CORRESPONDENCE

new tubes, made to the new standard, arrived from our supplier.

One aspect of the new design of cuffed tubes which concerns us is the point of separation of the cuff inflating tube from the parent tube wall. It is now proposed that this should be much further from the bevelled end of the tube than previously and it is now to be so high on the tube that, in many patients, several centimetres of the tube will require to protrude from the mouth to avoid intruding a bronchus. This is unsatisfactory in any anaesthetic situation, but in anaesthesia for surgery of the head and neck it is potentially dangerous, since such a tube may kink from the pressure of drapes and the surgeon's hands. There is the additional inconvenience in respect of access to the operating field in nasal and facial procedures.

The recommended new lengths from bevel tip to separation point for the larger diameter tubes are as follows:

<table>
<thead>
<tr>
<th>Tube (mm)</th>
<th>Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.0</td>
<td>250</td>
</tr>
<tr>
<td>9.5, 10 and 10.5</td>
<td>230</td>
</tr>
<tr>
<td>9.0</td>
<td>220</td>
</tr>
<tr>
<td>8.5</td>
<td>210</td>
</tr>
</tbody>
</table>

Smaller diameter tubes are manufactured in proportion. To avoid damage to the inflating tube by the endotracheal connector, the tubes supplied to us had to be cut at least 10–15 mm longer than the above lengths. If the tubes were cut immediately above the take-off point, there was a very high incidence of cuff failure.

Because of our concern about this matter, we have measured the total lengths of tubes currently in use in this hospital. The following were the average total lengths for larger diameter tubes:

<table>
<thead>
<tr>
<th>Tube (mm)</th>
<th>Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.0</td>
<td>226</td>
</tr>
<tr>
<td>9.5</td>
<td>224</td>
</tr>
<tr>
<td>9.0</td>
<td>195</td>
</tr>
</tbody>
</table>

It is emphasized that these are average lengths and therefore the majority of tubes were cut considerably shorter than would have been possible with the new standard tubes. We do not think our practice is different from that in other British hospitals and we feel that this problem may concern many anaesthetists. We would suggest that those who have not yet used them should cut some of the existing tubes in accordance with the new standard and try these in clinical use, especially in patients of short stature. If they agree with us, and we feel that many will do so, they should make their feelings known. Otherwise the specialty may be faced with using tubes which are, in many cases, totally unsuitable.

It is fair to add that the draft I.S.O. standard includes the following clause: "If the inflating tube be attached externally to the tracheal tube between the cuff and point of separation, the attachment shall be in such a manner that the inflating tube may be partly stripped off the tracheal tube, if required." It would appear from this, that many of us who have come to prefer the use of plastic tubes and tubes with inflating tubes incorporated into the parent tube wall may require to revert to the use of red rubber tubes. This, many of us feel, is undesirable.

We would urge any anaesthetist who is asked to comment on the new standard specification not to do so without first using the new tubes.

J. P. VANCE
AND 11 OTHERS
Glasgow

ALBUMIN EXTRAVASATION DURING SURGERY

Sir,—I have been interested in Dr Grogono's investigations into the relative losses of whole blood and albumin during anaesthesia and surgery (Grogono, 1976). If the small bowel is enclosed in an "Aldon" plastic intestinal bag during major abdominal surgery, as is now commonly practised, it is found invariably at the end of an operation that straw-coloured fluid has collected in the bag. The quantity of fluid depends on the duration of the procedure and on other variables, but in our patients the volume is usually approximately 150 ml. Analysis of the fluid has shown that the electrolyte and protein content closely resemble that of blood. When the small bowel is not enclosed during a long abdominal operation this transudate, together with that from other peritoneal surfaces, is lost on swabs and by suction. The summary of Dr Grogono's work does not give enough information to indicate if this is a full explanation of his findings, but it may well account for at least part, particularly as he did not observe this relative loss of protein during operations on the middle ear (Grogono, 1974).

D. ZUCK
Enfield, Middlesex

REFERENCES


Sir,—Thank you for allowing me to add a comment to Dr Zuck's letter. Albumin accumulation in the peritoneum has been described previously. Jarnum (1961) observed a loss into the peritoneum equivalent to 600 ml plasma at the end of a 3-h gastrectomy. Increased capillary permeability is characteristic of the inflammatory response and surgical trauma appears to be no exception.

A fuller account of the work to which Dr Zuck refers is in preparation, but in summary, using isotope-labelled albumin and red cells, it has been found that during abdominal surgery there was a depletion of intravascular albumin by approximately 5% per hour. In addition there was an increase in capillary permeability by twofold or more, and there was a reduction in plasma volume which exceeded that attributable to blood loss.

These findings are explicable on the basis of the inflammatory response and the accumulation of protein in the peritoneal cavity may be viewed as part of this process. However, peritoneal accumulation is not the only situation in which albumin extravasation occurs. Skillman (1976) confirms that loss occurs into other traumatized areas such as skin and muscle; and in the patients I studied, there were six episodes of albumin extravasation unrelated to trauma, but apparently related to stress (such as pain experienced during emergence from anaesthesia and dis-
comfort during an attempt to introduce an extradural needle. The losses on these occasions were between 4% and 10% of the intravascular pool and indicated that, in addition to local loss at the site of surgery, there can also be an increase in capillary permeability associated with stress.

The importance of these latter observations is that while traumatic loss of albumin provides a rational basis for the use of i.v. albumin, the albumin loss associated with stress suggests that at least under some circumstances albumin may be lost into areas remote from any wound.

**Alan W. Grogono**

**REFERENCES**


**HORMONAL CHANGES IN PORCINE MALIGNANT HYPERTHERMIA**

**Sir,**—Lucke, Hall and Lister (1976) investigated the metabolic and physiological changes during malignant hyperthermia (MH) in seven Pietrain pigs. We wish to report the results of the plasma cortisol and serum insulin concentrations in the same hyperthermic pigs.

The mean plasma cortisol concentration was 4.5 μg/100 ml (SEM 1.0 μg/100 ml) in the control period and increased throughout the hyperthermic response to 10.6 μg/100 ml (SEM 1.6 μg/100 ml) after halothane. Although this change was statistically significant (*P* < 0.01), Few and Worsley (1975) observed a similar increase in plasma cortisol concentrations when the body temperature increased by only 1°C in mild exercise. The very large increase in plasma catecholamine concentrations in porcine MH (Lucke, Hall and Lister, 1976) may be responsible for the plasma cortisol concentration remaining within normal limits, as Wilcox and others (1975) have shown that the i.v. infusion of noradrenaline in man decreased the plasma cortisol and serum insulin values, possibly by an action on the hypothalamus.

The mean serum insulin concentration of 5.0 μu./ml (SEM 0.5 μu./ml) in the control period was very low and increased to only 7.8 μu./ml (SEM 2.7 μu./ml) after halothane, in spite of the severe glycaemic stimulus (Lucke, Hall and Lister, 1976). The inability of the β cells of the pancreas to respond to the high concentrations of circulating glucose may have resulted from the inhibitory, α-adrenergic effects of the circulating catecholamines on insulin secretion.

Thus, large changes in circulating cortisol and insulin concentrations were not observed during porcine MH and this may be a result, in part, of the associated catecholamine response.

**G. M. Hall**

**K. Masshiter**

**J. N. Lucke**

**D. Lister**

**REFERENCES**


**A FOREIGN BODY IN THE LARYNX**

**Sir,**—The paper entitled “A foreign body in the larynx” (Nash, 1976) reminds me of a story which may interest your readers.

A young Fijian male was seen at an outlying hospital complaining of a sore throat. Clinical examination was negative and he was discharged. He reported 5 days later, still complaining of a sore throat which appeared slightly infected on examination. He was admitted to hospital and treated with sulphonamides, but respiratory and cardiac arrest occurred immediately after the third dose. Resuscitation was successful and he was flown to the base hospital, where a full examination including radiography and bronchoscopy was negative. An allergic response to the sulphonamide was presumed to have caused cardiorespiratory arrest.

Attempts to extubate the trachea were followed rapidly by respiratory obstruction which was relieved readily by replacing the tracheostomy tube. Bronchoscopic observation then disclosed a bulge on the posterior wall of the trachea as the tube was withdrawn.

Radiographs of the thoracic inlet revealed a fine linear opacity just above the sternum. This was thought to be a fish bone in the oesophagus, a very common finding in the islands. Oesophagoscopy showed a bone-like structure which was withdrawn revealing a dental plate. Subsequently tracheal extubation was performed easily and the patient made a smooth recovery.

We were interested to learn how a patient with a nearly full set of teeth could have swallowed a dental plate which obviously did not belong to him. On close questioning a very embarrassed male admitted that he had known that the dental plate was present all the time and was probably the cause of his trouble. What really worried him was the fact that the dental plate belonged to his girl friend. In a moment of passion it had passed from mouth to mouth and he had swallowed it.

**L. A. Phillips**

**REFERENCE**


**COMPARISON OF THE EFFECTS OF ENFLURANE AND HALOTHANE ON DEVELOPMENT OF PHASE II NEUROMUSCULAR BLOCK BY SUXAMETHONIUM**

**Sir,**—By nerve stimulation with a train-of-four pattern, it is possible to differentiate Phase I and Phase II neuromuscular block resulting from exposure to suxamethonium in man anaesthetized with nitrous oxide and halothane or