

Medicine in the Elderly

Percutaneous endoscopic gastrostomy in elderly patients

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Summary: Percutaneous endoscopic gastrostomy (PEG) was performed on 28 elderly patients (mean age 82 years) who were dysphagic and intolerant of naso-gastric feeding. Twenty-six patients were recovering from a stroke; the interval between the onset of stroke and PEG averaged 63 days. The procedure was successful and well tolerated by all patients. Nineteen (68%) still had a functioning PEG a median of 14 weeks after placement. One patient whose swallowing recovered had the tube removed 6 months after its insertion. Seven patients (25%) subsequently died from their underlying disease, a mean of 92 days following PEG. There was one procedure-related death from peritonitis. PEG is a useful alternative to surgical gastrostomy in selected elderly patients with dysphagia who are intolerant of naso-gastric feeding.

Introduction

Dysphagia is a common problem in elderly hospitalized patients and those affected are at risk from dehydration, malnutrition and aspiration pneumonia. Naso-gastric tube feeding is commonly undertaken to minimize these risks. An audit of the 2332 patients admitted to our 100 acute assessment geriatric beds during 1989 revealed that 139 (6%) required naso-gastric feeding at some stage (M. Price, personal communication). Dysphagia is a major complication of stroke, and during a 6-month audit period 24% of consecutive admissions to our departmental 24-bed stroke rehabilitation unit had naso-gastric feeding. Naso-gastric intubation is often distressing for patients, particularly as tubes need regular resiting. Our audit revealed that an average of 12 tubes were used per intubated patient on our stroke unit. The frequent placing of tubes is demanding on hospital staff as well as on radiology services when the correct siting of fine-bore tubes needs to be confirmed radiologically. Furthermore, even when *in situ*, tubes may be uncomfortable and unaesthetic.

Until recently, the only alternative to naso-gastric feeding was surgical gastrostomy, which requires general anaesthesia and laparotomy. However, in 1980 Gauderer *et al.* described a technique for the percutaneous insertion of a gastrostomy tube under local anaesthetic and

endoscopic control.¹ Our frustration with naso-gastric feeding prompted us to develop a percutaneous endoscopic gastrostomy (PEG) service for selected elderly people with dysphagia. We report on our preliminary experience of PEG, performed in 28 patients over a 12-month period.

Methods

The method we employ is based on the technique of Gauderer *et al.*¹ While wide-bore Foley and de Pezzer catheters were used as the first PEG tubes, in recent years several kits, employing tubes of various diameter, have been marketed. We use the Freka Gastrostomy Set (Fresenius AG, Bad Homburg, Germany) which contains a 30 cm fine-bore polyurethane tube with an outer diameter of 2.9 mm and an inner diameter of 1.9 mm.

Following a complete endoscopic examination, the stomach is insufflated to appose the gastric and abdominal walls. Under local anaesthetic and endoscopic supervision, a long thread is introduced into the stomach via a percutaneous cannula, gripped by a biopsy forceps, pulled out through the patient's mouth and tied to the distal end of the gastrostomy tube. The thread is then used to pull the tube retrogradely through the oesophagus and stomach and out through the anterior abdominal wall. The intra-gastric end of the tube is held in place with an integral retention disc made of silicon rubber which also seals the inner wall of the stomach. A small fixation plate keeps the tube in position on the anterior abdominal wall. To

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facilitate feeding, a luer lock adaptor is glued to the external end of the gastrostomy tube.

The first seven PEGs were performed by surgical colleagues. Subsequent procedures were undertaken in an endoscopy suite by a team of 1 endoscopist, 1 other physician and 2 nurses. PEG usually added some 15 minutes to the duration of standard upper gastrointestinal endoscopy. It should be noted that we needed to pass the endoscope once only, an advance on earlier techniques that required repassage of the endoscope so as to position the catheter.

Results

To date, we have performed PEG in 28 patients, 15 of whom were male. Their mean age was 82 years and ranged from 68 to 99 years. Swallowing was impaired as a result of a stroke in 26 patients, while two had severe Parkinson's disease (one of whom had also suffered a stroke) and another had motor neurone disease. Among stroke patients, the interval between the onset of stroke and PEG averaged 63 days and ranged from 6 to 210 days.

The procedure was successful and well tolerated by all patients. At the time of the procedure, technical problems were encountered twice. One patient had a benign oesophageal stricture requiring dilatation before the endoscope could be passed. Another patient had a functioning surgical gastrostomy which made gastric insufflation difficult. In this case, PEG was undertaken because of cutaneous hypersensitivity to the surgical gastrostomy tube and persisting local infection at its site of insertion. Problems were encountered at a later stage in one patient whose gastrojejunostomy tube became blocked by crushed tablets and needed replacing. Despite not using antibiotic prophylaxis, we did not encounter any wound infections.

Following the procedure, the ability to swallow returned in one patient, allowing us to remove the tube 6 months after its insertion. Of the remaining 27 patients, 19 still have their tubes *in situ*, a median of 14 weeks after insertion. Tubes have been *in situ* for longer than 1 month in 17 patients and for longer than 3 months in 10. Seven patients died of causes unrelated to the procedure. The interval between PEG and death averaged 92 days and ranged from 6 to 200 days. Death occurred within 30 days in 2 of these patients.

One patient who developed peritonitis died as a consequence of the procedure. This man was severely incapacitated following a stroke 2 months previously and was intermittently agitated and restless. He was unable to swallow and intolerant of naso-gastric feeding. Sustained weight loss and decubitus ulceration prompted us to perform PEG. He died suddenly 36 h after the procedure and at

post-mortem was found to have widespread peritonitis. A 1 cm laceration was found in the stomach wall at the site of PEG insertion; this could be explained only by the patient pulling on the tube while agitated.

Discussion

Naso-gastric tubes are used frequently in geriatric practice; we placed them in 6% of 2332 consecutive patients admitted to a geriatric service in 1 year. When they are needed for extended periods, as may happen after a stroke, naso-gastric tubes tend to become dislodged. The recurring need to re-site them is distressing for patients and hospital staff alike. Like others,²⁻⁴ dissatisfaction with naso-gastric intubation prompted us to explore alternative feeding strategies.

We were attracted to PEG because of its reported simplicity, feasibility and low complication rate.¹⁻⁶ Unlike surgical gastrostomy, there is no need for general anaesthesia and laparotomy, which elderly patients may not tolerate after a recent stroke. It is recognized that elderly people tolerate upper gastrointestinal endoscopy well⁷ and we have found that the same applies to PEG. The procedure was successful in all our patients – other studies have shown success rates of between 76%⁶ and 99%,⁸ with rates of greater than 90% in the majority.

In a recent review of some 1500 reported PEGs, the incidence of major complications ranged from 0% to 4.4%; the mortality rate ranged from 0% to 2.5% and averaged 0.6%.⁴ Complication rates have been found to be no higher in elderly patients than in their younger counterparts.² One patient in our series died as a consequence of the procedure. As described above, he developed peritonitis when he lacerated his stomach wall by pulling on the PEG tube. A fatality due to peritonitis has been previously reported⁹ and in his review of 1338 reported cases Mamel found 5 cases of gastric perforation and peritonitis.² Such an event is not necessarily fatal once there is early surgical intervention.^{5,8} Our patient did not have surgery as the diagnosis was made only at post-mortem. In assessing agitated patients for PEG, the advantages of the procedure must be balanced against such inherent risks. We are currently examining ways in which we can reduce the risk of patients interfering with the tube, without restraining them unduly. Larson *et al.* use an 'abdominal binder' to protect the tube in such situations.⁵

Late mortality following PEG reflects patient selection rather than technical success. Excepting the single patient who died as a consequence of the procedure, 7 patients (28%) have subsequently died. The interval between PEG and death aver-

aged 92 days and the 30-day mortality rate was 7%. This indicates that we are more conservative in our patient selection than most. In their literature review, Miller *et al.* found that the 30-day mortality rate in various other series varied between 7% and 18%.⁴ These authors suggest that performing PEG earlier in a patient's course might improve nutritional status and thereby reduce the early death rate. By contrast, Ponsky and Gauderer³ argue that PEG should be considered only for those who demonstrate potential for extended survival; those with rapidly progressive disease are better served with naso-gastric feeding.

Like many new procedures, the initial enthusiasm that greeted PEG was later followed by notes of caution and pleas against its unrestrained use.^{10,11} However, the procedure is now well established and in our opinion can be of considerable benefit to elderly patients when used judiciously. Having decided that a patient requires enteral feeding, our own policy is to commence with naso-gastric feeding. We persevere with this when it is well tolerated and accepted by the patient and when swallowing is likely to recover in the short term. Otherwise we recommend PEG.

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