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The importance of catheter insertion point during percutaneous endoscopic gastrostomy

Perkütan endoskopik gastrostomi sırasında kateterizasyon noktasının önemi

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SUMMARY

Objective: it is essential to minimize complications during percutaneous endoscopic gastrostomy(PEG). The relationship between catheter insertion point and minor complications of percutaneous endoscopic gastrostomy is very important. The aim of this study is to evaluate the PEG results in our surgical endoscopy unit.

Method: This study included retrospective review of 76 patients who underwent percutaneous endoscopic gastrostomy in the endoscopy unit of Yenikent state hospital between 2008 and 2011. PEG catheter insertion point evaluated retrospectively. The patients were divided into two groups according to PEG catheter insertion point. The results were processed with SPSS® ver. 21.0 (Chicago IL) $p<0.05$ was accepted to be statistically significant.

Results: There were 48 (63%) men and 28 (37%) women. The median age of the patients was 57.74 (23-87) years. There was no major complication. Minor complications were occurred in 3 (%7.89) of patients from group I, 10(%26,31) of patients from group II and 13(%17.10) all patients. Statistically significant differences were found between in group I and group II ($p<0.005$).

Conclusions: PEG is a very efficient, safe and fast method. Minor complications are occurred mainly among patients with inappropriate PEG insertion point, which is a technique-related factor. If catheter insertion is made appropriate point where is two-thirds or three-quarters of the distance from the umbilicus to the midpoint of the left costal magrin, it is seem to reduction of minor complications.

Keywords: Endoscopy, Gastrostomy, Technic, Complication.

ÖZET

Amaç: Perkütan endoskopik gastrostomi (PEG) sırasında komplikasyonları minimize etmek esastır. Kateterizasyon noktası ile PEG'in minör komplikasyonlar arasındaki ilişki çok önemlidir. Bu çalışmamızda cerrahi endoskopi ünitemizde uygulanan PEG sonuçlarının değerlendirilmesini amaçladık.

Yöntem: Yenikent devlet hastanesi endoskopi ünitesinde 2008- 2011 yılları arasında 76 hastaya PEG girişiminde bulunuldu. PEG uygulanan hasta sonuçları retrospektif olarak değerlendirildi. Kateter yerleştirme alanına gore hastalar iki gruba ayrıldı. Sonuçlar istatistiksel değerlendirilmesi SPSS, Windows 21.0 ile gerçekleştirildi ve $p<0.05$ istatistiksel olarak anlamlı kabul edildi.

Bulgular: Hastaların 48 (63%) erkek, 28 (37%) kadın ve yaş ortalaması 57.74 (23-87) idi. Majör komplikasyon gözlenmedi. Minor komplikasyonlar birinci grupta 3(%7.89), ikinci grupta 10(%26,31) ve tüm hastaların 13(%17.10) 'ünde meydana geldi. Istatistiksel olarak iki grup arasında anlamlı fark bulunmuştur($p <0.05$).

Sonuç: PEG güvenli, etkili ve hızlı bir yöntemdir. Minor komplikasyonlar özellikle kateterizasyonun yanlış noktada yapılmış hastalarda meydana gelmektedir. Kataterizasyon sol arkus castalis ile umblikus arasındaki doğrunun ¾ veya 2/3 lük alanda yapılır ise mimör komplikasyonları azaltır.

Anahtar sözcükler: Endoskopik, Gastrostomi, Teknik, Komplikasyon.

INTRODUCTION

The first percutaneous endoscopic gastrostomy(PEG) recorded in the medical literature was performed in 1980 by Gauderer and Ponsky[1,2]. PEG is now preferred method for long-term feeding in patients who are unable to swallow or who require supplemental nutrition or chronic gastric decompression. PEG has supplanted traditional surgical gastrostomy, or laparoscopic gastrostomy, since it is as safe[1,2] and is less invasive, and less expensive[3,4]. There are many indications for PEG such as esophageal and nasopharyngeal cancer, brain ınjury, stroke, facial and pharyngeal trauma, head and neck cancer, and other indications. PEG is contraindicated only in patients with total esophageal obstruction, massive ascites, or intra-abdominal sepsis. Two methods of PEG placement (push technique and pull technique) are in current used[5]. Although considered safe, PEG is associated with many potential complications. Complications related to PEG are stratified as major and minor. Major complications associated with PEG are reported at rates of 0.5% to 17%[2,5,6]. Minor complications associated with PEG are reported at rates of 5% to 16% and can include peristomal laekage, ileus, bleeding, hematoma, tube dislodgement, impacted lumen and peristomal infection. Peristomal infection is the complication most frequently reported[7,8]. This study was designed to investigate minor complications in the patients who underwent PEG.

MATERIAL AND METHOD

A retrospective analysis was performed of patients who underwent PEG on over a 3 year period (March 2008-November 2011). Indication for PEG is on the Table I. The procedure was performed by same staff using the pull technique at the endoscopy unit of the department of general surgery, Yenikent State Hospital, Sakarya-Turkey.

Table I: Indications of percutaneous endoscopic gastrostomy.

	N	%
Esophageal and nasopharyngeal cancer	4	5.3
Brain ınjury, stroke	54	71
Facial and pharyngeal trauma	4	5.3
Head and neck cancer	8	10.5
Other indications	6	7.9

Date about patients' age, sex, additional disease, and PEG catheter insertion points were collected (Table II). Patients were divided into 2 groups according to PEG catheter insertion point: Group I; Two-thirds or three-quarters of the distance from the umbilicus to the midpoint of the left costal magrin, and Group II; outside two-thirds or three-quarters of the distance

from the umbilicus to the midpoint of the left costal margin. PEG catheter insertion points were evaluated retrospectively (scanning patient files).

Table II: General characteristics of two groups.

	Group I	Group I	p Value
N	38	38	
Mean age, years	56±18	59±12	p>0.005
Body mass index	28,3	31.2	p>0.005
Abdomen skın scar	4	5	p>0.005
Sex(male/famele)	22/16	26/12	
Diabetes Mellitus	5	6	

The study was approved by the hospital ethical committee. Prior to the procedure, a single dose of prophylactic antibiotic (cephalosporin) was given all patients intravenously.

The process; Patient's were placed on the endoscopy table in the supine position or semi-fowler position. Topical anesthesia of the oropharynx was supplemented with intravenous sedation to allow endoscopy. Endoscope was inserted into the stomach and fully inflated with air. The site of PEG tube placement was determined by transillumination of the abdominal wall and indentation of the gastric lumen, with direct pressure of a blunt pointer. Ideally, this point should be 2-3 cm below the left costal margin. It is critical that the assistant's finger be clearly observed to ident the stomach. After skin disinfection, a local anesthetic was infiltrated around the puncture site and 3-5 mm incision was made on the skin. The needle was inserted through the abdominal and gastric walls, and the tip visualized with the endoscope. a guidewire was threaded through the needle, grasped with endoscopic snare, after that the needle withdrawn from the abdominal wall. The endoscope snare guidewire was withdrawn as a single unit. The tapered end of the gastrostomy tube was then secured to the guidewire and pulled back down into the stomach. The inner bumper was gently pulled up against the gastric mucosa and the tube was then secured in position by an external retention flange. A second look was performed occasionally to confirm the position of the tube within the stomach. The skin around the PEG tube site was cleaned with antiseptic solution and a bandage was placed to protect the PEG site.

The results were processed with SPSS® ver. 21.0 (Chicago IL) $p<0.05$ was accepted to be statistically significant.

RESULTS

PEG was performed 76 patients. There were 48 (63%) men and 28 (37%) women. The median age of the patients was 57.74 (23-87) years. The median age of men and The median age of women were compered, and no stastically significant differences were found between both groups ($p>0.05$). Neurological causes were the most frequent indication for the PEG (Table I). 54 (71%) patients were underwent PEG because of brain injury and stroke.

There were no major complications or death during the process. Minor complication rate in the whole series was %17.1 and occurred in 13 patients (Tablo III). The most frequent minor complication was peristomal infection. Peristomal infection, hematoma, tube dislodgement and peristomal laekage were occurred in 9 (11.80%), 1 (1.31%), 1 (1.31%), and 2(2.63%) of all patients. Minor complication such as peristomal infection, hematoma, tube dislodgement and peristomal laekage occurred in 3(7.89%) of patients from group I, 10(26.31%) of patients from group II. Significant statistically differences were found between group I and group II ($p<0.05$).

We identified 11 (14.47%) patients with diabetes mellitus (DM). 5 patients were in group I, and 6 patients in group II. There were no significant statistically differences between two groups according patient-related factor such as DM, sex, and body mass index ($p>0.05$).

Table III: Minor complications during percutaneous endoscopic gastrostomy.

Minor complications	Group I (n,%)	Group II (n,%)	Total (n,%)
No complication	35 (%92.10)	28(%73.68)	63(%82.90)
Peristomal infection	2(%5.26)	7(%18.42)	9(%11.85)
Peristomal laekage	-	2(%5.26)	2(%2.63)
Tube dislodgement	-	1(%2.63)	1(%1.31)
Hematoma	1(%2.63)	-	1(%1.31)
Total complications	3(7.89)	10(%26.31)	13(17.10)
Total patient	38	38	76(%100)

DISCUSSION

Three basic routes for gastrostomy creation are now avaible[5,9]. Traditional surgical gastrostomy, laparoscopic gastrostomy and PEG. PEG has supplanted traditional or laparoscopic gastrostomy, since it is as safe and is less expensive[1,2,3,4,10,11]. Two methods of PEG placement (push technique and pull technique) are in current use[5]. There are advantages and disadvantages to each method.

Gastrostomy may be indicated in patients with stroke, dementia, progressive neurologic processes, severe psychomotor retardation, tumor of the upper aerodigestive tract, or severe facial trauma[5]. PEG is an acceptable means of providing enteral feedings4. PEG is contraindicated in patients with total esophageal obstruction, morbid obesite, coagulapathy, massive ascites, or intra-abdominal sepsis[3].

Initial studies have shown limited effectiveness of antibiotic prophylaxis in reducing peristomal infection[12,13]. Prior to the procedure, a single dose of prophylactic antibiotic (cephalosporin) should be given all patients,intravenously. We used 1 gr cephalosporin prior the PEG.

It is essential to minimize complications during percutaneous endoscopic gastrostomy(PEG). Overall PEG placement complication rate was 13.7%[6]. Although considered safe, PEG is associated with many potential complications. Complications related to PEG are stratified as major and minor. Major complications associated with PEG are reported at rates of 0.5% to 17%[2,5,8] and can include peritonitis, gastrocolic fistula, early tube extrusion, visceral perforation, PEG site metastasis, sepsis,gastric hemorrhage and intra-abdominal abscess[9,10]. We had no major complication.

Minor complications associated with PEG are reported at rates of 5% to 16% and can include peristomal laekage, tube dislodgement, hematoma, ileus, bleeding, Gastroparasia, peristomal infection, peristomal pain and impacted lumen. Minor complications were more prevalent but can be prevented. The most frequent complications were peristomal laekage and peristomal infection[8,11]. Minor complication rate in this study was 17.10% and occurred in 13 patients, and similer previously report. There are two main factor cause minor complications; patient-related and technique-related. Both patient-related and technique-related have been linked to PEG site infection[8]. Obesity, DM, malnutrition, and corticosteroid use represent patient-related factors. Location and size of the abdominal wall incision and excessive traction on the PEG tube are technique-related factors[8,9,11].

This study; minor complication rate were occured mainly among patients with inappropriate PEG insertion point, which is a

technique-related factor. Our data show that minor complication such as peristomal infection, hematoma, tube dislodgement, and peristomal laekage correlated positively with inappropriate PEG insertion point of the patients. Appropriate point of incision during PEG placement decreased complication.

In conclusion; the point where transillumination is observed during the procedure, ideally this point should be approximately two-thirds or three-quarters of the distance from the umblicus to the midpoint of the left costal margin[3]. It is critical that the assistant's finger be observed clearly to indent the stomach. So excessive traction on the PEG tube can be prevented.

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