Current status of percutaneous endoscopic gastrostomy (PEG) in a general hospital in Japan: a cross-sectional study

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Abstract

Background: There has been debate over the indications for percutaneous endoscopic gastrostomy (PEG) in recent years in Japan. In addition, the level of satisfaction of patients and patient’s family after PEG remains unclear. The aim of this study was to investigate the current status of PEG and the level of satisfaction of patients and patients’ families after PEG in Japan.

Methods: We reviewed the existing data of all patients who underwent PEG tube insertion at Yuri Kumiai General Hospital (Akita, Japan) between February 2000 and December 2010. We examined the following points: underlying diseases requiring PEG, levels of consciousness, and performance status. We also sent a questionnaire to the patients and patient’s families to ask about their satisfaction with and thoughts about PEG.

Results: The data of 545 patients who underwent PEG were reviewed. There were 295 men and 250 women, with a mean age of 77.2 ± 11.4 years. PEG was indicated most frequently for cerebrovascular disorders (48.2%, 239/545). There were 515 (94.4%, 515/545) patients showing consciousness disturbance and 444 (81.5%, 444/545) bedridden patients. The questionnaire was answered by one patient himself and 316 patients’ families. When asked, “Was performing PEG a good decision?” 57.5% (182/316) of the patients’ families answered yes. Meanwhile, when patients’ family members were asked if they would wish to undergo PEG if they were in the same condition as the patient, 28.4% (90/316) answered yes, whereas 55.3% (175/316) answered no.

Conclusions: Few patients were able to make their own decision about PEG tube placement because of consciousness disturbance. As a result, many family members of the patients did not want to experience PEG for themselves. Future studies should be performed to clarify the quality of life and ethical aspects associated with PEG.

Key words: percutaneous endoscopic gastrostomy, current status, questionnaire survey

Introduction

Enteral nutrition reportedly improves the pathologic and nutritional conditions of patients in the acute phase after surgery and of those with malignant head-and-neck or esophageal tumours. Percutaneous endoscopic gastrostomy (PEG) was developed as a means of securing a route for enteral nutrition in patients with dysphagia owing to various causes. PEG tubes are widely used as a convenient and effective route to deliver enteral nutrition as well as to decompress the gastrointestinal tract. According to Japanese guidelines, PEG is widely performed and is indicated for “patients unable to voluntarily ingest by mouth owing to cerebrovascular disorders or dementia” and “patients with repeated aspiration pneumonia.

Enteral nutrition has been used in patients who have difficulty in oral ingestion. With the advent of PEG, tube replacement became relatively easy; thus, gastrostomy is generally selected when oral ingestion becomes difficult.
Although the efficacy of gastrostomy is medically proven, there has been debate over the indications for PEG in recent years, particularly with regard to its use in elderly patients. The Japan Geriatric Society published a guideline on the decision-making process for health care for the elderly in June 2012, noting that use of feeding tubes is a treatment option that should be included in the decision-making process that involves professionals, patients, and relatives. However, there have been no studies that have investigated underlying diseases requiring PEG, decision-making process for PEG, and the level of satisfaction of patients after PEG in Japan.

To understand the current situation of PEG, we retrospectively analyzed the underlying diseases and conditions of patients who underwent PEG in a provincial city in Japan. We also sent a questionnaire to the patients and their families to ask them about their satisfaction with and thoughts about PEG.

Materials and Methods

This study included 545 patients who underwent PEG at Yuri Kumiai General Hospital, Akita, Japan, between February 2000 and December 2010. In September 2014, we reviewed the medical records of these patients for the following information: underlying diseases, levels of consciousness, and independence in activities of daily living. The level of consciousness was determined using the Japan Coma Scale (JCS) and the bedridden level was determined using the Eastern Cooperative Oncology Group (ECOG) scale of performance status. We also sent a questionnaire survey to the patients and patients’ families between December 2012 and May 2013. The questionnaire consisted of the following questions: Q1 Who made the decision mainly for the patient to undergo PEG? Q2 Did the patient become able to ingest orally after PEG? Q3 Was performing gastrostomy a good decision? Q4 Would you wish to undergo PEG if you were in the same condition? This study was approved by the Institute Review Board of Yuri Kumiai General Hospital (March 16, 2012). All patients and patients’ family members who answered the questionnaire provided written informed consent.

PEG tubes were placed by the pull method using a Safety PEG Kit (Boston Scientific Japan K.K., Tokyo, Japan) until 2005 and thereafter were placed by the modified introducer technique using a Kangaroo Seldinger PEG Kit (Covidien, Medtronic, Tokyo, Japan) after fixation using a Funada-style fixture (Create Medic Co., Ltd., Yokohama, Japan). PEG was not indicated for patients with a history of gastrectomy or patients suspected of having other organs between the gastric and abdominal walls.

Results

**Indications for PEG and independence level**

Of the 545 patients with PEG tube placement, 295 were men and 250 were women, with a mean age of 77.2 ± 11.4 years (range: 19–98 years). PEG was indicated most frequently for cerebrovascular disorders, which accounted for 43.8% (239/545) of the cases, followed by aspiration pneumonia (24.0%), malignant tumors (6.4%), and neurological disorders (4.4%) (Table 2-1).

Among the 397 patients (72.8%) at Level I of the JCS, only 30 patients were lucid and were able to make their own decision about PEG tube placement; this accounted for 5.5% of all patients who underwent PEG tube placement. Approximately 90% of patients had a consciousness level at which they were unable to say their own names or date of birth, or worse (Table 2-2). More than 80% of the patients were classified as grade 4 of the ECOG scale of performance status, which is a bedridden state (Table 2-3). The number of patients classified as grade 0 or 1, indicating “independent daily living”, was only 10 (1.8%).

**Clinical outcomes after PEG tube placement**

Regarding the outcomes of patients after PEG tube placement, 124 patients (22.8%) became able to receive home medical care, and more than half were transferred to hospitals or nursing care facilities for recuperation. Eighty-six patients (15.8%) could not be discharged after PEG and died during hospitalization at our hospital (Table 3).

Follow-up after PEG was possible in 493 patients (90.4%) for a median of 864 days (range 4–5, 282 days). Confirmation of the survival or death of patients was performed by telephone or letter to the patients’ family. There were a total
of 434 deaths (79.6%); 34 deaths (6.2%) occurred within 30 days after surgery, 207 deaths (38.0%) occurred within 1 year, and 339 deaths (62.2%) occurred within 3 years.

**Questionnaire survey**

Questionnaires were sent to the patients and patients’ families. Because the whereabouts of the families of 56 patients were unknown, questionnaires were sent to the 489 (489/545 89.7%) patients who underwent PEG tube placement between February 2000 and December 2010. We received responses from one patient himself and 316 patients’ families (317/489, 64.8%). At that time, 51 patients were alive and only one patient could answer the questionnaire by himself.

The results of the questionnaire survey are shown in Table 4. With regard to the person who made the decision mainly about PEG tube placement, patients’ families most often made the decision, accounting for 61.2% (194/317), and this was followed by the doctors (30.3%) and patients themselves (2.4%). After PEG tube placement, only 17.0% (54/317) of the patients became able to ingest food orally. When asked “Was performing PEG a good decision?” 57.5% of the patients’ families (182/316) answered yes, whereas 25.0% (79/316) answered no. On the other hand, when the patients’ family members were asked if they would wish to undergo PEG if they were in the same condition as the patient, 28.4% (90/316) answered yes, whereas 55.3% (175/316) answered no.

**Discussion**

To understand the current situation of PEG tube placement in a Japanese provincial city, we examined underlying diseases requiring PEG and independence at the time of PEG and sent qualitative questions associated with PEG to patients and patients’ families. The rate of person 65 years or older was 29.4% in our city in 2012. This was higher than the average for Japan (24.1%). Underlying diseases requiring PEG tube placement were mostly cerebrovascular disorders and aspiration pneumonia. Regarding the level of independence, most patients undergoing PEG required assistance. In countries other than Japan, PEG tube placement is not

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**Table 2-1** Baseline characteristics of the patients

| Number (men/women) | 295/250 |
|-------------------|---------|
| Mean age, years (range) | 77 (19–98) |
| Disease at the time of PEG n (%) |
| Cerebrovascular disorders | 239 (43.9) |
| Aspiration pneumonitis | 131 (24.0) |
| Malignant tumors | 35 (6.4) |
| Neurological disorders | 24 (4.4) |
| Dementia | 23 (4.2) |
| Others | 93 (17.1) |

PEG: percutaneous endoscopic gastrostomy.

**Table 2-2** Consciousness disturbance of the patients

| JCS score | Number of patients (%) |
|----------|------------------------|
| I (Lucid) | 397 (72.8) |
| II | 110 (20.2) |
| III | 8 (1.5) |

**Table 2-3** Performance status of the patients

| ECOG score | Number of patients (%) |
|------------|------------------------|
| 0–1 | 10 (1.8) |
| 2 | 11 (2.0) |
| 3 | 80 (14.7) |
| 4 | 444 (81.5) |

**Table 3** Place of recuperation after PEG tube placement

| Place | Number of patients (%) |
|-------|------------------------|
| Home | 124 (22.8) |
| Hospital for recuperation | 178 (32.7) |
| Nursing care facility | 142 (26.1) |
| Death at our hospital | 86 (15.8) |
| Unknown | 15 (2.8) |

PEG: percutaneous endoscopic gastrostomy.

**Table 4** Results of the questionnaire survey

| Q1: Who made the decision for the patient to undergo gastrostomy? |
|---------------------------------------------------------------|
| Patient | 8 (2.4%) |
| Patient’s family | 194 (61.2%) |
| Doctor | 96 (30.3%) |
| Other | 13 (6.1%) |

| Q2: Was oral ingestion possible after gastrostomy? |
|-----------------------------------------------|
| Yes | 54 (17.0%) |
| No | 263 (83.0%) |

| Q3: Was performing gastrostomy a good decision? |
|-----------------------------------------------|
| Yes | 182 (57.4%) |
| No | 79 (24.9%) |
| Not clear | 56 (17.7%) |

| Q4: Would you wish to undergo gastrostomy if you were in the same condition as the patient? |
|--------------------------------------------------------------------------------------------|
| Yes | 90 (28.3%) |
| No | 175 (55.2%) |
| Not clear | 52 (16.5%) |
proactively indicated for patients with dementia or elderly patients receiving end-stage medical care because there is doubt about the efficacy and improvement in survival rate in such patients who undergo PEG tube placement.

In this study, we obtained responses, mostly from patients’ families, to questions concerning the level of satisfaction with and thoughts about PEG. The decision to undergo PEG tube placement was made in most cases by the patients’ families or physicians. In Japan, PEG tube placement can currently be performed without obtaining consent from the patients themselves. Only 17% of patients became able to ingest food orally, indicating that it is rare for many patients to achieve dramatic recovery in swallowing function when PEG is selected as a method to prolong life. While 57% of the family members replied yes when asked if undergoing PEG was a good decision, only 28% would wish to undergo PEG if they were in the same condition as the patients. There is a difference between the decision made by the patients’ families and family members’ opinion about PEG tube for themselves. When considering PEG tube placement, appropriate medical judgment and consideration of ethics are required. However, as the patients requiring PEG often cannot make choice for themselves, family members must make the choice on the patient’s behalf in many cases. In these cases, the decision to insert a PEG tube is influenced strongly by the family’s emotions, social traditions, and public opinion.

We examined underlying diseases requiring PEG and thoughts of the patients’ families about PEG in a provincial hospital in Japan. However, this study has certain limitations. First, the questionnaire response rate was low (64.8%). Second, the treatment period (undergoing PEG) and questionnaire period were varying different. Third, only 30 patients (5.5%) were lucid when they underwent PEG tube placement. Therefore, we could not obtain responses from the patients themselves. Nevertheless, the level of satisfaction with and thoughts about PEG could be measured after the patients themselves. Only 17% of patients became able to ingest food orally, indicating that it is rare for many patients to achieve dramatic recovery in swallowing function when PEG is selected as a method to prolong life. While 57% of the family members replied yes when asked if undergoing PEG was a good decision, only 28% would wish to undergo PEG if they were in the same condition as the patients. There is a difference between the decision made by the patients’ families and family members’ opinion about PEG tube for themselves. When considering PEG tube placement, appropriate medical judgment and consideration of ethics are required. However, as the patients requiring PEG often cannot make choice for themselves, family members must make the choice on the patient’s behalf in many cases. In these cases, the decision to insert a PEG tube is influenced strongly by the family’s emotions, social traditions, and public opinion.

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Conflict of Interest: The authors declare that they have no competing of interests.

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