



## MYRINGOTOMY WITH VENTILATION TUBE INSERTION

Tashneem Harris & Thomas Linder

Ventilation tubes (grommets) are generally inserted for refractory middle ear effusions with persistent conductive hearing loss, present for a minimum duration of 3 months and with hearing loss exceeding 25dB. They may also be inserted as an adjunct procedure in acute mastoiditis secondary to acute suppurative otitis media.

### Preoperative assessment

- Pneumatic otoscopy to confirm the diagnosis of middle ear effusion
- Pure tone audiometry within the preceding 3 months, or age appropriate hearing test, as well as tympanometry
- A middle ear effusion may be caused by pathology (benign or malignant) in the nasopharynx which causes tubal dysfunction. Therefore, particularly in adult patients the nasopharynx should be examined, and the neck palpated for metastases from a nasopharyngeal malignancy
- A CSF leak may present as a middle ear effusion. A high index of suspicion is therefore necessary in the presence of a clear serous or watery effusion or when the history is suggestive of a CSF leak

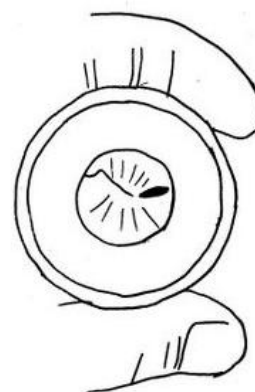
### Surgical technique

#### *Temporary ventilation tube insertion*

- General anaesthesia is used for children
- Local anaesthesia may be employed with adults. Topical anaesthetic spray (e.g. xylocaine) can be applied to the tympanic membrane 10 minutes before the procedure. Alternatively, Emla cream® (lidocaine 2.5% and prilocaine 2.5%) can be applied to the tympanic

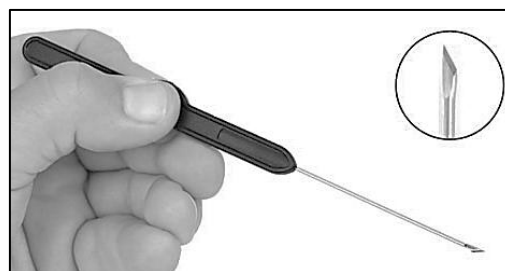
membrane 30 minutes prior to the procedure, or the deep ear canal may be injected with local anaesthesia with a dental needle

- Introduce an ear speculum into the ear canal and hold it in place with the left hand (Right-handed surgeon) (*Figure 1*)



*Figure 1: Ear speculum in place right ear with radial incision placed antero-inferiorly*

- Using an operating microscope or endoscope, make a radial incision in the anteroinferior quadrant of the eardrum with a myringotomy knife around the region of the light reflex (*Figures 1 & 2*)
- The incision must be large enough to accommodate a ventilation tube
- Avoid incisions in the posterosuperior quadrant as one can injure the ossicular chain or the chorda tympani



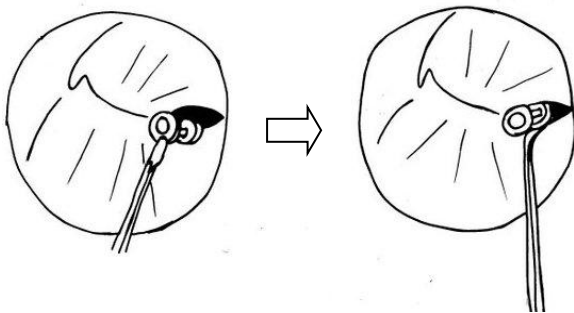
*Figure 2: Typical myringotomy knife*

- The middle ear effusion may be aspirated with a microsuction tube before inserting the grommet/ventilation tube
- Pick up the ventilation tube with crocodile forceps and introduced it into the ear canal using the right hand (*Figure 3*)



*Figure 3: Examples of short stay tubes*

- Place the tube on the tympanic membrane adjacent to the myringotomy opening (*Figure 4*)
- Using a 1,5mm, 45° hook, rotate the inner flange through the myringotomy incision so that the tube straddles the tympanic membrane (*Figure 4*)



*Figure 4: Placement of tube on right tympanic membrane, followed by advancement of tube with a hook*

### **Long-term ventilation tube insertion**

For long-term middle ear ventilation, a ventilating T-tube is used (*Figure 5*). It remains in place for up to 3 years. After extrusion or removal, it results in a chronic perforation of the tympanic membrane in 16-19% of cases.<sup>2,3</sup>



*Figure 5: Example of a T-tube*

- Grasp the flanges of the T-tube with crocodile forceps
- Trim the flanges so that the ends are pointed; this facilitates insertion of the tube through the myringotomy opening (*Figure 6*)



*Figure 6: The flanges are both trimmed*

- Make a myringotomy in the antero-inferior quadrant of the tympanic membrane (*Figure 1*)
- Grasp the T-tube with a fine crocodile forceps
- Insert the pointed end of the flange through the myringotomy incision

### **Special problem: Ventilation tube falls into middle ear**

- Although tubes are inert and are unlikely to cause damage when left in the middle ear, removal should be attempted because of the potential for a foreign body reaction<sup>4</sup>
- If the grommet lies close to the myringotomy and can be seen through the incision, then it may be possible to retrieve it using small crocodile forceps, and then reinserted correctly
- If the tube however lies beyond the confines of the mesotympanum, cannot

be seen and removal would be difficult, then an option is to leave it *in situ* and for the patient to return regularly for surveillance and otomicroscopy<sup>4</sup>

- Surgical removal when one has a healed, intact tympanic membrane entails a wide myringotomy and removal of ventilation tube
- Very rarely an exploratory tympanotomy may be required

## References

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