Enterostomy feeding for patients with stroke and bulbar palsy

Dysphagia occurs in about 40% of patients immediately after cerebrovascular accident (CVA)[1,2] so all patients should have their gag reflex carefully checked and, if aspiration of food is to be prevented, oral feeding must not be started until the reflex is clearly present. The gag reflex, together with 'wet-hoarseness', an index of pyriform fossa pooling, is the best clinical correlate with aspiration[3]; if it has not returned within a few days the patient will need to be fed in a way which does not expose him to risk. Because it is an acute event the patient is often well nourished at presentation, and he/she should be well able to cope for a few days on intravenous dextrose and electrolytes; the stroke causes little or no rise in resting energy expenditure[4]. After 2 or 3 days, if the patient still cannot swallow, enteral feeding by the nasogastric route is preferred. There seems little to recommend the use of gastrostomy feeding during the first 4 weeks after stroke. This is a time characterized by danger for the patient and emotional adjustments for patient and relatives, and the inability to swallow is likely to improve. If the patient has been unable to take food orally for more than 4 weeks despite the best efforts of the speech therapists, the swallowing difficulty is regarded as a longterm problem, though major improvement can continue to occur up to 3 months, or occasionally after longer. By 4 weeks the stroke patient functionally begins to resemble the patient with chronic progressive causes of bulbar palsy such as motor neurone disease and multiple sclerosis in that some means must be found to provide artificial feeding in the domiciliary context or in the longstay ward or nursing home. It is at this point that the placement of a feeding enterostomy is seriously considered. In our current series of patients fed by enterostomy in Tower Hamlets, about 70% have been fed following stroke and for other chronic neurological abnormalities of swallowing, a proportion very similar to that seen in the series of Moran and Frost in their recent *JRSM* paper[5].

Gastrostomy insertion has now become a fairly simple procedure because it is possible to avoid laparotomy. A percutaneous cannula is inserted[6] directly into the stomach or upper small intestine, guided by transillumination from a suitably placed fibre-endoscope, through which it is visualized entering the gastric or intestinal lumen. With the cannula in place a thread or wire is passed and retrieved endoscopically, brought out of the mouth and used to pull a catheter through the mouth from lumen to skin (pull technique) or to guide a tapered catheter pushed over it from the mouth, via the stomach retrogradely through the abdominal wall (push technique). Tubes can also be inserted endoscopically or non-endoscopically under radiological control by direct puncture from the abdominal wall and using track dilators or peel-away introducers. Both radiological and endoscopic techniques have lower cost and complication rates than surgical approaches which should be reserved for cases in which previous surgery and the presence of adhesions make 'blind' insertion more likely to result in puncture of other viscera. Feeding tubes are changed after 12-24 months and the replacement procedure can be done on a day case basis. The new techniques' simplicity has resulted in a much wider use of feeding enterostomies, particularly in the United States, over the last 10 years or so since its first description[6].

Though there are many potential complications of gastrostomy insertion, with attention to detail risks can be reduced to acceptable levels in practice[5]. Early complications are pneumoperitoneum, bleeding, abdominal wall sepsis, peritoneal contamination and transfixing of other viscera. Provided that care is taken to avoid the epigastric arteries by making the insertion lateral to the rectus muscles, bleeding is slight but it is sensible to check clotting status before the procedure. Pneumoperitoneum is virtually inevitable, resolves spontaneously and is of no clinical consequence. Abdominal wall sepsis or cellulitis may be bacterial or candidal and may be trivial or devastating. Its frequency of about 30% may be reduced 4-5-fold by prophylactic cefazolin[1]. When the tube is to be inserted by the endoscopic techniques it is probably also sensible to cleanse the mouth before the procedure with a chlorhexidine mouthwash. Direct insertion using a radiological technique removes the risk of contamination of the tube from the mouth flora. With such an approach the liver may be visualized ultrasonographically and contrast placed in the lumen of the colon to reduce the risk of inappropriate puncture. Whether placed endoscopically or radiologically, the fistula through which the catheter traverses matures over about 2 weeks and it is important to ensure that the catheter's retention flange or balloon is put under sufficient tension to pull the gastric wall against the anterior abdominal wall. Tension is maintained with a Molnar ring or similar friction device placed externally on the abdominal surface. Inadequate tension may result in peritoneal soiling by gastric contents; too much tension may cause ulceration and necrosis of the gastric mucosa and wall. Leakage around the tube can be troublesome; it can sometimes be countered with tissue glue, or by changing the catheter after the tract has matured for a gastrostomy button. However it can be difficult to correctly gauge the size of buttons and their internal flange may be put under excess tension with consequent gastric mucosal ulceration. Design faults have led to the withdrawal of some of these from the market. However, correctly placed, they can be very acceptable cosmetically in that the external opening lies flush with the skin and is easily hidden under clothes. Pain on infusion requires careful investigation for correct tube placement, a search for gastric ulceration near the internal flange, and for possible intestinal obstruction either mechanical or motility-related to flow of the feed. As with other forms of enteral feeding diarrhoea may occur and may necessitate slower (but not more dilute) infusion, though the diarrhoea associated with enteral feeding is usually not caused by the feed[8]. Placement of a gastrostomy increases lower oesophageal pressure in the fasting state and *reduces* acid reflux at least in the short term[9]. Converting the gastrostomy to a jejunostomy may not reduce rates of aspiration[10] and introduces new problems of tube blockage or kinking because of the extra length. In our own series in which we have prospectively sought reflux with barium imaging of feeds we have not found reflux to be a problem with gastrostomies. We therefore use enterostomies only

if there is some abnormality of gastric emptying (stasis or partial obstruction).

Though the longterm feeding of severely handicapped patients unable to swallow has aroused ethical debate, it is in a minority of patients only that decisions are difficult. There seems little problem in trying to alleviate the thirst or hunger, or trying to improve the well being through increased muscle strength, of patients with bulbar or pseudo-bulbar palsy. There may be less of a case for placing a gastrostomy in unconscious or near-unconscious patients, though anecdotes suggest that some chronically comatose patients may be improved with feeding. The principal argument seems to be whether it is appropriate by nutritional means to prolong a miserable life. However the argument begs the question as to whether nutritional support *does* prolong life in these circumstances. Hypostatic and inhalational pneumonia do not depend upon food and drink for their occurrence and inhalation of pharyngeal contents and bacteria will occur, particularly in patients who sleep deeply or have a depressed level of consciousness, in the absence of feed[11]. There are many touching anecdotes to suggest improvement of life's quality with artificial feeding but better documentation of the treatments effects upon mortality and quality of life is needed.

What are the nutritional implications of enterostomy placement? Undernutrition results in type II atrophy of skeletal muscle fibres with weakness, increased fatiguability and reduced exercise capacity of muscles unaffected by the underlying neurological disease including respiratory muscles and refeeding can be expected to reverse these problems. In old age physical activity and energy requirements diminish, with the result that, unless excess is eaten and obesity caused, there may be a tendency towards deficiencies of micronutrients. This is especially true of the patient immobilized by a stroke or motor neurone disease and artificial feeds are useful for this reason. Constipation and incontinence can be problems with artificial feeding. The effects of stroke and other cortical lesions upon gastrointestinal motility are not known. It is important that longterm feeding takes into consideration the patient's needs to maximize recovery, to maintain or restore normal nutrition, to prevent the development of obesity (as every attendant involved in lifting the patient will agree) and enable as near normal bowel function as possible. Energy requirements will only be a little in excess of resting expenditure. Nevertheless many of the commercially available feeds for enteral use provide sufficient vitamins even at energy intakes of 1000 kcal/day, though doubt has been expressed about trace element content. Feeds are now available which contain additional trace elements and fibre which may have advantages in the longterm.

The placement of the gastrostomy and the choice of the feed are but the beginning of the treatment. The patient or a close relative must be carefully taught how to infuse it hygienically and about the use of the pump and giving sets. Maintenance of the cleanliness of the gastrostomy hub and the skin puncture site seem sensible precautions against bacterial contamination and here the involvement of a nutrition nurse specialist is invaluable[12]. The choice of when to infuse can be left to the patient and his attendants but we encourage nocturnal infusion in the more mobile patients so that they can be disconnected from what is often a cumbersome pump and feed container during the day. Many however feel more comfortable infusing slowly, and, particularly the less mobile feel more confident with, and find less disturbance in, infusing by day. A system of providing and paying for supplies will need to be arranged. Usually we depend upon community services to pay for feeds and giving sets. A number of the suppliers of feeds provide a very valuable service in delivering to the patients home. Patients and their attendants need to be able to gain skilled support. This will come in variable measure from their GP and district nurses; Patients on Intravenous and Nasogastric Nutrition Therapy, (PINNT)*, is a helpful organization of patients receiving artificial feeding at home and increasingly they are recruiting patients with enterostomies as well as those on parenteral nutrition. It is very important that the patient and attendant have someone they can easily contact at the hospital, whether clinician, nutrition nurse specialist or dietitian or a team of all three. At the Royal London Hospital we provide an outpatient clinic to provide nutritional and biochemical monitoring for these patients and to provide continued support, both emotional and technical; our nurse specialist will from time to time visit at home those for whom a hospital visit is impractical. The careful attention to detail during follow up can make all the difference between the feeding becoming a terrible chore resulting in worse immobility and a truly practical means of keeping the patient well-nourished, well-hydrated and comfortable.

J Powell-Tuck
N van Someren
Departments of Human Nutrition and Gastroenterology,
The Royal London Hospital,
London E1 2AD

Acknowledgments: Gastrostomy feeding is a team effort. We acknowledge with pleasure the contributions of our close colleagues Dr C P Swain, Dr B C N Ang, Ms Helen Fawcett and Ms Teresa Day.

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The role of surgery in the management of pulmonary metastasis

The surgical resection of secondary tumours from the liver and brain is a feasible treatment option in carefully selected patients[1,2]. The role of surgery for patients with pulmonary metastasis has recently received renewed attention in the USA[3-5]. It has been suggested that with improved surgical techniques and perioperative care, surgeons have become more aggressive and liberal when considering surgery for this group of patients[3]. The reviews from the USA document the results following resection of metastasis from malignant melanoma[4], and of two or more thoracotomies performed in patients who had pulmonary metastasis from soft tissue sarcomas[5]. These tumours are notoriously unpredictable and lethal and the seemingly beneficial results of surgery raise important issues which need to be addressed by surgeons and physicians in the UK.

The first series of patients to have pulmonary metastases surgically resected was reported in 1947[6]. In 1958, Ehrenhaft and colleagues published the criteria they used to select patients suitable for surgical treatment[7]. These criteria have changed little over the last 33 years and are similar to those used to select patients prior to resection of hepatic secondary tumours[1]. They include total excision of the primary lesion with no evidence of local recurrence, the absence of metastasis to other organs, and for lung secondaries adequate pulmonary function for resection to be viable[3]. These criteria may be expanded in view of advances in adjuvant therapy to include surgery to remove residual disease following chemotherapy, and to biopsy the tumour for tumour markers and assess its response to chemotherapy[8]. There is little data however to substantiate these additional criteria and advocate their widespread use.

Patients in the UK who have had a pulmonary resection for metastatic disease are registered in the UK Thoracic Surgical Register. The number of patients undergoing thoracotomy for secondary malignant lung tumours was 166, 184 and 183 in 1985, 1986 and 1987 respectively[9-11]. In 1988 this number was 194[12] and the total was 193 in 1989[13]. These figures suggest that thoracic surgeons in the UK, in contrast to their USA counterparts, have not expanded their indications for resecting pulmonary metastasis[3]. The UK figures may be an underestimation however since the returns to the Register are voluntary. The Thoracic Register does not document the number of patients referred by physicians to thoracic surgeons for consideration of surgery, so the number of patients initially assessed then refused operation remains unknown. The figures do indicate that surgery can be performed with a consistently low mortality and the rates for 1986, 1987 and 1988 were 1.1%, 1.1% and 1.5% respectively[10-12].

The criteria described by Ehrenhaft to select suitable patients for resection of a lung secondary are not in doubt, and it is obvious that patients should be thoroughly investigated before a thoracotomy is performed so unnecessary surgery is avoided. In the past, patients considered suitable for resection have been observed for up to 3 months to detect the appearance of any additional metastasis prior to thoracotomy[14,15]. The figures from the UK Thoracic Registers of 1985-1988 show only the number of patients who underwent a thoracotomy for a secondary lung tumour. If the more detailed register of 1989 is analysed we find that 30 patients (21%) had an exploratory thoracotomy only and no pulmonary resection. It is difficult to draw detailed conclusions from this data as no reasons are given why individual patients were refused resection at the time of operation, but clearly the figures suggest that the selection of patients prior to surgery could be improved.

When investigating a patient with pulmonary metastasis to assess suitability for pulmonary resection the following points should be addressed. A resection should be technically possible and thorough investigation should exclude the possibility of incomplete removal of the primary tumour or tertiary spread. The responsiveness of the tumour to radiotherapy and chemotherapy should also be considered as these may be valuable alternatives to surgery and provide good palliation.

Many factors including the number of metastasis, the disease-free interval, the tumour doubling time and the tumour histology have been investigated as determinants of survival but none of these have been found to be consistently related to long term outcome[3]. Debate still continues regarding the extent of surgery that should be carried out in suitable patients and most authors advocate a conservative approach[8,16]. Some reports suggest a more extensive resection should be performed especially considering the propensity of pulmonary metastasis to spread to regional lymph nodes[14]. In the UK in 1989, the majority of patients (62%) were treated by segmentectomy or wedge resection with only 36 patients treated by lobectomy or bilobectomy and eight by pneumonectomy[13].