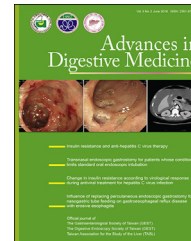




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ORIGINAL ARTICLE

Influence of replacing percutaneous endoscopic gastrostomy for nasogastric tube feeding on gastroesophageal reflux disease with erosive esophagitis



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KEYWORDS

Esophagitis;
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Summary *Background:* The occurrence rate and severity of gastroesophageal reflux disease with erosive esophagitis (EE) in patients after converting nasogastric tube (NGT) feeding to percutaneous endoscopic gastrostomy (PEG) are not well-known. The aim of this study was to determine the influence of PEG placement on the occurrence and severity of EE in patients with long-term PEG feeding.

Methods: This retrospective study included patients with NGT feeding who were converted to PEG feeding and received pre- and post-PEG endoscopy between January 2000 and June 2013. Factors predictive of the occurrence of EE after PEG were analyzed.

Results: One-hundred and twenty patients with NGT feeding were converted to PEG, and 47 patients were included. Before PEG, 21 (44.7%) NGT-feeding patients had EE. The mean follow-up time was 45.7 months (range, 6–147 months). Erosive esophagitis occurred in nine (19.1%) patients after PEG. The occurrence rate ($p < 0.01$) and severity ($p < 0.05$) of EE significantly improved after PEG, compared to before PEG. Hill's classification of gastroesophageal valve was associated with the occurrence of EE after PEG ($p < 0.01$).

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Conclusion: The occurrence and severity of esophagitis improved after converting the patient to PEG. Hill's grading of gastroesophageal valve provides useful information for predicting the occurrence of EE after PEG.

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Introduction

Percutaneous endoscopic gastrostomy (PEG) is increasingly used for long-term enteral nutrition in different chronic disorders. In the United State, the placement of a PEG tube increased from 2.71 to 3.75 placements per 1000 hospitalized patents in 1993 to 2003, respectively [1]. Percutaneous endoscopic gastrostomy is generally regarded as safer than the traditional surgical gastrostomy. However, several complications have been documented such as peristomal wound infection, pneumonia, gastroesophageal reflux disease (GERD), buried bumper syndrome, gastroparesis and bleeding [2–4].

Gastroesophageal reflux disease is defined as “a disease comprising symptoms, end-organ effects and complications related to the reflux of gastric contents into the esophagus, oral cavity, and/or the lung” [5]. Several studies have provided conflicting evidences on the influence of PEG placement on GERD. In the absence of a gold standard method for diagnosing GERD, some investigators have only relied on clinical symptoms [6]. Other investigators have relied on the findings of pH metry [7–11] or scintigraphy [12,13], which cannot confirm the diagnosis of GERD. In addition, the follow-up period of these studies is short, ranging from 3 days to 9 weeks [8–11]. The influence of PEG on GERD remains an incompletely answered question.

Endoscopy has excellent specificity for diagnosing GERD, especially when patients have GERD with erosive esophagitis (EE) [5]. In previous studies, patients have not received the same pre- and post-PEG endoscopic assessment for GERD [4,8]. In addition, most studies only evaluate the incidence of gastroesophageal reflux episodes after PEG [10–12]. However, gastroesophageal reflux episodes do not necessarily indicate EE. Distinguishing gastroesophageal reflux episode from EE is particularly important to avoid an over- or underdiagnosis of the disease and its complications. To the best of our knowledge, no study using endoscopy directly compares the occurrence rate and severity of EE in patients before and after converting NGT feeding to PEG.

To elucidate the relation between PEG placement and EE, we performed a retrospective study with the data of pre- and post-PEG endoscopy to determine whether PEG placement would influence the occurrence and severity of EE in a long-term follow-up cohort.

Patients and methods

Patients

From January 1, 2000 to June 30, 2013, 120 patients with NGT feeding were converted to PEG feeding in Taipei

Medical University Wan Fang Hospital (Taipei, Taiwan). Endoscopic images and reports of PEG procedure were documented in all patients. We recorded clinical history, primary diagnosis, complications, and morbidity during the follow-up period. Six months before PEG placement, 79 patients received endoscopy (i.e., pre-PEG endoscopy). However, 60 patients received endoscopy after PEG (i.e., post-PEG endoscopy). In this study, we included 47 patients with pre- and post-PEG endoscopy. Excluded were the remaining patients who had head and neck, esophageal, or gastric cancer; esophageal stenotic disorder, or achalasia (Figure 1). The Taipei Medical University–Joint Institutional Review Board approved the protocol of this study.

Pre-PEG endoscopy

Six months before the PEG operation, all 47 patients had endoscopy for the evaluation of upper gastrointestinal complaints. If EE was diagnosed, the severity of EE was classified according to the Los Angeles (LA) classification [14]. Grading of the gastroesophageal valve was graded according to Hill's classification [15]. Grade I is defined as a prominent fold of tissue along the lesser curvature that is closely opposed to the endoscope. In Grade II, a fold is present, but it is not as prominent and opens with respiration. In Grade III, a fold is not prominent and the hiatus is patulous. In Grade IV, there is a hiatal hernia without a fold, and the lumen of the esophagus is wide open (Figure 2). All reports and endoscopic images of the 47 patients were retrospectively reviewed by two authors (C.N.C. and F.M.S.). These two authors had performed > 3000 upper gastrointestinal endoscopies. The scores of the LA classification of GERD and Hill's classification of gastroesophageal valve were evaluated, according to the defined criteria.

We treated all endoscopically diagnosed EE patients with a proton pump inhibitor (PPI), based on the indication of the Taiwan National Health Insurance Bureau reimbursement policy. A proton pump inhibitor was used for 4 months in LA Grade A and B patients and for 12 months in LA Grade C and D patients. After completing one treatment course and if another PPI treatment course was intended, the EE patients needed to receive a repeated endoscopy to confirm the continuous presence or occurrence of EE.

PEG procedure

The principle indication for replacing PEG for NGT feeding in patients with swallowing disorders is for the long-term maintenance of nutritional requirements. All patients received prophylactic antibiotics within 30 minutes before the procedure. We performed PEG with Ponsky and Gauderer's [16] pull

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