G Chir Vol. 27 - n. 10 - pp. 388-391
Ottobre 2006

Complications of percutaneous endoscopic gastrostomy: a surgical experience

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SUMMARY: **Complications of percutaneous endoscopic gastrostomy: a surgical experience.**

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Aim: *Percutaneous endoscopic gastrostomy (PEG) is a practical and safe option to place an alimentary gastrostomy. We observed that a relevant rate of complications are related to management of PEG.*

Patients and methods: *We registered the patients treated in our Unit from September 1994 to December 2005. We placed 293 PEG (243 pts). Preferably using a tube 16 Fr, in 7 cases 18 Fr, in 21 cases 20 Fr and only in 3 cases 9 Fr. The median age was 69,8 years; ratio female:male 3:1. In 67 cases the treatment was carried out in not hospitalized patients.*

Results: *The incidence of late and early complications is statistically higher in hospitalized patients than at home.*

Conclusion: *We think that a correct management of PEG (nurses correct information) and the experience of endoscopist and a dietician can significantly reduce the rate of complications.*

RIASSUNTO: **Le complicanze della gastrostomia percutanea endoscopica: un'esperienza chirurgica.**

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Scopo: *La gastrostomia percutanea endoscopica (PEG) è una pratica e sicura opzione per il posizionamento di una gastrostomia alimentare. Abbiamo osservato che una quota significativa di complicanze sono correlate alla gestione della PEG.*

Pazienti e metodi: *Dal settembre 2004 al dicembre 2005 abbiamo posizionato presso la nostra Unità Operativa 293 PEG (243 pazienti). Abbiamo preferibilmente utilizzato sonde da 16 Fr, in 7 casi da 18 Fr, in 21 casi da 20 Fr e solo in 3 casi da 9 Fr. L'età mediana dei pazienti è risultata essere pari a 69,8 anni; il rapporto maschi/femmine pari a 1:3. In 67 casi il trattamento è stato condotto in pazienti non ospedalizzati.*

Risultati: *L'incidenza di complicanze precoci e tardive è statisticamente più alta in pazienti ospedalizzati rispetto ai pazienti gestiti a domicilio.*

Conclusioni: *Suggeriamo che una corretta gestione della PEG (informazioni corrette al personale di assistenza) e l'esperienza dell'endoscopista e del nutrizionista possano ridurre significativamente la percentuale di complicanze.*

KEY WORDS: PEG - Enteral Nutrition - Complications - Buried bumper syndrome - Congenital hernia.
Gastrostomia percutanea endoscopica - Nutrizione enterale - Buried bumper syndrome
Ernia congenita.

Introduction

Percutaneous endoscopic gastrostomy (PEG) is today a gold standard to place an alimentary gastrostomy to patients who require an enteral nutrition. Malnutrition is a cause of morbidity and mortality in traumatised patients, surgical patient and cardiovascular cases (1-2) and PEG should be a therapeutic option for the fixation of congenital diaphragmatic hernia in high surgical risk cases (3).

The endoscopic procedure is safe and can be conducted in hospitalized and not hospitalized patients that require an enteral nutrition (patients affected by oncological and cerebrovascular diseases and traumatised patients).

We have analyzed the incidence of early (within a month) and late complications in 293 patients treated from September 1994 to December 2005 by the équipe of General Surgery and Organ Transplantation of the University of Parma.

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Patients and methods

From September 1994 to December 2005 we have treated 293 patients with PEG for enteral feeding. The indication to PEG was in 148 pts. a head and neck cancer, in 68 pts. cerebro-vascular diseases, trauma in 49 pts. and other conditions in 28 cases. The median age was 69,8 years with a ratio female:male as 3:1. In 58 cases the treatment was carried out in not hospitalized patients.

The technique used in our cases is the classic approach to a PEG placement; we do not consider always necessary the transillumination to place the PEG. In our experience is fundamental the finger's visualization through pull the wall of stomach to identify the place for a correct gastrostomy under endoscopic vision.

We prefer a tube of 16 Fr; in few cases we have used a smaller tube only in correlation with logistic conditions (Table 1).

TABLE 1 - DIAMETER OF PEG TUBE.

	Pts (n)
Tube of 16 French	262
Tube of 18 French	7
Tube of 20 French	21
Tube of 9 French	3

During the procedure all patients are monitored through an oxymeter and in 33 cases we used a mild sedative (midazolam). We administer 2,2 g of amoxicillina-clavulanic acid 1 hour before the procedure as a profilaxis (4).

The mean follow up was 6,1 months for 211 patients,

All dates have been statistically analyzed to chi-square and t-student test. We have considered statistically significant $p<0,05$.

Results

In 25 cases we have registered the early development of complications (within a months from procedure) and in 19 cases the late development of these (Table 2). The incidence of complications was statistically higher in hospitalized patients ($p<0,05$). The average life of positioned tube was 297 days; in 48 cases the PEG was removed before six months because enteral feeding was no longer necessary.

TABLE 2 - COMPLICATIONS.

	Pts (n)	
	hospitalized	**at home**
Early complications		
Peristomal infection	6	2
Abscess	4	1
Peristomal bleeding	6	-
Accidental removal	4	1
Peristomal leak (major)	1	-
Late complications		
Accidental removal	4	-
Abscess	4	-
Buried bumper syndrome	2	1
Peristomal fistula	4	-
Ab ingestis	3	1

In 9 cases we were not able to positioned the PEG for anatomical problems correlated to neck's surgical procedures.

We registered major and minor complications. In the first group (major damage) we found four cases:

a) A 59 years old woman, affected by a laryngeal cancer, showed after 3 weeks from PEG procedure the presence of a peristomal leak. This complication was charachterized by an acute abdomen, leukocytosis (> 15.000 white cells/mm^3), signs of perforation to Rx abdomen. We treated surgically the patients with a median laparotomy that registered the presence of fluid in abdomen and in the muscle wall. We drained the collection and sutured the stomach leak and washed the abdominal cavity. The patient was discharged after 6 days.

b-c-d) Three patients affected by buried bumper syndrome were treated by endoscopic approach to free the internal bumper (Fig. 1) with a diatermic needle; in two cases we conducted with success the endoscopic procedure but in the third case we placed a second PEG in another zone of gastric wall after the cut of the external first tube (the internal bumper was deserted inside the wall) for the ASA status of patient (ASA IV), with a real contraindication to surgical procedure.

All the others cases (minor complications) were treated with ambulatory admissions.

Fig. 1 - Buried bumper syndrome: internal bumper buried in the gastric wall.

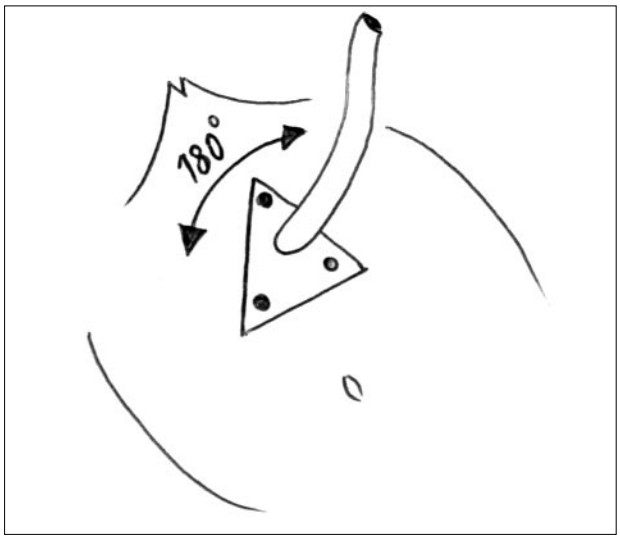

Fig. 2 - Move the tube clockwise and anticlockwise.

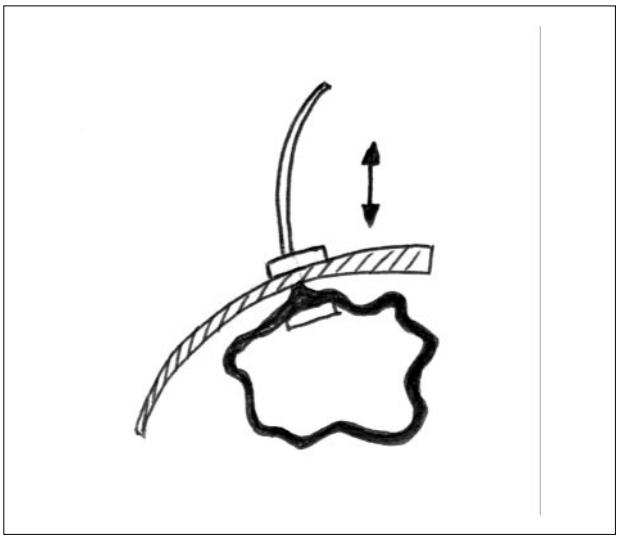

Fig. 3 - Backwards and forwards at least 1 cm.

Discussion

Several studies have reported the advantage of PEG in surgical, traumatised, cerebrovascular and oncological patients. The incidence of complications is directly correlated to experience of endoscopist. Today the mortality rate to PEG procedure is 0,05-8% and the morbidity is 10-30% (5-14).

We showed a higher incidence of PEG complications in hospitalised patients than in not hospitalised; these records are correlated to the major attention that the family give to management of PEG at home. We reccomend to family the use of a protocol for the care the PEG which is characterized by the need to move the tube dayly clockwises and anticlockwise, and backward and forwards at least 1 cm (Figs. 2 and 3). All this to guarantee a gradual reduction of tension between the bumpers especially in patient that show body weight loss to diminished the incidence of buried bumper syndrome.

The buried bumper syndrome is related to the characteristic of internal bumper: if this is softer, is more easily buried in to the gastric wall especially if the traction is too much between the internal and external bumpers (15-17). In this case we prefer not to free the internal bumper and place the second PEG in another zone of stomach, as in one case of our experience. We place a second PEG without remove the first bumper only in patient with an expectancy life low (ASA IV), because the risk of bleeding and cardiovascular accident are higher than other cases.

In cases that require a long term enteral nutrition and have an expected life span of more than a year, we justify the use of polyurethane gastrostomies. To the life of tube is important the correct use of this and the personalization of the diet to avoid the gastrointestinal correlated symptoms. Several studies have demonstrated that the causes of PEG deterioration are several (the correct use, the correct diet, the bacterial infection and fungal colonization can reduce the median life of the enteral tube). We must pay a particular attention to a complication burned in patients affected by ischemic cerebrovascular disease or not collaborant because the clinical symptoms are always later.

The correct management of PEG (nurses correct information), the experience of the endoscopist in the selection of candidates to procedure (18) and a dietician can significantly reduce the rate of complication.

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