The Journal of Laryngology and Otology
January 1999, Vol. **113,** pp. 68–69

Corrosion of a silver Negus tracheostomy tube

C. A. AYSHFORD, F.R.C.S., R. M. WALSH, F.R.C.S.(ORL), D. W. PROOPS, B.D.S., F.R.C.S.

Abstract
Corrosion of silver tracheostomy tubes has previously been reported. In all of these reports, it occurred at the junction between the neck plate and the outer tube where an alloy of inferior corrosion resistance, compared to silver, has been used in the brazed joint. We present, to our knowledge, a previously unreported case of corrosion of the main body of the outer tube of a silver Negus tracheostomy tube where no such alloy is present.

Key words: Tracheostomy, Prosthesis failure

Case report

A 29-year-old man with recurrent juvenile laryngeal papillomatosis, and a permanent tracheostomy since the age of four, attended our department for regular microlaryngoscopy and laser treatment. Under general anaesthesia, his silver Negus tracheostomy tube was changed as he refused to clean and change it himself. The main body of the outer silver tube was found to be severely corroded (Figure 1). This tube had been inserted one year previously, at the time of his last microlaryngoscopy and laser. The patient was asymptomatic and unaware of the state of his tracheostomy tube. He made an uneventful post-operative recovery and is now being strongly encouraged to manage his own tracheostomy tube changes.

Discussion

Corrosion of silver tracheostomy tubes has previously been documented. Usually it occurs at the junction between the neck plate and the tracheostomy tube (Okafor, 1983; Bowdler and Emery, 1985; Brockhurst and Feltoe, 1991) resulting in a fracture of the tube from the flange with the risk of a foreign body inhalation. At this junction, a brazing alloy containing high proportions of copper and zinc with silver is used. This alloy is known to be less resistant to corrosion compared to standard (sterling) silver and therefore more likely to be the site of fracture. Corrosion of the body of metal tracheostomy tubes has also been documented (Kakar and Saharia, 1972; Maru *et al.*, 1978). However, in both of these cases the tubes were made of an alloy of copper and zinc and not silver.

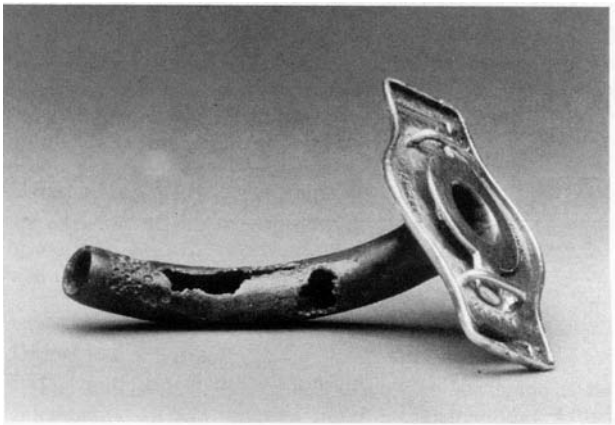

FIG. 1
Silver Negus tracheostomy tube showing corrosion of the main body of the outer tube.

This case is unique as the corrosion occurred in the outer tubing of the silver Negus tracheostomy tube. This part was made with standard silver, which contains a minimum of 92.8 per cent silver, copper and a trace of phosphorus. This is then silver-plated.

In the previous reported cases the possible causes of corrosion proposed included, cleaning with a corrosive fluid such as sodium hypochlorate solution and prolonged exposure to alkaline bronchial secretions. In this case, the authors believe the corrosion was probably a result of the tracheostomy tube being constantly exposed to bronchial secretions for such a prolonged period without cleaning. This is against the advice of the manufacturer, who suggest regular removal and cleaning with a non-abrasive and non-corrosive cleaner such as warm soapy water and a soft cloth. A fault in the manufacture should also be considered, as previous tracheostomy tubes left *in situ* for this length of time had not displayed this corrosion.

It would appear, from reviewing the previous reports, that standard silver is still the metal of choice in the manufacture of these tracheostomy tubes, but as shown by this case, careful attention should be paid to the manufacturer's instructions in the care of these tracheostomy tubes.

References

Bowdler, D. A., Emery, P. J. (1985) Tracheostomy tube fatigue an unusual case of inhaled foreign body. *Journal of Laryngology and Otology* **99:** 517–521.
Brockhurst, P. J., Feltoe, C. K. (1991) Corrosion and fracture of a silver tracheostomy tube. *Journal of Laryngology and Otology***105:** 48–49.

From the Department of Otolaryngology, Queen Elizabeth Hospital, Edgbaston, Birmingham, UK.
Accepted for publication: 10 November 1998.

Kakar, P. K., Saharia, P. S. (1972) An unusual foreign body in the tracheo-bronchial tree. *Journal of Laryngology and Otology* **86:** 1155–1157.
Maru, Y. K., Puri, N. D., Majid, A. (1978) An unusual foreign body in the tracheo-bronchial tree. *Journal of Laryngology and Otology* **92:** 1045–1048.
Okafor, B. C. (1983) Fracture of tracheostomy tubes pathogenesis and prevention. *Journal of Laryngology and Otology* **97:** 771–774.

Address for correspondence:
Mr C. A. Ayshford,
Department of Otolaryngology,
Queen Elizabeth Hospital,
Edgbaston,
Birmingham B15 2TN.

Fax: 0121 627 2999

https://doi.org/10.1017/S002221510014318X Published online by Cambridge University Press