

Percutaneous endoscopic gastrostomy in dysphagic stroke patients

Stroke is the most common cause of severe disability in the UK, which is frequently complicated by dysphagia. Percutaneous endoscopic gastrostomy is a useful procedure that can help maintain nutrition in such patients. **Amy-Louise Jones, Dr Senthil Raghunathan, Dr Bella Richard, and Dr Pradeep Khanna**, review this procedure.

Stroke is the third most common cause of death and single most common cause of severe disability in the UK. Dysphagia is a common complication after stroke and is present in 23–50% of cases.¹ Poor nutrition in dysphagic stroke patients has been associated with increased rates of infections, extended treatment periods, and increased morbidity.² Conventional enteral feeding can take the form of nasogastric, nasojejunal, or surgically placed gastrostomy tubes. However, since its first use in 1980,³ percutaneous endoscopic gastrostomy (PEG) has been the preferred method of long-term enteral feeding. PEG tubes are better tolerated than nasogastric tubes and provide better short-term nutrition.⁴ The procedure has many benefits as it can be done quickly in most cases, requires minimum sedation, has low morbidity in the general population, and is successful in 98% of patients.⁵ PEG-feeding may improve the rehabilitation potential of patients.⁶

Swallowing assessment

To identify and rehabilitate stroke patients with dysphagia, it is important to determine the nature and severity of the dysphagia during swallowing assessments. Simple bedside swallowing assessments can be done by having the patient sit upright and drink 30 ml water and watching for signs of dysphagia including loss of liquid from the mouth, poor co-ordination of oral muscles,

breathlessness, delayed pharyngeal or laryngeal elevation, coughing, attempting to clear throat, and changes in voice quality after swallowing.

Swallow assessments need to be done on an individual basis and other co-morbidities that could affect swallow should be considered. The current gold-standard for swallowing assessment is videofluoroscopy, also known as a modified barium swallow. Other methods of assessment include: fiberoptic endoscopic evaluation of swallowing, scintigraphy, ultrasound, and impedance tomography.

Indications

PEG should be considered for patients who have a functional gastrointestinal tract but are unable to consume sufficient calories needed to meet their body's metabolic needs or who are intolerant to nasogastric-tube feeding. Stroke is the most common indication for PEG tube insertion,⁷ other less common indications include facial trauma, neoplasms of the oropharynx or larynx, neurological conditions that affect swallow, upper gastrointestinal dysfunction, and miscellaneous catabolic conditions

Contraindications

Absolute contraindications include inability to bring the anterior gastric wall in apposition to the

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anterior abdominal wall. Such anatomical change could be due to prior subtotal gastrectomy, ascites, or marked hepatomegaly. Gastrointestinal-tract obstruction is another absolute contraindication. Relative contraindications include proximal small bowel fistula, neoplastic and infiltrative diseases of the gastric wall, and obstructing oesophageal lesions.

PEG versus nasogastric tube

Both PEG and nasogastric tubes are frequently used in stroke patients. Both have benefits and disadvantages (table 1). For patients who repeatedly pull out their nasogastric tubes and are medically unstable for a PEG, nasal loop could be considered. Nasal loop is a new technique, whereby nasogastric tubes are attached to a fine-bore polyurethane tube which loops loosely around nasal septum to prevent extubation. A 6-month prospective audit by Anderson *et al*⁸ concluded that nasal loops were safe, non-invasive, well tolerated, effective at delivering full enteral nutrition, and might avoid the need for PEG. The authors also concluded that nasal loops were useful for people who have a poor prognosis and are unlikely to survive their initial stroke, thereby avoiding the necessity of the more invasive and complicated PEG tube.

Timing

Although there is broad agreement that PEG feeding is desirable if dysphagia is likely to persist for 14 days or more, careful patient selection is vital because the presence of factors such as coma or semicomatose, pupillary disturbances, gaze palsy, Cheyne Stokes respiration, and urinary incontinence will influence the decision on PEG. Importantly, dysphagia is an independent adverse prognostic factor in stroke patients, which has an associated mortality of 40% within 1 month.⁹ The three most commonly suggested times for PEG are:¹ within 2 weeks of stroke, to ensure improvement of patient's nutritional status; 2 weeks after stroke, to be sure that the dysphagia is persistent; after 30 days, because of the high 30-day mortality suggested by some studies.

87% of patients will regain their ability to swallow about 2 weeks after stroke, and currently there is no definite consensus on timing of PEG placement. The absence of guidelines combined with the wait for spontaneous improvement in the ability to swallow can often lead to poor

nutritional status for dysphagic stroke patients, which can indirectly increase morbidity (eg, increase in infections). If dysphagia is thought to be permanent, PEG is commonly advised approximately 2 weeks after stroke.

PEG technique

The original techniques first described by Gauderer and Ponsky³ have been modified. However, all the methods involve the same basic steps. First the patient undergoes gastric insufflation to bring the stomach into apposition with the abdominal wall. Second, a tapered cannula is placed percutaneously into the stomach. Third, a suture or guide wire is passed into the stomach. Fourth, the gastrostomy tube is placed. And finally, the proper position is verified.

Complications

The procedure of PEG insertion has very low risk of complications with a morbidity rate of 3–5.9%. In stroke patients, wound infection and pneumonia are common. Minor complications occur in about 10% of cases and major complications occur in 3%.¹⁰ PEG-tube insertion is a safe and simple procedure. Reports of procedure-related mortality are extremely unusual and mortality within 24 hours of the procedure is usually due to underlying co-morbidity. In dysphagic stroke patients, 30-day mortality is estimated at between 27 and 37%,¹ mostly resulting from progression of the original illness.

PEG tubes are placed successfully in approximately 95% of the time. Swallowing is regained by 27% of patients after PEG-tube insertion.¹ Most still require PEG at 3 months.⁴ Although some patients die with their PEG *in situ*, others regain their swallow and progress to oral feeding. There will also be cases in which PEG will become the accepted method of feeding. The suggested high mortality after PEG insertion could be explained by the poor prognosis of patients' underlying illnesses.

Legal, emotional, social, and ethical considerations¹¹

The decision whether to offer and recommend PEG-tube placement to patients is a topic of considerable interest. Often, doctors feel compelled to offer PEG because they believe

Table 1. Benefits and drawbacks of nasogastric versus PEG tubes

Benefits of PEG	Benefits of nasogastric tubes
PEG tubes rarely displaced	Less invasive
Provide satisfactory feeding more often than nasogastric tube	Can be done on the ward
Improves nutritional status because more food is received	Easily removed
Absence of pharyngeal irritation can help improve oropharyngeal function	
Drawbacks of PEG	Drawbacks of nasogastric tubes
More invasive	Longstanding nasogastric tubes are not well tolerated
More complications	Less cosmetically pleasing
Needs referral to specialist for fitting	Frequently dislodged
Harder to remove	Can cause irritation
	Time consuming to give food

that they are legally or ethically obligated to provide artificial nutrition and hydration, which is a form of medical treatment. The decision to place a PEG tube should be determined on the basis of whether it will provide an actual benefit to the patient. In all cases, doctors are not obligated to offer PEG-tubes unless benefit is anticipated. However, PEG-tube as a medical treatment has aspects that should be recognised as contributing to decisions on placement. These aspects include an emotional component that perceives withholding artificial nutrition and

hydration as starving the patient, underlying biases of physicians as to which patients are appropriate for PEG, and barriers to planning patients' discharge from hospital because of nursing home requirements.

A PEG can disrupt daily routine and social interactions (eg, eating socially at a restaurant). However, it is quicker, simpler, and easier for carers or the patient to deliver food through the PEG. Psychological stress can be an issue for both the patient and their carer. The pleasure of

eating and taste should not be underestimated. Since patients' understanding and communication after a stroke may be inhibited, it is important that the patient and their family are well educated about the advantages and disadvantages of PEG tubes. The challenges of the decision-making process are to facilitate communication, respect the ethical principles of autonomy and beneficence, and tolerate a variety of belief systems while safeguarding the vulnerable patient.

The third FOOD trial¹² aimed to establish if PEG-feeding of patients with stroke and dysphagia improved outcomes more than feeding via nasogastric tube. In this study, PEG tubes were rarely misplaced, and provided satisfactory feeding more often than nasogastric tubes. More patients with PEG were still receiving artificial feeding at final follow-up than those who had nasogastric tubes. Functional outcome for those with PEG might be worse than those with nasogastric tubes. PEG feeding in the first few weeks after stroke is unlikely to be associated with better outcomes.

PEG-feeding remains a necessity in dysphagic stroke patient but needs to be considered on a case-by-case basis. Overall PEG is safe, simple, and quick but has increased morbidity and mortality rates, especially when used in patients with poor prognosis and serious underlying co-morbidities.

Box 1. Complications of PEG

Major complications

Haemorrhage
Bowel perforation
Fistula
Aspiration
Buried bumper syndrome

Minor complications

Pain at the PEG site
Erythema at the PEG site
Bumper-related abdominal wall ulcers
Wound infections
Leakage
Tube displacement or obstruction
Nausea
Diarrhoea
Constipation

There should be a delay of at least 2 weeks between the time of stroke and PEG, as this cooling off period allows time for recovery of swallow. In the longer term PEG does improve nutritional status and should be considered when artificial nutrition and hydration is needed for longer than 2 weeks. It is important to involve the patient and their family members at all stages of decision-making process regarding PEG-tube placement.

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