Forgotten T-Tube in the Middle Ear
Muhammad Shakeel, Aaron Trinidad, Imran Khan and Kim Wong Ah-See

ABSTRACT
Retention within the middle ear cleft is an unusual complication of T-tube insertion. A 40-year-old woman with Kartagener's Syndrome presented with hearing impairment in the right ear. She was found to have a previously inserted Goode T-tube lying within the middle ear behind an intact drum. She underwent successful removal of the T-tube via a myringotomy, and a new tube was re-inserted. Migration of a T-tube into the middle ear cleft should always be kept in mind in patients who present with otological symptoms and have a history of T-tube insertion, even in the presence of an intact drum.

Key words: Kartagener's syndrome. T-tube retention. Middle ear.

INTRODUCTION
T-tubes are associated with several complications, including persistent perforations, tympanosclerosis, repeated otorrhoea or tympanic membrane granulations, and impacted wax. More unusual is the slipping into and retention of the T-tube into the middle ear cleft. Several authors have described cases of patients presenting with this problem.1-4 Retained T-tube can be classified as either primary, when the tube migrates due to a technical error, or secondary, when the tube is initially seen in the correct position but is later found medial to a healed, intact tympanic membrane.5

We present a case with retained T-tube in the middle ear and discuss its unique presentation and conflicting views of its management.

CASE REPORT
A 40-year-old Caucasian woman with a history of Kartagener's syndrome presented to the ENT Department with long standing middle ear effusions, which were treated with insertion of bilateral Goode T-tubes under a general anaesthetic. She made a good recovery and reported improved hearing. Four years later the left tube was found to have extruded from the tympanic membrane at a routine clinic visit. One year later, she developed a right ear infection with the T-tube still in situ. She responded well to topical antibiotics with full resolution of the infection. Two years later, she was referred back to our Department with right sided otalgia associated with a mucopurulent discharge from right ear.

Examination revealed a pin-point perforation of the tympanic membrane with evidence of an otitis externa, which was again treated with topical antibiotics. One year later, she attended the clinic with hearing impairment. Examination revealed bilateral intact tympanic membranes and bilateral middle ear effusions. In addition, there was a T-tube lying within her right middle ear cleft (Figure 1). Pure tone audiogram revealed moderate conductive hearing loss in both ears.

Figure 1: Intact drum showing middle ear effusion. The T-tube was evident on closer inspection.

Figure 2: T-tube within middle ear cleft is revealed following myringotomy.
At examination of her ears under anaesthesia, bilateral myringotomy, suction clearance of middle ear effusions, removal of T-tube from her right middle ear (Figure 2) and insertion of bilateral new T-tubes was performed. She reported improvement in her hearing and remained under clinical surveillance.

**DISCUSSION**

T-tube migration might be related to the depth of the middle ear cleft, the migrating epithelium of the lateral surface of the tympanic membrane, and the time elapsed since insertion. One likely mechanism is similar to that which occurs in the process of epithelial immigration during cholesteatoma formation, during which squamous epithelium progresses from the margin of a tympanic perforation into the middle ear cleft. This migration of cells may pull the T-tube inwards with it. Alternatively, the process may be multifactorial but may in part be the result of persistent negative middle ear pressure.

In most cases, a retained T-tube causes no symptoms and is usually found incidentally on examining the ear for other reasons. For this reason, in most cases described, the T-tube was left in situ. However, it can be the cause of conductive hearing loss and ear infection as in this case. Persistence of a foreign body in the middle ear cleft may cause a reaction, including chronic otitis media with granulation tissue. Some authors advise removal in all cases. This can easily be performed via a small Myringotomy and removal of the tube with Crocodile forceps.

This case also highlights the importance of meticulous record-keeping. Arguably, had there been a better account of extrusion (or non-extrusion) of both T-tubes, then this tube may not have been forgotten. Proper record-keeping is important as it helps in the scientific evaluation of patient profile, helping in analyzing the treatment results, and in planning treatment protocols; aids in planning governmental strategies for future medical care; is the key in cases of alleged medical negligence.

This case reiterates the importance of thorough examination of the tympanic membrane during otoscopy. Migration of a T-tube into the middle ear cleft should always be kept in mind in patients who present with otological symptoms and who have a history of T-tube insertion, even in the presence of an intact drum. Sound medical record-keeping has a role in preventing such occurrences.

**REFERENCES**