

A Study of Different Surgical Treatment in Otitis Media with Effusion

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ABSTRACT

Introduction: "Otitis media with effusion" has been increasingly used in most of the recent literature and has become the current terminology, even though, the term effusion does not differentiate purulent and non purulent.

Materials and methods: It was a retrospective study of 100 patients presenting with hearing loss between the study period of one year (July 2001 to June 2002) in the Department of Otolaryngology and Head and Neck Surgery, Assam Medical College, Dibrugarh, Assam, India. Different approaches like myringotomy and aspiration, myringotomy and tympanostomy tube insertion, adenoidectomy and myringotomy and all combined.

Results: A gain in hearing of more than 55% was seen in all the approaches. Surgical treatment like myringotomy and tympanostomy tube insertion restore the hearing impairment immediately. The possible etiological factors like adenoid hyperplasia, infected tonsils are better cured by surgery.

Conclusion: The role of surgical treatment has become more important in this era of antibiotic resistant bacteria. The early diagnosis and proper treatment is of utmost value in order to prevent the harmful sequelae of otitis media with effusion.

Keywords: Surgical Treatment, Otitis media, myringotomy and tympanostomy

INTRODUCTION

Otitis media with effusion is one of the most prevalent disease of ear characterized by presence of fluid in the middle ear either unilateral or bilateral with intact tympanic membrane without symptoms of inflammation. Otitis media with effusion is the commonest cause of conductive hearing loss in children. Secretory otitis media became the most generally accepted popular title which has been commonly used.^{1,2} The criticism against this is that the assumption here of the middle ear effusion to be secretory may not always be true. Moreover "Serous Otitis Media" is incorrect because the fluid is not serum. "Glue Ear" is a good description but the fluid is not adhesive, non-purulent otitis media is considered incorrect by some because bacteria can sometimes be isolated. "Otitis media with effusion" has been increasingly used in most of the recent literature and has become the current terminology, even though, the term effusion does not differentiate purulent and non purulent. Literature and has become the current terminology. The recent concept on medical treatment for OME is that no medication has been shown a effect on cure.^{3,4} Medication is unlikely to correct the hearing disability associated with the condition as rapidly as aspiration of middle ear contents and re-creation of ventilation tube. The failure of 20th Century Otologists to eradicate otitis

media with anti-biotic despite "adequate therapy" has led to the development of therapeutic and preventive strategies designed to disrupt the Pathophysiology of OME (Otitis Media with Effusion). These strategies include myringotomy, tonsillectomy, adenoidectomy, panostomy tube placement and even radical mastoidectomy. Surgical management of patients with otitis media with effusion is being re-evaluated for the following reasons:

- The steadily increasing incidence of the disease.
- Calling for better methods of preventive
- The dramatic emergence of multidrug-resistant bacterial pathogens
- Making judicious use of antibiotics imperative.
- The growing financial impact of the disease in today's cost-conscious climate.

We have now enough evidence based information to select patients who should benefit from surgical intervention. The role of surgical procedures has become more important in this era of antibiotic resistant environment which method of management is more expensive, surgery or prolonged medical management. More judicious use of antimicrobial agents should result when surgical operations are appropriately selected for patients they have been proven beneficial for.^{4,5} Out of different surgical procedures myringotomy with or without grommet insertion is to be considered effective surgical treatment in the belief that prolonged middle ear effusion lead to complications and harmful sequelae.

MATERIALS AND METHODS

It was a retrospective study of 100 patients presenting with hearing loss between the study period of one year (July 2001 to June 2002) in the, Department of Otolaryngology and Head and Neck Surgery, Assam Medical College, Dibrugarh, Assam, India. 100 patients were treated in the study period. Different approaches like myringotomy and aspiration, myringotomy and tympanostomy tube insertion, adenoidectomy and myringotomy and all combined.

The criteria for selecting the children with otitis media with

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effusion for adenoidectomy are:

- Clinical Evaluation: Obstructive Nasal Symptoms (with three sub-categories).
- Age (4-8 years): Naso-Pharyngeal airway size < 4 mm
- Radiological Evaluation

Criteria for selecting the children with otitis media with effusion for adenoidectomy and tonsillectomy:

- Bilateral documented hearing loss greater than 20 dB.
- Obstructive Nasal Symptoms.
- Recurrent attacks of sore throat and acute tonsillitis.

In the present study following surgical management options were undertaken considering the different clinical and diagnostic criteria:

1. Myringotomy and aspiration
2. Myringotomy and tympanostomy tube insertion
3. Adenoidectomy and myringotomy
4. Adenotonsillectomy, myringotomy and tympanostomy tube insertion

Group-A: Myringotomy and Aspiration: The Group consisted of 25 (twenty-five) cases including both adult and children with documented hearing loss of more than 20 dB, positive otoscopic findings:

Group-B: Myringotomy and Tympanostomy Tube Insertion: The group consisted 25 (twenty-five) cases including both adult and children with history of chronic otitis media with effusion, documented hearing loss of more than 20 dB, type B tympanogram with positive otoscopic findings.

Group-C: Adenoidectomy and Myringotomy: The group consisted of 25 (twenty five) cases (children under the age of 12 years) with documented hearing loss of more than 20 dB, obstructive nasal symptoms like snoring, mouth breathing with radiological evaluation of persistence of hypertrophied adenoid.

Group-D: Adenotonsillectomy, myringotomy and insertion of tympanostomy tube: The group consisted of 25 (twenty five) cases under the age of 12 years with documented hearing loss of more than 20 dB; with recurrent attack of sore throat, positive otoscopic findings.

All the cases were advised to perform valsalva's manoeuvre twice in a day. A mucolytic oral preparation - Bromhexidine and steroid had been added in cases of persisting effusion for more than two weeks.

Following any of the surgical procedure, in this study, a course of antibiotic had been prescribed to all cases. The cases with tympanostomy tube were advised to apply antibiotic ear drop and to avoid swimming.

In this series, major percentages of cases were children under the age of 10 years. The youngest patient was of 4 years of age and the oldest was 60 years of old. It is seen that maximum number of cases were found at the age of 7 years which constituted the peak incidence (29.75%). Most of the adults and older children complained of diminished hearing and feeling of fullness in the ear. The onset of deafness was sudden in some

of them. The fluctuating nature of deafness has been noted in patients of this series. The other common symptoms in adults were tinnitus, autophonia, itching in the ear and headache. In majority of the cases, previous history of frequent attacks of cold and upper respiratory tract infection were obtained. In this study, unilateral middle ear effusion was in major percentage (68.57%) of adults and bilateral effusion was found more commonly in children (84.61%). Maximum number of ears suspected for middle ear effusion were found to have dull, thick, opaque, grey and retracted tympanic membrane. A thin, yellow and transparent tympanic membrane with hair and air bubbles were found in some cases. Among the ears with yellow tympanic membrane, 7 ears showed the "chicken fat" texture. In 34 ears, the tympanic membrane appeared normal. Majority of dull, thick, lusterless and retracted tympanic membrane were found to be immobile. The presence of partial mobility as obtained in most of the thin, yellow and transparent tympanic membrane. 17% of tympanic membrane were distinctly mobile. In this study, Rinne Test was negative in 151 cases of which 47 being unilateral and 52 bilateral. All these ears possess the tympanic membrane appearance, audiometric findings and tympanometry in favour of otitis media with effusion.

The Rinne Test was positive in 51 ears out of which 20 ears had the clinical picture and audiometric findings of otitis media with effusion.

Out of 47 cases who had Rinne negative in one ear, the opposite ears were found to be Rinne positive in 8 cases in whom the presence of effusion was suspected. There were 5 bilaterally Rinne positive cases in whom otitis media with effusion was clinically diagnosed only on one side. The total number of ears clinically suspected for middle ear effusion was 171. The hearing loss of 20-30 dB observed in maximum number of ears 140 (70%), 35-45 dB loss in 56 ears (28.0%) and 50-60 dB in 4 ears (2%).

For the purpose of our routine pre-operative screening, both Type-A Tympanogram and Type-C Tympanogram were considered to imply a dry middle ear, and the need for surgery carefully reassessed. A flat, Type-B Tympanogram was taken to confirm the middle ear effusion. The cases with flat, Type-B Tympanograms were selected for the surgery, irrespective of the otoscopic appearance of the tympanic membrane.

RESULTS

In a few cases with allergic history, the number of eosinophils in differential count was found to be raised. Random blood sugar level had been estimated for adult age group of patient. In this series, 25 middle ear effusions were examined microscopically and the smear shows cellular content consisting mainly of neutrophils and lymphocytes. Number of eosinophils were minimum and found in effusion of a few cases. In this study myringotomy and aspiration was performed in 25 cases in whom middle ear effusion was suspected. Myringotomy was performed for 43 ears and the effusions were aspirated through an electric suction to evacuate the affected middle ears. Myringotomy and insertion of tympanostomy

tube was performed in 25 cases (27 ears). In this study adenoidectomy and myringotomy was performed in 25 cases (44 ears) in whom the middle ear effusion was suspected in both the ears. Adenotonsillectomy, myringotomy and tympanostomy tube insertion was performed in 25 cases. Tympanostomy tube insertion was done for 32 ears. All the cases were clinically proved of presence of effusion in the middle ear, with hypertrophied adenoids and infected tonsils.

Group-A: (Miringotomy and Aspiration): Myringotomy and aspiration were performed for 25 cases (43 ears). 17 cases (29 ears) resolved and hearing returned to normal when checked up at 2nd and 4th weeks. During the time of operation, myringotomy revealed effusion in 20 cases (36 ears). Dry tap was encountered in 5 cases (8 ears). At the 3th week of check-up, deterioration of hearing was found in 8 cases (12 ears) with recurrence of effusion. 3 cases (6 ears) of this group did not report in the follow-up period.

Group-B: (Miringotomy and Tympanostomy Tube Insertion): In this series myringotomy and tympanostomy tube insertion was performed in 25 cases (27 ears). Unilateral insertion of tympanostomy tube in unilateral myringotomy was done for 8 cases (8 ears) of this series and most of them were of adult age group. Bilateral myringotomy and unilateral insertion of tympanostomy tube was done for 15 cases (15 ears) and bilateral myringotomy and bilateral tympanostomy tube insertion was done for 2 cases (4 ears). Out of 25 cases 22 cases (24 ears) were confirmed for effusion and dry tap (no effusion) in 3 cases (3 ears). All the 22 cases responded to treatment and hearing returned to normal or near-normal at the 2nd and 4th week check-up. 3 cases (3 ears) with dry tap did not report for follow-up. At the 6th and 3th week of check-up deterioration of hearing was observed in 4 cases (6 ears). 4 cases (4 ears) came with recurrence.

Group-C: (Adenoidectomy and Myringotomy): In this series, adenoidectomy and myringotomy was performed for 25 cases. All the selected cases were clinically confirmed for the presence of hypertrophied adenoid and middle ear effusion. Out of 25 cases (44 ears), for 16 cases (28 ears) bilateral myringotomy and for 9 cases (16 ears) unilateral myringotomy was performed. 21 cases (36 ears) responded to treatment and hearing returned to normal at the 2nd and 4th week of check-up. 4 cases (8 ears) with dry tap did not report for follow-up. At the 6th and 3th week of check-up deterioration of hearing was observed in 5 cases (8 ears). 5 cases (8 ears) came with recurrence after 3th week.

Group-D: (Adenotonsillectomy, Myringotomy and Tympanostomy Tube Insertion): In this series, adenotonsillectomy, Myringotomy and Tympanostomy Tube Insertion was performed for 25 cases (32

ears). All the cases were under the age group of 12 years. Out of 25 cases 24 cases (30 ears) resolved and hearing returned to normal when checked up at 2nd and 4th week. Deterioration of hearing was found in one case (2 ears). At the end of 5th week of check-up, 3 cases (4 ears) came with deterioration of hearing and recurrence.

Audiometric Gain After Treatment

Group-A: (Miringotomy and Aspiration): A gain of hearing upto 20 dB was achieved in 68.96%, 25-30 dB in 31.03% of ears following myringotomy and aspiration.

Group-B: (Miringotomy and Tympanostomy Tube Insertion): A gain of hearing upto 0dB was achieved in 55.55%, 25-30 dB in 33.33% and more than 30 dB in 11.11% of ears following myringotomy and tympanostomy tube insertion.

Group-C: (Adenoidectomy and Myringotomy): A gain of hearing upto 20 dB was achieved in 71.42%, 25-30 dB in 28.57% of ears following adenoidectomy and myringotomy.

Group-D: (Adenotonsillectomy, Myringotomy and Tympanostomy Tube Insertion): A gain of hearing upto 20 dB was achieved in 66.66%, 25-30 dB in 33.33% of ears following adenotonsillectomy, myringotomy and tympanostomy tube insertion.

In this series the total number of ears which were submitted to myringotomy was 146 out of which middle ear effusion was present in 20 ears (81.11%). There was no effusion (dry tap) in 26 ears (13.06%).

DISCUSSION

In the present study, a majority of patients had an attack of cold or upper respiratory tract infection preceding the development of otitis media with effusion. In children constituting 60% of total cases there was associated tonsillitis and adenoiditis. It seems possible from the fact that tonsil and adenoid may act as a source of infection. Middle ear effusion may be produced either by a mechanical obstruction or by post-inflammatory oedema causing obstruction of the Eustachian tube. These findings are in support of previous authors commented that adenoid should be regarded as a potential source of infection in the middle ear than causing as an obstructor to the Eustachian tube that is a contributing factor rather than a pathogenic one.¹⁻³

Smear examination of (20 cases) showed the cellular contents pre-dominantly of lymphocytes and polymorphs, a few of moderate number of eosinophils in 9 cases. Basophils and macrophages were not seen. These findings of polymorphs and lymphocytes indicate inflammatory origin of the effusion. Senturia; Kokko E and Palva et al reported the cytological findings consisting mainly of polymorphs and lymphocytes, frequently macrophage and come to the conclusion that the middle ear effusion is of inflammatory origin.^{4,5,6} Though otitis media with effusion is a disease of multiple aetiology and inflammatory origin is more likely in the pro-

duction of middle ear effusion.

The aetiology of otitis media with effusion remains controversial though the incidence is higher among children. However, more recent studies have drawn attention to the isolation of bacteria in 22-52% of the cases.⁷⁻⁹ Middle ear effusion is now believed to occur as a result of post-inflammatory increase of mucous producing elements in the middle ear and accompanying dysfunction of the Eustachian tube¹⁰ In this study, none of the cases following adenoidectomy or adenotonsillectomy develops complications, reported of chronic suppurative otitis media.¹¹ Two cases (2 ears) developed chronic suppurative otitis media following myringotomy and aspiration. A short-term complications such as discharging ear in 4 cases (4 ears), granulation tissue around the tympanostomy tube in one case and occlusion of tympanostomy tube in 4 cases was found in this series. No long-term complications like tympanosclerosis, atelactasis, cholesteatoma, retraction, scar or permanent perforation was found in this short duration of follow-up made in present study. Our finding in this series is in consonance with that of Brick and Mravec who reported of short term complications, that is draining ear, granulation around the tube, otitis externa, tube occlusion and perforation.¹² For cases with otorrhoea the discharge was sent for culture and sensitivity and oral antibiotic were prescribed according to sensitivity report. During the short follow-up made in the present study, no unwanted complications such as atelectasis, adhesive otitis media, tympano sclerosis, or cholesteatoma which occur in a long standing effusion in the middle ear did arise in the series. These complications do arise in the long term when effusion persistently present in the middle ear. During the short follow-up made in the present study, no unwanted complications such as atelectasis, adhesive otitis media, tympano sclerosis, or cholesteatoma which occur in a long standing effusion in the middle ear did arise in the series. These complications do arise in the long term when effusion persistently present in the middle ear.¹³

CONCLUSION

This small piece of work is nothing, but a humble endeavour to throw a thin beam of light into the well-illuminated age old problem of otitis media with effusion in the domain of otorhinolaryngology with a keen hope to achieve something for its amelioration. As the present study encompassed within its limit only for a short period of time with a selected group of patients and a short follow-up period, the results and observations should be viewed on the above context. As such, a definite conclusion cannot be drawn. However, from the observation, it is felt that, the disease is a very common entity in otorhinolaryngological practice occurring mostly in the childhood.

The role of surgical treatment has become more important in this era of antibiotic resistant bacteria, against steadily increasing incidence of the disease, also calling for better methods of prevention which requires only well-designed and conducted studies for evidence based information to select patient who should benefit from surgical intervention.

The early diagnosis and proper treatment is of utmost value in order to prevent the harmful sequelae of otitis media with effusion.

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