

# Comparison of Percutaneous Endoscopic Gastrostomy with Nasogastric Tube Feeding in Patients Suffering from Obstructing Esophageal and Upper Aero-Digestive Malignancies - A Retrospective Analysis

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## Abstract

**Background:** A number of conditions compromise the passage of food along the digestive tract. A nasogastric tube (NGT) feeding is a classic, time-proven technique to provide nutritional support, although its prolonged use can lead to complications. Another method, percutaneous endoscopic gastrostomy (PEG) involves a feeding tube inserted directly into the stomach through the abdomen and is particularly useful when enteral nutrition is needed for a length of time.

**Materials and Methods:** Prospective observational study in which patients with obstructing growth of esophagus and oropharyngeal malignancies with dysphagia and poor oral food intake, who were selected for further treatment under curative or palliative intent with chemo-irradiation were included in the study. Patients who underwent PEG tube insertion as feeding procedure before the onset of treatment were compared with patients who had NGT as the feeding procedure.

**Results:** A total of 26 patients with PEG insertion were compared with control group of 28 patients with NTG tube feeding during the treatment. All patients in the PEG group completed chemo irradiation for 5 or 6 weeks depending on the intent to treat. In the NGT group, 5 patients interrupted treatment due to inadequate hydration and nutrition as a result diminishing performance status and required multiple readmissions during the course of treatment. In PEG group, minor complications, such as small leak and minor, wound infection occurred in 7/26 patients which subsided with treatment. No major side effects like pneumonitis or perforation occurred in this group. One patient had slipped of PEG tube due to the extension of growth into the body of stomach. In NGT group, kinking of NGT occurred in 5/26 patients and so had to be reinserted.

**Conclusion:** The studies showed a higher probability of treatment failure with an NGT. The number of deaths was no different with the two methods, nor was the overall occurrence of adverse events. Patients with PEGs may have a better quality of life.

**Key words:** Nasogastric tube, Obstructing esophageal and upper aero-digestive malignancies, Percutaneous endoscopic gastrostomy

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www.ijss-sn.com

**Month of Submission :** 07-2016

**Month of Peer Review :** 08-2016

**Month of Acceptance :** 09-2016

**Month of Publishing :** 09-2016

## INTRODUCTION

A number of conditions compromise the passage of food along the digestive tract. A nasogastric tube (NGT) feeding is a classic, time-proven technique to provide nutritional support, although its prolonged use can lead to complications such as lesions to the nasal wing,

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chronic sinusitis, gastroesophageal reflux, and aspiration pneumonia. Another method, percutaneous endoscopic gastrostomy (PEG) involves a feeding tube inserted directly into the stomach through the abdomen and is particularly useful when enteral nutrition (EN) is needed for a length of time.<sup>1,2</sup>

Conditions associated with swallowing disorders include stroke, neurological diseases, dementia, cancers of the head and neck, amyotrophic lateral sclerosis, physical obstruction, and dysphagia from stroke. The patients with swallowing disturbances can develop low nutritional status, which affects their recovery from illness.

The patients unable to maintain an adequate oral intake have greater rates of weight loss, hospitalization, and forced treatment breaks.<sup>3</sup> Loss of >10% body weight has also been associated with decreased quality of life (QOL).<sup>3,4</sup> Some 40-57% of head and neck cancer patients may be malnourished at presentation,<sup>5</sup> with figures increasing to 88% during the treatment.<sup>6</sup> Causes are multifactorial, with contributions from patient, treatment and tumor factors. EN, delivered via NG or PEG tube, may enable select patients to maintain their weight and minimize toxicity.

#### **Aim**

To evaluate the effectiveness and safety of PEG compared with NGT for patients who were suffering from obstructing growth of the esophagus and upper aero-digestive tract, in terms of nutritional outcomes, complications, patient satisfaction, and cost.

## **MATERIALS AND METHODS**

Prospective observational study was conducted in the Department of Medical Gastroenterology, Thoothukudi Medical College Hospital. The study was conducted over a period of 3-year from June 2013 to May 2016. The patients with obstructing growth of esophagus and oropharyngeal malignancies with dysphagia and poor oral food intake who were selected for further treatment under curative or palliative intent with chemo irradiation were included in the study. The patients had PEG insertion done as feeding procedure before definitive treatment by chemo irradiation. These patients were compared with a similar control group of patients who were given only NGT feeding as the feeding procedure due to various reasons. All these patients underwent radiotherapy for 5-6 weeks depending on the intent to treat - palliative or curative along with chemotherapy regimens. All patients who were candidates for surgical treatment and who had severe trismus due to primary in retromolar trigone were excluded from the study.

A total of 26 patients underwent PEG insertion in the Department of Medical Gastroenterology, Thoothukudi Government Medical College after 2013 for obstructing malignancies of upper aero-digestive tract.

They were compared with an age-matched control group of 28 patients who were managed only with NGT feeding during the treatment.

## **RESULTS**

All the study patients were in the age group between 40 and 80, 19 males and 7 females in the PEG group, and 20 males and 6 females in the NGT group. In PEG group, there were 4 oropharyngeal malignancies, 3 postcricoid malignancies, 1 in upper third esophagus, 7 in middle third esophagus, and 11 in lower third esophagus OG junction growth. In NGT group, there were 7 oropharyngeal malignancies, 3 postcricoid malignancies, 7 in middle third esophagus, 9 lower third esophagus. In PEG group, 24 were squamous cell carcinoma. 2 patients had adenocarcinoma involving the lower third esophagus and OG junction who were inoperable and were on palliative chemotherapy. In NGT group, all 26 were squamous cell carcinoma. All patients in the PEG group completed chemo irradiation for 5 or 6 weeks depending on the intent to treat. In the NGT group, 5 patients interrupted treatment due to inadequate hydration and nutrition and as a result diminishing performance status. In the remaining 21 patients, 8 had removed the NGT during the 2<sup>nd</sup> or 3<sup>rd</sup> week of radiation treatment. In 5 of them, NGT was reinserted for nutrition. The remaining 3 had improvement in dysphagia and so they continued radiation therapy (RT) with the adequate oral intake. Only 13 patients kept the NGT *in situ* at the end of 5 weeks of treatment.

Follow-up: PEG group: 4 patients were lost to follow-up, 14 patients expired after completion of treatment after surviving for varying intervals from 2 months to 1 year, 3 patients expired within 3 months. 19 patients survived for more than 3 months after treatment and 8 patients were alive after 1 year. In NGT group, 6 patients were lost to follow-up, 17 patients expired after completion of treatment after surviving for varying intervals from 2-month to 2-year. 19 patients survived for more than 3 months after treatment and 4 patients were alive after 1 year.

Nutrition and performance status: PEG group: Weight loss was seen only in 3 patients. They had the WHO progression-free survival (PFS) of III or IV. All the remaining 23 patients gained a weight of 1-2.5 kg during treatment and maintained the WHO PFS of II. In NGT

Group, weight loss was seen in 5 patients. They had WHO PFS of III or IV. The remaining 21 patients gained a weight of 0.5-1 kg during the treatment and maintained a WHO PFS of II or III.

The patients with PEG did not have any intermittent hospitalization during and immediately after completion of treatment for nutritional supplementations. All patients in the NGT group had to be admitted for 2-3 times during treatment for reinsertion of NGT and for nutritional supplementation.

Long-term follow-up: PEG tube removal was done in 6 patients who had complete clinical response. In 5 of the 8 patients, who survival was more than 1 year, post-RT stricture was seen and so PEG tube removal was not attempted. NGT: 50% patients removed the NGT either during or toward the end of treatment as the dysphagia improved. Only 5 patients completed the treatment with NGT *in situ* and for whom it was removed after completion of treatment.

Adverse events: PEG: Minor complications such as small leak and minor wound infection occurred in 7/26 patients which subsided with treatment. No major side effects like pneumonitis or perforation occurred in this group. One patient had slipped of PEG tube due to the extension of growth into the body of stomach. NGT: Kinking of NGT occurred in 5/26 patients and so had to be reinserted.

The cost of a PEG tube was 10 times that of an NGT.

## DISCUSSION

A number of conditions compromise the passage of food along the digestive tract. NGT feeding is a classic, time-proven technique to provide nutritional support, although its prolonged use can lead to complications such as lesions to the nasal wing, chronic sinusitis, gastroesophageal reflux, and aspiration pneumonia. Another method, PEG involves a feeding tube inserted directly into the stomach through the abdomen and is particularly useful when EN is needed for a length of time.<sup>1,2</sup>

The patients unable to maintain adequate oral intake have greater rates of weight loss, hospitalization, and forced treatment breaks.<sup>3</sup> Loss of >10% body weight has also been associated with decreased QOL.<sup>5-7</sup> Some 40-57% of obstructing malignancies of esophagus and upper aero-digestive tract patients may be malnourished at presentation,<sup>7</sup> with figures increasing to 88% during treatment.<sup>8</sup> Causes are multifactorial, with contributions

from patient, treatment and tumor factors. EN delivered via NGT or PEG tube, may enable select patients to maintain their weight and minimize toxicity.

Our study showed a higher probability of treatment failure with a nasogastric tube, which is consistent with other reported studies. The number of deaths was no different with the two methods; nor was the overall occurrence of complications. However, the QOL and the WHO PS were better in the PEG group compared to the NGT group. The high cost of PEG and requirements for endoscopy limits the use of PEG as it requires a specialized team for insertion. Possible limitations of this review include the small number of participants.

## CONCLUSION

In the patients with obstructing esophageal and upper aero-digestive tract growths, PEG was associated with a lower probability of intervention failure and interruption of nutrition, while NGT has lower rates or morbidity, suggesting the endoscopic procedure may be more effective and safe compared with NGT. There is no significant difference in mortality rates between comparison groups, or in adverse events, including pneumonia related to aspiration. QOL and performance status during treatment were better with PEG tube than NGT, which is very important for the continuation of treatment in these malignancies. In a country like India, most of the patients with esophageal malignancies present with Grade II or III dysphagia with significant weight loss, and so PEG will be a better modality of nutrition in these patients. Future studies should include details of participant demographics including underlying disease, age and gender, and the gastrostomy technique.

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## Lalitha, *et al.*: Percutaneous Endoscopic Gastrostomy with Nasogastric Tube Feeding

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**How to cite this article:** Lalitha S, Ramasubramanian R, Rejoice P, Shafique A, Anandan H. Comparison of Percutaneous Endoscopic Gastrostomy with Nasogastric Tube Feeding in Patients Suffering from Obstructing esophageal and Upper Aero-Digestive Malignancies - A Retrospective Analysis. A Cross-sectional Study. *Int J Sci Stud* 2016;4(6):161-164.

**Source of Support:** Nil, **Conflict of Interest:** None declared.