

## An unusual complication of T-tubes

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### Abstract

The morbidity of long-term ventilation tubes (Goode T-tubes) is often discussed with reference to otorrhoea, tympanosclerosis and long-term perforation. We report three cases of the T-tube slipping into the middle-ear cleft. In two of the three patients this was asymptomatic and the T-tubes were left *in situ*. In the third patient this complication was documented on three occasions when the T-tube was removed and reinserted for recurrent effusions. We are unaware of this complication being previously reported in the literature.

**Key words:** Otitis media with effusion; Middle ear ventilation

### Introduction

T-tubes are long-term ventilation tubes and are used in patients with persistent otitis media with effusion (Goode, 1973; Rothera and Grant, 1985). They are usually inserted after several sets of grommets have been extruded. We present three cases in which the T-tube had slipped into the middle ear and was visualized behind an intact tympanic membrane.

### Case reports

#### Case 1

A 12-year-old girl with a history of recurrent otitis media with effusion was noted to have a T-tube behind an intact left tympanic membrane as an incidental finding. This was not associated with an effusion nor a conductive hearing loss. Her right T-tube was present and in the correct position. She had had two sets of grommets and an adenoidectomy prior to having T-tube insertion at the age of eight. The patient had been lost to follow-up until the age of 12. No symptoms have developed and no surgical intervention has been required. Two years later no problems have been encountered.

#### Case 2

A 12-year-old boy had bilateral T-tubes inserted. He had a history of cleft palate repair and had had bilateral grommets inserted on three occasions. He was reviewed one year later when the left T-tube was noted to be in the correct position but the right T-tube was behind an intact tympanic membrane. There was no associated effusion and there was no conductive hearing loss. This patient has been reviewed over a two and a half year period during which time the T-tube has remained behind the tympanic membrane without causing symptoms.

#### Case 3

A 42-year-old lady, who had recently moved into the area, was seen in the ENT clinic and noted to have a T-

tube in the left ear. This had been inserted two years previously and was patent. She was reviewed six weeks later by which time the left T-tube was in the middle ear behind an intact tympanic membrane. An effusion was present and there was a 40 decibel conductive hearing loss at three frequencies. At surgery the T-tube was removed from the middle ear via a myringotomy. A further T-tube was inserted through the same incision in the tympanic membrane. At six-week review, her T-tube was *in situ* and patent. Her hearing was back to normal subjectively and audiometrically. She was reviewed one year later when the left T-tube was found to have slipped into the middle ear again (Figure 1). The tympanic membrane was intact and an effusion was present. There was a 30 decibel conductive hearing loss. The T-tube was subsequently removed from



FIG. 1

T-tube seen behind an intact atelectatic tympanic membrane.

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the middle ear via a postero-inferior myringotomy. A new T-tube was inserted through an antero-inferior myringotomy. Six months later the T-tube was still in the correct position and her audiogram was within normal limits.

At review eight months later, the left T-tube was again visible in the middle ear cleft behind an intact tympanic membrane with an associated 20 decibel conductive hearing loss. The T-tube was removed from the middle ear and a new T-tube was inserted via a separate myringotomy. Eight months later the T-tube had extruded into the external auditory canal. The tympanic membrane was intact and there was a recurrent effusion. A further T-tube was therefore inserted. This is still in place and functioning 10 months later.

### Discussion

T-tubes inserted for persistent otitis media with effusion are associated with a high complication rate. Recognized complications include tympanosclerosis, recurrent otorrhoea, tympanic membrane granulations and blocking of the T-tube due to impacted wax. The most significant complication is that of persistent perforation. Although the incidence of persistent perforation after T-tube removal has been reported as being as low as two per cent (Hawthorne and Parker, 1988), it is more generally accepted that the rate is between 20 per cent and 30 per cent (Brockbank *et al.*, 1988; Pritchard, 1992; Mangat *et al.*, 1993). Medial displacement of the T-tube into the middle ear cleft has not been reported in the literature.

It is our experience that granulation tissue is often seen on the promontory following operative removal of T-tubes. It is reasonable to conclude that, under normal circumstances, this is where the base of the T-tube rests. It is unclear why a T-tube should fall into the middle ear cleft, but we feel the presence of an abnormally deep hypotympanic cleft offers a possible explanation.

The rarity of this complication and its recurrence within a specific patient leads us to the conclusion that medial displacement of the T-tube is due to a patient factor rather than surgical technique. These patients' T-tubes were inserted by different surgeons in Manchester, Sheffield, London and Preston.

The presence of a T-tube in the middle ear cleft does not appear to be associated with problems, and does not

require removal unless there is a symptomatic effusion. The 'ectopic' T-tube can then be removed at the same time as a replacement is inserted. The recently described technique of inserting the T-tube via a tympanotomy (Martin-Hirsch *et al.*, 1995) may be of use in this situation as the T-tube is anchored beneath the annulus.

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