The impact of age on the outcome of tympanoplasty in adult population

Dr Tanha Zarin Naaz,
PG candidate for M.S. ENT

Dr. Madhusudhan Malpani,
Prof of ENT

Abstract- **Chronic suppurative otitis media is one of the most common cause of reversible conductive hearing loss in world especially in developing countries because of poor socio-economic status, poor nutritional habits, poor hygiene and lack of health education. It affects both sexes and all age groups. Successful outcome of tympanoplasty depends on various factors. This study was conducted to evaluate impact of age on outcome of type 1 tympanoplasty. Cases were selected, after proper history taking and preoperative evaluations, type 1 tympanoplasty was conducted under local anaesthesia with temporalis fascia graft using underlay technique through post-auricular approach. Patients were followed up in postoperative period for 6 months, with a conclusion that the outcome of type 1 tympanoplasty is affected by age.**

Keywords: **Type 1 tympanoplasty, CSOM, conductive hearing loss, patient's age**.

INTRODUCTION

It has been suggested that many factors influence the surgical outcome of tympanoplasty, age of the patient being the most controversial of all. Whether to conduct tympanoplasty in a child is a dilemma faced by many otorhinolaryngologists. Because of its long duration and greater severity compared with acute otitis media, and because most children need louder auditory stimuli than adults to perform optimally, CSOM in children is likely to impede language and cognitive development. Several studies have linked persistent and significant hearing loss from otitis media (not just CSOM) during the first two years of life with learning disabilities and poor scholastic performance [1]. Children suffer from more episodes of recurrent upper respiratory tract infection and with more patulous and straighter Eustachian tube in children the episodes of infections may lead to reinfection of operated ear, thus leading to the failure of surgery.

Tympanoplasty is "a procedure to eradicate disease in the middle ear and to reconstruct the hearing mechanism, with or without tympanic membrane grafting."[2]

Types of Tympanoplasty (Zollner Wullstein).[3]

Type 1 – Repair of the tympanic membrane alone; no middle ear abnormality. Type 1 tympanoplasty is synonymous with myringoplasty.
Type 2- Repair of the tympanic membrane and middle ear ; The malleus is eroded. Tympanoplasty involves grafting the tympanic membrane to the incus.
Type 3- Repair of the tympanic membrane on to the stapes head; The malleus and incus have a defect.
Type 4- The tympanic membrane is grafted to the stapes footplate , which is movable.
Type 5- Repair involves the stapes footplate, which is fixed.

AIMS AND OBJECTIVES

To observe and evaluate the impact of age of patient on outcome of type 1 tympanoplasty by assessing the

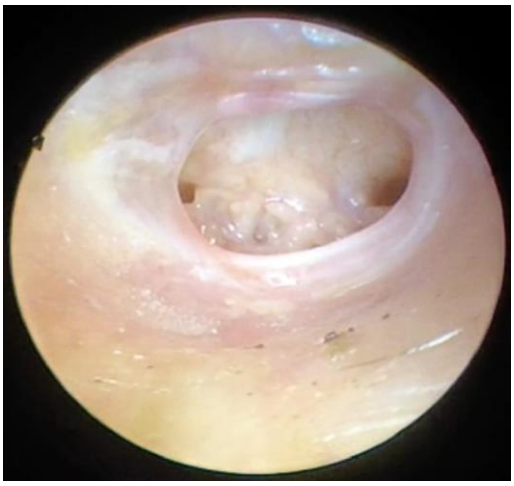
- hearing gain
- status of graft and
- discharge free status of patients in 6 months postoperative follow up visits.

MATERIALS AND METHODS

The study was conducted from August 2022 to October 2023 in Department of Ear, Nose and Throat, in a tertiary care hospital of Pravara Institute of Medical science, Loni, Maharashtra with 15 months follow up in postoperative period. 100 patients were selected with following criteria:

1. Patients with mucoid type of chronic suppurative otitis media.
2. Presence of conductive hearing loss with no sensorineural hearing loss.

3. Good general physical condition.
4. No evidence of infection in nose, throat and paranasal sinuses.
5. Undergoing surgery for the first time for the concerned ear. These selected patients were subjected to routine clinical examination, audiological, radiological and laboratorial investigations.



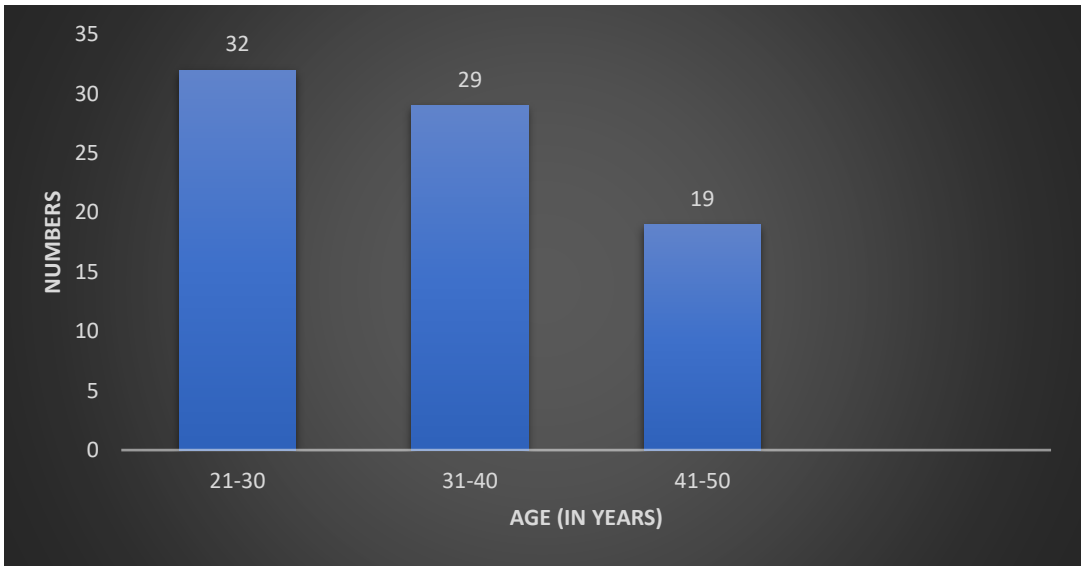
The pattern of examination followed was, detailed history of the patient, general physical and systemic examination, examination of nose, throat and paranasal sinuses, especially for any source of chronic infection or allergy, otological examination, along with examination under microscope, pure tone audiogram with proper masking, preoperative still image capture and relevant routine laboratory investigations.

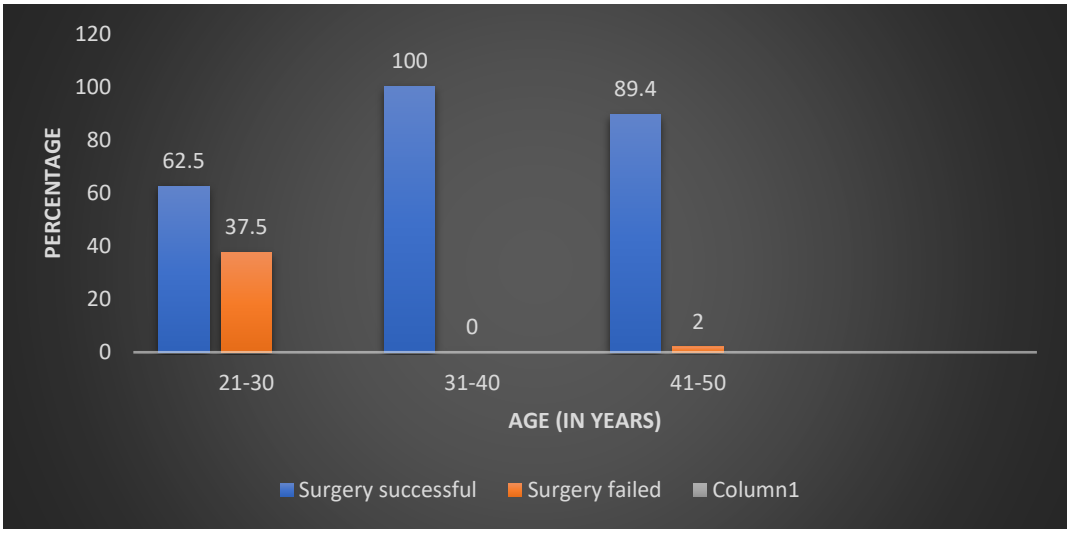
Type 1 tympanoplasty was performed in all selected cases by postaural approach by underlay technique using temporalis fascia autograft. Postoperatively all the patients were put on oral antibiotics, analgesics and steroids if middle ear mucosa was found inflamed perioperative. All patients were instructed to take adequate precautions to prevent entry of water into the ear canal. Skin stitches were removed after 7 days. Antibiotics were continued for 15 days, steroids for 10 days. Status of graft and hearing evaluation by PTA was done at 1month, 3month and 6 months postoperative.

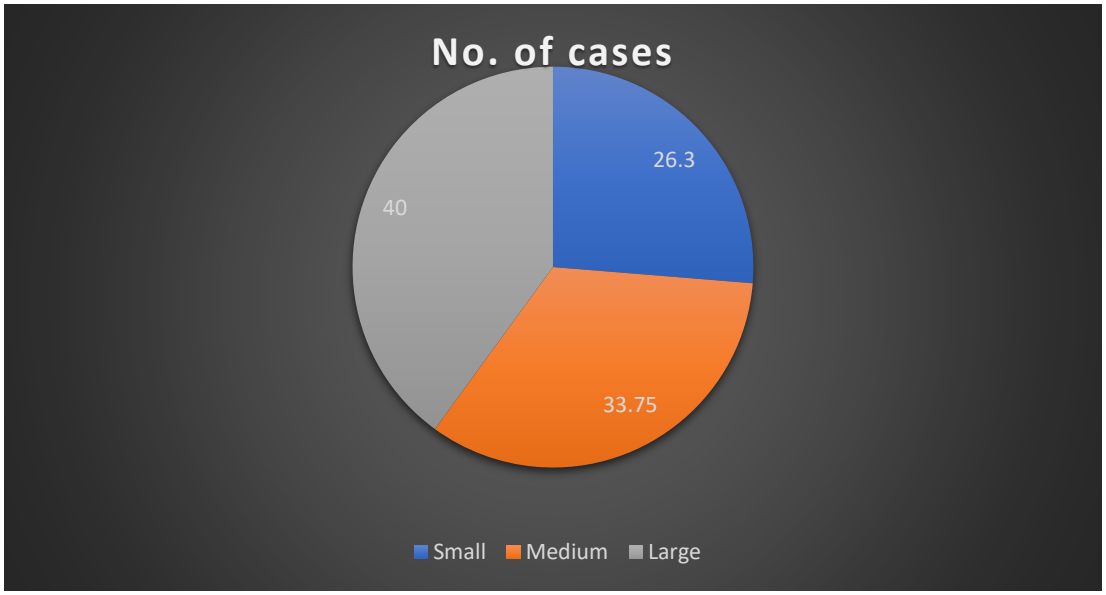
OBSERVATION AND RESULTS

Success of tympanoplasty was based on the criterion: presence of intact graft and improvement of air conduction thresholds by more than or equal to 10 dB at 6 month follow up PTA compared to the preoperative PTA. 100 patients participated in the study to begin with out of which 15 were lost in the follow up. Amongst remaining 85 patients 8 (9.4%) developed residual perforation during the period of study. These 8 patients underwent chemical application (40% trichloroacetic acid) following which 3 had healed perforation (included in study), rest 5 underwent revision surgery and thus were excluded from the study.

Amongst 80 patients who participated and were followed up for a period of 15 months in our study 38 (47.5%) were female and 42 (52.5%) were male. Majority were of 32 (40%) in 21 – 30 years, 29 (36%) in 31 – 40 years and 19 (23%) in 41 – 50 yrs.







21 (26.3%) had small (0 – 25%) perforation, 27 (33.75%) had medium (26 – 50%) sized perforation, 32 (40%) had large (> 50%) perforation. 13 (16.25%) had anterior perforation, 14 (17.5%) had posterior perforation, 53 (66.25%) involved both halves 66 (82.5%) of 80 patients with intact graft had improvement of pure tone thresholds > 10 dB at the end of 6 months follow up. Rest 14 patients failed to have specified improvement in hearing.

12 (30.8%) of 14 failure cases were in 21 – 40 age group, rest 2 belonged to 41 – 50 age group. These statistics shows significant association of success of surgery with increase in age of patient with p value equal to 0.004.

DISCUSSION

A recent study in Nepal Medical College concluded that the graft takes rate was better with the advancing ages similar to trend observed in our study[4].

In another study conducted by Habib ur Rehman et al, graft was taken up successfully in 80% (40/50) cases. They concluded that the success rate of myringoplasty is affected by various factors especially age, nature and size of perforation, the type of graft used, cellularity of mastoid and good functioning Eustachian tube[5].

In 1994 study published by Alexander Kessler et al concluded that reperforation was more common in patients younger than 6 years[6.]

In a study conducted by N Gupta and R K Mishra in 2002, the success rate was observed to be slightly higher in 12-15 year age group (90.24%) than in 8-11 year age group (81.8%)[7.]

While in their study "Type 1 tympanoplasty: Influencing factors" conducted by Warren Y.Adkins & Benjamin White (1984) found the age of patient to have no affect on success of tympanoplasty[8.]

CONCLUSION

Overall graft uptake rate in our study was 80%. Out of this 82.5% showed improvement in hearing documented by improvement in average air conduction by more than or equal to 10 dB in 6 month follow up PTA. Of the failure cases 85.7% were from younger age group. Surgical results improved with increase in patient's age with significant p value equal to 0.004.

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