peroperative pathology

Peroperative pathology finding	Taste disturbance after surgery		
	Taste sensation not disturbed	Numbness of tongue	Absence of taste
Cholesteatoma (n=9)	8	0	1
Granulation tissue (n=9)	9	0	0
Mixed (n=95)	83	10	2

Chi-Square test was used to correlate, which showed no correlation between type of preoperative pathology and postoperative taste disturbances ($p>0.05$).

DISCUSSION:

The included patients were all more than 12 years of age because children less than 12 years of age were less likely to appreciate, accurately assess and express change in taste function.

Patients with COM squamous active disease planned for mastoid surgery were taken up for this study. Total 139 patients underwent mastoid surgery during the study period. Among 139 patients, 26 patients were excluded from the study. All 113 patients underwent mastoid surgery. In this study modified radical mastoidectomy was the commonest surgery followed by atticotomy and radical mastoidectomy.

In this study different pathological findings were found peroperatively. In 95 out of 113 patients (84%) mixed pathology was found, i.e., both cholesteatoma and granulation. In 9 out of 113 patients (8%) only cholesteatoma was found and in another 9 out of 113 patients (8%) only granulation tissue was found. On reviewing the literature, no study was found where type of peroperative pathology and its effect on CTN and post operative taste disturbance in patient with chronic otitis media squamous active undergoing mastoid surgery was analysed.

In this study peroperative CTN was identified/found in 69 patients and while it was not found/not identified in 44 patients in spite of all attempts to find it. The fact that CTN could not be found in 44 patients may be because the nerve was damaged preoperatively by disease. However, there is a rare possibility that the surgeon failed to identify an existing CTN peroperatively. Out of 44 patients in whom peroperative CTN was not found, 35 patients had mixed pathology (cholesteatoma and granulation tissue), 6 patients had granulation tissue alone whereas 3 patients had cholesteatoma alone. This showed that chorda tympani nerve is more frequently damaged by mixed pathology (cholesteatoma and granulation tissue), which is followed by granulation tissue alone and cholesteatoma alone. On reviewing the literature no study was found where preoperative chorda tympani nerve damage has been correlated with different types of pathology mentioned above.

Landis et al,[4] stated that change in taste of the tongue on the ipsilateral side of chronic inflammatory middle ear disease goes unnoticed by the patients. That could be the reason that none of the patients included in this study complained of taste disturbance preoperatively. All patients were specifically asked for any taste disturbances as they did not voluntarily complain about it. All the patients were assessed at the time of 1st dressing, i.e., on 2nd postoperative day and on 10th postoperative day.

In this study none of the patients were aware of symptoms until they were asked about taste disturbance specifically. Contrary to this study, Gopalan et al,[7] found that 54 % and Mahendran et al,[8] found that 18% of the symptomatic patients actually complained of taste disturbances following middle ear surgery without being specifically asked for it. Out of 113 patients in this study, 13 patients (11.50%) developed taste disturbance after mastoid surgery.

In this study there were 44 patients where CTN was not found. Among the 44 patients, only 5 patients (38%) were symptomatic even when the nerve was not found. The mostly like cause is that CTN was present and unknowingly injured. Saito et al,[5] in his study found that 8.3% of patients whose CTN was not touched showed elevated threshold for taste. He suggested that the CTN could have been manipulated without the surgeon being aware of its existence in the surgical field.

CONCLUSION:

Mixed type of pathology (both cholesteatoma and granulation) was the commonest pathology in 95 patients (84%). The chorda tympani nerve was not identified in 44 (39%) patients and this was most commonly seen in mixed type of pathology (cholesteatoma and granulation) as compared to other pathologies like cholesteatoma alone or granulation alone. However, this was not statistically significant ($p=0.320$). Postoperative taste disturbance was found in only 13 patients (11.50%) out of 113 patients that underwent mastoid surgery. Among the 13 patients, one patient where peroperative pathology was cholesteatoma and CTN was injured during surgery and 12 patients where preoperative pathology was mixed and among them in 3 patients CTN was not identified and in 9 patients it was injured. However, none of the patients voluntarily complained of postoperative taste disturbance. Hence there is no relation between peroperative status of CTN findings and its injury with postoperative taste disturbance. Though there is a very small possibility of taste disturbance following mastoid surgery all patients who are to undergo mastoid surgery should be counseled regarding postoperative taste disturbance and this study was carried out in small number of patients, therefore, further studies with large number of patients are recommended.

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