

Management of hearing loss in children

Richard Gan
Aimee Rowe
Claire Benton
Matija Daniel

Abstract

As hearing is crucial in the development and well-being of children it is important for clinicians to be up to date with the management options for hearing loss in children. Current options include hearing aids, surgery such as ventilation tubes or cochlear implants, or conservative management. All management strategies are most successfully carried out as a team effort involving the child, parent, school and multidisciplinary team. This article outlines each of these options in detail according to conditions causing conductive or sensorineural hearing loss.

Keywords children; cochlear implants; hearing aids; hearing loss; management; ventilation tubes

Management of hearing loss in children

Hearing loss in children can be divided into conductive and sensorineural hearing loss. Conductive hearing loss is caused by disease in the outer (pinna or ear canal) or middle ear (tympanic membrane, ossicles or middle ear cavity), affecting the transmission of sound to the inner ear (Figure 1). Sensorineural hearing loss involves disease affecting the inner ear (cochlea) or pathways transmitting neural impulses to the brain.

Conductive hearing loss

Otitis media with effusion (OME)

OME (glue ear) is characterised by 'glue' (thick mucus) in the middle ear causing conductive hearing loss. Its aetiology is

Richard Gan *BMedSci (Hons) BMBS, Core Surgical Trainee in the Department of Otorhinolaryngology Head & Neck Surgery, Nottingham University Hospitals NHS Trust, Nottingham, UK. Conflict of interest: none declared.*

Aimee Rowe *BMBS, Core Surgical Trainee in the Department of Otorhinolaryngology Head & Neck Surgery, Nottingham University Hospitals NHS Trust, Nottingham, UK. Conflict of interest: none declared.*

Claire Benton *MSc, Clinical Scientist (Audiology), Interim Head of Audiology at the Nottingham Audiology Services, Nottingham University Hospitals NHS Trust, Nottingham, UK. Conflict of interest: none declared.*

Matija Daniel *PhD FRCS, Consultant Otorhinolaryngologist in the Department of Otorhinolaryngology Head & Neck Surgery, Nottingham University Hospitals NHS Trust, Nottingham, UK. Conflict of interest: none declared.*

complex, and probably involves a combination of bacterial bio-film infection, poor Eustachian tube function, and genetic predisposition. OME is the commonest cause of hearing impairment in children, affecting 20% and 8% of children aged around 2 and 7 years, respectively.

Initial management: 'watch and wait with/without auto-inflate': In the vast majority of cases, the natural history of OME is towards spontaneous resolution. About 50% of cases spontaneously resolve within 3 months. Therefore, initial management is a 3-month period of observation from the time of diagnosis, with a clear explanation of the condition and advice on how to minimise the effects of the hearing loss (Table 1). This period of conservative management also allows an observation of how the condition impacts the child. This 'watchful waiting' can be undertaken by either primary or secondary care, paediatric or ENT teams.

The drugs don't work: According to several comprehensive reviews, medication has little role in this condition. There is no evidence to suggest that antihistamines, decongestants or steroids improve outcome. Antibiotics may help to treat acute exacerbations or convey short-term improvement, but do little in affecting the long-term outcome.

If they can cooperate, auto-inflate: If the child is cooperative, they could perform the Valsalva manoeuvre regularly. This Eustachian tube 'auto-inflation' is thought to improve middle ear aeration and aid OME resolution. Parents can buy over the counter balloons that are blown up via the nostrils to make the task more fun for the child. Small studies have shown that it may confer some benefit, and due to its low cost and lack of adverse effects, auto-inflation may be considered during the 'watch and wait' period, but further research in this area is required.

If it persists, should we operate?: If OME is confirmed after a 3 month observation period, is bilateral, and causes hearing loss (with a hearing level of 20–25 dB or worse in the better hearing ear) then the patient should be referred to ENT (if not already) for consideration of surgical treatment. OME is worth treating because, although it is likely to eventually resolve, persistent OME may lead to language, learning, behavioural problems, and poor physical health due to repeated ear infections. However, there is much disagreement as to the exact impact that OME has, and in general children catch up quickly once hearing normalises. In general, ventilation tubes (grommets) for OME do not prevent any long-term middle ear disease, and are best seen as a temporary relief from a temporary problem. Grommets extrude after a period of time (typically 6–9 months), and OME then frequently returns, so that about a quarter of children have grommets again within 2 years.

Ventilation tubes allow atmospheric air into the middle ear, and surgery is done under general anaesthetic. There has been some controversy on whether a child with grommets may be allowed to swim. In most cases, there will be no problems with swimming, although soapy or dirty water should be avoided. If the child suffers with pain or infections after water exposure, it is then appropriate to take avoidance measures, for example with

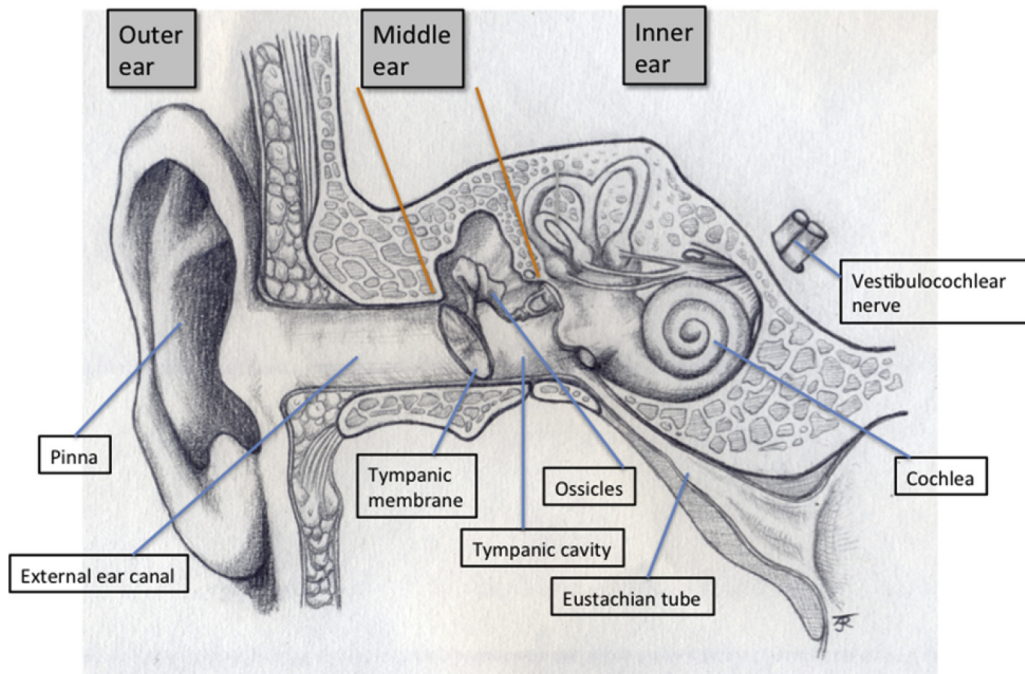


Figure 1 The ear: outer, middle and inner ear.

swimming plug. Diving should be prohibited while the grommets are in situ. Post grommet insertion, a hearing test should be carried out to ensure that the hearing has indeed improved. Ear discharge after grommet surgery is not normal, but signifies infection, requiring treatment with systemic or topical antibiotics (ciprofloxacin drops are not ototoxic, and are licenced in the United States for use with infected grommets).

Adenoidectomy (adenoids sit at the opening of the Eustachian tube and are a source of pathological bacteria ascending to the middle ear) also improves the health of the middle ear, and reduces the chance of OME recurrence after grommet extrusion. In the UK, adenoidectomy at time of grommet insertion is recommended if the child also has frequent and/or severe upper respiratory tract symptoms. However, exactly which child should receive adenoidectomy is at present not clear, because many children with OME do well even without adenoidectomy, so it is crucial that the additional risks of adenoidectomy can be justified by the benefit that a particular child is likely to get; at present,

literature suggests that children with OME aged more than 4 are likely to benefit most from adenoidectomy.

What are the alternatives to surgery?: If surgery is contraindicated or parents wish to avoid it, appropriate hearing aids should be offered to the child. Hearing aids are discussed in detail in the section on sensorineural hearing loss. Children with Trisomy 21 are often offered bilateral hearing aids in the first instance. This is because they typically have more persistent OME, requiring repeated grommet surgery, and are at a greater risk of complications and early grommet extrusion. In addition, their narrow ear canals sometimes make grommet surgery impossible. Children with cleft palate are also at increased risk of OME. In the past, grommet placement was routine at time of primary palate repair, but contemporary practice assesses children on an individual basis with treatment with grommets or hearing aids if required.

Tympanic membrane perforation

Tympanic membrane perforations can occur from acute otitis media, trauma or ventilation tube insertion. Small perforations can have no symptoms or have a minimal effect on hearing. Large perforations can give rise to a more significant hearing loss. Tympanic membrane perforations normally heal spontaneously within about 2 months. Water precautions are advised, as getting water into the ear may precipitate an infection. If a tympanic membrane perforation is associated with chronic or recurrent middle ear inflammation the child may suffer with ear discharge (typically painless), and the condition is then termed chronic suppurative otitis media.

Persistent perforations may require surgery (termed myringoplasty if just ear drum repair takes place, or tympanoplasty if

Advice on minimising effects of hearing loss

General advice to give to the parent includes:

- Getting child's attention when speaking to him/her
- Facing the child and maintaining eye contact when speaking
- Speak clearly and avoid shouting
- Minimise background noise
- Inform school so that they are aware and can make arrangements such as seating the child closer to the teacher in class

Table 1

Download English Version:

<https://daneshyari.com/en/article/4172065>

Download Persian Version:

<https://daneshyari.com/article/4172065>

[Daneshyari.com](https://daneshyari.com)