

## **Grommets**

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**Although the insertion of grommets is a highly successful operation its indications are controversial and confusing.**

Grommets are designed to provide ventilation for the middle ear and mastoid. They are extremely successful in doing this except when they become blocked by thick mucus or polypoid mucosa, are extruded prematurely or when persistent otorrhoea prevents ventilation. Their very ability to ventilate the ear and resultant relief (often immediate) of symptoms such as pain, discomfort and hearing loss may result in their overuse.

### **Indications**

Many different guidelines exist as countries or professional groups have attempted to standardise indications. When many varying approaches exist one can be sure that none of them is exactly correct. Opinions vary from the ultra-conservative 'wait and see' approach of a 3-month observation period for patients with middle ear effusion before considering grommets, to the more aggressive approach of grommet insertion for all persistent effusions and even acute effusions as in acute otitis media. Clearly grommets are indicated in persistent middle ear effusion that fails to resolve within a reasonable time period, but what is a 'reasonable' time?

### **The 'reasonable' time period**

As there is no general agreement on how long to wait before ventilating ears with persistent effusions, the decision to operate needs to incorporate other factors, viz:

- severity of symptoms
- degree of hearing loss
- age of patient
- socio-economic circumstances.

### ***Severity of symptoms***

Symptoms may vary from completely asymptomatic, eg, effusion discovered at routine examination without the child or parent being aware of the condition, to the child with recurrent otalgia, poor sleeping patterns or recurrent otorrhoea.

The more severe the symptoms the more reasonable it becomes to intervene early. The length of waiting should therefore be tailored to patient symptoms. However, even in

asymptomatic children the waiting period should probably not exceed 3 months.

### *Degree of hearing loss*

This important symptom should be considered separately. The hearing loss caused by persistent effusion varies from minimal to moderate to severe. The exact pathophysiology of this variation is not completely understood. Persistent or recurrent hearing loss may lead to speech delay or pathology and possible learning difficulties. This is more significant in families with poor oral communication. Children in homes with good vocalisation and communication are at less risk.

Communication skills are extremely important in development and future employment markets. Significant hearing loss, particularly in children living in at risk home environments (poor communication/vocalising) is an indication for earlier intervention with grommets.

### *Age of patient*

Children under 2 years of age are at risk of impaired speech development as a result of persistent or intermittent hearing loss. Development of central hearing centres is similar to that of visual centre development. Problems in end-organ use (eye or ear) may result in delays or defects in special sensory development in the brain. Early grommet insertion in children under 2 years with persistent or recurrent effusions may therefore be indicated.

### *Socio-economic circumstances*

Children who attend day-care centres or are from homes where both parents smoke are at greater risk of middle ear effusion and recurrent otitis media. Conservative treatment is less likely to succeed in these circumstances and earlier insertion of grommets would be reasonable. Working parents may request earlier intervention with grommets as a result of the additional pressures that may arise, eg, loss of work resulting from persistent or recurrent illness in children. These problems should also be considered when considering intervention.

Costs of conservative treatment, ie, medication or loss of work may be higher than those of grommet insertion. In certain conditions grommet insertion may be more cost effective than repeated medication. Individual circumstances require compassionate judgement.

### **Non-surgical management of chronic middle ear effusion**

Time and cortisone are the two definitive factors in resolving middle ear effusion. Observation will result in resolution of effusion in most patients, but the duration should be considered in association with the other factors mentioned above. Tympanometry, microscopy and rigid otoscopy may be required in assessment of these patients.

Oral or parenteral cortisone results in resolution in many patients. Parenteral cortisone is not generally recommended. Nasal cortisone drops are frequently used but there is no evidence that they work. However, they reduce nasal symptoms and congestion which are important in the management of middle ear disease. The addition of antibiotics for persistent middle ear effusion is controversial. A slight improvement in results is possible when antibiotics are used in conjunction with steroids. Any minor gain should be balanced against the possibility of selecting antibiotic-resistant bacteria, eg, penicillin-resistant pneumococcus.

### **Acute otitis media and grommets**

Grommets are indicated in complicated acute otitis media, viz facial nerve palsy, sensorineural hearing loss and CNS complications. Recurrent acute otitis media or resistant organisms may also require grommets.

### **Managed care and grommets**

Grommets are unquestionably cost-effective when indicated. The surgery is relatively low cost and day clinic facilities are suitable. Postoperative costs are low.

### **Adenoidectomy and grommets**

Adenoidectomy is frequently combined with grommet insertion, particularly in cases where recurrent grommets have been necessary or persistent otorrhoea is present.

### **Allergy and grommets**

Allergy as a causative factor in middle ear effusion is controversial. It is important to control nasal symptoms caused by allergy as they may result in eustachian tube dysfunction and consequent middle ear disease.

### **Flying and grommets**

There is no evidence that flying is contraindicated in children with persistent middle ear effusion. Flying is not a strong indication for grommets. However, circumstances such as problems with medication or difficulty with medical care at the destination may strengthen the indication for grommets. Flying may in fact help resolve middle ear effusion.

### **Water and grommets**

Swimming in clean swimming pools is permitted, and does not normally result in problems. Special coverings such as caps and plugs are usually unnecessary. Children should be warned against deep diving or spending time at depth.

Dirty water (dams and rivers) and sea water should be avoided as this may result in infection and otorrhoea.

Care should be taken when washing hair as soapy water may enter the middle ear via the grommet. Careful washing and preventing the ears from dipping below the surface of the bathwater is usually adequate. Children may wet their ears with bathwater before it is soapy or dirty.

### **Ear drops and grommets**

Caution is required when prescribing drops in ears with grommets. Drops are indicated for persistent otorrhoea, but possible ototoxic mixtures should be avoided.

Ciprofloxacin, ofloxacin and chloramphenicol are non-ototoxic and in common use. High volume and short duration (2-5 days) is safer than using drops for long periods.

### **Complications of Grommets**

These are rare. Persistent otorrhoea is usually a result of disease rather than a reaction to the grommet. Occasionally polypoid changes occur at the grommet and replacement may then be necessary. Perforations may occur following grommet extrusion, but these are rare with the commonly used grommets.

Scarring (tympanosclerosis) may occur, but this may also result from middle ear infection. Scarring is more common in ears that have grommets. This scarring is usually asymptomatic.

### **Removal of Grommets**

Grommets are usually extruded by the ear. The drum naturally rotates the grommet in a postero-superior direction, where it usually exits the drum. This usually occurs within 12-18 months. Removal is rarely indicated. 'Routine' removal and replacement is not indicated.

### **Multiple Grommets**

Repeated grommets may mean failure to control underlying disease such as chronic sinusitis, chronic adenoid disease or allergy. Submucous cleft of cleft palate results in chronic middle ear disease that may require multiple grommets. T-tube placement may be preferable in patients with cleft palate.

### **Summary**

Grommets are one of the most commonly performed surgical procedures. The technique has a very high success rate with immediate resolution of symptoms in many patients. Their very success results in their greatest failure - overuse.

Decisions based on a compassionate appraisal of the patient and the family dynamics are more likely to result in appropriate surgery than rigid adherence to any protocol or guideline.

There is perhaps no better illustration of the art and science of medicine than in the enigma of grommets.

### **In a Nutshell**

Grommets result in rapid resolution of middle ear effusion. They are ventilation tubes, not drainage tubes.

Indications are controversial.

Steroids are useful in the medical treatment of middle ear effusion.

Caution is required when using ear drops in patients with grommets.

Patients with grommets may swim in clean water.

Removal and replacement of grommets is rarely indicated.

Persisten or recurrent discharge following grommet insertion may be treated with non-ototoxic drops (ciprofloxacin, ofloxacin, chloromycetin).