MORE ABOUT . . . EARS, NOSES AND THROATS

GROMMETS

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Ventilation tubes, more commonly known as grommets, were introduced in 1954 by Armstrong[1] and have transformed the surgical management of certain middle ear conditions. Insertion of ventilation tubes remains one of the most likely reasons why a small child will require general anaesthesia.[2] Therefore it is important to know what ventilation tubes are, the indications for using them, and how to manage a patient with these tubes.

Introduction

Although grommets are used for a wide variety of conditions, the most common indication is for persistent or unresponsive otitis media with effusion (OME), i.e. no resolution of OME after a 3-month period of watchful waiting, and/or failed medical treatment. OME is a condition often seen in childhood, caused by Eustachian tube dysfunction and resulting in poor pneumatisation of the middle ear cleft. The middle ear is filled with a thin serous or thicker secretory-type fluid, causing hearing loss. In a high percentage of cases OME undergoes spontaneous resolution within 3 months. Consequently, many otolaryngologists feel there is no need to treat this condition unless it persists beyond 3 months. This conservative approach is shared by the *Effective Health Care Bulletin* published in 1992 by the University of Leeds, which is used in the UK as the guideline for treatment of OME. Most authors agree that decongestants and mucolytics have no role to play in the treatment of OME, but meta-analysis suggests that the use of steroids and antibiotics may be beneficial. The main indication to insert grommets in children with OME is a persistent hearing loss amounting to more than 20 dB. This level of hearing loss, if persistent, is associated with a delay in speech development, and is often associated with severe behavioural problems.[3]

Background

Grommets are made of a variety of materials, most commonly Teflon. The tubes are classified as either the short-term type (remain *in situ* for 6 - 12 months), or the long-term type (generally remain *in situ* for 1 - 2 years). This is due to the difference in size of the flange that is placed in the middle ear, the large flange size resulting in a long-term grommet, as spontaneous extrusion from the middle ear cleft will take longer.

Indications for surgery

Although grommets are used as surgical management for certain middle ear conditions in both adults and children, the conditions giving rise to the need for grommets are much more common in children. One may regard a grommet almost as an 'artificial Eustachian tube' in that it allows ventilation of the middle ear in conditions where Eustachian tube dysfunction contributes to the problem.

Indications include the following:
- persistent OME (glue ear)
- acute otitis media, not resolving on medical treatment
- recurrent bouts of acute otitis media
- Eustachian tube dysfunction (with limited long-term success)
- certain conditions where temporary or long-term equalisation of middle ear pressure is required, as in patients undergoing hyperbaric oxygen treatment.

Grommets allow the equalisation of middle ear pressure with atmospheric pressure, thus taking over the function of the Eustachian tube. They do not 'drain the middle ear', as some believe. A grommet may be inserted under local anaesthesia, although this is usually only possible in adults. Children do not tolerate this procedure. Usually general anaesthesia is used, during which a myringotomy is done under microscopic vision in the tympanic membrane, through which the grommet is inserted.

As part of the postoperative management patients should know if swimming is permitted. According to well-known authors/otologists Maw *et al.*,[2] this remains controversial and could perhaps be permitted, but with definite restrictions on diving and jumping into the water.

Complications

The following complications are associated with grommets:[2]

Intraoperative
- Damage to the tympanic membrane.
- Damage to middle ear structures.
- Grommet misplaced in middle ear cleft.

Postoperative
- Tympanic membrane scarring/tympanosclerosis.
- Segmental atrophy of the membrane.
- Permanent perforation.

- Infection around the tube, and otorrhoea secondary to middle ear infection (could be viewed as a side-effect of grommets).

The most common negative consequence associated with the insertion of grommets is permanent scarring of the tympanic membrane (tympanosclerosis), which occurs in 30 - 50% of patients. However, it almost never causes significant hearing loss and is therefore of no clinical consequence. Permanent perforations occur in as few as 3% of patients and are often seen in conditions requiring long-term ventilation tubes.

The side-effects associated with grommets are often more troublesome. The most frequently encountered side-effect is secondary infection — in up to 30% of patients. This is associated with otorrhoea, which, apart from being socially unacceptable, may also cause blocking of the tube. This, in turn, could promote earlier extrusion of the tube, and/or be associated with a permanent small perforation. Aural toilet in combination with antibiotic steroid drops is helpful for this condition. Small perforations after insertion of grommets need to be dealt with on an individual basis, as they may either be left or repaired later by tympanoplasty.

Summary

- Most cases of OME spontaneously resolve over a period of time (from 3 to 6 months).
- When indicated, the insertion of grommets remains a very useful intervention for the following reasons:
  - it is a minor procedure
  - the associated side-effects/complications are minimal
  - it is of great value in normalising hearing thresholds
  - it therefore assists with speech development in these children
  - it may allow a child to 'outgrow' Eustachian tube dysfunction, and thus avoid anatomical changes to the tympanic membrane such as retraction/atrophy.

Conclusion

In private practice OME remains one of the most commonly seen conditions and grommets have become one of our most effective ways to manage this condition.[4]

References available on request.

SNORING — MORE THAN A SOCIAL NUISANCE!

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Snoring is an undesirable sound originating from the soft tissues of the upper airway during sleep. It has more often than not been part of a social dogma that has plagued society through the sands of time. However, it is a manifestation of a large group of sleep disorders loosely termed sleep-disordered breathing (SDB). SDB is a broad term encompassing obstructive sleep apnoea (OSA), obstructive sleep hypopnoea (OSH), excessive daytime somnolence and upper airway resistance syndrome (UARS).

There are numerous sleep disorders that are organised in the International Classification of Sleep Disorders by the American Sleep Disorders Association. The predominant problems that may warrant a patient seeking assessment and possible surgical intervention is snoring (adults) and obstructive sleep apnoea (adults and children). A brief approach to understanding these conditions is discussed with special attention being paid to clearly defining certain sleep disorders.

Definitions

- **Snoring:** noisy breathing arising from upper respiratory tract during sleep.
- **Hypopnoea:** nasal airflow falling by 50 - 75% for longer than 10 seconds.
- **Apnoea:** nasal airflow falling by > 75% for longer than 10 seconds.
- **Obstructive sleep apnoea (OSA):** cessation of airflow at the nose or mouth for at least 10 seconds.
- **Apnoea/hypopnoea index (AI):** number of apnoea/hypopnoea episodes in 1 hour.

OSA is a sleep disorder in which there are repeated reductions or cessations in airflow at the nostrils or mouth and can be either central, obstructive or mixed. In obstructive apnoea there is absence of airflow with continued inspiratory effort and in central apnoea there is no inspiratory effort — the latter is not amenable to surgical correction. The mixed type presents with symptoms of both obstructive and central apnoea.

The apnoea index (AI) is defined as the number of episodes of apnoea per hour. Reports usually define OSA as an apnoea index of 5 or more and a respiratory disturbance index (RDI) of at least 10 on polysomnograph readings. A typical apnoeic episode in a patient with OSA usually lasts 20 - 30 seconds and seldom exceeds 100 seconds. It generally has an AI greater than 20. The severity is markedly variable, and it is often associated with other physiological sequelae (e.g. systemic hypertension, cor pulmonale, cardiac arrhythmias, etc.).

Grading of sleep apnoea syndrome (SAS) as per American Sleep Association:

- mild: 5 - 20 apnoeic episodes per hour
- moderate: 21 - 40 per hour
- severe: > 40 per hour.

It is therefore of paramount importance to realise that everyone with SDB snores, but everyone who snores