

## Adenoidectomy Before Or After Myringotomy In A Single Stage Procedure: Does The Sequence Matter?

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### ABSTRACT:

**Objective:** To evaluate the sequence of performing adenoidectomy or myringotomy first in a single stage procedure has any bearing on the per-operative outcome on middle ear effusion and subsequent grommet insertion in a patient of otitis media with effusion (OME). The hypothesis was that initially performed adenoidectomy allowed the middle ear fluid to drain passively and precluded grommet insertion.

**Study Design and Setting:** Comparative study conducted at Department of ENT, Combined Military Hospital Sialkot and PNS Shifa Hospital Karachi, from Jun 2016 to Jun 2017.

**Methodology:** One hundred and twenty patients (218 ears) with OME and adenoid hypertrophy, meeting the inclusion criteria, were inducted in this study and divided into 2 groups. Group A (60 patients with 110 ears) had adenoidectomy first followed by myringotomy and or grommet insertion, while Group B (60 patients with 108 ears) had myringotomy with or without grommet insertion first and followed by adenoidectomy.

**Result:** There were 76 males and 44 female patients with a ratio of 1.7:1 and the age range was 3 to 14 years with a mean age of  $4.81 \pm 0.77$  years. There was a significant difference between the two groups. Out of a total of 110 ears in group A, 74 ears (67.2%) had no mucoid fluid or dry tap on myringotomy in contrast with group B where out of total 108 ears, only 26 ears (24.1%) had dry tap or no mucoid fluid ( $p = 0.001$ ).

**Conclusion:** Adenoidectomy performed before myringotomy significantly reduced the need for grommet insertion. Larger studies however are needed to corroborate these findings.

**Key Words:** Adenoidectomy, Grommet, Myringotomy, Otitis Media with effusion.

### INTRODUCTION:

Otitis media with effusion (OME) or glue ear is presence of sterile effusion in the tympanic cavity without signs or symptoms of an acute ear infection. It is considered as one of the foremost source of acquired yet preventable hearing loss in the paediatric population, primarily between the ages of 1 and 3 years, averaging 30 dB<sup>1</sup>. It usually occurs as a result of poor eustachian tube function, chiefly secondary to adenoid hypertrophy or following an attack of acute otitis media. Most of the cases resolve naturally in 2 to 3 months, but up to 30% to 40% of the patient may develop recurrent OME and among them 5% to 10% may last longer than 1 year. It is this latter group of patients that require treatment.<sup>2</sup> Patients developing OME earlier in life or those having bilateral or recurrent disease will show effects of impaired reading comprehension along with phonetic and speech articulation difficulties<sup>3</sup>.

The management of OME varies from watchful waiting to conservative treatment to surgery<sup>4</sup>. To date there is no convincing evidence to indicate the benefits of grommet insertion over antibiotic use<sup>5</sup>. Surgical management of OME includes, myringotomy with or without grommet insertion and adenoidectomy if the adenoids are enlarged. There is as yet no consensus on the way surgery for OME/Adenoid hypertrophy/ Myringotomy/ Grommet insertion is performed<sup>6</sup>. Some surgeons perform myringotomy first considering it to be a clean sterile procedure, followed by adenoidectomy; while others do it the other way round.

The hypothesis that adenoidectomy performed first would allow the middle ear fluid to drain passively and preclude grommet insertion prompted us to carry out this study and to evaluate whether the sequence of performing adenoidectomy or myringotomy first has any bearing on the per-operative findings of middle ear effusion and subsequent need for grommet insertion.

### METHODOLOGY:

This study was conducted at the Department of ENT, Combined Military Hospital Sialkot and PNS Shifa Hospital Karachi, from Jun 2016 to Jun 2017. The inclusion criteria for the study were patients of both gender with diagnosis of otitis media with effusion (with type B graph on tympanogram) and enlarged adenoids (confirmed on x-ray soft tissue nasopharynx, lateral view) and failure to respond to at least 3 months of medical treatment. The exclusion criteria were OME without adenoid hypertrophy, OME

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secondary to acute otitis media, Type A and C on tympanogram, patients with nasal allergy, cleft palate or craniofacial abnormalities, severe retraction pocket and history of previous myringotomy and tube extrusion. The approval of ethical review committee of the institute was taken before the start. One hundred and twenty patients attending the ENT OPD of CMH Sialkot and PNS Shifa Karachi; and meeting the inclusion criteria, were registered for the study.

The objective, process, hazards and benefits of the study were explained; confidentiality was ensured, and informed consent was obtained from the attendants or parents of the patients. A complete history was elicited followed by a thorough and immaculate ENT examination. The presenting complaints, status of tympanic membranes and any signs of effusion in the middle ear were documented. Pure tone audiogram (PTA) was performed only in elder children where possible and tympanogram was performed in all patients. The patients with conductive deafness and type B tympanogram were included in the study. X-ray soft tissue nasopharynx (lateral view) was done in all the patients and adenoid hypertrophy was graded according to the Clemens classification.

The study population was divided into two groups, A and B. In Group A (n=60/ 110 ears), adenoidectomy was performed first, followed by myringotomy with or without grommet insertion. In Group B (n=60 / 108 ears) myringotomy with or without grommet insertion was performed first and subsequently adenoidectomy was performed. Per-operatively the soft palate was retracted using an oro-nasal Foley's catheter and adenoidectomy was carried out by curettage in all the cases. Myringotomy was performed in the antero-inferior quadrant in all ears and grommet was inserted if the mucoid discharge was physically observed coming out from the middle ear cavity. The data was noted on a proforma and all the statistical analysis was done by using SPSS version 23 and a p-value of < 0.05 was considered significant.

**RESULTS:**

In this study, a total number of 120 patients with a total of 218 ears were included (as in 22 patients only one ear was involved). There were 76 males and 44 female patients with a ratio of 1.7:1. Group A had 36 males and 24 females while group B had 40 males and 20 female patients. The age range was 3 to 14 years with a mean age of  $4.81 \pm 0.77$  years. Fig 1 shows the gender and age distribution in each group A and B. Majority of the patients were between the age of 3 to 6 years (n = 85, 70.8%), 24 (20%) were between the age of 7 to 10 years and 11 (9.2%) were between the age of 11 to 14 years.

Fig 2 depicts the common symptoms by which patient came for consultation. Hearing impairment or inattentiveness in school and home was the most common symptom in 89

patients (74.1%) while mouth breathing, or nasal obstruction was the second common symptom in 81 patients (67.5%). The other symptoms were rhinolalia clausa (n= 78, 65%), snoring (n = 63, 52.5%) and learning problems (n = 38, 31.6%).

Out of 120 patients, 98 (81.6%) had bilateral ear disease (50, 83.3% in group A and 48, 80.0% in group B) while 22 had only one ear disease (10, 16.7% in group A and 12,

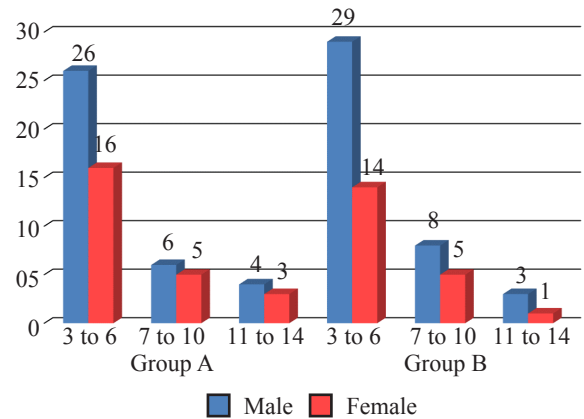


Fig. 1. Age and gender distribution in both groups A and B (n = 120)

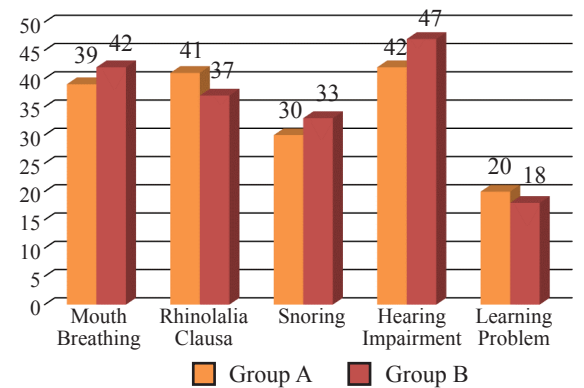


Fig. 2. Presenting symptoms of the patients in each group

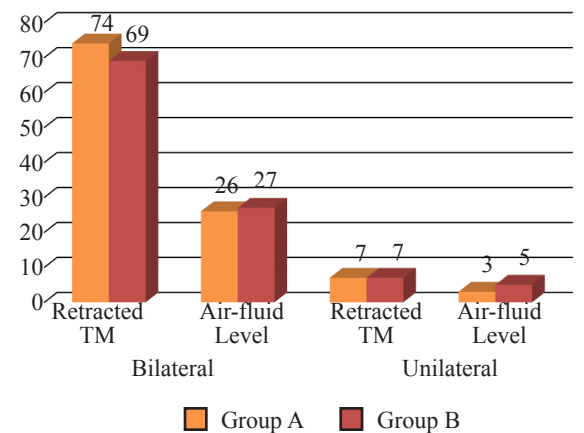


Fig. 3. Otoscopic findings of tympanic membrane in each group (n = 218 ears)

	Mucoid fluid present			Mucoid fluid absent or Dry tap			Grand Total
	Bilateral	Unilateral	Total	Bilateral	Unilateral	Total	
<b>Group A</b>	32	4	36	68	6	74	110
<b>Group B</b>	74	8	82	22	4	26	108
<b>Total</b>	106	12	118	90	10	100	218

Table 1. Per-operative findings on myringotomy in each group A and B (n = 218 ears)

20.0% in group B). On otoscopic examination, dull or retracted tympanic membrane was seen in 157 ears (72%) and air-fluid level was seen in 61 ears (28%). Fig 3 shows the findings of otoscopic examination of the tympanic membrane in each group A and B. On plain x-ray soft tissue nasopharynx (lateral view) adenoid hypertrophy was measured according to the classification of Clemens et al. where grade III hypertrophy was seen in 98 (81.66%) patients and grade II hypertrophy in 22 (18.33%) patients.

Table 1 depicts the overall per-operative findings on myringotomy in each group A and B. It is clearly showing out of total 110 ears in group A, 74 ears (67.2%) had no mucoid fluid or dry tap on myringotomy in contrast with group B where out of total 108 ears, only 26 ears (24.1%) had dry tap or no mucoid fluid ( $p = 0.001$ ).

#### DISCUSSION:

Otitis media with effusion is a prevalent clinical entity in kids because of eustachian tube dysfunction and enlarged adenoids is the most important cause for dysfunction of the eustachian tube. The ventilation and drainage of natural mucus production in the middle ear is effected during the upper respiratory tract infection until the age of 5 years. The age range in our study was 3 to 14 years and majority of our patients were between the ages of 3 to 6 years which is commensurate with the findings of Timna<sup>7</sup> (3-5 years) and partly with Humaid<sup>8</sup> (age less than 8 years). There is no consensus about the predominant gender involved. Kocyigit<sup>9</sup> claims a female, while Khayat<sup>10</sup> documents a male predominance, consistent with our study. The main complaints in our study are also consistent with other similar studies<sup>11-14</sup>. The Otoscopic findings in our study i.e. predominantly dull or retracted tympanic membrane followed by air fluid level also correspond with most other studies<sup>15,17</sup>.

Mechanical obstruction of the eustachian tube is among the chief recognizable causes of eustachian tube dysfunction, particularly due to enlarged adenoids in children. The existence of enlarged adenoids can obstruct the opening of the eustachian tube and leads to negative pressure in the middle ear cavity, and ultimately mucosal transudation. Currently adenoidectomy is one of the most commonly performed pediatric surgical procedure for the treatment of enlarged adenoids. The ratio of size of the adenoid in relation with the size of the nasopharynx is important to assess

adenoids enlargement and subsequent surgical removal<sup>14</sup>. Certain studies have stressed the need for screening of the general population for otitis media with effusion as Kocyigit<sup>9</sup> recommends regular screening because almost 16% were positive. Balbani et al<sup>16</sup> noted that hearing loss secondary to OME results not only in impaired reading comprehension but also phonetic and speech articulation difficulties while Butler et al<sup>17</sup> claims that there is no positive implication of screening general population in the first 4 years of life regarding behaviour and language development.

Adenoidectomy is strongly linked with relieving the middle ear effusion in most studies<sup>18,19</sup>, while Gates<sup>12</sup> claims that the size of adenoid is not directly proportional to the relief obtained following adenoidectomy. Few studies claim that grommet insertion provides no permanent or significant relief<sup>20</sup> while others believe that not only it drains the effusion but is also cost effective and additionally precludes revision surgery<sup>21-25</sup>. Regarding the effect of the combination of adenoidectomy and grommet insertion, there are both opponents<sup>26,27</sup> and proponents<sup>28-30</sup>. However, both schools of thought agree that more extensive and long-term studies are required to be conducted to arrive at a conclusive decision.

Regarding the sequence of surgery in a single stage procedure whether adenoidectomy should be done first or myringotomy first, there are no clear guidelines in the literature and this study is the first of its kind. Removal of enlarged adenoids alone is also recommended in children with OME who had associated postnasal obstruction and chronic rhinosinusitis and have previously undergone surgery for OME. It is reported to be of utmost value in children less than 3 years of age. Adenoid hypertrophy and its closeness to the opening of the eustachian tube is considered as significant factor in the development of OME. The bacterial biofilm around the adenoids and opening of the eustachian tube is important for its dysfunction. The main objective of adenoidectomy in patients of otitis media with effusion is not only to restore patency of the eustachian tube but also to eliminate this biofilm. We have found in our study that proper adenoidectomy causes release of mucoid secretion through the eustachian tube very effectively.

#### CONCLUSION:

Adenoidectomy performed prior to myringotomy significantly reduces the need for grommet insertion.

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