

A Clinical Study to Determine the Effects of Adenoidectomy in Cases of Secretory Otitis Media

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Abstract

Background: Otitis media with effusion (OME) is a common pediatric condition associated with adenoid hypertrophy and Eustachian tube dysfunction, leading to conductive hearing loss and developmental concerns. This study evaluates the effect of adenoidectomy on clinical and hearing outcomes in children with OME.

Methods: A prospective interventional study was conducted on 90 children aged 5–15 years with secretory otitis media and adenoid hypertrophy. All underwent adenoidectomy after failed medical therapy. Otoscopy, tympanometry, and pure tone audiometry were assessed preoperatively and at 6-month follow-up.

Results: Type B tympanogram was present in 80% preoperatively. At six months, 60% converted to Type

A. Hearing improvement occurred in 72.22%, with a mean PTA gain of 15.75 dB ($p < 0.001$).

Conclusion: Adenoidectomy effectively improves hearing and middle ear status in persistent OME.

Keywords: Otitis media with effusion, Adenoidectomy, Hearing outcome, Tympanometry

Introduction

Secretory otitis media (SOM) is one of the most common otologic conditions in childhood. It is characterized by the buildup of non-purulent fluid in the middle ear without indications of an acute infection, which frequently leads to conductive hearing loss. Persistent or recurrent effusion can adversely affect speech and language development, scholastic performance, and social interactions in children. SOM occurs mainly due to anatomical and functional

immaturity of the Eustachian tube, frequent upper respiratory tract infections, and environmental factors^{1,2} Hypertrophy of the adenoids is considered one of the most important contributing factors in the persistence of SOM. When enlarged or chronically inflamed, they may cause mechanical obstruction, impair mucociliary clearance, and act as a reservoir for pathogenic organisms. This leads to impaired ventilation of the middle ear, negative pressure, and subsequent fluid accumulation. The relationship between adenoid hypertrophy and middle ear effusion has been well established, and adenoidectomy has long been advocated as a treatment modality in such cases.^{3,4}

While medical management is often attempted, their efficacy in chronic cases remains limited. Adenoidectomy has been shown to improve middle ear ventilation, reduce the recurrence of effusion, and enhance hearing outcomes.^{5,6}

Materials and Methods

Study Design and Setting: This was a clinical interventional study conducted at the Department of ENT, Santosh Medical College and Hospital, Ghaziabad from 2024-2025

Study Population: Children visiting the ENT outpatient department were assessed for eligibility. A total of 87 patients who met the inclusion criteria were included in the study.

Inclusion Criteria

- Children aged 5–15 years.
- Patients diagnosed with chronic unilateral or bilateral secretory otitis media associated with adenoid hypertrophy.
- Parents or guardians willing to provide written informed consent.

Exclusion Criteria

- Children aged below 5 years or above 15 years
- Patients with acute or chronic suppurative otitis media
- Presence of congenital deformities of the ear, cleft palate, Down syndrome, or craniofacial anomalies
- Patients whose parents or guardians did not give consent

Data Collection:

A comprehensive medical history was obtained for all children. A thorough examination of the ear, nose, throat, and systemic conditions was conducted. • Symptoms such as nasal obstruction, snoring, nasal discharge, hearing difficulties, a sensation of fullness in the ear, and sore throat were documented. Otoscopic observations, including dull, lustreless, amber-colored, or retracted tympanic membranes, were recorded and tabulated. • The hearing thresholds for both ears were assessed using pure tone audiometry.

The gathered data were input into Microsoft Excel and examined with the use of relevant statistical software. Categorical variables were represented as frequencies and percentages, whereas continuous variables were represented as mean and standard deviation. Preoperative and postoperative hearing thresholds were compared utilizing appropriate statistical tests. A p-value of <0.05 was deemed statistically significant.

Results

A total of 90 children aged 5–15 years diagnosed with secretory otitis media associated with adenoid hypertrophy were included.

- The maximum number of cases (31.11%) belonged to the 11–13 years age group, followed by 8–10 years (24.44%), 5–7 years (23.33%), and 14–15 years (21.11%).

- Female children (51.11%) slightly outnumbered males (48.89%), showing no significant sex predilection.
- Nasal obstruction (53.33%) was the most common presenting symptom, followed by nasal discharge (43.33%), snoring (41.11%), ear fullness (38.89%), and sore throat (33.33%). Multiple symptoms were noted in several patients.
- On otoscopic examination, air bubbles behind the tympanic membrane were observed in 40.00% of cases, followed by dull tympanic membrane (33.33%) and amber tympanic membrane (26.67%).
- On diagnostic nasal endoscopy, Grade III adenoid hypertrophy (43.33%) was most common, followed by Grade IV (27.78%), Grade I (18.89%), and Grade II (10.00%).
- Pre-operative tympanometry revealed Type B tympanogram in 80.00% of patients, while Type C1 (12.22%) and Type C2 (7.78%) were less common. Type A tympanogram was absent pre-operatively.
- At 6 months post-operative follow-up, Type A tympanogram was seen in 60.00% of cases, followed by Type B (25.56%) and Type C1 (14.44%).
- Post-operative follow-up showed no complications in 30.00% of patients. The remaining patients had infection (27.78%), otitis media (22.22%), or bleeding (20.00%).
- Final hearing outcome assessment showed improvement in 72.22% of children, no change in 22.22%, and worsening in 5.56% of cases.
- Conversion from pre-operative Type B/C tympanograms to post-operative Type A was observed in a majority of cases; however, the association was not statistically significant.

- Hearing improvement was observed across all pre-operative and post-operative tympanometry types, with no statistically significant association.
- Mean Pure Tone Average (PTA) improved progressively from 32.55 ± 3.33 dB pre-operatively to 16.80 ± 4.49 dB at 6 months post-operatively.
- Mean PTA improvement was 11.95 dB at 1 month, 14.57 dB at 3 months, and 15.75 dB at 6 months, with all changes being statistically significant ($p < 0.001$).

Table 1: Distribution of cases according to age group

Age group	Number	Percentage
5-7	21	23.33
8-10	22	24.44
11-13	28	31.11
14-15	19	21.11
Total	90	100.00

Table 2: Distribution of cases according to sex

Sex	Number	Percentage
Female	46	51.11
Male	44	48.89
Total	90	100.00

Table 3: Distribution of cases according to presenting symptoms

Presenting Symptoms	Number N=90*	Percentage
Nasal obstruction	48	53.33
Nasal discharge	39	43.33
Snoring	37	41.11
Ear fullness	35	38.89
Sore throat	30	33.33

*multiple responses

Table 4: Distribution of cases according to otoscopic findings

Otosopic Findings	Number	Percentage
Dull TM	30	33.33
Amber TM	24	26.67
Air bubbles	36	40.00
Total	90	100.00

Table 5: Distribution of cases according to Diagnostic Nasal Endoscopy Grading

Endoscopy Grade	Number	Percentage
Grade III	39	43.33
Grade IV	25	27.78
Grade I	17	18.89
Grade II	09	10.00
Total	90	100.00

Table 6: Distribution of cases according to final hearing outcome

Final Hearing Outcome	Number	Percentage
No change	20	22.22
Worsened	5	5.56
Improved	65	72.22
Total	90	100.00

Table 7: Association between Tympanometry (Pre-op Type) and Tympanometry (Post-op) at 6 months

Pre-op Type	Tympanometry type (Post-op) at 6 months			
	Type A	Type B	Type C1	Total
Type B (n=72)	42 (58.3%)	18 (25.0%)	12 (16.7%)	72
Type C1 (n=11)	7 (63.6%)	3 (27.3%)	1 (9.1%)	11
Type C2 (n=7)	5 (71.4%)	2 (28.6%)	0 (0.0%)	7
Total	54	23	13	90

-value: 0.18

Discussion

Otitis media with effusion (OME) is a common cause of hearing impairment in children and is frequently associated with adenoid hypertrophy and Eustachian tube dysfunction. This study evaluated clinical presentation, otoscopic and tympanometric findings, and hearing outcomes in 90 children aged 5–15 years with a follow-up of six months, and compared the findings with established literature.

The highest proportion of children belonged to the 11–13-year age group (31.11%), followed by 8–10 years (24.44%), supporting observations by Paradise et al. who reported persistent or recurrent effusion beyond 8 years in nearly 30–35% of affected children. Maw and Bawden similarly noted that children requiring intervention commonly fall within the 8–12-year age range. Females (51.11%) and males (48.89%) were almost equally affected, consistent with reports by Zielhuis et al.⁸ and Gates et al., who found no significant sex predilection.

Nasal obstruction was the most common symptom (53.33%), in agreement with El-Anwar et al., who demonstrated a strong association between adenoid hypertrophy and OME. Otoscopic findings included air–fluid levels (40%), dull tympanic membrane (33.33%), and amber discoloration (26.67%), which are classical signs described by Bluestone. Preoperatively, Type B tympanogram was observed in 80% of cases, comparable to the 70–85% reported by Gates et al.⁷

At six months, 60% showed normalization to Type A tympanogram, similar to outcomes reported by Gurmani et al.⁹ Hearing improvement occurred in 72.22% of children. Mean pure tone average improved significantly from 32.55 ± 3.33 dB to 16.80 ± 4.49 dB ($p < 0.001$), comparable to gains of 10–15 dB reported by Gates et al.

Hearing recovery was independent of demographic variables, as also noted by Maw and Paradise.

Conclusion

The present study demonstrates that otitis media with effusion in children predominantly affects the late childhood age group and commonly presents with nasal obstruction, nasal discharge, and snoring. Pre-operative evaluation revealed classical otoscopic findings and a predominance of Type B tympanograms, indicating middle ear effusion in the majority of cases.

Post-treatment follow-up showed a significant shift toward normalization of tympanometric patterns, with Type A tympanogram observed in a majority of children at six months. Hearing improvement was noted in nearly three-fourths of the study population, with a statistically significant reduction in mean pure tone audiometry thresholds over successive follow-up periods. Improvement in hearing outcomes was observed across all age groups and both sexes, with no statistical significant association between demographic variables and final hearing outcome.

References

1. Gupta P, Vishwakarma R, Yadav K. Chronic suppurative otitis media: A microbiological review with special reference to India. *Indian J Otol.* 2020;26(2):59–64.
2. World Health Organization. Chronic suppurative otitis media: Burden of illness and management options. Geneva: WHO; 2004.
3. Brar S, Ramalingam R. Tympanoplasty. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023.
4. Wullstein H. The restoration of the function of the middle ear in chronic otitis media. *Ann Otol Rhinol Laryngol.* 1956;65:1020–1041.
5. Merkus P, et al. Microscopic tympanoplasty: principles and outcomes. *Otol Neurotol.* 2018;39(7):857–864.
6. Indorewala S, et al. Tympanoplasty outcomes: Review of 789 cases. *Indian J Otolaryngol Head Neck Surg.* 2015;67(4):363–368.
7. Gates GA, Avery CA, Prihoda TJ, Cooper JC Jr. Effectiveness of adenoidectomy and tympanostomy tubes in the treatment of chronic otitis media with effusion. *N Engl J Med.* 1987;317(23):1444–51.
8. Zielhuis GA, Rach GH, van den Bosch A, van den Broek P. The prevalence of otitis media with effusion: A critical review of the literature. *Clin Otolaryngol Allied Sci.* 1990;15(3):283–288.
9. Gurumani S, Verma A, Naveen, Maran SA, Verghese SS. Changes in middle ear function after adenoidectomy in children with adenoid hypertrophy. *J Chem Health Risks.* 2026;16(1):801–806.