

Long-term ventilation tubes: for how long should they be used?

Dear Sirs,

We read with great interest the recent article by Mohammed and Martinez-Devesa.¹ We fully agree with their recommendations to follow up the long-term use of ventilation tubes in order to avoid possible related complications.

Otitis media with effusion (OME), or ‘glue ear’, is one of the most common conditions of early childhood.¹ It is characterised by accumulation of fluid in the middle ear behind an intact tympanic membrane, without any symptoms or signs of acute infection. Otitis media with effusion is often bilateral and associated with transmission hearing loss, which in childhood can have implications for the child’s social and intellectual development.²

The insertion of ventilation tubes is one of the most common surgical treatments in children with OME resistant to conservative therapy.^{1,3} Various types of ventilation tube are available. Long-term tubes are normally used in patients with chronic OME, often when repeated insertions of short-term tubes have been unsuccessful.¹ In comparison with short-term tubes, which are usually extruded spontaneously within six months, long-term tubes are designed to remain in place for extended periods, and they often need to be surgically removed after the appropriate intubation period.^{1–3} The most commonly documented complications associated with long-term tubes are otorrhoea, scarring, tympanosclerosis, residual perforation, peritubal drum atrophy and granulation tissue formation.^{4,5}

Although the indications for ventilation tube insertion have been widely discussed in the literature,^{1,3} very few published reports have addressed the appropriate timing for removal of long-term tubes in children, and there is no clear consensus.^{3,5,6} The intubation period should be mainly influenced by two considerations: (1) the longer the tubes remain in place, the higher the incidence of persistent residual tympanic perforation; and (2) OME in children usually resolves spontaneously after seven or eight years of age, because of physiological improvement in eustachian tube function.² Most otolaryngologists agree that the intubation period should be between 6 and 24 months.² Iwaki *et al.* stated that the appropriate intubation period in children with OME is over 12

months, and that it may be better to postpone extubation until the patient is 8 years of age.² Lentsch *et al.* have recommended elective removal of tubes prior to 36 months’ intubation.⁵

We routinely use silicone Richards T-tubes (1.14 mm internal diameter and 12 mm length) and surgically remove them after an intubation period of 24 months, with simultaneous freshening of the tympanic perforation edges and silicone patch myringoplasty. Our experience has shown a low rate of persistent perforation (8 per cent) and OME recurrence (19 per cent).

Clinical studies have reported that eustachian tube function tests can predict OME recurrence after the ventilation tube becomes nonfunctional.⁷ When assessing the appropriate intubation period during the follow up of the paediatric patient, we have observed the usefulness of both nasal endoscopy and tubomanometry at low pressures.^{8–10} Nasal endoscopy allows evaluation of the conformation of the tubaric ostium and the motility of the peristaphyline muscles, thus excluding any mechanical tubal obstruction, for example due to peritubaric recurrence of adenoid hypertrophy, oedema, hyperaemia related to laryngopharyngeal reflux, or chronic exudative inflammation.^{8–10}

Although tubomanometry is not always feasible in the paediatric population because a substantial degree of patient compliance is required, it allows objective measurement of eustachian tube patency and monitoring of its function over time; it can also be performed even in patients with tympanic membrane perforation or a ventilation tube in situ.^{8–10}

In our experience, when following up children with long-term tubes, these tests, supported by adequate surgical and/or non-surgical therapy, are critical in order to tailor the correct timing of the intubation period.

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References

- 1 Mohammed H, Martinez-Devesa P. Complications of long-term ventilation tubes. *J Laryngol Otol* 2013;**127**:509–510
- 2 Iwaki E, Saito T, Tsuda G, Sugimoto C, Kimura Y, Takahashi N *et al.* Timing of removal of tympanic ventilation tube in children. *Auris Nasus Larynx* 1998;**25**:361–8
- 3 Surgical management of otitis media with effusion in children. In: <http://www.nice.org.uk/nicemedia/live/11928/39633/39633.pdf> [6 March 2011]
- 4 Rinaldi V, Rinaldi P, François A, Fatah F, Nengsu A, Messaoudi A. Medial displacement of T-tubes: case report. *Rev Laryngol Otol Rhinol (Bord)* 2011;**132**:157–8
- 5 Lentsch EJ, Goudy S, Ganzel TM, Goldman JL, Nissen AJ. Rate of persistent perforation after elective tympanostomy tube removal in pediatric patients. *Int J Pediatr Otorhinolaryngol* 2000;**54**:143–8
- 6 El-Bitar MA, Pena MT, Choi SS, Zalzal GH. Retained ventilation tubes: should they be removed at 2 years? *Arch Otolaryngol Head Neck Surg* 2002;**128**:1357–60
- 7 Mandel EM, Swarts JD, Casselbrant ML, Tekely KK, Richert BC, Seroky JT *et al.* Eustachian tube function as a predictor of the recurrence of middle ear effusion in children. *Laryngoscope* 2013, in press
- 8 Ars B, Dirckx JJ. *Tubomanometry*. The Hague: Kugler, 2003
- 9 Esteve D. Tubomanometry and pathology. In: Ars B, ed. *Fibrocartilaginous Eustachian Tube–Middle Ear Cleft*. The Hague: Kugler, 2003;184–92
- 10 Sudhoff H, Ockermann T, Mikolajczyk R, Ebmeyer J, Korbacher D, Garten D *et al.* Clinical and experimental considerations for evaluation of Eustachian tube physiology [in German]. *HNO* 2009;**57**:428–35

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Dear Sirs,

I thank Dr Rinaldi *et al.* for taking the time to read my and Dr Martinez-Devesa's article, and for their kind and useful comments.

It is an intriguing idea to follow patients for two years, perform tubomanometry and then undertake elective removal of the T-tube followed by approximation and freshening of the tympanic membrane edges.

The results provided by Dr Rinaldi *et al.* are much better than the reported complication rates for T-tubes remaining in situ for more than 36 months.¹

It is also worth noting that long-term tympanostomy tube follow up is recommended for the paediatric population in the United States. Follow up is advised to continue until the tympanostomy tube extrudes or is removed, with recovery of normal hearing and normal eustachian tube function, together with closure of the tympanic membrane perforation.²

It would be interesting know more about the study which supplied the quoted figures for persistent perforation and recurrence. The most helpful piece of information would be whether any of the patients undergoing T-tube removal developed other complications such as cholesteatoma. Secondly, clarification of the tubomanometry method would be useful, that is, whether it employed the forced opening method or the physiological opening method, or both. Thirdly, it

would be helpful to know whether the cases of OME recurrence following removal with 'normal' tubomanometry affected Dr Rinaldi and colleagues' subsequent decision-making regarding elective T-tube removal.

It might be difficult to confirm the normality of eustachian tube function using tubomanometry. A study performed by Straetmans *et al.* found that the forced response test, pressure equalisation test and sniff test did not predict accurately the recurrence of otitis media in children.³ On the other hand, the adenoidal-nasopharyngeal index, which is measured from lateral neck X-rays, was found to be associated with middle-ear effusion and negative middle-ear pressure when it was greater than 0.71.⁴ The problem with this method is the need to expose the child to radiation; it is worth noting that both these studies were conducted in children.

In my current practice, I now follow up more patients after long-term tympanostomy tube insertion. However, others tend not to follow up these patients (various personal communications). This policy seems to be based on the assumption that if a patient develops any problem that cannot be managed by their general practitioner, then that patient can be referred to ENT again. Such a policy relies on patients' awareness of their symptoms (generally discharge and/or pain) to lead the process. While such practice succeeds in reducing the pressure on National Health Service resources, it may be unreliable for patients with poor health awareness, and it can certainly have negative consequences: examples include the development of a 'silent' cholesteatoma which shows no