

# SURGICAL MANAGEMENT OF OTITIS MEDIA WITH EFFUSION; A PROSPECTIVE STUDY OF 120 PATIENTS

Zakirullah, Mohibullah and Saeedullah

Department of ENT and Head & Neck Surgery,  
Postgraduate Medical Institute,  
Lady Reading Hospital, Peshawar.

## SUMMARY

*In this prospective study the effectiveness of surgical procedures for the treatment of otitis media with effusion was assessed from January 1991 to January 1996. 120 patients were divided into groups on the basis of symptomatology and the surgical procedures carried out. The follow up period was from six months to three years. The results were based on the last examination within this period. Out of 120 patients one hundred could be followed up. Recurrence was very high in those groups where myringotomy without grommet insertion was done irrespective of adenoidectomy, tonsillectomy or nasal surgery.*

## INTRODUCTION

Otitis media with effusion (OME) is the commonest cause of impaired hearing in childhood.<sup>1</sup> The exact aetiology is not known. Eustachian tube dysfunction, bacterial or viral infections of the middle ear cleft and nasal inflammation resulting from allergic rhinitis or upper respiratory infection are acknowledged contributing factors.<sup>2-3</sup> It may result from alteration of the mucocilliary system within the middle ear cleft, where serous or mucoid fluid accumulates in association with negative pressure.

This negative pressure is due to malfunction of the eustachian tube.<sup>4</sup>

Otitis media with effusion is an asymptomatic presence of effusion in the middle ear cleft. There may be only mild to moderate hearing loss, depending upon the amount and type of effusion and age of the patient. Infants and small children may be missed because they may not complain of it. In such children the condition may manifest itself as impaired speech and language development, inattention and poor performance at school. This disease needs proper evaluation for diagnosis. If remained undiagnosed or untreated, this

## DISTRIBUTION OF CASES ACCORDING TO THE PROCEDURES PERFORMED

No.	Procedures	No. of cases	Percentage
A	Myringotomy + Grommet insertion	31	25.83
B	Myringotomy alone	22	18.33
C	Adenotomylectomy + Myringotomy	21	17.50
D	Adenoidectomy + Myringotomy	17	14.17
E	Adenoidectomy + Myringotomy + Grommet	11	09.17
F	Adenotomylectomy + Myringotomy + Grommet	05	04.17
G	Tonsillectomy + Myringotomy	06	05.00
H	Nasal Surgery + Myringotomy	04	03.33
I	Antral washout + Myringotomy	03	02.50
		120	100.00

TABLE - 1

may affect the speech and language development, hearing and behavior of the child.<sup>5</sup> Surveys of healthy Danish children for the presence of middle ear effusion have identified a high incidence of OME<sup>6</sup> while the prevalence is low in Pakistani children.<sup>7</sup>

Mild form of otitis media with effusion resolve spontaneously by itself. Such pa-

## AGE SWISE DISTRIBUTION (N = 120)

No.	Age in years	No. of cases	Percentage
I.	1 - 4	06	05.83
II.	5 - 8	63	52.50
III.	9 - 1	29	23.33
IV.	13 - 16	16	13.33
V.	17 & above	06	05.00

TABLE - 2

tients require only observation.<sup>8</sup> Some patients may require medical management and special teaching facilities and individual attention in the classroom and at home. If the disease becomes chronic and bilateral, then surgery is the treatment of choice.

## MATERIAL AND METHODS

We studied a series 120 patients with otitis media with effusion of 2 months or longer duration that was unresponsive to medical management. Suspected cases were picked up and properly evaluated in the department of ENT and Head & Neck Surgery Postgraduate Medical Institute Lady Reading Hospital Peshawar from January 1991 to January 1996. Detailed history and thorough clinical examination including

## PROBABLE ETIOLOGY OF OME (N = 120)

No.	Aetiology	No. of cases	Percentage
I.	Idiopathic	34	28.33
II.	Hypertrophied Adenoids	29	24.17
III.	H. Adenoids + Res. tonsillitis	22	18.33
IV.	Recurrent tonsillitis	21	17.50
V.	Nasal Allergy	07	05.83
VI.	Sinusitis	04	03.33
VII.	Trauma (Surgery for Angiofibroma)	02	01.67
VIII	Cleft palate repair	01	00.83

TABLE - 3

pneumatic otoscopy were performed. Clinical tests for hearing, voice and Tuning fork tests were done depending upon the age of the patient. Audiometric tests included pure tone audiometry (air and bone conduction threshold) for patient above 5 years of age and tympanometry (impedance study) for all cases. Other laboratory and radiological

SOCIOECONOMIC STATUS (N = 120)

Socioeconomic condition	No. of patients	Percentage
Poor	79	65.83
Average	34	28.33
High	07	05.83

TABLE - 4

investigations were based on clinical findings and requirements of individual cases.

Regardless of the prior therapy, we treated most of these patients conservatively for two months. This included antimicrobial therapy for fourteen days, mucolytics for thirty days, antihistamine for thirty days, vasoconstrictive nasal drops for ten days and ventilatory exercises throughout this period. Surgical intervention was advised in all those cases, which were unresponsive to medical treatment. Selection criteria for surgical treatment included; bilateral persistent effusion, a lack of improvement after two months of medical management, bilateral conductive hearing loss of 20 dB or more and persistently abnormal tympanic membrane. On the basis of clinical features and results of investigations, patients were divided into nine groups for various surgical procedures. Each group underwent myringotomy and/or grommet insertion and surgery for the associated pathology for example adenoidectomy, adenotonsillectomy and nasal surgery. The distribution of different procedures is given in Table-1.

NATURE OF EFFUSION (N = 240)

No.	Effusion	No. of ears	Percentage
I.	Very thick mucoid (glue-like)	107	44.58
II.	Mucoid	90	37.50
III.	Serous	43	17.92

TABLE - 5

DISTRIBUTION OF RECURRENCE FOLLOWING DIFFERENT SURGICAL PROCEDURES (N = 66)

No.	Procedures	Ears with recurrence	%
A	Myringotomy without grommet insertion	18	27.27
B	Adenotonsillectomy + Myringotomy	18	27.27
C	Adenoidectomy + Myringotomy	14	21.21
D	Adenoidectomy + Myringotomy + Grommet	08	12.12
E	Tonsillectomy + Myringotomy	04	06.06
F	Adenotonsillectomy + Myringotomy + Grommet	02	03.03
I	Myringotomy + Grommet insertion	02	03.03
		66	100.00

TABLE - 6

## RESULTS

In our study 120 patients were operated upon, 85 were male and 35 female (ratio of 2.5:1). The age ranged from 2 to 25 years with maximum number of cases were between the age of five to eight (5-8) years, average age was 9 years. Seventy-nine patients came from low socioeconomic families (66%). The most common known etiological factor was found to be adenoid hypertrophy in 51(42.5%) cases followed by 34(28.33%) cases of idiopathic group (Table-3). The effusion was very thick mucoid (glue-like) in 107(46%), mucoid in 90(37%) and serous in 7(18%) cases. The recurrence rate was highest in those patients who had myringotomy without grommet insertion (27%) and lower (3%) where myringotomy with grommet insertion was performed (Table-7). In ears where myringotomy with

**COMPLICATIONS OF MYRINGOTOMY  
WITH/WITHOUT GROMMET INSERTION  
(TOTAL NO. OF EARS FOLLOWED = 160)**

No.	Type of complication	No. of ears	Percent-age
I.	Recurrence	66	41.25%
II.	Scar	08	05.00%
III.	Infection	06	03.75%
IV.	Perforation	04	02.50%
V.	Tympanosclerosis	03	01.87%

TABLE - 7

grommet insertion was performed, hearing was very good and remained satisfactory for as long as the grommet was in place and functioning.

Among the complications recurrence was the commonest (33%). Infection was noted in four cases and two had persistent perforation. Tympanosclerosis was seen in two ears and scars in six ears.

## DISCUSSION

Otitis media with effusion (OME) is a common condition of childhood. If neglected or left untreated the education of the child and language development is affected. This condition may also lead to certain sequelae and complication. The mechanism of middle ear effusion and the factors responsible for its production are much debated in the literature. The same is the case regarding its management, where still controversy exists.

In our study the male to female ratio was 2.5:1. This ratio is different in different parts of the world but many studies demonstrate a high incidence of suppurative otitis media and Otitis media with effusion (OME) in male than female<sup>8</sup>.

Most of our patients were from poor families' (65.83%). These patients were from

rural areas where poverty is rife and livings are unhygienic, leading to ill health and disease. Most of the patients' (52.50%) were of younger age group 5-8 years. The average age in our study was 9 years. Bluestone<sup>9</sup> reported that middle ear effusion was more frequent in children of 1-4 years of age than children aged 7 years and older. In our society common man is uneducated about this condition and even doctors don't pay due attention to such cases. That may be the reason the common age group presented for management is a little higher in our study.

The aetiology is controversial. Many predisposing factors have been identified which lead to the development of otitis media with effusion. In our study the most common findings were hypertrophied adenoids followed by upper respiratory tract infection and idiopathic Table-3. Ahmed et al<sup>20</sup> reported similar findings from Bangladesh. In some patients more than one aetiological factor were seen to be involved in pathogenesis of otitis media with effusion. But in many cases no aetiological factor could be found. From these findings no single aetiology can be blamed for the production of effusion but some of them may work together or alone to produce the condition.

The follow up in our study was 83.33%. The drop out in follow up is universal. In our cases the reason may be that patients belonged to far-flung areas where poverty and high illiteracy exist. Once felt well they never turned up for follow up. The highest follow up was observed in patients who had myringotomy with or without grommet insertion. Patients who underwent grommet insertion appeared to be free of recurrence than the other groups in our study. Effusion recurred significantly earlier in patients without grommet insertion. Similar results were reported by Gate et al<sup>10</sup> and Bonding<sup>11</sup> in their studies. Patients who underwent adenoidectomy or Adenotonsillectomy with

myringotomy but without grommet insertion showed a very high recurrence rate. Thus it becomes clear that removal of adenoids and tonsils provided no additional beneficial effect in our cases. Our study covers a limited period of follow up. There may be long term benefits as reported by Gates et al<sup>10-12</sup> But our results closely match those reported by Black et al<sup>13</sup> and Roydhouse.<sup>14</sup> A high recurrence rate of effusion in ears treated with grommet is reported by Salam & Wengraf<sup>15</sup> in a follow up period, ranged from 18 to 32 months but these were the cases of glue under pressure which is a bad prognostic factor.

According to Maw<sup>16</sup> the incidence of tympanosclerosis and persistent perforation of tympanic membrane is high in ears treated with grommets. In our study three (01.87%) cases developed tympanosclerosis, in two grommet was inserted and in one only myringotomy was done. The lower incidence of tympanosclerosis in the two groups may manifest with prolong follow up for years because our study is of limited duration. Ears treated with grommet insertion were associated with persistent perforation in four ears (2.50%) in our study. The same incidence of perforation after extrusion or removal of grommet is reported by Weigel et al<sup>17</sup> & Golz et al<sup>18</sup>

With repeated grommet insertion or use of a long-term ventilation tube of Good-type, the incidence of persistent perforation becomes higher.<sup>19</sup> The recurrence was high in groups where myringotomy without grommet insertion performed in our study. Ears presented with second and third recurrence were treated with insertion of grommet to provide instant return of hearing and to prevent atrophic changes in the tympanic membrane.

## CONCLUSION

We recommend children with OME a course of medical treatment. If effusion persists and is associated with bilateral hearing loss, surgical intervention in the form of myringotomy with or without grommet insertion, depending upon the type of effusion. If these children are also suffering from chronic tonsillitis hypertrophied adenoids or nasal problem that should be treated in the same setting. For recurrent cases grommets should be used if the effusion is mucoid.

For otitis media with effusion (OME) unresponsive to medical treatment myringotomy with or without grommet insertion should be the treatment. Grommet insertion is superior to simple myringotomy for ears with chronic OME when effusion is mucoid or very thick mucoid. Adenotonsillectomy, tonsillectomy, nasal surgery have no additional benefit, regarding the management of chronic OME unless their treatment is indicated on their own merit. Adenoid hypertrophy was found to be the major aetiological factor. OME occurred most commonly 5-8 years of age group. The disease presented more in male children.

## REFERENCES

1. Hilton A, Herdman RC, Hartley C, O Keefe L. The incidence of bacteria in middle ear effusion; *Clin Otolaryngol* 1996; 21(2):158.
2. Fireman P. Otitis media and eustachian tube dysfunction; connection to allergic rhinitis. *J Allergy Clin Immunol* 1991; 99(2): 578.
3. Healy GB, Smith HG. Current concepts in the management of otitis media with effusion. *Am J Otolaryngol* 1981; 2(2): 138.
4. Kubba H, Pearson JP, Birchall JP. The aetiology of otitis media with effusion: a review. *Clin Otolaryngol* 2000; 25(3):181.

5. Maw R, Stewart I, Schilder A, Browning G. Surgical management of chronic of otitis media with effusion. *Int J Paediatr Otorhinolaryngol* 1999; 5; 49 Suppl 1:S 239.
6. Tos MH. Spontaneous improvement of secretory otitis media in impedance screening *Arch Otol Laryngol* 1980; 106: 345.
7. Jan A, Mohibullah. Prevalence of secretory otitis media in NWFP with a review of the literature. *J Medical Science* 1992; 15.
8. Teele DW, Klein JO, Rosener BA. Epidemiology of otitis media in children *Ann Otol Rhinol Laryngol* 1989; 5.
9. Bluestone CD, Klein JO. Otitis media atelectasis and eustachian tube dysfunction. In *Pediatric otolaryngology*. Bluestone CD, Stool SE Eds. Saunders Company. 1990; 1173.
10. Gate GA, Avery CA, Cooper Jr JC, Prihoda TJ. Chronic secretory otitis media; effects of surgical management. *Ann Otol Rhinol Laryngol* 1989; (Suppl; 138) 1: 2.
11. Bonding P, Tos M. Grommet versus paracentesis in secretory otitis media. A prospective controlled study. *Am J Otol* 1985; 6(6): 455.
12. Gate GA, Muntz HR, Bredan G. Adenoidectomy & otitis media: Current issues in ENT infectious diseases. *Annals of Otol Rhinol & Laryngol*. 1992; 101: 24.
13. Black N, Crowther J, Freeland A. The effectiveness of Adenoidectomy in treatment of glue ear: a randomized controlled trial. *Clinical Otolaryngology* 1986; 11: 149.
14. Roydhouse N. Adenoidectomy for otitis media with mucoid effusion. *Ann Otol Rhinol Laryngol* 1980; 89: 312.
15. Salam MA, Wengraf C. Glue under pressure: a bad prognostic signs for recurrence of otitis media with effusion. *J Laryngol Otol* 1992; (106)11: 974.
16. Maw RR. Development of tympanosclerosis in children with otitis media with effusion and ventilation tubes. *J Laryngol Otol* 1991; 105: 614.
17. Weigel MT, Parker MY, Goldsmith MM, Postma DS, Pilsbury HC. A prospective randomized study of four commonly used tympanostomy tubes. *Laryngoscope* 1989; 99: 252.
18. Golz A, Netzer A, Joachims HZ, Westerman ST, Gibert LM. Ventilation tubes and persisting tympanic membrane perforations. *Otolaryngol Head Neck Surg* 1999; 120(4): 524.
19. Courtney-Harris RG, Ford GR, Ganiwala TMJ, Mangat KS. The closure of tympanic membrane perforation after the removal of Goode-type tympanostomy tubes: The use of silastic sheeting; 1992; (106)11: 960.
20. Ahmed SU, Chowdhury AM, Haque RM, Alauddin M. Influence of adenoid hypertrophy on otitis media with effusion. *Bangladesh J of ORL* 1997; 3(1): 3.