Comparative study of outcome of type I tympanoplasty in dry and wet ear

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Abstract Chronic suppurative otitis media is a common condition seen in patients attending the otolaryngology clinic. The discharging ear presents the otologist with the dilemma of operating on it or not. This due to the widespread belief that the success rate while doing tympanoplasty on wet ears is decidedly inferior. To evaluate this fact we conducted a study to compare outcomes of type I tympanoplasty in dry and wet ears. Wet ear meant that the patient had a mild mucoid discharge which was negative on culture. Type I tympanoplasty was done in all patients under local anesthesia using temporalis fascia graft and by underlay technique. We conclude that the presence of discharge in the ear at the time of operation does not interfere with the results of tympanoplasty, but it should be mucoid and scanty.

Keywords Type I tympanoplasty · Dry ear · Wet ear

Introduction

Chronic suppurative otitis media is a common condition seen in patients attending the otolaryngology clinic. The discharging ear presents the otologist with the dilemma of operating on it or not. This due to the widespread belief that the success rate while doing tympanoplasty on wet ears is decidedly inferior

Aims and objectives

To compare the incidence of graft uptake in dry and wet ears. To compare the postoperative hearing improvement in dry and wet ears.

Materials and methods

100 patients were selected for the study at Department of E.N.T, J.J. Hospital, Mumbai which was conducted over a period of one year (June 2005–May 2006) with regular follow-up.

The patients for study were selected on following criteria.

1. Age: between 15–40 years in both sexes.
2. Patients with small/moderate/subtotal central perforation with exclusion of total and attic perforation.
3. 50 patients with dry ear and 50 patients with mild mucoid discharge were selected.
4. Patients with only mild to moderate conductive hearing loss with no sensorineural hearing loss.
5. Patient having good general physical conditions.
6. Patients not having any evidence of active infection in nose, throat and paranasal sinuses.
7. All wet ear patients, the aural discharge culture and sensitivity showed no microorganisms.
8. Patients in whom X-ray mastoid showed sclerotic or partially sclerotic pneumatization, cortical mastoidectomy were performed.

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These selected patients were subjected to clinical, audiological, radiological and laboratorial investigations.

The pattern of examination followed was:

1. Detailed history of the patient.
2. General physical and systemic examination.
3. Examination of nose, throat and paranasal sinuses, especially for any source of chronic infection or allergy.
4. Otological examination, along with examination under microscope and hearing evaluation by tuning forks.
5. Pure tone audiogram with proper masking.
6. Radiological investigations including X-ray chest, X-ray mastoids and X-ray paranasal sinuses as and when required.
7. Relevant routine laboratory investigations including hemogram and urine examination.

Type 1 tympanoplasty was done in all patients under local anesthesia using temporalis fascia graft and by underlay technique. Cases in which X-ray mastoid showed sclerotic or partially sclerotic pneumatization, cortical mastoidectomy were performed

Postoperatively all the patients were put on oral antibiotics, analgesics, antihistamies and topical nasal decongestants. Mastoid dressing was removed on first postoperative day. All patients were instructed to take adequate precautions to prevent entry of water into the ear canal. Skin stitches were removed after 7 days. Antibiotics were continued for 10 days, antihistamies for 3 weeks and topical decongestants for 2 weeks. All patients were followed-up in the OPD after 1st, 2nd, 3rd, 6th and 12th week. Intactness of the drum and presence of discharge was assessed. Hearing assessment including repeat audiograms was done at 6 and 12 weeks. The presence of any complication was also noted.

Observation and result

In our case study of 100 patients, 50 patients had wet ear and 50 patients had dry ear. In dry ear there were 21 male and 29 females. Whereas in wet ear there were 24 males and 26 females. In dry ear out of 50, there were 8 male patients and 9 female patients in 15–20 years age group. In 21–25 years age group 4 were male and 8 were female; In 26–30 years age group there were 3 males and 4 females. In 31–35 years age group there was 1 male and 5 females. In 36–40 years age group 5 males and 3 were females. In wet ear out of 50 there were 9 male and 5 females in 15–20 years age group. In 21–25 years age group there were 5 male and females, in 26–30 years age group there were 6 males and 6 females, in 31–35 there were 2 males and 3 females, in 36–40 years age group there were 2 males and 7 females.

The perforation was more commonly on the right side 42%. In dry ears it being 24% and in wet ears it being 18%.

Whereas on left side it was 40%, in dry ears being 18% and wet ears it being 22%. Bilateral perforation were found in 18% of cases, in dry ears being 8% and wet ears being 10%.

The duration of disease was less than 5 years in 44 cases, 26 being in dry ears and 18 in wet ears. While in 18 patients the duration was more than 10 years, 9 being dry ears and 9 in wet ears and other 38 patients the duration of disease was between 5 and 10 years.

Out of the 100 patients, 57 cases had moderate perforation, 28 being in dry ear and 29 in wet ears, 23 had subtotal perforation 10 in dry ears and 13 in wet ears. Whereas in 20 cases there was small perforation, 12 in dry ears and 8 in wet ears.

In all the patients preoperative hearing level was measured by pure tone audiometry. 5 patients had hearing level of 20–25 dB out of which 3 were having dry ear and 2 had wet ear, those with 26–30 dB were 17 in all with dry being 9 and wet being 8, with 31–35 dB there were 23 in all with 11 having dry ear and 12 having wet ear, with 36–40 dB totally there were 40 with 17 in dry ear and 23 in wet ear, in 41–45 dB level in all there were 8 cases with 5 being in dry ear and 3 in wet ear and in 46–50 dB there were 7 in all with 5 in dry ear and 2 in wet ear

All the wet ear selected cases had scanty mucoid discharge whereas in dry ear they had an episode of mucoid discharge previously and there was no discharge from last 6 weeks without taking any medicine.

All patients were taken for microscopic examination 35 patients had edematous mucosa, 6 in dry ear and 29 in wet ear; 19 had hypertrophied mucosa, 10 in dry ears and 9 in wet ears, whereas in 26 cases had thin normal mucosa, 14 in dry ears 12 in wet ears; in dry ears 20 patients had atrophic mucosa.

Out of the 50 patients in wet ear 28 had sclerotic mastoid while 22 had partial sclerotic mastoid, whereas in dry ears 12 had sclerotic mastoid and 15 had partial sclerotic mastoid and 23 had normal pneumatized mastoid.

Patients were operated either in local anesthesia with sedation or in general anesthesia. All the patients were operated by the postauricular approach.

In all wet ears we opened the antrum and attic whereas in dry ears only in 27 cases whose X-ray mastoid showed sclerotic and partial sclerotic mastoid.

Intraoperatively in wet ears, in 10 cases atticointral blockage was present and in 12 cases limited minimal granulation tissue was present. Rest of the wet ears were normal. In dry ear only in 2 cases atticointral blockage was present. Rest of the findings were normal.

Postoperative day 1, all patients underwent check dressing, in wet ears 32 patients complained of minor auricular pain and 2 patients had serosanguinous soakage, while in dry ears 34 patients complained of minor auricular pain and 1 patient had serosanguinous discharge.

Sutures were removed on postoperative day 7 and all wound were healthy and healing. 2 cases suffered from

stitch abscess in wet ears and 2 developed granulation tissue in external auditory canal in dry ears.

Postoperative follow-up shows complete control of Otorrhoea in 44 cases while 4 patients complained of ear discharge after 15 days. They were given oral antibiotic, antihistamines and antibiotic ear drops. The otorrhoea was due to associated upper respiratory tract infection. While in wet ear the complete control of otorrhea in 37 cases while 7 patients developed ear discharge on 10th day which was associated with upper respiratory tract infection.

In dry ear complete graft uptake was seen in 44 (88%) patients, 4 had residual perforation and 2 patients underwent reoperation. The 4 residual perforation healed by applying 40% trichloroacetic acid.

In wet ear complete graft uptake was seen in 37 cases (74%), 10 had residual perforation and 3 patients underwent reoperation.

Hearing results were graded as air bone gap upto 0–10 dB, excellent; 10–20 dB, good; 20–30 dB, fair; and >30 dB, poor. 15 patients had excellent hearing results, 8 being dry and 7 being wet, 66 patients had good hearing results, 36 being dry and 30 being wet, 19 patients had fair hearing results, 9 dry and 10 being wet.

Discussion

Surgical repair of tympanic membrane and tympanic membrane grafting have traveled a long way, after initial reports tympanic membrane grafting filtered out of Germany in 1950s.

These years have been filled with numerous technical advances that have improved surgery for tympanic membrane repair to high level of accuracy. At this point, the graft take up rates and hearing results are fairly consistent and reproducible.

Tympanic membrane grafting in past and present basically differs in regards to graft material and method of placement. Temporalis fascia remains by far the commonly employed material today

In 1987, Ophir et al., in their study on myringoplasty in pediatric population reports a success rate of 79% [1]. They claim that the outcome of surgery could not be related

to the presence or absence of chronic otitis media in the untreated ear, the status of operated ear (whether dry or discharging) or the performance of adenoidectomy before myringoplasty.

In 1993, Vartianiner, in his report on study of failures in myringoplasty using temporalis fascia, put the necrosis in the middle of the graft without infection and anterior blunting as the commonest of the cause of early failures. Infection was the most common cause of late failures. They claim that the preoperative factors such as dry or wet ear, site of perforation, or grafting technique (overlay or underlay) do not affect the take up rate

In 1999 a study conducted by Raj et al. on patients with wet ears undergoing myringoplasty showed primary closure of perforation in 84% of patients and improvement of hearing in 68% of the patients [2].

Conclusion

In dry ear primary closure rate of 88% was obtained while in wet ear primary closure rate of 74% was obtained, statistically p value is 0.07 ($p > 0.05$) which is insignificant.

Postoperatively hearing improvement was excellent (0–10 dB) in 8 patients of dry ear and 7 patients of wet ear; good (10–20 dB) in 36 patients of dry ear and 30 patients of wet ear; fair (20–30 dB) in 9 patients of dry ear and 10 patients of wet ear, statistically p value is 0.85 ($p > 0.05$) which is insignificant.

The very fact that the p value is insignificant in both, the graft take up rate and the hearing improvement, shows that the presence of discharge in the ear at the time of operation does not interfere with the results of tympanoplasty, but it should be mucoid and scanty.

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