EFFICACY AND SAFETY OF PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN PATIENTS WITH DYSPHAGIC STROKE IN HUE UNIVERSITY HOSPITAL

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Abstract:
Background: Quality of nutrition and prevention of aspiration pneumonitis are two difficult problems in the management of stroke patients. The development of the percutaneous endoscopic gastrostomy (PEG) procedure and standardized PEG kits was an important technological advancement for enteral access. The aim of this study was to assess the efficacy and safety of PEG in stroke patients in Hue University Hospital. **Objectives and methods**: 32 stroke patients hospitalized in the Department of Internal Medicine, Hue University Hospital from June 2006-May 2011. The PEG kit of Wilson-Cook Medical was used (Pull technique): p 24- Pull; Technique description: Pull technique (Ponsky). **Results**: The pull technique -PEG was successfully performed in 93.75% of cases. The mean time of the pull technical procedure was 28 ± 8 min. Quality of nutrition was markedly increased in 81.25%. In 90.62% of cases, patient care became much easier. Incidences of aspiration, and pneumonitis due to aspiration tended to decrease although the differences were not statistically significant. The rate of minor and major complications was very low. No cases of peritonitis, necrotizing fasciitis or death were found. **Conclusion**: The use of PEG in stroke patients with dysphagic disorder appeared effective and relatively safe.
Key words: PEG, dysphagic stroke .

1. BACKGROUND

Stroke diseases account a large percentage among the patients hospitalized in Hue University hospital. The results of treatment depend on many factors. Quality of nutrition and prevention of aspiration pneumonitis are two difficult problems in the management of stroke patients. The development of the percutaneous endoscopic gastrostomy (PEG) procedure and standardized PEG kits was an important technological advancement for enteral access. The aim of this study was to assess the efficacy and safety of PEG in patients with dysphagic stroke in Hue University Hospital.

2. POPULATION AND METHODS

1.1. Populations:

32 stroke patients hospitalized in the Department of Internal Medicine, Hue University Hospital from June 2006-May 2011.

- Inclusion criteria :

o Stroke diseases confirmed by clinics and CT-Scan

o Deglutition disorders after unsuccessful use of nasogastric tubes or long-term tube feeding

o Permission of patients or family to PEG.

- historic control group: 40 patients of dysphagic stroke receiving NG tube feeding.

2.2. Methods

- History of patients
- Quality of nutrition before and after PEG placement (Kcal/day)
- Technique of PEG placement:
- Material:

o Gastroscope Olympus (GIF-V)

o Kit of PEG of Wilson-Cook Medical (Pull technique): p 24- Pull

o Antibiotic prophylaxis (Ceftriaxone) was administered intravenously prior to the

procedure

o Technique description: Pull technique (Ponsky)

- An endoscopy of the stomach was performed to evaluate the anatomy of the stomach.

- the anterior stomach wall was identified and techniques were used to ensure that there were no organs between the wall and the skin.

- a catheter was used to puncture the abdominal wall through a small incision

- a soft guide wire was inserted through this and pulled out of the mouth.

- the feeding tube was attached with the guide wire and pulled through the mouth out of the incision.

- fixation of the PEG tube on the abdominal wall

Contraindications:

Contraindications to PEG placement include: peritonitis, abdominal wall infection, abdominal burns, atypical abdominal anatomy (e.g. malrotation).

Fig 1: set of PEG-Cook

Fig 2: location of penetration point

Fig 3: small incision on abdominal wall

Fig 4: insert guide wire through the trocart

Fig 5: Pull the tube through abdominal wall

Fig 6: After procedures

- Follow up: 3 months
- The outcomes of study:
  - Rate of success
  - Quality of nutrition (kcal/day): considered increased when improve > 50 Kcal/day achieved.
  - Facility of patient care
  - Aspiration and aspiration pneumonitis
  - Complications of procedure
- Statistics: using Epi-table in Epi-Info 6.0 (WHO); $p<0.05$ was considered statistically significant.

3. RESULTS

3.1. Rate of successful PEG placement

Table 1. Rate of successfulness of procedure

Results	n	Percentage (%)
Successful	30	93.75
Failure	2	6.25
Total	32	100

Comments: Pull technique -PEG was successfully performed in 93.75%, only one case (6.25%) failed to finish.

- Mean time of procedures: X ± SD = 28 min ± 8

3.2. Efficacy of PEG

Table 2. Nutrition quality

Quality	n	Percentage (%)	p
Increased quality	26	81.25	<0.001
Decreased quality	0	0	
Unchanged quality	6	18.75	
Increased facility of care	29	90.62	<0.001
Decreased facility of care	1	3.13	
Unchanged quality	2	6.25	

Comments: Quality of nutrition was clearly increased in 81.25% of cases. In 90.62%, patients care became easier.

Table 3. Changes aspiration pneumonitis

Events	PEG feeding n=32		NG tube feeding n= 40		p
	n	%	n	%	
Aspiration without pneumonitis	2	6.25	9	22.5	>0.03
Aspiration pneumonitis	1	3.13	5	12.5	>0.05
Fatal pneumonitis	0	0	2	5	

Comments: incidence of aspiration, pneumonitis due to aspiration appeared to decrease although the differences were not statistically significant (p>0.05).

Table 4. Minor Complications

Complication	**n**	**Percentage (%)**
Ileus	2	6.25
Peristomal infection	2	6.25
Stomal leakage	1	3.13
Buried bumper	0	0
Gastric ulcer	3	9.37
Fistulous tracts	0	0
Inadvertent removal	0	0

Comments: the rate of minor complications were very low, only 9.37 having gastric ulcer, 6.25% having ileus, peristomal infection and 3.13 having stomal leakage.

Table 5. Major complication

Complication	**n**	**Percentage (%)**
Aspiration	1	3.13
Hemorrhage	1	3.13
Peritonitis	0	0
Necrotizing fasciitis	0	0
Death	0	0

Comments: only 3.13% had aspiration and 3.13% had minor hemorrhage. No case of peritonitis, necrotizing fasciitis or death was found.

4. DISCUSSION

Percutaneous endoscopic gastrostomy (PEG) is the preferential route when the treatment is expected to last for a longer period of time since it is associated with less treatment failures and better nutritional status than nasogastric tube feeding (NGT) [10]. Moreover, the risk for complications is less with PEG than with NGT [9]. PEG was originally described for pediatric use, but today it is the most common way of supplying artificial enteral nutrition also in adults including the elderly. The intent by using artificial enteral nutrition may be to increase quality of life or to prolong survival.

There are various ways to place PEG tubes. The most common technique is "Pull" technique. This technique was first performed by Ponsky and other colleagues. This procedure, when done in experienced hands, was simple, straightforward and rapidly performed and the complications are minimal. In this study, the rate of success was very high (93.75%), only one case had difficulty due to bad cardiovascular condition. The mean time of the pull technique procedure was 28 $\pm$ 8 min.

Many studies in patients with dysphagic strokes have demonstrated improved nutrition and rehabilitative gains following PEG placement. In this study, the quality of nutrition was markedly improved in 81.25% of patients. The care provided by the relatives of the patients clearly became much easier. In fact, many authors suggest that poor nutritional status on admission predicts poor outcomes after a stroke, providing a rationale for controlled trials evaluating means to improve nutritional status. One such study compared routine early (within the first seven days) oral protein-energy supplementation with a regular hospital diet in patients who had a stroke but could still swallow. Most patients were not undernourished at baseline [6],[7].

In one trials, 859 patients were randomly assigned to early enteral tube feeding (via the clinicians preferred method) or no tube feeding (only parenteral fluids) for more than seven days, while in the other trial 321 patients were randomly assigned to PEG or nasogastric tube feeding. In the first trial, early tube feeding did not reduce the likelihood of death or a composite endpoint of death or poor outcomes more than no tube feedings at six months. In the second trial, enteral tube feeding via PEG did not reduce death or poor outcomes more than nasogastric tube feeding [7],[8]

These data suggest that there does not appear to be a compelling urgency to begin nutrition support immediately after a stroke in patients who are not undernourished at presentation, although some forms of nutrition should be started within the first week. Furthermore, PEG feeding can be deferred for two to three weeks to determine whether spontaneous recovery will develop and to allow time to discuss the risks and benefits of PEG tube placement.

Concerning aspiration pneumonitis, in this study, incidence of aspiration, pneumonitis due to aspiration tend to decrease although the differences were not statistically significant ($p>0.05$). This may be due to an insufficient number of patients, although the preliminary results were very promising.

Many other studies in the world have found significant decrease in the rate of aspiration pneumonitis in stroke patients and consequently decrease death rate.[3]]4]

Safety of pull technique:

In our study, the rate of minor complications was very low, only 9.37 having gastric ulcer; 6.25% for ileus, peristomal infection and only 1/32 cases (3.13%) having stomal leakage which is improved by removing the tube for a few days allows the stoma to narrow and permits an identically sized replacement

tube to be re-inserted. Among major complications, only 3.13% had aspiration and 3.13% had minor hemorrhage. No case of peritonitis, necrotizing fasciitis or death was found. Carol and some other authors had also found that the rate of procedure-related mortality and 30-day mortality attributable to PEG placement itself are extremely low (0% to 2% and 1.5% to 2.1% respectively) [1][2] [5]. It should be noted that mortality associated with PEG placement is significantly higher in hospitalized patients, patients with diabetes, poor nutritional status, and long-term corticosteroid administration. Complication rates of percutaneous gastrostomy tubes placed endoscopically versus radiologically using fluoroscopy are similar.

The available data support the use of PEG in stroke patients with disordered swallowing. In such patients they are a convenient and relatively low-cost means of providing nutrition, which can improve rehabilitation potential and possibly accelerate recovery of acceptable swallowing function and improve clinical response to other medical therapies.

5. CONCLUSION

- Pull technique - PEG was successfully performed in 93.75% of cases. The mean time of the pull technique procedure was 28 min ± 8

- Quality of nutrition was markedly increased in 81.25%. In 90.62%, patients care became much easier. Incidences of aspiration, pneumonitis due to aspiration appeared to decrease although the differences were not statistically significant.

- The rate of minor and major complications was very low. No cases of peritonitis, necrotizing fasciitis or death were found

- Future studies are needed to elucidate the effect of PEG on survival time in these patients.

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