

## ***Original Article***

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# **Role of Adenoidectomy Alone in Otitis Media with Effusion - Our Experience**

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### **Abstract:**

**Objective:** *Otitis Media with effusion (OME) is a vital and common problem in school going children. It is the prime cause of impaired hearing and social trouble in children which has long term impact on speech and language development. Enlarged Adenoid is a very common causative factor in the development of OME. The aim of this study is to observe the ground of the disease in favour of correction of effusion after adenoidectomy.*

**Methods:** *This is a prospective descriptive study had been carried out in BIRDEM General Hospital from January 2012 to December 2015. A total 40 patients aged 3 to 12 years old who had adenoid hypertrophy and OME, confirmed with pre operative X-ray nasopharynx lateral view, PTA and tympanometry were included in this study. All patients underwent adenoidectomy under General anaesthesia. Follow up was done with PTA and tympanometry at 3<sup>rd</sup> months after operation.*

**Result:** *Among 80 ears of 40 patients, pre operative tympanometry showed type B curve in 43.2% of ears. Post operative audiometric assessment showed mean hearing gain at 3<sup>rd</sup> month being 5.32 dB. At 3<sup>rd</sup> month follow up, 20 ears had type A curve, only 6 ears had type B curve and 53 ears had type C curve.*

**Conclusion:** *So, adenoidectomy is an effective operation in correcting middle ear effusion and resulting hearing improvement as well as speech and language development in children with enlarged adenoid and OME.*

**Key words:** *Otitis media with effusion, Adenoid hypertrophy, Adenoidectomy, Pure tone audiometry, Tympanometry.*

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### Introduction:

OME is the chronic accumulation of mucus, serous or glue like fluid within the middle ear and sometimes in the mastoid air cell system for more than 12 weeks<sup>1</sup>. In children, OME usually present because of the associated hearing impairment, defective speech and sometimes with a preceding history of fever and otalgia consequent on an episode of acute otitis media (AOM)<sup>1</sup>. Some conditions are generally accepted to play a direct role or as a predisposing factors to develop OME such as eustachian tube(ET) dysfunction, previous or ongoing middle ear inflammation, nasal inflammation secondary to upper respiratory tract infection, allergic rhinitis etc. But adenoid hypertrophy is an important leading etiologocal factor that can adversely affect the normal ET function and result in OME especially pediatric age group.

When the long term impact of OME is considered, surgical treatment is most cost effective than medical treatment for severe cases. There have been studies on role of enlarged adenoids in causation of OME. Adenoidectomy is being increasingly used for treatment of OME because recent studies have confirmed its effectiveness<sup>2</sup>.

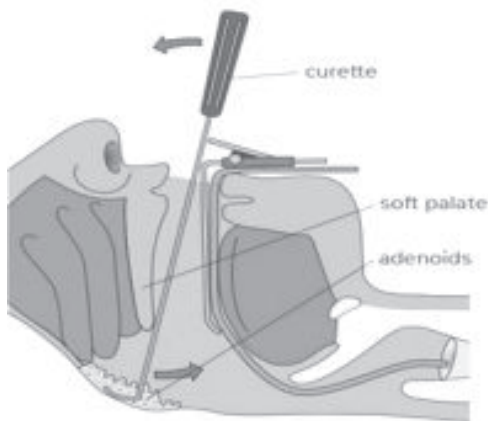


Fig.-1: Diagrammatic picture of adenoidectomy

### Methods:

A prospective study was being conducted at BIRDEM General Hospital/Dhaka during the period of January 2012 to December 2015.

Verbal consent was taken from the children's parents to whom full explanations about the study were given. The following steps were implemented in reaching the diagnosis.

History was taken from the parents, focusing on different aspects of the condition including nasal obstruction, snoring, hyponasal speech, difficulty in hearing, H/O previous earache and previous operation in the field of ear, nose and throat. Complete clinical examinations of ear, nose and throat were done. Rinne and Weber test for cooperative children above 6 years of age were done. Otoscopy to look for the signs of OME was done. Nasoendoscopy was done.



Fig.2: Adenoid facies

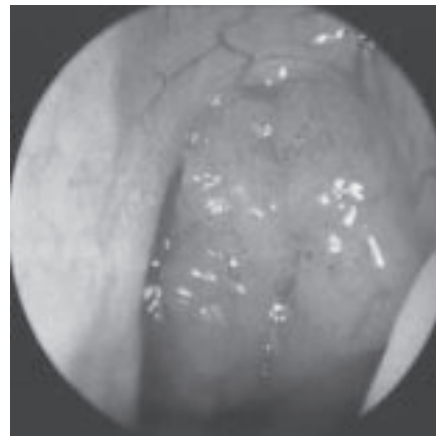


Fig.3: Nasoendoscopic view

**Investigations:** Radiographs of nasopharynx was done to determine the size of adenoid. Pure tone audiometry and tympanometry were done to check the hearing status. Tympanometry graphs obtained were noted as Type A- normal compliance, Type B- OME and Type-C reduced compliance. Questionnaire was filled out with positive findings. The prospective study included 40 patients presenting primarily with features suggestive of adenoid hypertrophy not responding to medical therapy underwent adenoidectomy under general anaesthesia at our tertiary care hospital during the period of January 2012- December 2015. Post operatively all patients were treated with antibiotics, nasal decongestants, and antihistamins. All patients were followed up at third month after surgery with repeat PTA and Tympanometry to see the hearing improvement and occurrence of peak respectively.

**Result:**

Present study included 40 patients with enlarged adenoid and OME who presented to our outpatient department during the study period.

**Table I**  
*Age distribution of the patients*

Age in years	Number of patients	Percentage %
3 - 4	6	15
5 - 6	20	50
7 - 8	7	17.5
9-10	5	12.5
11-12	2	2.5
Total	40	100

**Table II**

*Distribution of symptoms of patient:*

Symptoms	No. of patients (N=40)	Percentage %
Nasal obstruction/ Snoring	40	100
Mouth breathing	36	90
Sleep apnoea	22	55
Aural fullness	23	57.5

All patients had nasal obstruction / snoring, 90% of patients had mouth breathing, 55% of patients had sleep apnoea and 57.5% patients had aural fullness.

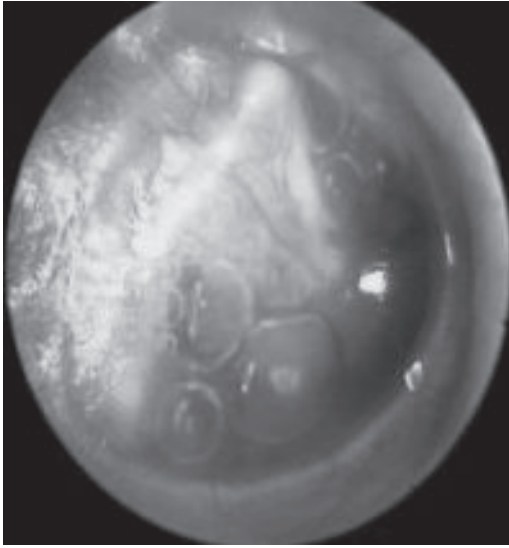
**Table III**

*Distribution of signs of the patients*

Signs	No. of patients	Percentage %
TM appearance		
• Dull / Amber	38	95
• Retraction	25	62.5
• Air bubbles	6	15
• No cone of light	5	12.5
X-ray Nasopharynx		
• 25% block / Encroaching	2	5
• 50% block	20	50
• > 75% block	18	45

On otoscopic examination, dull coloured TM was the common findings seen in 95% of cases. Retraction of TM was seen in 62.5%, air bubbles were seen in only 15% of cases. No cone of light was seen in 12.5% of caes.

Diagnostic X-ray nasopharynx showed 25% encroaching the nasopharynx in 5% cases, 50% encroaching in 50% cases and more than 75% encroaching in 45% cases.



**Fig.4:** otoscopic view



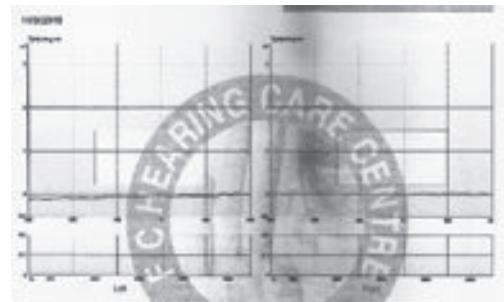
**Fig.5:** X-ray nasopharynx lateral view

**Table IV**  
*Distribution of tympanometry curve type of patients*

Curve type	Pre operative N= 80 ears	Post operative 3 <sup>rd</sup> months N=80 ears	% change	P value
A	0	20 (25%)	+ 25%	< 0.001
B	43 (53.75%)	7 (8.75%)	- 45%	< 0.001
C	37(46.25%)	53 (66.25%)	+ 20%	< 0.001



**Fig.6:** Preoperative tympanogram Type B curve



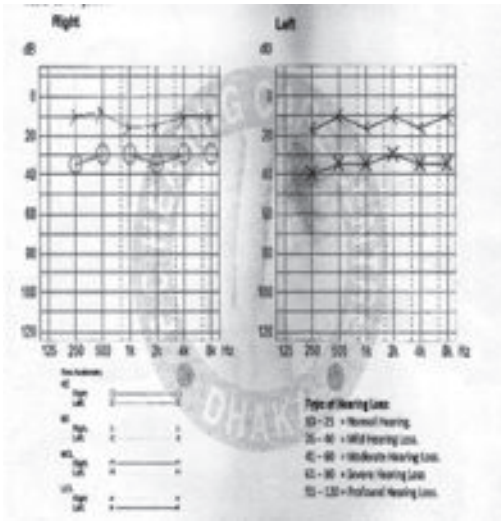
**Fig.7:** Postoperative tympanogram Type A curve

Type A tympanometry curve was seen in none of the ears preoperatively which changed to 20 ears at 3<sup>rd</sup> month. Type B curve was seen in majority of the ears (43) preoperatively which

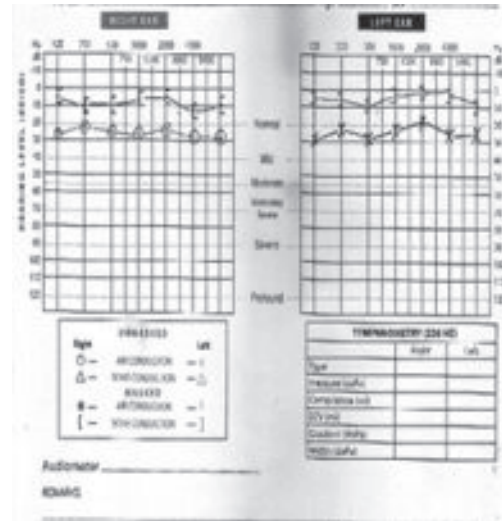
decreased to 7 ears at 3<sup>rd</sup> month. Type C curve was seen in 37 ears which increased to 53 ears in 3<sup>rd</sup> month of follow up. The changes in curve types were found to be statistically significant.

**Table V**  
*Comparison of Pure Tone Audiometry of patients (based on numbers of ears):*

Pure Tone Audiometry	Pre operative (dB)	Post operative (dB)
Min - Max	24.00 – 33.00	18.00 – 29.00
Mean ± SD	27.76 ± 2.34	22.44 ± 2.79
P value		
Pre op Vs 3 <sup>rd</sup> month	PTA is significantly decreased in 3 <sup>rd</sup> month from pre op. with P < 0.001	



**Fig.8: Pre-operative Pure Tone Audiometry**



**Fig.9: Postoperative Pure Tone Audiometry**

Preoperatively most of the children in our study had mild hearing loss according to Clark’s classification and Average hearing loss was 27.76 dB. Mean hearing gain at 3<sup>rd</sup> month post operatively was 5.32 dB which was statistically significant.

**Discussion:**

A prospective study of 40 cases of adenoid hypertrophy with associated OME was studied to assess the effect of adenoidectomy alone in improvement of hearing. In our study, the age of patients with OME ranged between 3- 12 years, the mean age was 6.5 years(50%). The mean age in our study is near to that obtained by Abdul Baqi et al<sup>3</sup>, Yassan et al<sup>4</sup>, Agidir et al<sup>5</sup>, Cangel & Akyol<sup>6</sup>;

Tanpowpong et al<sup>7</sup>. Their results were 5.8, 7, 6.9, 6 and 6.8 respectively. These results are probably due to the fact that adenoid reaches its maximum size at age of 7, and then gradually regress in size. Di Francesco<sup>8</sup> mentioned that OME mainly affects preschool children due to ET dysfunction, which may be due to adenoid enlargement.

Regarding gender distribution, in our study it was found to be slightly more in male 22(55%) rather than female 18(45%) which is similar to the result obtained by Yassan et al<sup>4</sup>, who found that 62% were male, and 38% were female also Agidir et al<sup>5</sup> found that 60% were male, and 40% were female. This is may be due to the overall male predominance for

childhood infection. However, Paradise et al (1997) reported no apparent gender based difference in the incidence of OME. Tong et al<sup>9</sup>, did not found any significant difference between male and female in the prevalence of OME.

The result of adenoid hypertrophy in children with OME were nasal obstruction/ snoring 40 (100%), mouth breathing 36 (90%), sleep apnoea 22 (55%) and aural fullness 23 (57.5%) which was similar to the symptoms in a study done by Yeldirin et al<sup>10</sup>, who found among 23 children with adenoid hypertrophy (AH) and OME symptoms of nasal obstruction in 23 (100%), snoring in 12 (52%), rhinolalia in 2 (8.7%) and obstructive sleep apnoea in 1 (4.3%). Egeli et al, studied 64 children and the symptoms of AH were nasal obstruction, mouth breathing and hyponasal speech<sup>11</sup>.

The otoscopic findings in our study showed colour changes of the tympanic membrane which was dull grey in 38 (95%), retraction in 25 (62.5%), air bubbles in 6 (15%) and no cone of light in 5 (12.5%). Similar results were found by Vikas et al<sup>12</sup> who found retracted drums in 45%, dull appearance in 13%, opaque appearance in 4%, oil drop appearance in 1%, air bubbles behind the tympanic membrane in 6%.

Regarding the tympanometry in present study, most children had type B curve, it was in 53.75%, type C curve in 46.25% and there was no type A curve. Guragain & Sinha<sup>13</sup> concluded that tympanometry is the most sensitive tool for the diagnosis of OME. When otoscopy suggests OME and is associated with type B tympanogram, the combined sensitivity is 98%<sup>2</sup>.

According to the Clark's classification, regarding audiometry, average hearing loss in our study was 27.76 dB. OME causes mild conductive hearing loss, the average loss

being 27 dB<sup>14</sup>. In Glasgow studies by Dempster & Makenzie (1991) have shown 26 dB hearing loss<sup>15</sup>.

Mean hearing gain at 3<sup>rd</sup> month post operatively was 5.32 dB in our study which was statistically significant. According to N A Black et al<sup>16</sup>, the mean dB gain at 7 weeks and 6 months are 4.5 and 3.5 respectively.

Coyle et al<sup>17</sup> also concluded that adenoidectomy is a useful procedure for correction of medically resistant chronic OME and should be considered as the first line procedure when surgical treatment is chosen. Thus the evidence supports the conclusion that adenoidectomy is effective in improving the natural history of OME.

All patients were regularly followed up post operatively. During follow up there was improvement in hearing and tympanogram which were statistically significant.

#### Conclusion:

Adenoidectomy is being increasingly used for the treatment of OME because recent studies have confirmed its effectiveness. OME leads to hearing impairment in paediatric age group. It is a social morbidity. Hence adenoidectomy in children having hypertrophied adenoids at this stage of disease effectively prevents hearing impairment. To conclude, according to our study adenoidectomy in hypertrophied adenoids with OME is simple and effective procedure in the resolution of OME and improvement in hearing postoperatively.

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