Editorial

Percutaneous Endoscopic Gastrostomy. Twenty four years after, still space for debate

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PEG was first introduced in 1980 in Cleveland, Ohio.[1] The aim was to provide access to nutritional support for patients unable to tolerate adequate oral intake. Since then, the technique has gained great popularity and is now widely available in endoscopy rooms throughout the world. PEG is well known to be a safe, effective, and technically feasible method. In US more than 216,000 tubes were placed in 2000,[2] up from 15,000 tubes in 1989 with as many as 10% of nursing home patients being tube-fed.[3] In a review article[4] several years ago we underlined the very small number of procedures performed in our country, but recently, an increasing interest has developed. The decision on whether to recommend and to perform PEG placement has been a subject of extensive debate in the medical literature

Many issues, both clinical and medical, surround the PEG procedure. PEG tube placement is also influenced by other factors that include legal, socioeconomic, cultural and religious considerations. The topic is, therefore, complicated and all these parameters must be taken into account when deciding to perform a PEG. The aim of the present article is to reveal some of the above mentioned issues and to stimulate the reason for further debate. Principally, a patient's needs, benefits and wishes remain of paramount importance. It is therefore necessary to define an updated, practical strategy for the use of PEG tubes in patients who are unable to maintain sufficient oral intake. According to a recent ESGE workshop on the ethics of percutaneous endoscopic gastrostomy placement for nutritional support,[5] clinicians looking after the patient need to clearly recognize the rationale for performing a PEG procedure. A decision-making algorithm which integrates the medical and ethical dimensions of the decision to offer a PEG would be a reasonable approach. Within this framework, the recent proposed algorithm by Angus and Burrkoff[6] for cancer patients, patients with neurological deficit and the geriatric population, is of great interest.

There are basic questions concerning the clinical part which must be answered, as for example who should receive a PEG, why and when in the clinical course of an illness the procedure should be performed. In general, PEG should be considered for patients who have a functional GI tract but are unable to consume sufficient calories to meet their metabolic demands. The rationale for using the PEG procedure can be summarized as the need to maintain hydration and nutrition for the duration of the patient´s dysphagia. The procedure is not appropriate for patients with rapidly progressive and incurable disease and life expectancy of less than 1-2 months, or when peroral feeding is expected to resume within 30 days, because, in this case, short-term nasoenteric feedings may produce similar results. However, in certain cases, PEG placement may be appropriate to provide fluids and medications for comfort care even in patients with a limited long-term prognosis in whom nutrition may not be perceived as beneficial. Therefore, placement of a PEG requires careful individualization based on prospects for recovery and quality of life, though the latter is very difficult to measure in neurodegenerative patients. The above mentioned ESGE workshop stated that the basis of PEG management is a multidisciplinary clinical team approach. Within this context, the endoscopist must not simply act as a technician but should be an active member of the clinical

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team caring for the patient.

The most common indications for PEG placement include impaired swallowing associated with neurologic conditions, mainly after an acute stroke, head and neck tumours, head/facial traumas, miscellaneous catabolic conditions which require supplemental feedings, such as cancer cachexia, severe burns, acquired immunodeficiency syndrome, cystic fibrosis etc. It is also appropriate for delivery of hydration, medication and is useful to attain chronic gastric decompression in selected individuals with benign and malignant GI tract obstruction.[7]

The optimal timing of tube placement is important. A period of assessment is useful before proceeding to PEG placement. In neurological patients, a possible spontaneous improvement of the dysphagia may render the procedure unnecessary. An assessment period is also desirable in other cases e.g. in cancer patients, as a rapid deterioration of the general status may lead to changing a decision. A period of 2 weeks has been suggested after an acute stroke.[8] Nevertheless, if it is strongly anticipated that severe dysphagia will be protracted, an earlier tube placement of less than 5 days postacute event would be justified.[9] This could be best estimated in cooperation with neurogists. In certain conditions, the assessment period can be extended up to 1 or 2 months.

The contraindications of PEG underline the need for careful selection of the candidates. Absolute contraindication to PEG placement include those of standard upper endoscopy as well as the inability to bring the anterior gastric wall in apposition to the abdominal wall, pharyngeal esophageal obstruction, and uncorrectable coagulopathy. Prior gastric resection, ascites, hepatomegaly and obesity are some conditions that may impede gastric transillumination and subsequent PEG placement. Relative contraindications include dementia, ascites, coagulopathy, gastric varices, morbid obesity, prior gastric surgery, and neoplastic, infiltrative, or inflammatory disease of the gastric or abdominal wall.

The most widely used technique of PEG placement is the "pull" method, introduced by Gauderer and Ponsky, but the "push" and the "introducer" methods, described by Russel *et al* have also been used. The choice depends on the endoscopist's acquaintance with a particular method. The technical differences between the pull and push methods are minor but we consider that the first is easier in manipulation, especially during puncturing of the abdominal wall with the sharp tip of the tube. It is important to perform a diagnostic OGD prior to PEG placement because the endoscopic findings may lead to major changes in the medical management (abandoning the procedure or considering alternatives). Repeat endoscopy after PEG procedure is nowadays the usually selected option, described also in the original report. Repeat endoscopy confirms the correct position as a probable excessive traction of the tube can lead to mucosal or even transmural ischemia and later on to other complications such as perforation, peritonitis, buried bumper syndrome etc. However, it has been supported that the one-pass approach is equally safe, easier to perform, quicker and with potentially reduced risks of aspiration and pharyngeal injury.[10]

There are several other issues concerning the safety of the procedure. The appropriate selection of a safe site for puncturing the abdomen during tube placement is very important. Great emphasis has been given to the role of transillumination of the abdominal wall to ensure than no hollow organ is trapped between this and the stomach at the site of puncture. A worrying complication would be the puncture of adjacent viscera, usually the colon, resulting in gastrocolic fistula or even in peritonitis. The transillumination of the abdominal wall with the scope light in combination with endoscopic identation of the appropriate place after application of external finger pressure are considered prerequisites for performing the procedure. Failure to complete the above manouvres constitutes an absolute contraindication for performing the procedure. We believe that another important complementary test to guarantee safety is the aspiration of the lidocaine-loaded syringe during penetration of the abdominal and gastric wall with simultaneous endoscopic visualization of the needle entering is the gastric lumen. If air is aspirated prior to needle appearance, it suggests the presence of intervening air-containing viscous.

Antimicrobial prophylaxis is recommended because it may reduce the frequency of peristomal wound infection, but is only necessary in those patients not already receiving appropriate antibiotic treatment at the time of the PEG insertion. The optimal time to start feeding is controversial. Provided that bowel sounds have returned, it seems that even the initiation several hours later is also safe.

Patients undergoing PEG are often at high risk for complications caused by associated comorbidity. There is a variety in the reported percentage, which is explained by differences in what is defined as a complication. In one of a series of statements of the Standards of Practice Committee of the ASGE on the complications of upper GI endoscopy techniques,[11] the relative chapter for PEG

complications summarize them as follows. Minor complications associated with PEG placement occur in 13% to 43% of patients and include tube occlusion, maceration from leakage of gastric contents around the tube, and peristomal pain. Major complications, reported in 0.4% to 8.4% of procedures, include infections, bleeding, perforation, ileus, injury of internal organs, tumour seeding, and death. Procedure-related mortality has been reported to range from 0% to 2%, with a 30-day mortality in the range of 6.7% to 26%, which may be due to patient comorbidities.

There are basic ethical issues related to PEG. The decision to place a PEG tube should be determined on the basis of whether it will provide actual benefit to the patient. Benefit to patient is determined ethically by two factors - potential medical benefits and benefits as determined by the patient and/or the patient´s family. Ethical guidelines have suggested that PEG is not ethically justified where no physiological benefit is expected (e.g. in permanent cachexic patients) and where the patient will not have any improvement in quality of life (e.g. in permanent vegetative states). The endoscopist must determine whether the procedure is appropriate in the situation and whether benefits outweigh risks. Many patients who require long-term enteral feeding are in advanced stages of chronic illness and would not be able to survive without enteral access for nutrition, hydration, and/or medication. The decision to provide enteral access for long-term nutritional support is difficult in patients who are terminally ill or neurologically impaired. Some guidance may be helpful in reaching these decisions, which will ultimately be individualized and made in conjunction with the patient, the family, or both.

Important legal issues surround the subject of enteral nutrition through PEG and underline the complexity of the topic. Competent patients have the legal authority to decide about PEG tube placement according to what reflects their preferences. It is also legally accepted that physicians are not obliged to prolong life when the likelihood of survival is minimal or restoration of consciousness is unlikely. In Europe, the legal principles and the laws governing the area are not uniform and this renders any effort to create a general statement impossible. In ESGE workshop,[5] it was emphasized that local practice must be followed until the law become uniform in the EU. Several professional organizations offer some directives. The American Academy of Neurology takes the position that the provision of hydration and nutrition is a medical treatment that may be withheld or withdrawn in accordance with the principles and practices governing other forms of medical treatment. Furthermore, this organization states that "it is good medical practice to withdraw the artificial provision of fluids and nutrition when the patient's condition becomes hopeless". The American Medical Association endorses this position. Other professional organizations have also published statements regarding the ethics of foregoing nutrition and support the right of patient self-determination.

Informed patient or family consent is of critical importance in decision making. In competent patients, informed consent must be considered a prerequisite, both ethically and legally. If the patient is unable to consent, it is important to determine whether he had previously expressed any opinion about tube feeding or what role food plays in his value system. Spiritual and cultural beliefs must be taken into account. For example, Christians and Orthodox Jews support any intervention that might prolong life. Both further consider that such interventions should not cause or prolong suffering or that the burdens should not outweigh the benefits. When seeking the family's consent, in case of an incompetent patient, it must clearly explained why PEG is being performed, what the possible alternatives, if any, are, the likely outcomes, complications, etc. It must be made clear that patients do not uniformly benefit from the procedure which does not necessarily prolong life. There are families with unrealistic expectations, hoping that the underlying progressive illness will be reversed or a bed-bound patient will become independent, or that, in any cace survival will be prolonged. Therefore, true informed consent is a gradual process, not limited to the mere signing of a consent form. In a recent Greek retrospective study, Ladas S. *et al*[12] tried to evaluate the quality of information given to the relatives and determine the overall acceptance of the procedure by the patient´s family. They concluded that though several decision-makers were not satisfied with the quality of information given before informed consent, the overall acceptance of the PEG placement for nutritional support was high.

In conclusion, PEG can be performed in patients with anticipated long-term impairment in ability to maintain sufficient oral intake and reasonably long predicted survival. Many parameters must be taken into account leading to individualization of each case but patient's needs and actual benefit always remain the cornerstone of any decision. Informed patient and/or family consent is absolutely necessary.

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