

EVALUATION OF MASTOID PATHOLOGY IN TUBOTYMPANIC TYPE OF CHRONIC SUPPURATIVE OTITIS MEDIA

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ABSTRACT

Tympanoplasty with or without cortical Mastoidectomy has been a matter of debate for a long time among the ENT specialists, some of them suggests that tympanoplasty combined with cortical Mastoidectomy in Tubotympanic type of chronic suppurative otitis media (CSOM) is useful, whereas others believes that cortical Mastoidectomy combined with tympanoplasty has added benefit on the surgical result. The aim of the study was evaluation of the various pathologies found in Mastoid process of a patient suffering from Tubotympanic type of CSOM with the secondary aim to formulate suggestions as when Mastoidectomy may be done in Tubotympanic type of CSOM. On the basis of our current study we suggest that opening the mastoid will be good surgical option in the following cases: Discharge / Glue coming from Aditus area / Discharge / Glue coming from attic area / Hearing loss disproportionate to size of perforation / Medialisation of malleus / Polypoidal middle ear mucosa / any segment of middle ear mucosa / Cholesteatoma visualized (during surgery) Granulations visualized in attic or aditus area (during surgery) / Sclerotic mastoid if found preoperatively

KEY WORDS: Tympanoplasty, Cortical Mastoidectomy, Tubotympanic type of CSOM

INTRODUCTION

Otitis media is an inflammation of a part or whole of the mucoperiosteal lining of the middle ear cleft which is composed of Eustachian tube, hypotympanum, mesotympanum, epitympanum, aditus and mastoid air cells(1). It is one of the commonest ear disease of all age groups and it is caused by multiple interrelated factors including infections, eustachian tube dysfunction, nasal allergy and trauma.

The disease has been classified on the basis of its underlying pathology as active or inactive mucosal, active or inactive squamous and healed chronic otitis media (2). A number of factors are involved in the outcome of surgery for Chronic suppurative Otitis media and one of them is condition of the mastoid. According to Jackler and Schindler (3) Mastoid factors are extent of pneumatization and presence of inflammatory disease in mastoid. Holmquist and Bergstorm (4) in 1978 said that well aerated mastoid is a prerequisite for well ventilated middle ear and long lasting success.

Tympanoplasty with or without cortical Mastoidectomy has been a matter of debate for a long time among the ENT specialists, some of them suggests that tympanoplasty combined with cortical Mastoidectomy in Tubotympanic type of chronic suppurative otitis media (CSOM) is useful, whereas others believes that cortical Mastoidectomy combined with tympanoplasty has added benefit on the surgical result. Also Those arguing in favor suggest that cortical

Mastoidectomy increases the air reservoir in the mastoid and also help in achieving the patency of aditus but the rationale use for the addition of simple mastoidectomy to tympanoplasty does not universally accepted, with the fear that an unoccluded antrum would invite the in growth of squamous epithelium. Others believe that the potential for injury to the inner ear structures and facial nerve during mastoid surgery. (5)

OBJECTIVES:

The aim of the study was evaluation of the various pathologies found in Mastoid process of a patient suffering from Tubotympanic type of CSOM with the secondary aim to formulate suggestions as when Mastoidectomy may be done in Tubotympanic type of CSOM

MATERIAL & METHODS:

A total of 100 patients who met the Inclusion criterias were taken into the study. All the patients were operated upon in the Department of E.N.T., Mayo Institute of Medical Sciences, Barabanki in the past 18 months.

Inclusion criterias:

1. Tubotympanic type of CSOM
2. Dry ear for the past 3 weeks
3. Conductive type hearing loss

Exclusion criterias:

1. Atticoantral type of CSOM
2. Wet ear
3. Sensorineural or mixed hearing loss
4. Age below 14 years and above 65 years
5. Previous mastoid surgery

Pre-operative evaluation included a detailed history of the patient, examination both -general and local, along with EUM, tuning fork tests with 256,512 and 1024 Hz for the degree of hearing loss, and pure-tone audiometry for documentation. Routine radiological evaluation for Tubotympanic type of CSOM is not done. Routine blood investigations included complete

blood count, bleeding and clotting time, kidney function test, liver function test, and random blood sugar examination. They were then subjected to routine preanesthetic checkup. Depending on the intervention, all the patients were then subjected to Cortical Mastoidectomy with tympanoplasty. Classical underlay tympanoplasty was done in all the cases. All the preoperative and peroperativ findings were documented and evaluated statistically. Surgery was done under General Anaesthesia.

OBSERVATIONS:

In the present study a total of 100 patients who met the Inclusion criterias were operated with Tympanoplasty with corticalMastoidectomy. The present study extends to 18 months in the Department of E.N.T., Mayo Institute of Medical Sciences, Barabanki

On preoperative evaluation of all the patients who underwent surgery by Microscopic examination (EUM) the middle ear was found to be normal. The mucosa was wet but there was no abnormal discharge even in the middle ear. The mucosa also did not have any edema, polypoidal changes, polyps or granulations. In about one third (n=30 / (33%) cases the handle of maleus was found to be medialised to varying extent. Most of the patients i.e. n=80/80% had a conductive hearing loss in the range of 30-40 decibels (db) although n=20/ 20% had a conductive hearing loss in the range of 40-50 decibels (db).

We also observed the following important correlations:

- There was also no relationship between duration of ear discharge and size of perforation as even smaller perforations had a history longer than the larger perforations.
- The duration of ear discharge was found to have no relation with the pathology of the Mastoid.

After opening the mastoid antrum we found that

in majority of cases i.e. n=62 / 62% the status of the pneumatization and condition of mucosa was found to be normal. In n=18/18% cases we found that the mucosa of the mastoid antrum was hypertrophied or polypoidal with some discharge in despite the middle ear being normal which was because of the polyp blocking the drainage and aeration of the antrum. Granulations i.e. the formation of a small mass of tiny red granules of newly formed capillaries, as on the surface of a wound that is healing was found in the mastoid antrum in n=15/15% of cases, which was also associated with collection of muco-pus cause of which can be attribute to be the same i.e. granulations blocking the drainage and aeration of the antrum. The pneumatization in both cases i.e. in cases with hypertrophied or polypoidal mucosa and Granulations in the mastoid was diminished

In n=2 / 2% of cases of safe type of CSOM on opening the mastoid we found cholesteatoma in the antrum although localized which was conformed histologically. In these cases we had to convert cortical Mastoidectomy to modified radical Mastoidectomy.

The incidence of Sclerotic mastoid i.e. a term applied to the reaction occurring most usually at the periphery of the **mastoid**, whereby the cortex takes on an unusual thickness and continuing over many years, the entire mastoid is converted into solid bone, resembling ivory was found to be only n=3/3% as given in table 1 below.

Table:1

Findings In Mastoid	Hearing loss	Number of Cases	Percentage
Normal	30-40db	62	62%
Hypertrophic mucosa / polyps	30-40db	18	18%
Granulations	40-50db	15	15%
Cholesteatoma	40-50db	2	2%
Sclerotic mastoid	40-50db	3	3%

DISCUSSIONS

The objective of Tympanoplasty in Tubotympanic type of CSOM is to close the perforation, remove the disease and improve hearing of the patient. It is an established procedure for tympanic membrane perforation repair. But all the ENT surgeons suffer from failure of the surgical

procedure; hence now the quest is on to improve the results further by studying the different influencing factors. Mastoid is becoming a centre of evaluation of the reasons for failure of Tympanoplasty. Recently many studies have been undertaken to evaluate the role of cortical mastoidectomy to improve the results of tympanoplasty.(6/7) They found that mastoid factors include the extent of mastoid pneumatization and the presence of inflammatory disease in the mastoid. Holmquist and Bergstrom first suggested that mastoidectomy improves the chance of successful tympanoplasty for patients with noncholesteatomatous chronic otitis media. They maintained that creation of an aerated mastoid enhances success in patients with poor tubal function or a small mastoid air cell system. As we know obstruction of the aditus contributes to the pathogenesis and accentuates pathologic conditions in otitis media. Moreover, it interferes with the aeration of the epitympanum and contributes to a great extent of the failure rates following tympanoplasty.

Merchant SN et al (8) states that simple closure of a perforation in active mucosal chronic otitis media without surgical removal of infected mucosa and granulation tissue from the mastoid is fraught with failure to control the disease.

McGrew BM et al suggested that Mastoidectomy impacted the clinical course in patients by reducing the number of patients requiring future procedures and by decreasing disease progression.(9)

Sheehy in 1985 recommended performing simple cortical mastoidectomy routinely for all tympanoplasties because it is "good practice" and because "it's better to be safe than sorry."

Sade (10) reported a correlation between mastoid pneumatization and middle ear aeration. Atelectatic tympanic membranes (poorly aerated middle ear systems) are associated with poorly pneumatized mastoids, and patients with deep retraction pockets are more likely to have a poorly pneumatized mastoid system.

Incidence of granulations hypertrophic mucosa / polyps and Granulations is usually reported very low. Raut et al (11) in their series have reported as 9.5% patients were having granulations and 5.3% patients were having aural polyp in Tubotympanic type of CSOM. Mohammed Bahgat (12) in his study reported an incidence of unhealthy, thickened, and edematous mucosa which on histopathology revealed a chronic inflammatory nature with granulation tissue in 20% of patients. In our series the incidence of hypertrophic mucosa / polyps was 18% where as granulations were encountered in 15% cases which was very high as compared to others.

Cholesteatoma in Tubotympanic CSOM – Rout MR (11) et al stated that although cholesteatoma is commonly found in CSOM with attic and marginal perforations, it is also found in case of central perforations. Although the involvement is rare, it was found in 3.4% of the study sample.(11) He further states that when we reviewed all the patients with central perforation and cholesteatoma, we found all of them came with complaints of either intermittent foul smelling ear discharge or intermittent pain in the ear and reduced hearing. On examination, four of seven patients were having dry perforation and three patients were having scanty non-foul smelling watery discharge.

In a Japanese study, 28 of 2948 (0.94%) ears with central perforation of the Tympanic membrane had cholesteatoma. Author was of the opinion that although a central perforation of the tympanic membrane is the typical finding of chronic otitis media without cholesteatoma, a keratinizing squamous epithelium on the tympanic side of the Tympanic membrane or in the tympanic cavity is occasionally found during surgery, although rarely (13)

In a study conducted by S Sandeep et al (14) they found a higher proportion of cholesteatoma in histopathology than seen by microscope. The overall incidence microscopically was 2% where

as the incidence was raised to 8% after all the tissue from the mastoid were subjected to histopathological examination.

In a study done by Sanjeev Kumar Thakur et al (15) they found cholesteatoma in 5.23% which was confirmed by histopathological study. In our study we found Cholesteatoma in only 2% cases both macroscopically and histopathologically. In both the cases we converted the surgery to Modified radical mastoidectomy

Sclerosis of the mastoid is associated with decreased pneumatization - a factor considered by most to be important for graft uptake and success of tympanoplasty as stated by Holmquist and Bergstrom (4), they argued that creation of an aerated mastoid enhances success in patients with poor tubal function or a small mastoid air cell system. We found mastoid sclerosis in only 3% of cases.

CONCLUSIONS

Tympanoplasty with or without cortical Mastoidectomy has been a matter of debate for a long amongst ENT specialists. In the inactive Tubotympanic CSOM with mild or moderate conductive hearing, as we saw the aditus was not always patent. It was obstructed in 35% of cases in our study group. Performing an aerating cortical Mastoidectomy in such cases would, theoretically, help in creating an aerated ear, thereby possibly reducing the recurrence rates. On the basis of our current study we suggest that opening the mastoid will be good surgical option in the following cases:

1. Discharge / Glue coming from Aditus area
2. Discharge / Glue coming from attic area
3. Hearing loss disproportionate to size of perforation
4. Medialisation of malleus
5. Polypoidal middle ear mucosa / any segment of middle ear mucosa
6. Cholesteatoma visualized (during surgery)
7. Granulations visualized in attic or aditus

area (during surgery)

8. Sclerotic mastoid if found preoperatively

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Note:

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