



## Treatment Updates

# Myringotomy and Insertion of Tympanostomy Tubes (Grommets)

## ACUTE OTITIS MEDIA

Acute otitis media is a viral or bacterial infection of the middle ear that causes pain and fever. On examination the eardrum looks inflamed, hyperaemic and may be bulging.

Occasionally the eardrum bursts resulting in mucopurulent ear discharge. This infection often settles quickly and requires no treatment but sometimes antibiotic treatment is required.

## RECURRENT OTITIS MEDIA

Otitis media is recurrent when the infection occurs three or more times in six months. Repeated middle ear infections are likely to occur in children:

- in a child day care setting
- with intercurrent upper airway obstruction such as adenoid hypertrophy
- with rhinosinusitis
- exposed to cigarette smoke or other irritants
- with any upper airway mucosal immune deficiency problems

## CHRONIC OTITIS MEDIA WITH EFFUSION (GLUE EAR)

If fluid persists in the middle ear cleft for more than three months the condition is known as chronic otitis media with effusion or glue ear. The fluid is usually sterile and it varies in viscosity from thin to thick and sticky. Glue ear is nearly always due to eustachian tube dysfunction, is more common in children under the age of three because when we are born the eustachian tube is horizontal and orientation very thin and as we grow the tube becomes wider and more vertical. It is more common in children with rhinosinusitis as inflammatory swelling can cause blockage in the tube. It is more common in the colder seasons and it is more common with associated structural abnormalities such as cleft palate.

The thick and sticky fluid interferes with the transmission of sound through the middle ear and can cause mild or moderate hearing loss. Most

cases of glue ear settle down without the need for active medical treatment however treatment may be needed if glue ear is present for more than 3 months and especially if it is associated with:

- documented hearing loss
- scarring or damage to the ear drum
- evidence of damage to the three bones in the middle ear

Evidence is quite strong in children with an ongoing conductive hearing loss due to glue ear often experience a delay in speech and language development, have learning difficulties at school, behavioural problems, frequent ear aches and may suffer from imbalance.

## LONG TERM COMPLICATIONS OF GLUE EAR

### Thinning of the eardrum

**Collapse of the eardrum** with formation of retraction pockets. This can lead to damage to the small bones of the middle ear further impairing the ability to heal. Deep posterior retraction pockets can lead to cholesteatomas. A cholesteatoma is an abnormal ingrowth of skin from the outer ear canal into the middle ear canal and nearly always requires surgical removal.

## GROMMETS

Grommets are small metallic or polyteflon tubes placed through the eardrum to help treat either recurrent acute otitis media or glue ear. They allow air to follow into the middle ear in the presence of a blocked eustachian tube restoring equal pressure between the middle ear and the atmosphere and they allow the fluid to drain either out the tympanostomy tube or to be reabsorbed into tissues. This equalisation of pressure is important for middle ear good health while the eustachian tube is itself not working.

Indication for grommets:



## Treatment Updates

## Myringotomy and Insertion of Tympanostomy Tubes (Grommets)

- Three or more significant ear infections occurring within a six month period
- Complication of otitis media
- Glue ear when present for more than three months especially in the presence of documented conductive hearing loss and/or evidence of scarring or damage to the eardrum.

### BENEFITS OF GROMMETS

Grommets return **hearing** to normal or near normal provided there is no damage to the nerve of hearing. Restoration of normal hearing is especially important in children with delayed speech development, learning difficulties or intellectual impairment

**Behavioural problems** associated with glue ear are often improved by grommets

**As grommets allow air to enter the middle ear** cleft a retracted pocket in the eardrum is likely to return to normal and it nearly always prevents further damage to the ear drum and/or to the three small bones of the middle ear

**In children who have recurrent otitis** media, grommets usually decrease the frequency of infection

### ALTERNATE TREATMENTS

There is little doubt that fluid in the middle ear cleft often resolves without the need for medical intervention however if the fluid persists for three months or more and/or is associated with any developing complication as alluded to before, treatment is required.

#### Antibiotics

Antibiotics do not hasten the resolution of fluid in the middle ear cleft. They work by chemoprophylaxis – while the fluid is there they reduce the number of infections in the blocked middle ear. The problem with using antibiotics is the development of resistant organisms in the middle ear.

#### Steroids

Several American studies have shown that systemic steroids in appropriate doses, by their non specific anti inflammatory effect, can hasten the resolution of middle ear fluid. Unfortunately when the steroids are discontinued, the fluid tends to re-accumulate. Due to the potential risks of oral steroids their use is no longer recommended by either the American Academy of

Otolaryngology, Head & Neck Surgery or the American Academy of Paediatrics.

#### Mechanical therapy

In older children the use of a nasal balloon technique (Otovent) has been shown to be successful in hastening the resolution of middle ear fluid. It should always be used before considering grommets. In younger children, use of the Tonybee manoeuvre is recommended if the child is old enough to be able to swallow with it's nose pinched.

### INSERTION OF GROMMETS

Grommets are inserted under a gaseous general anaesthetic. Children are not paralysed and they are not intubated. The surgical procedure involves the use of an operating microscope, a small cut in the eardrum, aspiration of some of the fluid and insertion of a tympanostomy tube. The child returns home after several hours in recovery. Most surgeons recommend that water be excluded from the ear while the grommet is insitu.

### TYPES OF GROMMET

Grommets come in a variety of sizes from a very small metal tube (Kurz tube) through a Shepherds tube to a Collar Button tube right up to large Goodie T tubes. As a rule of thumb, the bigger the grommet, the longer it stays in, but the bigger the grommet, the bigger the cut and the greater the risk of the hole where the grommet was not healing spontaneously. With the Kurz tube (the smallest) the risk of the perforation not closing is less than 1%. With a Shepherds tube it is about 1%, with a Collar Button tube about 1-2% and with a larger tube like a Goodie T tube about 5-10%. A hole that persist after extrusion of a grommet may require a minor secondary surgical procedure to close the hole.

Ear discharge of the grommet may occur at any time. It is usually recommended that water be excluded from the ear. With an upper respiratory tract infection a sterile serous fluid may come out through the grommet. This is not serious and requires no treatment.

### EARLY EXTRUSION

The grommets are designed to stay in for between six months and a year. During this period of time between 85–90 children in 100 grow and develop enough to not require a second



tube. 10-15 in 100 will. Early displacement of a grommet is defined as a grommet coming out in less than 3 months. If this is the case, depending on the eustachian tube status a grommet may need to be inserted.

The hole in the grommet may become blocked if there has been mucopurulent discharge. Sometimes this can be unblocked by use of sodium bicarbonate ear drops. Sometimes it renders the grommet non-functional and the grommet itself needs to be removed. Thinning of the eardrum at the site of grommet insertion can occur. This occurs in less than 1/3 of cases and is usually of no functional significance.

Calcium deposits and scarring (tympanosclerosis) can occur at the site of grommet insertion. Several studies however have shown that the likelihood of tympanosclerosis is greater with the persistence of fluid in the middle ear cleft than if the fluid is aspirated and a grommet is inserted. A small plaque of tympanosclerosis does not significantly interfere with the vibration of the eardrum hence does not affect hearing.

Recurrent infection around the grommet can lead to the formation of granulation tissue. This can block the grommet, lead to mucopurulent discharge or intermittent bleeding. Once the grommet, which is a foreign body, has become colonised by antibiotics and a cycle of recurrent infection and/or granulation tissue is established the grommet needs to be removed. When there is infection in and around the grommet and/or granulation tissue the appropriate treatment is by topical ear drops. The only ear drop that has been shown not to be ototoxic is ciprofloxacin. If any ear drops are required this is probably the ear drop of choice.

## ANCILLARY PROCEDURES

Several large American studies have shown that if grommets need to be inserted on more than two occasions, adenoidectomy should be performed as this reduces the chance of any subsequent glue ear formation. In children who have evidence of post nasal obstruction, low grade chronic rhinosinusitis and/or who adopt a chronic mouth open posture at rest, adenoidectomy at the time of grommet insertion should be considered.

## RISKS OF NOT HAVING TREATMENT

It is important for parents to realise that the persistence of fluid in the middle ear cleft can lead to ongoing conductive hearing loss which has been documented to affect speech and language development, learning, behaviour and balance.

- The presence of ongoing fluid can damage the eardrum
- The presence of ongoing fluid can damage the three little bones of the middle ear
- If a cycle of recurrent infection is established then the toxins from that middle ear infection can damage the nervous hearing permanently

**If further information is required,  
please email us:  
[enquires@earnosethroat.com.au](mailto:enquires@earnosethroat.com.au)**