

Feasibility and Reliability of Open Gastrostomy as an Old Method

Eski Bir Yöntem Olarak Açık Gastrostominin Uygulanabilirliği ve Güvenilirliği

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ÖZ

Amaç: Enteral nutrisyon için gastrostomi çoğunlukla endoskopik olarak yapılır. Endoskop veya diğer aygıtlar olmadığında veya faringoözofageal obstrüksiyon olması halinde, açık teknik, lokal anestezi altında minilaparotomi ile uygulanabilir. Biz bu çalışmada, ihtiyaç halinde bu eski tekniğin güvenilirlik ve uygulanabilirliğini sunmak istedik.

Araçlar ve Yöntem: Bu eski yöntemle 28 hasta opere edildi. Yöntem, ksifoidin hemen altından mini vertikal insizyon (2-3 cm) ile lokal anestezi altında uygulandı. Gastrostomi tüpü, gastrotomi sonrası direk görüş altında mide duvarından girildi. Mide duvarı çift purse string dikişle dikildi. Tüp sol subkostal karın duvarından dışarı çıkarıldı. Tüm veriler retrospektif olarak değerlendirildi.

Bulgular: Tüp gastrostomi, lokal anestezi altında minilaparotomi ile kolayca ve güvenle uygulandı. Herhangi bir komplikasyon gözlenmedi. Ortalama operasyon süresi 36.07 ± 10.18 dakikaydı ve tüm hastalar operasyondan 24 saat sonra beslenmeyi tolere etti.

Sonuç: Minilaparotomi ile lokal anestezi altında yapılan tüp gastrostomi, ihtiyaç halinde güvenle ve kolayca yapılabilir. Bu eski tekniği, endoskop, diğer enstrümanlar olmadığında veya özefagus obstrüksiyonu durumunda kullanabiliriz. Her ne kadar lokal anestezi altında minilaparotomi ile tüp gastrostomi uygulaması kolay ve güvenli olsa da, tüp gastrostomiler için endoskopik yöntemler kullanılmalıdır.

Anahtar Kelimeler: Gastrostomi, laparotomi, nutrisyon

ABSTRACT

Purpose: Gastrostomy for enteral nutrition is often performed endoscopically. If an endoscope or other instruments are not available or a pharyngoesophageal obstruction is seen, an open gastronomy technique can beuseful under local anesthesia using minilaparotomy. In this study, we aim to present the feasibility and reliability of this old method when needed.

Materials and Methods: Twenty-eight patients were operated on using this old technique. The operations were performed under local anesthesia with a mini vertical incision (2-3 cm) just below the xiphoid process. A gastrostomy tube was inserted through the gastric wall under direct vision after the gastrotomy. The gastric wall was fastened with double-purse string sutures. The tube was taken out from the left subcostal gastric wall. All the data were evaluated retrospectively.

Results: A tube gastrostomy was performed easily and safely in all patients under local anesthesia by way of a minilaparotomy. There were no observed complications. The mean operative time was 36.07 ± 10.18 minutes and all the patients tolerated feeding within 24 hours of the operation.

Conclusion: A tube gastrostomy can be performed safely and easily under local anesthesia by way of a minilaparotomy when necessary. We can use this old technique when we don't have an endoscope, other instruments or in case of an esophageal obstruction. Although this technique is safe and easy to perform, endoscopic methods should be used for tube gastrostomies.

Key Words: Gastrostomy, laparotomy, nutrition

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INTRODUCTION

Enteral nutrition is mostly preferred via mouth for all patients. But sometimes, it can be impossible or deficient on account of gastrointestinal surgery, neuromuscular diseases or obstruction of pharyngoesophageal route. Under those conditions, nutrition must be supplied via a different route.^{1,2} Gastrostomy and jejunostomy are common methods for enteral nutrition. It can be performed by radiological, surgical or endoscopic techniques.³

Percutaneous endoscopic gastrostomy (PEG) was first described in 1980 by Gaudener et al⁴ Subsequently, gastrostomies have been performed endoscopically due to not requiring general anesthesia and laparotomies. PEGs are more suitable for patients needing enteral nutrition. But they have some complications such as wound infections, leakage, peritonitis, hemorrhage, gastrocolic fistula and etc.^{5,6}

In case of a high grade stenosis caused by an esophageal-pharyngeal tumor or some head and neck tumors, an upper gastrointestinal system endoscopy may not be possible.⁷ Moreover, a PEG may not be possible especially for patients with severe neuromuscular disease and continuous non-invasive ventilatory support.⁸ Endoscopy specialists or instruments are not widely available in some community hospitals in Turkey and in these cases, surgery may be required.

In this study, all gastrostomies were performed under local anesthesia by way of a minilaparotomy. All parameters were analyzed retrospectively.

MATERIALS AND METHODS

Descriptive retrospective study is designed, and the universal principles of the 1964 Declaration of Helsinki and its later amendments were applied. This research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects".

This study included 28 gastrostomies that were performed by the same surgeon between September 2011 and March of 2017. The indications for the gastrostomies and the patients' diagnosis were recorded. The study included all patients who were feeding via a nasogastric tube for more than one month. The patients were evaluated by endoscopy or radiological examinations to exclude the gastric pathology. Radiological examinations were performed

due to obstruction or sedoanalgesia rejection of endoscopy. The same operative technique was used in all patients and Cefazolin sodium (1000 mg) was used for antibiotic prophylaxis.



Figure 1. Gastric wall was pull out via a Babcock .

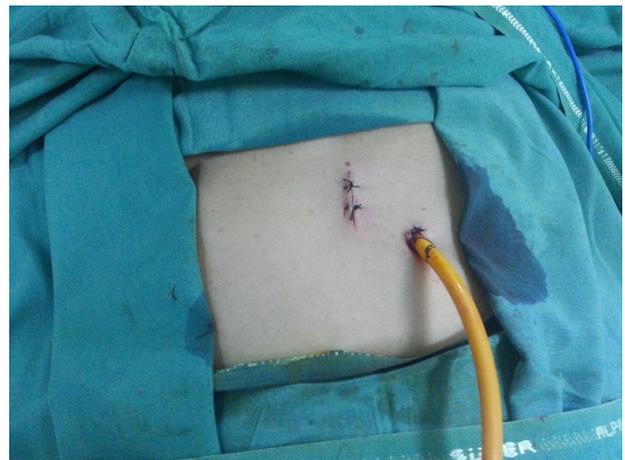


Figure 2. End of operation.

In the operating room, a laparotomy was performed under local anesthesia via a mini vertical incision (2-3 cm) just below the xyphoid process. A 10ml Lidocain HCL and Epinephrine mixture (Lidocaine HCL 10mg/ml and Epinephrine 0.00625mg/ml) was used for the local anesthesia. The gastric wall was localized under direct vision and pull out via a Babcock (Figure-1). When it was difficult to find the gastric wall, some air was pumped into the stomach with a nasogastric tube. Twenty two French Foley catheters (foley catheter® Beybi plastic fab.san. A.Ş. Istanbul, Turkey) were passed through a left subcostal stab wound. The gastric wall was perforated with an electrocautery and sutured with 2/0 round silk double purse string sutures after the catheter passed through the perforated gastric wall. The catheter cuff was

inflated with 15ml of serum physiologique. No sutures were placed between the stomach and the peritoneum. The fascia was closed with absorbable sutures and the skin was closed with silk sutures after the catheter was retracted. Then, the operation was finished by the surgeon (Figure-2).

During surgery, sedation was given to some of the patients. A midazolam infusion (2 mg in 100cc serum physiologique) was used as the sedative. The operative time was recorded from the skin incision to the wound closure.

Nutrition was started at least 24 hours after surgery. Patients were followed up on within the first week and during the first month after the operation. All data were presented as mean \pm standard deviations and ranges.

RESULTS

Among the 28 cases, 15 of the patients were female (53.6%) and 13 of them were male (46.4%). The mean age of the patients was 70.78 ± 12.98 years (range 45-98 years). Twenty of the patients suffered from cerebrovascular attack. Alzheimer's disease, Amyotrophic Lateral Sclerosis (ALS), Multiple Sclerosis (MS), Larynx Carcinoma and Malnutrition were the other causes (Table-1).

Table1. Diseases of patients

Disease	N (n)	Frequency (%)
Cerebrovascular Attack	20	71.4
ALS	2	7.1
MS	2	7.1
Alzheimer Disease	3	10.7
Larynx Ca + Malnutrition	1	3.6
Total	28	100

ALS, Amyotrophic Lateral Sclerosis; MS, Multiple Sclerosis; Ca, carcinoma

The mean operating time was 36.07 ± 10.18 minutes (range 20-60 minutes). There were no complications, mortality or morbidity during the operations. All patients operated on under local anesthesia and nine of them needed sedation (32%).

All patients tolerated feeding within 24th hours of the procedure. All patients were observed for postoperative complications such as peritonitis, hemorrhage, aspiration, peristomal wound infections and buried bumper syndrome. There was no postoperative morbidity or mortality attributed to the surgeries. One patient died of pulmonary sepsis without aspiration after one month of the operation in the intensive care unit. There were no

adhesive ileuses, wound infections or incisional hernias due to the minilaparotomy within the first month.

DISCUSSION

Tube gastrostomies performed under local anesthesia have been shown by many studies.^{9,10} Patients who have head and neck cancer, oropharyngeal dysfunction, neuromuscular disease or major trauma and patients with long-lasting burns over 30 days are candidates for a gastrostomy.

PEGs have been performed safely and easily for a long time. But it has some major and minor complications. The major complications are peritonitis, hemorrhage, aspiration, peristomal wound infection, buried bumper syndrome and gastrocolic fistula. These complications are occurring in approximately 3% of patients in large series.¹¹⁻¹⁵ In 22 out of 100 PEG procedures that Hassein et al³ performed, eight of them had PEG site infections; five of them had PEG obstructions and other complications.

In large series, hemorrhage can occur in up to 2.5% of the cases, peritonitis in 0% to 1.2% and peristomal wound infections in 5% to 30% of the cases. Aspiration of the gastric contents carries a 57% mortality rate and peritonitis is associated with a 31% mortality.¹¹⁻¹⁵ Pneumoperitoneum can be seen at different rates in cases of endoscopic technique, but current studies show that these complications are decreasing.^{16,17}

In our study there were no major complications intraoperatively or postoperatively; moreover, no major complications. Because, the gastrostomy tubes were placed under direct vision via minilaparotomy and we were able to see the gastric vessels directly. In addition, the tube was surrounded by the gastric wall with double purse string sutures.

PEGs always need endoscopic instruments and gastrostomy kits; therefore, PEG operations cannot be performed in all centers. But an open technique can be performed in all centers, including operating rooms that have basic surgical instruments.

Bach et al⁸ performed an open technique and reported that there were no complications. Correspondingly, some comparative studies reported complications at similar rates.^{18,19}

We performed this technique with a mini vertical incision in contrast to laparotomy. The risk of complication with an incisional hernia is decreased compared to a great laparotomy

incision.²⁰ Adhesive small bowel obstructions are another complication of laparotomies. Our of all incisions were localized on the upper abdomen and bordered on the stomach, liver, omentum and falciform ligament. If adhesion develops, these organs will first adhere to the incision. Small bowel obstructions commonly occur after gynecological and lower abdominal operations.²¹ Based on these factors, a decreased incidence of small bowel obstruction for minilaparotomy may be anticipated. But we need more long-term studies for safer results.

Foley catheters were used on all patients in the study, and there were no associated complications. Kiatipunsodsai²² used it and reported a 12% complication rate with dislodgement and granulation tissues. No severe complications were found.

The limitation of our study was the absence of an endoscopic evaluation of the stomach and duodenum. We couldn't perform an endoscopic evaluation on all patients so, we performed radiological examinations for them. There were no complications due to the absence of an endoscopy.

As a result, this technique can be performed easily and safely under local anesthesia with a minilaparotomy. If we don't have an endoscope or other instruments for a PEG, and if the patient has an obstruction in the esophagopharyngeal route, we can use this technique alternatively. Although, an open technique seems more invasive than a PEG, we didn't observe any complications or problems in our study. Currently, a PEG should be the first choice for a tubegastrostomy.

We can perform an open technique in the absence of an endoscopy specialist or instruments and in the case of an obstruction in esophagopharyngeal route.

Conflict of Interests: All authors declare no financial or proprietary interest in any material or method.

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