

# Treatment of Otitis Media through Adenoidectomy

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**Abstract** To study the effectiveness and safety of adenoidectomy as means for managing otitis media in children and measure them against alternative methods of treatment. The report is based on the examination of four peer-reviewed sources of literature focusing on otitis media with effusion and especially the management through adenoidectomy. The approved sources are gleaned from PubMed, Cochrane Library, and EMBASE databases and were published between 2007 and 2014. The findings in the chosen sources are described in this study and this forms the basis for the discussion section. The study found that the application adenoidectomy alongside mentioned surgical approaches leads to an improvement in the ontological capacity of the patient. It also found that the method of resolving OME may lead to significant prevention of further occurrence of middle ear effusion.

**Keywords** Otitis media with effusion, Middle ear effusion, Adenoidectomy

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## 1. Introduction

Otitis media (OM) is one of the commonest illnesses of childhood. OM is defined as an inflammation of the middle ear cleft of rapid onset and infective origin, associated with a middle ear effusion and a varied collection of clinical symptoms and signs [1].

The clinically-appreciated rates of incidence of otitis media in children below the age of 3 years suggest that the condition may be a leading cause of sickness within the age group [2], prevalence in different regions has been recorded by the strong manifestation of climatic and geographical conditions [3].

Often, the condition may lead to the perforation of the tympanic membrane. Spontaneous healing of the tympanic membrane is affected by chronicity of infection and changes at the perforation margins, leading to a non-healing permanent perforation. This leads to constant exposure of middle ear for reinfection and hearing disability [4].

A type of otitis media which is asymptomatic (is not characterized by the inflammation of the middle ear) and with similarities with the acute genre is known as otitis media with effusion (OME). One of the common methods of management of OME is the surgical removal of the effusive adenoids (adenoidectomy). The sensitive nature of the ear implies that only maximum effectiveness and safety can be approved for any chosen medical management method.

Otitis media with effusion is characterized by the presence of non-purulent effusion of the middle part of the ear with the presence of mucus or serum. The main symptom for the condition is fullness of the aural part and limited hearing loss. However, fever and pain have not clinically been associated with OME [5].

Any type of otitis media is the most common medical condition affecting children in preschool age in the United States of America. Middle ear effusion has been deemed to have an incidence rate of between 15% and 40% in children below 5 years of age. Within extended assessment of one year and above, 50-60% incident rates have been discovered in children under outsourced child care. The rates for school-age children have been found to be 25%. The occurrence of acute otitis media for all children is between 84% and 93%. In addition, 80% of all children experience at least a single episode of OME by their sixth year of life [5].

In most children the OM resolves with anatomic and physiologic changes with growth. Until the condition has resolved, it may affect balance, hearing, and speech and language development and cause poor school performance [1].

Due to the extent and significance of otitis media with effusion in young children, their hearing, OM can lead the occurrence of sensorineural hearing loss in 12% of the patients [6], and their general health and comfort, it is often important to assess the common medical methods for their effectiveness and safety. Adenoidectomy receives unique focus since it recommends surgical interference and the removal of a pivotal part of the middle ear. It is thus plausible to analyze the existent levels of effectiveness and security in managing OME. This would help in whether the method has

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medical and otolaryngology-based obligation.

## 2. Methods

### Search Strategy

On September 18, 2017, a systematic search of PubMed, Cochrane Library, and EMBASE databases was done with an aim to finding sources that focus on the treatment of OME with adenoidectomy. The articles were specifically published between 2007 and 2014. Since the basic search query was prognostic, articles dealing with the development of otitis media and degeneration in OME were not included in the search to avoid missing out on relevant findings. Relevant search words such as “otolaryngology”, “otitis media with effusion”, and “adenoidectomy” were used.

### Selection Criteria

The found articles were initially screened for their peer-reviewed nature. All sources which were not basically peer-reviewed were thus removed. Then, the articles were screened on the basis of their titles and abstract. This criterion served to approve only those articles whose objective was to assess the various aspects of adenoidectomy. Specifically, the articles were assessed on the use of randomized control trials to assess the effectiveness of adenoidectomy in managing otitis media with effusion in children.

### Data Extraction

The study compares the described findings for the efficiency of adenoidectomy in treating OME in children as expressed in percentages. The level of safety of the surgical method as found in each relevant study was also considered. The gleaned results were then presented as the average all of the findings. The average value of efficiency of adenoidectomy is taken as being representative of efficiency of the method for the treatment of otitis media in children. Studies using comparative assessment between adenoidectomy and alternative medical approaches recorded such findings under risk difference (RD). Average RD values are taken as representative of the effectiveness of the surgical method in resolving otitis media with effusion in children. Postoperative assessments of patients focusing on the degeneration of effusion affecting the tympanic membrane as well as the improvement in the ontological attributes of the ear are some of the parameters used to determine the application of stand-alone traditional adenoidectomy in resolving OME.

## 3. Data Analysis (Meta-Analysis)

### Search Strategy

After a key-word-based search, a total of 745 articles were found. Screening on the basis of titles and abstracts yielded 35 relevant results. Then, the articles were assessed on the availability in PDF and downloadable formats. This step led

to the approval of a total of 4 peer-reviewed articles based on randomized control trials which met the selection criteria and which were relevant to the search query.

### Patient Characteristics and Follow-up Duration

Den Aardweg, Schilder, Herkert, Boonaker, & Rovers (2010) based their studies on 14 randomized trials which included 2712 children between 24 and 60 months of age. The children possessed heterogeneous attributes. The study had a maximum follow-up period of two years [7].

Casselbrant, et al. (2009) included 220 children between ages of 24 and 47 months who had documented experiences of middle-ear effusion for at least three months (the number of patients eventually reduced to 99 due to a termination of funding for the study program). Screening of ENT was performed on the patient group for 2 weeks after undergoing various surgical operations on their middle ears [8].

Capaccio, Toretta, Marciante, Marchisio, Forti, & Pignataro (2014) assess the application of adenoidectomy under anesthesia to patients between 4 and 12 years of age. The study findings were done across gender attributes of individual patients [9].

Wang, Wang, Chu, Tu, Shiao, Tou (2014) assessed patients groups recorded in the National Health Insurance Databases between 2000 and 2009. The patients groups are examined on age stratification to ascertain any effect of age on the application of tympanostomy treatment with or without adenoidectomy [10].

**Table 1.** Effectiveness of adenoidectomy in managing OME in children

Article	Parameter for effectiveness of adenoidectomy in managing OME in children
Den Aardweg, Schilder, Herkert, Boonaker, & Rovers (2010)	Surgical application of adenoidectomy with unilateral tympanostomy had a more beneficial effect in the resolution of OME than the lack of any surgical operations with a risk difference of 22% 6 months postoperatively and 29% after 12 months postoperatively. The method led to a small difference in hearing capacity as compared to unilateral tympanostomy only (< 5 dB)
Casselbrant, et al. (2009)	The management of OME with adenoidectomy alone lead to an improvement of audiological and ontological capacities 3 months postoperatively. The same parameters improved 9 months postoperatively. Endoscopic-assisted adenoidectomy led to a significantly lower occurrence of tympanogram 3 months postoperatively (15%) than in traditional adenoidectomy (32%).
Capaccio, Toretta, Marciante, Marchisio, Forti, & Pignataro (2014)	A risk difference of 17.2% was calculated for children undergoing primary adenoidectomy against 38% for children undergoing tube tympanostomy postoperatively. The protective effects of adenoidectomy diminished with age below 4 years.
Wang, Wang, Chu, Tu, Shiao, Tou (2014)	Adenoidectomy patients showed a rate of necessity for tympanostomonic tube insertion of 5.1% with the surgical tympanostomy alone leading to a tube insertion rate of 9%

## 4. Discussion

The study found that the incorporation of adenoidectomy in the management of otitis media with effusion may lead to various benefits to patients. The patient groups were predominantly stratified on their age. Moreover, research findings show that the application of primary endoscopic-assisted adenoidectomy alongside tube tympanostomy as compared to either method being applied independently or the lack of any otological operation technique.

A combination of endoscopic adenoidectomy and tube tympanostomy led to a significant prevention of the development of further middle ear effusion postoperatively. Thus, the surgical approach can be said to lead to significant prevention of the degeneration of OME. It also leads to significant effectiveness in resolving cases of otitis media with effusion. It also shows an increased prevention of further inflammation or occurrence of pus or mucus in the tympanic membrane. Specifically, the method leads to a small improvement in the hearing range of the patient after the operation as compared to non-operated patients.

## 5. Conclusions

The management of otitis media with effusion by the surgical operation of endoscopic adenoidectomy alongside tympanostomy tube insertion is an effective way of resolving otitis media in children. The postoperative occurrence of degenerate inflammation of the middle ear and the occurrence of effusion may be prevented by applying this surgical approach. In addition, the method leads to a small improvement in otological and hearing capacities at least three months after the operation.

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