

Use of Short Term Ventilation Tube in Children Having Chronic Otitis Media with Effusion

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Abstract

Background: Otitis media with effusion is a collection of fluid inside the middle ear cleft, treatment of this condition include medical and surgical methods. This research goal is to focus and specify the clinical features of OME and the association between the new staging and the postoperative findings after surgery of insertion of ventilation tubes (VTs). **Objectives:** The objective of the study was to assess postoperative sequelae after VT insertion in children. **Patients and Methods:** Thirty two children with OME with surgical insertion of short term ventilation tubes were included in this study and followed up for one year. **Results:** In 22 patients, the fluid aspirated surgically after myringotomy was serous, whereas 10 patients were mucinous; for the patients, 53.12% had recurrence, whereas 46.88% showed no recurrence of OME. Only 6.25% of cases included in this study developed myringosclerosis; no otorrhea was reported during the period of the presence of VT in the tympanic membrane, no persistent tympanic membrane perforation after VT auto-extrusion. **Conclusion:** Even though VT have shown to be very useful in solving conductive hearing loss, its efficacy is a matter of debate in preventing long-term poor effects of the tympanic membrane and delayed onset of hearing loss. Even though ventilation tubes have shown to be very useful in solving the problem of conductive hearing loss.

Keywords: Otitis media, recurrence rate, ventilation tube

INTRODUCTION

Otitis media with effusion (OME) and tubal dysfunction manifested as a state of middle ear effusion are usually the most common problems of the middle ear in children.^[1]

Otitis media is considered one of the main causes for patients to visit otolaryngologic clinics and centers and high costs of management.

This disease can lead to a persistent deficit of the auditory system if insufficient treatment is carried out to reach the diagnosis and management. The complications include tympanic membrane diseases such as (thinning, sclerosis, granulation tissue, tympanic membrane perforation, and cholesteatoma), behavioral changes, and sensorineural hearing loss.^[2,3]

It is very critical to decide when to perform surgery and when to keep close observation of the patient.

Medical treatments, such as antibiotics, decongestants, and antihistamines with or without leukotriene antagonists, have no role or recommendation by different guidelines published up to date.^[4-7] Surgery of a ventilation tube (VT) is the best

method when a child is a surgical candidate.^[6-8] However, the time to perform this surgery during the course of the disease is not easy to determine. There is also some disagreement in various guidelines for the treatment of OME, which can differ depending on the health-care system, facilities available and the nature of the medical center of the hospital, in which the treatment conducted.^[9]

Different studies discussed the prognosis of OME following surgery which was closely related to clinical factors such as the age at the time of intervention, the occurrence of adenoidectomy at the same session of VT insertion, time duration of VT retention, and presence of otorrhea with the VT, in addition to early extrusion.^[10]

In our study, we tried to configure the follow-up result after 1 year from short-term insertion of VT. Development of

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any complications including recurrence of the disease were reported in this study.

Objectives

The objective of the study was to assess postoperative sequelae after VT insertion in children.

PATIENTS AND METHODS

Prospective study of 32 children with clinical and audiological evidence of OME, for which conservative treatment failed to solve the problem, and surgical treatment was done, including myringotomy, short-term VT insertion, and adenoidectomy.

Children included in the study were those with OME not responding to the conservative treatment with clinical evidence of OME confirmed by otoscopic of that disease and audiological evidence of pure conductive hearing loss in pure-tone average (PTA) or by auditory brainstem responses (ABRs) study, including bone conducting ABR for younger children that cannot cooperate with the conventional adult tympanometry.

Exclusion criteria

- One: Children younger than 3 years of age (not in the inclusion group)
- Two: Children older than 12 years of age (not in the inclusion group)
- Three: Impedance curve anything except Type B (flat curve) – (Types A and C were excluded)
- Four: Bone conduction by PTA or ABR worse than 20 dB (possibility of mixed hearing loss)
- Five: Patients with unilateral OME (possibility of other underlining pathologies)
- Six: Recurrence of OME after surgery.

The study proposal was accepted by Chi-square test, by the scientific and ethical committee of the College of Medicine – Mustansiriyah University in September 2022. All parents signed a consent form of inclusion of their children in the study; the study was conducted in a private clinic in Baghdad from February 1, 2021, to November 30, 2021, and all surgeries were conducted in a private hospital in Baghdad; all children were followed up for 1 year after surgery.

Chi-square was used to identify the significance of different outcome parameters of this study test.

RESULTS

From the 32 children included in our study, ages ranged from 4 to 12 years; the median age was 7 years, and gender distribution was 12 females and 20 males. In 22 patients, the fluid aspirated surgically after myringotomy was serous, whereas ten patients were mucinous extruded.

After 1-year follow-up for the patients, 53.12% had recurrence, whereas 46.88% showed no recurrence of OME as shown in

Figure 1. Only 6.25% of cases included in this study developed myringosclerosis; no otorrhea was reported during the period of the presence of VT in the tympanic membrane, no persistent tympanic membrane perforation after VT auto-extrusion was reported in any patient included in this study; Table 1 summarizes the long-term postoperative complications after 1 year of follow-up of the patients included in this study.

Statistical analysis showed that there was no correlation between the type of fluid present inside the middle ear at the time of surgery and the degree of hearing loss at presentation with the occurrence of the recurrence with *P* values more than 0.05%.

DISCUSSION

The management results of OME were well explained in many previous manuscripts, and the results of long-term follow-up had also been discussed,^[11,12] Audiological tests such as measure of impedance of the tympanic membrane by tympanometry and audiometry were used to confirm the diagnosis of OME. However, most of the children included in this study were so young and unable to perform pure-tone audiometry and ABR with both air and bone conductions were performed to confirm the diagnosis.

In accordance with the guidelines published by “The American Academy of Otolaryngology – Head and Neck Surgery”^[4] and “The Korean clinical practice guideline: otitis media in children;”^[4] patients with OME with longer than 3 months persistence of the disease were indicated for surgery of VT. The decision of that surgery was made based on the presence of that disease in both ears, the time duration of the existence of the disease in the diseased ears, the level of hearing, and the child’s developmental milestones.^[12,13]

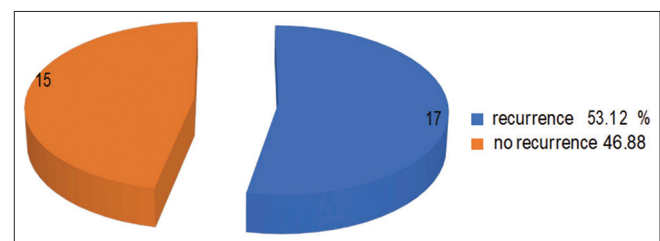


Figure 1: Percentage of recurrence of otitis media with effusion after treatment with short term ventilation tube

Table 1: The incidence of the possible complications that can occur in surgeries of otitis media with effusion and in this study

Possible complications	Number of cases, <i>n</i> (%)
Recurrence of OME	17 (53.12)
Myringosclerosis	2 (6.25)
Otorrhea	0
Persistence of perforation	0

OME: Otitis media with effusion

In a study on 174 children at Shahid Sadooghi University of Medical Sciences,^[3] most VT extrusions were reported in 3–6 months after insertion, and there was no significant difference between genders; these findings were compatible with our study which also showed the same extrusion period for the tubes and no significant difference between sexes.

Our study showed 6.25% had myringosclerosis after VT extrusion, whereas in a study of Saki *et al.* showed myringosclerosis was seen in 37.9% of the patients.^[14]

Hassmann-Poznańska *et al.* showed OME recurrence of 23.7%, whereas in our study, 53.1% had recurrence for the occurrence of otitis media. The percentage of recurrences after tympanostomy tube insertion is not uncommon prolonged period of follow-up of those children is recommended. There are different follow up regimes reported in the literatures^[15] and prolongation of this period seems to result to better conclusions.^[15]

Maw *et al.*'s^[16] study showed that the nature of the fluid of the middle ear of effusion aspirated before VT insertion has no prognostic value, which correlate with our study as *P* value was not significant <0.05%.

Our study emphasizes close follow-up and monitoring for children suffering from otitis media who underwent surgery for VT insertion, the period of follow-up should be well focused with good communication skills between the doctor and the child's family.

To get more precise results and better conclusions, further studies are recommended that includes larger number of patients with a prolonged follow up periods which certainly will leads to better data analysis.

CONCLUSION

Despite that VT have shown very effective in improving the degree of hearing in the short term, they have not shown efficacy in preventing long-term complications affecting the tympanic membrane and level hearing.

Short-term VT is successful in treating OME with less complications but was associated with a high recurrence rate; other studies on the same patient category are needed to confirm that intermediate-term VT is superior.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Yaman H, Yilmaz S, Alkan N, Subasi B, Guclu E, Ozturk O. Shepard grommet tympanostomy tube complications in children with chronic otitis media with effusion. *Eur Arch Otorhinolaryngol* 2010;267:1221-4.
2. Forsen JW. Chronic disorders of the middle ear and mastoid. In: Wetmore RF, Muntz HR, McGill TJ, Potsic WP, Healy GB, Lusk RP, editors. *Pediatric Otolaryngology: Principles and Practice Pathways*. New York: Thieme; 2000. p. 281-9.
3. Karimi GH, Hatfi H. A study of the rejection time and complications of ventilation tube in children with serous otitis who had undergone a VT placement operation. *J Shahid Sadooghi Univ Med Sci* 2001;4:43-7.
4. Rosenfeld RM, Shin JJ, Schwartz SR, Coggins R, Gagnon L, Hackell JM, *et al.* Clinical practice guideline: Otitis media with effusion (update). *Otolaryngol Head Neck Surg* 2016;154:S1-41.
5. Ito M, Takahashi H, Iino Y, Kojima H, Hashimoto S, Kamide Y, *et al.* Clinical practice guidelines for the diagnosis and management of otitis media with effusion (OME) in children in Japan, 2015. *Auris Nasus Larynx* 2017;44:501-8.
6. Lee HJ, Park SK, Choi KY, Park SE, Chun YM, Kim KS, *et al.* Korean clinical practice guidelines: Otitis media in children. *J Korean Med Sci* 2012;27:835-48.
7. National Collaborating Centre for Women's and Children's Health. National Institute for Health and Clinical Excellence: Guidance. *Surgical Management of Otitis Media with Effusion in Children*. London: RCOG Press; 2008.
8. Rovers MM, Schilder AG, Zielhuis GA, Rosenfeld RM. Otitis media. *Lancet* 2004;363:465-73.
9. Clay-Williams R, Stephens JH, Williams H, Hallahan A, Dalton C, Hibbert P, *et al.* Assessing the appropriateness of the management of otitis media in Australia: A population-based sample survey. *J Paediatr Child Health* 2020;56:215-23.
10. Ahn JH, Yoon TH, Pae KH, Kim TS, Chung JW, Lee KS. Clinical manifestations and risk factors of children receiving triple ventilating tube insertions for treatment of recurrent otitis media with effusion. *Pediatrics* 2006;117:e1119-23.
11. Todberg T, Koch A, Andersson M, Olsen SF, Lous J, Homøe P. Incidence of otitis media in a contemporary Danish National Birth Cohort. *PLoS One* 2014;9:e111732.
12. Khodaverdi M, Jørgensen G, Lange T, Stangerup SE, Drozdziwicz D, Tos M, *et al.* Hearing 25 years after surgical treatment of otitis media with effusion in early childhood. *Int J Pediatr Otorhinolaryngol* 2013;77:241-7.
13. Koivunen P, Alho OP, Uhari M, Partanen A, Luotonen J. General anesthesia with and without nitrous oxide (N₂O) and the weight of middle ear effusion in children undergoing adenoidectomy and tympanostomy. *Laryngoscope* 1996;106:724-6.
14. Saki N, Nikakhlagh S, Salehi F, Darabifard A. Incidence of complications developed after the insertion of ventilation tube in children under 6 years old in 2008-2009. *Iran J Otorhinolaryngol* 2012;24:15-8.
15. Hassmann-Poznańska E, Goździewski A, Piszcz M, Skotnicka B. Long term sequelae of otitis media with effusion during childhood. *Otolaryngol Pol* 2010;64:234-9.
16. Maw AR, Bawden R, O'Keefe L, Gurr P. Does the type of middle ear aspirate have any prognostic significance in otitis media with effusion in children? *Clin Otolaryngol Allied Sci* 1993;18:396-9.