ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 12 | December - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A COMPARISON BETWEEN GROMMET INSERTION AND CONSERVATIVE MANAGEMENT OF PARS TENSA RETRACTION POCKETS

Otorhinolaryngology

Prof. Dr. M. K. Rajasekar Professor And Hod, Department Of Ent, Sree Balaji Medical College And Hospital, Chennia, India

Dr. Nithya Balasubramanian Junior Resident, Department Of Ent, Sree Balaji Medical College And Hospital, Chennia, India

ABSTRACT

The management of tympanic membrane retraction pockets surgically is a contentious issue. When patients present without a predisposing factor, the course of the disease cannot be anticipated. Some patients may develop cholesteatoma, while others may remain asymptomatic. As a result, the issue occurs when one is unable to foresee the progression of the disease, such as whether the disease is progressing to cholesteatoma, due to normal hearing acuity. A study was conducted in the department of ENT, Sree Balaji Medical College and Hospital, Chennai in which we compared grommet insertion and conservative management of pars tensa retraction pockets in a group of 50 patients. The subjects were divided into two groups of 25 patients, one group was managed conservatively while the other group underwent surgical intervention. Up to 6 months after the initial presentation, both groups were followed up on at regular intervals. 16 patients (69.6%) in the group managed with myringotomy and grommet insertion (group A) showed reversal of retraction.

KEYWORDS

AIMS AND OBJECTIVES

- To assess the effectiveness of insertion of grommet and myringotomy as surgical management of retraction pockets involving pars tensa over conservative measures.
- To see whether the retraction pockets, if treated early enough can reverse the retraction and prevent the disease from progressing to cholesteatoma.

Inclusion Criteria:

1. Patients with grade II & III pars tensa retraction pockets classified according to SADE.
2. 18 – 60 years of age.
3. Male and female
4. Patients not having paranasal pathology and pathology of the nasopharynx.

Exclusion Criteria:

1. Patients with grade I & IV pars tensa retraction pockets classified according to SADE.
2. Patients with retraction of pars flaccida
3. Age group less than 18 years & more than 60 years.
4. Patients with granulation and cholesteatoma.
5. Patients in immunocompromised state or with co-morbid conditions like diabetes.

MATERIALS AND METHODS:

This study included fifty patients whose consent has been taken for participation in the study, who have pars tensa retraction pockets and they were further divided into two groups consisting of twenty-five patients each

Otoendoscopy of the ear, audiometry, impedance, nasal endoscopy, and CT- paranasal sinuses were used in the preoperative evaluation.

Antihistamines, nasal decongestants, topical steroids, and regular Valsalva manoeuvres were used to manage patients in one group. Myringotomy and grommet implantation were used to treat patients in the second group. Regular videootoscopy and pure tone audiometry will be used to monitor for reversal or worsening of retraction in both groups over the next six months. The outcomes were compared at the first, third, and sixth months after surgery to see if there is a substantial difference between the two treatment options.

All individuals included in this study underwent a thorough history and examination of their ears, nose, and throat.All patients who were scheduled for grommet insertion and myringotomy had their general anaesthesia needs assessed.After a thorough pre-operative evaluation, one set of patients were scheduled for surgery, while the other were managed conservatively.

Procedure

Patient is put under general anaesthesia and positioned with his/her turned to the opposite side. The patient is painted and draped under aseptic precautions and ear is cleaned with povidone iodine solution to remove residual wax or debris. In the anteroinferior quadrant, a radial incision is made with the help of a myringotome and grommet is inserted and kept in place.

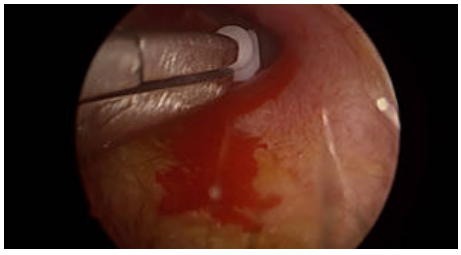

Fig: Placement of grommet

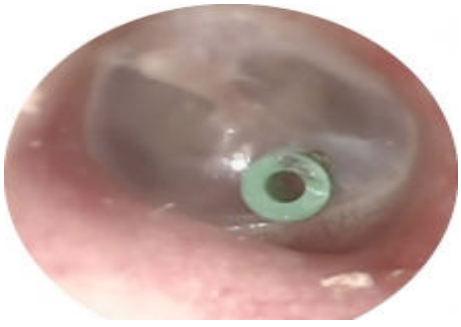

Fig: Grommet in-situ

Observation And Results Of The Study

From August 2019 to August 2021, a 50-patient study was undertaken at the Department of ENT at Sree Balaji Medical College and Hospital. According to Sade's classification, all of the patients had grade II and III pars tensa retraction pockets. Disorders of the nasopharynx and sinuses were ruled out with the help of meticulous investigatory efforts. Otoendoscopy, pure tone audiometry, and impedance were done pre-operatively. One group was treated surgically with myringotomy and subsequent grommet insertion, while the other was treated with antihistamines, nasal decongestants, topical steroids, and were asked to perform the Valsalva manoeuvre on a regular basis. At the first, third, and sixth months after surgery, all patients were examined for reversal and advancement of retraction pockets and, hearing improvement or worsening as well. The following are some of the study's findings: For the sake of simplicity,

Group A was assigned to the group that was managed cautiously and Group B to the group that was controlled by Grommet insertion.

3 from medical management group (12.0%) and 2 from myringotomy group (8.0%) were lost to follow up and hence medical management group for comparison of outcomes later had 22 study subjects and the other group had 23 study subjects among 25. The remaining patients were throroughly followed up and looked out for any reversal of retraction as well as progression by meticulous otoendoscopy. Their hearing was also tested using a pure tone audiogram to see if the air-bone gap had improved or deteriorated. The results were analysed and compared using the Chi-Square test.

Age distribution:
The criteria for age distribution was kept between 18 to 60 years Majority of the study subjects in the medical management group belonged to 31 to 40 years age group (28.0%) and to 21 to 30 years in the other group (32.0%). However, the mean age of the study subjects did not differ significantly among the study groups (P>0.05). The distribution of the study subjects also did not differ significantly according to gender and they were equally distributed across the groups. (P>0.05).

Table-1: Distribution of study subjects based on socio-demographic profile:

Variables	Medical Management (n=25)	Myringotomy (n=25)	P–value
Age group in years n (%)			
≤20 21 – 30 31 – 40 41 – 50 >50	04 (16.0) 04 (16.0) 07 (28.0) 05 (20.0) 05 (20.0)	04 (16.0) 08 (32.0) 07 (28.0) 03 (12.0) 03 (12.0)	--
Mean age±SD*	36.32±13.05	32.40±12.05	0.55
Gender¥ n (%)			
Male Female	13 (52.0) 12 (48.0)	14 (56.0) 11 (44.0)	0.78
Symptoms¤ n (%)			
Yes No	25 (100.0) 00 (0.0)	24 (96.0) 01 (4.0)	1.00

Symptoms
25 patients from Group A presented with symptoms, while Group B had 24 patients presenting with symptoms. The main symptoms seen with both the groups is worsening of hearing, tinnitus, ear block and otalgia.

The symptoms with which the study subjects presented in respective groups of medical management and myringotomy were history of hearing loss (72.0% vs 76.0%), tinnitus (60.0% vs 56.0%), ear block (52.0% vs 44.0%), otalgia (36.0% vs 32.0%) (P>0.05).100.0% of them in the medical management group presented with either of the symptoms and in the other group, 96.0% had symptoms. However, the proportions of study subjects did not vary significantly (P>0.05) among the two study groups. However, the proportions of study subjects did not vary significantly (P>0.05) among the two study groups.

Examination findings:
All patients in both the groups had Grade II and Grade III retraction pockets. Group A and Group B had 12 patients each who presented with Grade II retraction pockets. 13 patients from both groups presented with Grade III retraction pockets as well. P-value being 1.000.

Table-2: Distribution of study subjects based on clinical profile:

Variables	Medical Management (n=25)	Myringotomy (n=25)	P–value
Symptoms¤ n (%)			
Yes No	25 (100.0) 00 (0.0)	24 (96.0) 01 (4.0)	1.00
Baseline Retraction Gradient¥ n (%)			
II III	12 (48.0) 13 (52.0)	12 (48.0) 13 (52.0)	1.00
Mean Baseline Air Bone Conduction Gap in dB□			
Mean±SD	33.28±4.78	33.88±5.82	0.69
Impedance¥¥ n (%)			
B C	09 (36.0) 16 (64.0)	08 (32.0) 17 (68.0)	1.00

The proportion of baseline gradients of II and III, impedance categories of B and C and mean baseline air bone conduction gaps (Medical management: 33.28 dB vs Myringotomy: 33.88 dB) also did not differ among the groups (P>0.05).

Pre-operative hearing:
The comparison of mean air bone conduction gaps were not significantly different between the groups (medical management vs myringotomy) either at 1st month of follow up (34.86 dB vs 33.27 dB) or 3rd month of follow up (35.87 dB vs 31.79 dB) or at 6th month of follow up (36.81 dB vs 30.51 dB) (P>0.05)

Table-3: Comparison of means of air bone conduction gaps among the two study groups:

Air Bone Conduction Gap in dB	Medical Management (n=22) (Mean± SD)	Myringotomy (n=23) (Mean±SD)	t-value [95% CI]	P–value
Baseline	33.28±4.78	33.88±5.82	-0.39 [-3.63 to 2.43]	0.69
At 1st month	34.86±6.52	33.27±9.68	0.64 [-3.39 to 6.57]	0.52
At 3rd month	35.87±8.80	31.79±10.86	1.38 [-1.88 to 10.04]	0.18
At 6th month	36.81±10.77	30.51±10.54	1.98 [-0.10 to 12.70]	0.05

The mean air bone conduction gaps seem to be on increasing trend in the medical management group, however in the myringotomy group, at first month there was no much difference and then there was slight improvement in terms of reduction in the air bone conduction gap. The difference in the mean air bone conduction gaps within the group was not significantly different compared to baseline. On applying, repeated measures ANOVA, Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $\chi^2(5) = 74.81$, P<0 .001, and therefore, a Greenhouse-Geisser correction was used. There was no significant effect of both line of treatment on reduction of air-bone conduction gap $F(1.58, 69.74) = 0.086$, P=0.88.

Table-4: Comparison of proportions of study subjects with improvement in the retraction compared to baseline among the two study groups:

Air Bone Conduction Gap in dB	Medical Management (n=22) (Mean±SD)	Myringotomy (n=23) (Mean±SD)	t-value [95% CI]	P–value
Baseline	33.28±4.78	33.88±5.82	-0.39 [-3.63 to 2.43]	0.69
At 1st month	34.86±6.52	33.27±9.68	0.64 [-3.39 to 6.57]	0.52
At 3rd month	35.87±8.80	31.79±10.86	1.38 [-1.88 to 10.04]	0.18
At 6th month	36.81±10.77	30.51±10.54	1.98 [-0.10 to 12.70]	0.05

*indicates significant statistical difference at P<0.05

The proportions of those who improved in terms of reduction in the grades of retraction compared to baseline were more in myringotomy (S) group compared to medical management (M) group at first (S:69.6 % vs M:31.8%), third (S:78.3% vs M:36.4%), and sixth month (S:69.6 % vs M:40.9%). However the difference was significant at first and third month but lost it's significance at sixth month (P>0.05).

Follow -up examination:
Up to 6 months after the initial presentation, both groups were followed up on at regular intervals. 16 patients (69.6%) in the group managed with myringotomy and grommet insertion (group A) showed reversal of retraction. Despite intensive surgical intervention, 7 (30.4%) patients had chronic or progressive retractions. None of the patients developed cholesteatoma, tympanosclerosis, ossicular disruption, or granuloma formation as a result of their tympanostomy tubes.

At the end of 1st month, 31.8% had reversal of retraction from the medically managed group, while the surgically managed group had 69.6% of the patients showing reversal of retraction.

By the end of 3rd month, the medically managed group had 36.4% of patients showing reversal of retraction while 78.3% of patients showed reversal in the surgically managed group.

At the end of 6th month, 40.9% showed reversal in medically managed group, while 69.6% showed reversal in the surgically managed group.

The above statistics tell us that the rate of reversal of retraction pockets in the surgically managed group is better than in those patients managed conservatively. The reversal of retractions prove that surgical management helps prevent the development and progression of cholesteatoma.

As a consequence of our investigation, it is obvious that there was a clinically and statistically significant difference in all follow-up findings between the groups managed conservatively and surgically by myringotomy and grommet insertion. In the care of pars tensa retraction pockets, simple excision or myringotomy with ventilation tube insertion should be considered first, rather than more severe surgeries such reinforcement tympanoplasty employing temporalis fascia or cartilage graft. None of the patients in our study group developed cholesteatoma as a result of retraction, demonstrating that early intervention, whether medicinal or surgical, can stop the progression to cholesteatoma.

DISCUSSION

In clinical practise, tympanic membrane retraction pockets are widespread, and they can be difficult to cure because they normally cause no symptoms. Despite this, it is recognised as a distinct precursor to the development of cholesteatoma. As a result, it's now standard practise to properly manage retraction pockets early on.

Treatment options for retraction pockets include watchful waiting, medical methods to eliminate eustachian tube obstruction, excision of retraction pocket, myringotomy with ventilation tube insertion, Cartilage Tympanoplasty, and Cortical mastoidectomy.

The main goal of this study, which was conducted at Sree Balaji Medical College's Department of ENT, was to evaluate the clinical profile of pars tensa retraction pockets, their presenting features, the natural course of the disease, to compare outcomes of medical and surgical management, whether intervention in the form of medical or surgical management can alter the progression of the disease to cholesteatoma, and to compare the efficacy of the two lines of management, over a period of six months.

In the present study we have assessed the outcome of ventilation tube insertion as one of the modalities of surgical management.

The study concludes that the mean air bone gap in medically managed patients was 33.28 and in surgically managed patients was 33.88, at the end of first month. At the end of 3rd month and 6th month, the air bone conduction gap in medically managed group showed better outcomes.

However, with regard to reversal of retraction and progression of cholesteatoma, there was improvement noted in the surgically managed group--- 69.6%(1st month), 78.3%(3rd month), 69.6%(6th month) , with significant improvement seen at 3rd month of follow-up.

In a study conducted in children by Rath et al, simultaneous insertion of ventilation tubes along with transmeatal excision of retraction pockets was assessed. 30 out of 40 patients showed decrease in air bone conduction gap from 22.4dB to 9.7dB.

Likewise in a study conducted by Luntz et al on the influence of ventilating tubes in surgical management of atelectatic ears, 55 of the 111 patients underwent surgery for insertion of ventilation tubes. Patients were followed up for an average of 53 months and were found to have adequate aeration as long as the ventilation tube was in place. The study concluded that atelectatic prone ears are best treated with insertion of ventilation tubes. [8]

CONCLUSION

Myringotomy group showed some improved hearing outcome, though not significant compared to the medical management group where the air bone conduction gap increased indicating no effect of medical intervention on the hearing. Myringotomy also showed significant improvement in terms of proportions of those who improved with retractions compared to medical management in initial three months of follow up. But at 6th month of follow up, there was not much difference in the improvement of retractions among both indicating delayed effect of medical management compared to myringotomy and grommet insertion. However myringotomy and grommet insertion takes a lead as an important intervention of retraction pockets with immediate effect on reducing the gradient of retractions and also improved hearing as compared to medical management. Thus myringotomy and grommet insertion is more effective and has to be considered as an important option for management of retraction pockets rather than conservative medical management.

Declaration

Consent was obtained for all participants in the study.Sree Balaji Medical college ethics committee approves this study in its presented form.

All authors have declared that no financial aid was provided for the conduction of the study

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