Endoscopic Placement of the Bengmark Tube

Upper gastrointestinal intolerance, gastroparesis and high gastric aspirate volumes are commonly encountered in the Intensive Care Unit (ICU) [1], and may be associated with a higher incidence of nosocomial pneumonia, longer ICU stay and increased mortality [2]. High gastric aspirate volumes during intragastric feeding may be interpreted as "failure of absorption" and result in temporary abandonment of the enteral route. In comparison, postpyloric feeding has been shown to improve nutrient delivery [3], and may also reduce the time required to achieve feeding goals [4]. However, placement of postpyloric feeding tubes is frequently difficult, often requiring multiple attempts, fluoroscopy and endoscopy. In our experience, successful postpyloric tube placement demands the use of radiographic monitoring. Transfer of patients to the radiography department is often not possible and, moreover, fluoroscopy is not practicable in the ICU. Successful placement by endoscopy alone may be limited by displacement and reflux back into the stomach, both as the scope is withdrawn and later as a result of retrograde peristalsis. Wire-guided systems may overcome placement problems to some extent but necessitate difficult oral-to-nasal transfer of the wire. Such difficulties can significantly delay postpyloric access and may prompt prolonged parenteral support.

The Bengmark tube is a self-locating nasojejunal tube which has been reported to achieve a success rate of over 90% in passage into the jejunum and to stay in position longer than alternative weighted tubes [5]. The underlying principle is that the preformed large-diameter coil facilitates movement beyond the pylorus and limits regurgitation into the stomach. Bedside placement of this tube, however, requires a functionally preserved stomach and adequate gastric emptying. In an attempt to overcome the problems of postpyloric access in patients in the ICU we have used a simple technique of endoscopic placement of the Bengmark tube.

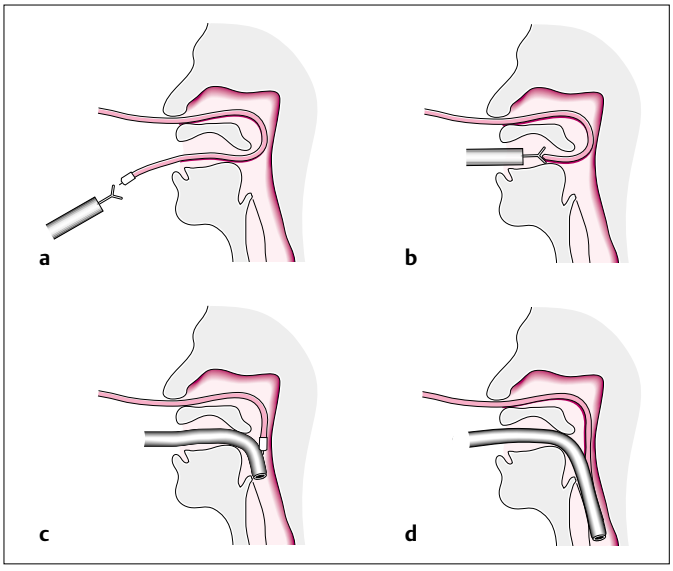

Figure **1** Intubation with the Bengmark tube. A suture is applied to the distal end of the tube. The tube is introduced nasally and retrieved orally using a laryngoscope and Magills forceps. **a** The Bengmark tube is grasped close to the mouth with forceps deployed within the therapeutic channel of the endoscope. **b** During intubation the Bengmark tube must initially be pulled back, to avoid looping in the nasopharynx. **c, d** The endoscope is then gently advanced into the stomach carrying the Bengmark tube.

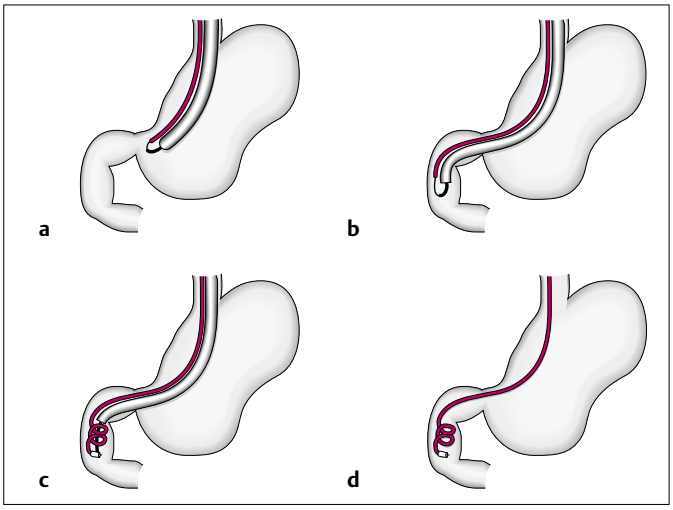

Figure **2** Deployment of the Bengmark tube in a postpyloric position. ***Note:*** The preformed coil approximates to the distal 25 cm of the length of the Bengmark tube. It is important therefore to record the distance of insertion of the Bengmark tube and ensure that this length is taken into account when deploying the coil within the duodenum. An inadequate length beyond the pylorus will result in reflux into the stomach as the coil forms. **a** Step 1. Within the antrum the Bengmark tube is brought into view by advancing the forceps. **b** Step 2. The Bengmark tube is then advanced through the pylorus under direct vision. **c** Step 3. The Bengmark tube is advanced well into D2/D3. The guide wire is withdrawn 25 cm to allow the distal coil to form whilst the grasp with the forceps is maintained. **d** Step 4. The forceps are disengaged and removed. The endoscope is then carefully withdrawn. The guide wire is completely removed after the scope has been withdrawn. Radiography is required to confirm the final position of the tube.

This method takes advantage of the preformed coil, both in avoiding displacement of the tube as the endoscope is withdrawn, thereby obviating the need for monitoring, and also in preventing reflux into the stomach following successful placement. The method is illustrated in Figures **1, 2**.

The results of our use of this technique have been very encouraging, and we have placed eight tubes without procedure-related complication in a range of ICU patients with existing complications, as follows: problems following major gastrointestinal resection ($n = 3$); pneumococcal septicaemia with multiple organ dysfunction syndrome ($n = 1$); acute severe pancreatitis with multiple organ dysfunction syndrome ($n = 1$); ileus following emergency aortic valve replacement and coronary artery bypass graft (CABG) ($n = 1$); traumatic intracranial bleeding and multiple injuries following road traffic accident (RTA) ($n = 1$), and viral encephalitis, in one child. The mean duration of feeding was 12 days. One tube was placed successfully, in the neuro-intensive care unit, but became dislodged whilst the patient was turned during the night and had to be re-positioned. One tube became blocked on day 10 but was no longer required. The remainder facilitated successful feeding without complication.

We acknowledge that experiences of successful postpyloric tube placement will vary widely amongst practitioners and this method may not be appropriate for many. We are reporting this technique principally for practitioners who have had little experience of endoscopic tube placement, and also as a possible alternative which may be used in units where practical difficulties lead to delay in obtaining postpyloric access.

G. Constable [1], J. Pappachan [2], M. A. Stroud [1]

[1] Institute of Human Nutrition, Southampton General Hospital, Southampton, UK

[2] Intensive Care Medicine, Southampton General Hospital, Southampton, UK.

References

[1] Mentec H, Dupont H, Bocchetti M et al. Upper digestive intolerance during enteral nutrition in critically ill patients: frequency, risk factors, and complications. Crit Care Med 2001; 29: 1955 – 1961

[2] Jacobs S, Chang RW, Lee B, Bartlett FW. Continuous enteral feeding: a major cause of pneumonia among ventilated intensive care unit patients. J Parenter Enter Nutr 1990; 14: 353 – 356

[3] Montecalvo MA, Steger KA, Farber HW et al. Nutritional outcome and pneumonia in critical care patients randomised to gastric versus jejunal tube feedings. The Critical Care Research Team. Crit Care Med 1992; 20: 1377 – 1387

[4] Kortbeek JB, Haigh PI, Doig C. Duodenal versus gastric feeding in ventilated blunt trauma patients. A randomised controlled trial. J Trauma 1999; 46: 992 – 996

[5] Bengmark S. Progress in peri-operative enteral tube feeding. Clin Nutr 1998; 17: 145 – 152

Corresponding Author

G. Constable, MB BS MRCP (UK)

Institute of Human Nutrition
Mail Point 113
Southampton General Hospital
Tremona Road
Southampton SO16 6YD
UK
Fax: + 44-2380-794945
E-mail: g.constable@doctors.org.uk