Correspondence

Disruption of an armoured endotracheal tube caused by biting

To the Editor:

We would like to report a problem with an armoured endotracheal tube, recently encountered in our hospital.

A 63-year-old female was anaesthetized for transcallosal removal of a tumour of the third ventricle. Because she was to be positioned supine, with the head sharply flexed, an armoured endotracheal tube was used to prevent obstruction of the airway, due to kinking of the tube. The patient was intubated with a previously unused #7.5 armoured endotracheal tube (W. Rusch Co.). The anaesthetic was uneventful and the patient was taken to the recovery room. Because of concern about airway reflexes she was kept intubated, while breathing spontaneously on a 'T-piece'. Five hours later the distal end of the armoured tube was found dangling from the mouth (Figure). The patient had chewed

completely through the endotracheal tube. At this point her airway reflexes were deemed adequate and she was extubated without further problems.

McTaggart *et al.*¹ reported two cases of obstruction of armoured endotracheal tubes because of patients biting them. Schwartz *et al.* reported difficulty in removing an armoured endotracheal tube which had been inadvertently cut during maxillofacial surgery.² To our knowledge no one has reported an armoured tube being bitten through.

In the present case the loss of the integrity of the tube was of no great consequence since the protection of the airway was not jeopardized. However, the potential does exist in a lightly anaesthetized patient for compromise of the airway. If the cut in the tube was small it could result in an unrecognized air leak. Disruption of a tube could require re-intubation of the patient under potentially difficult circumstances.

The armoured endotracheal tube is designed to avoid kinking. It does not prevent or avoid the problem of tube obstruction or disruption due to a patient biting it, nor was it designed to do so.³ Certainly in a lightly anaesthetized or conscious patient, when one is concerned about the airway, a bite block or oral airway should be in place to prevent damage to all types of oral tracheal tubes. Perhaps the term "armoured" is a misleading adjective with which to describe these tubes. In actual fact the "armoured" nature of these tubes means that they are extremely difficult to kink, however, it is not satisfactory to prevent occlusion or disruption of the tube by patients biting it, or it being cut by the surgeon.

FIGURE Armoured endotracheal tube which has been bitten through.

R. McLean MD
P. Houston MD FRCP(C)
F. Carmichael MD FRCP(C)
M. Bernstein MD FRCS(C)
Departments of Anaesthesia and Neurosurgery
Toronto Western Hospital
Toronto, Ontario, M5T 2S8.

REFERENCES

- 1 McTaggart RA, Shustak A, Noseworthy T, Johnston R. Another cause of obstruction in an armoured endotracheal tube. *Anesthesiology* 1983; 59: 164.
- 2 Schwartz BL, Sordill WC, Liebers RM, Schwab W. Difficulty in removal of accidentally cut endotracheal tube. *J Oral Maxillofac Surg* 1982; 40: 518.
- 3 Wiegert PE. Reply to 1 *Anesthesiology* 1983; 59: 164.

Fentanyl and emesis

To the Editor:

We read with interest the recent two part review by Palazzo and Strunin on "Anaesthesia and Emesis".^{1,2} We were surprised by the statement that fentanyl had not been tested to evaluate its influence on vomiting.

Hackett *et al.*³ compared a fentanyl, nitrous oxide and oxygen technique with an enflurane, nitrous oxide, oxygen technique for outpatient termination of pregnancy. They found a 29 per cent incidence of nausea and vomiting in the former group compared to a 8 per cent incidence in the latter.

Similarly, Melnick *et al.*⁴ compared enflurane, isoflurane, and fentanyl for outpatient anaesthesia. All patients received droperidol, nitrous oxide and oxygen. The incidence of nausea and vomiting was 24 per cent in the fentanyl group but only 4 per cent in both the enflurane and isoflurane groups.

Interestingly, in both of the above studies there was no greater need for post operative analgesics in patients not receiving fentanyl compared to those who did receive fentanyl. We therefore try to avoid fentanyl for outpatients. We disagree with the statement by Palazzo and Strunin that "it is difficult to suggest that opiates used for the maintenance of anaesthesia should be omitted on the strength of their emetic potential, for this in our view is overwhelmingly offset by their other useful properties".

Mitchel Sosis MD PhD
Department of Anesthesiology
Thomas Jefferson University
Philadelphia, PA 19107

REFERENCES

- 1 Palazzo MGA, Strunin L. Anaesthesia and Emesis I: Etiology. *Can Anaesth Soc J* 1984; 31: 178-86.
- 2 Palazzo MGA, Strunin L. Anaesthesia and Emesis II: Prevention and Management. *Can Anaesth Soc J* 1984; 31: 407-15.
- 3 Hackett GH, Harris MNE, Plantevin OM. Anaesthesia for outpatient termination of pregnancy. A comparison of two anaesthetic techniques. *Br J Anaesth.* 1982; 54: 865-70.
- 4 Melnick BM, Chalasani J, Uy NTL. Comparison of enflurane, isoflurane and continuous fentanyl infusion for outpatient anaesthesia. *Anesthesiology Review* 1984; 11: 36-9.

REPLY

Dr. Sosis raises a number of points and we thank the Journal for giving us the opportunity to reply to them. Dr. Sosis correctly draws our attention to two studies^{1,2} that record postoperative emesis among patients who had received fentanyl as part of their anaesthetic management. Unfortunately the study by Melnick and his colleagues³ was unavailable at the time of preparation of our article.

*However, in our article we did not say that fentanyl had not been evaluated with regard to postoperative emesis, but that any data that was available came from trials that were primarily designed to investigate the haemodynamic or respiratory effects of fentanyl and that, for this reason, it is difficult to make comparisons with earlier work. In our view, a study designed for the investigation of emetic problems must include information and standardisation of at least some of the following factors: history of vomiting or motion sickness (including morning sickness), pre-medication, patient sex, number of anaesthetics and anaesthetic technique (in particular oropharyngeal stimulation and ventilatory assistance by mask). Furthermore, postoperative observation should be by a single person over a period of several hours paying particular attention to motion stimuli, pain, and administered analgesics. The multifactorial aspects of emesis makes these studies particularly difficult to control and this is amply demonstrated by the literature. Although the studies of Hackett *et al.*² and Melnick *et al.*¹ offer useful information, they were designed primarily for evaluation of techniques for short operations. Melnick's³ study suggests that fentanyl is superfluous and/or a menace when used for some day surgery. For relatively painless procedures we would accept this view, on the grounds that fentanyl may increase emesis and delay discharge.*

Dr. Sosis also questions whether the useful properties of fentanyl such as analgesia and haemodynamic stability ever outweigh its disadvantage to cause emesis. Our experience suggests that patients who undergo major surgery, such as abdominal or thoracic procedures, without any analgesic agent invariably wake up in