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# Indications, Morbidity, and Mortality of Surgical Gastrostomy in Delayed Emergency

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## ABSTRACT

*Background:* Around the year of 1970-1980, Gastrostomy was analyzed by a technique called Stamm technique. After this, endoscopic techniques evolved and because of its efficiency and convenience it became the permanent choice especially for a longer period of enteral route. The main objective of the study is to evaluate the indications and morbidity and mortality rates of surgical gastrostomies.

*Materials and methods:* It was a retrospective type of study in which a total of 200 patients were selected and surgical gastrostomy was performed on them in accordance with Witzel technique. A complete analysis of the patient's age, sex, anesthesia type, indication, complications and mortality for 30 days were done. The listed complications were classified as major and minor types.

*Results:* The mean of the patients in this study was 63 years. Gastrostomy was carried out for enteral nutrition in 15% of the patients and for gastric decompression in 85% of the patients. The important complications observed in the patients were neurological pathologies, tumors in lungs, digestive cancers, urological cancers and a variety of abdominal disorders. And the total mortality rate for 30 days was reported to be 16%.

*Conclusion:* The Witzel technique of gastrostomy can be used in a large number of cases with different diseases and it also yields an acceptable level of Morbidity and 30- day mortality rates. Since this study deals with only a single centre these analysis provides a complete review of the surgical gastrostomy in delayed emergency.

**Keywords:** *Gastrostomy, gastric tube, enteral access, morbidity, mortality rates*

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## INTRODUCTION

In 1839, gastrostomy was first performed in dogs by Sedillott and in 1846 he tried the same technique in humans yet he failed and three patients died regrettably. Then after 30 years, in 1876 first gastrostomy in humans was performed successfully by Verneoil [1]. From then various modifications were invented like the Witzel gastrostomy which has a subserosal tunnel on top of the tube [2]. These several modifications have developed promptly and become a subject of research in order to investigate their morbidity and mortality success rates [3, 4].

Gastrostomy is a procedure wherein a G-tube is inserted through the abdomen into the stomach of the patients for the purpose of maintaining and improving their nutritional level [5]. This procedure is useful in patients suffering from chronic motor dysfunction, oral and esophageal cancer and many more conditions like these [6]. The disadvantages of the G-tubes used in gastrostomy are food residual barrier, they may get easily misplaced, not cost efficient and inadequacy of the tubes in some centers [7].

Surgical gastrostomy has many complication criteria, and they differ from one hospital to another since this technique is performed with local anesthesia [8, 9]. The most common complications are:

(1) During a celiotomy associated with another surgery, enteral nutrition may occur

(2) When there is no possibility of endoscopic access

(3) Contraindication of general anesthesia

(4) When there is no possibility of "gastric parietal trans-illumination"

(5) gastrostomiesis no availability of radiologists or gastroenterologists to perform gastrostomy in case of delayed emergency

There are three different gastrostomy types: "Percutaneous endoscopic gastrostomy (PEG)", "percutaneous fluoroscopic gastrostomy", and "surgical gastrostomy" [10]. However

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percutaneous endoscopic gastrostomy is considered safer than the surgical gastrostomy but it has a huge number of limitations like endoscopic access to the stomach cannot be done and it cannot place the stomach adjacently to the abdominal wall and so "transillumination" cannot be done. Hence surgical gastrostomy remains to be the best option in such cases, and it can be done in two ways: through celiotomy and through laparoscopy [11, 12].

The main aim of this study is to investigate surgical gastrostomy in delayed emergencies and also to evaluate its indication and morbidity and mortality rates in patients from a single centre.

## MATERIALS AND METHODS

It was a retrospective study conducted in a total of 200 patients and surgical gastrostomy was performed on them in accordance with Witzel technique. A complete analysis of the patient's age, sex, anesthesia type, indication, complications and mortality for 30 days were done. The listed complications were divided as major and minor types. The minor type of complications includes infection on the site of the tube, removal of gastric tube, interference, breakage of the tube and leakage of the tube. The major type of complication includes bleeding of gastrointestinal region, aspiration pneumonia, reflux of gastro esophageal area, redness or swelling of peritoneum, hernia, occurrence time and Dindo-Clavien's classification.

The obtained data were recorded in the software called Cristal-Net v.01.03.03 Company Alma, France. The reference for gastrostomy whether it was performed for enteral nutrition or gastric decompression was also observed.

The cases were treated in a delayed emergency using the "Witzel technique of gastrostomy" and local anesthesia was used in the patients. The process of induction was initiated with a "Naropeine injection" with a solution of 7.5% at a dose of 3-5 mg/kg.

Firstly a superior laparotomy was obtained and secondly a stock with an absorbable suture thread in anterior and superior sides of the stomach was made and thirdly a probe was

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initiated and over locked with the same suture thread, the probe was hidden in an area of 10-12 cm using the serosa of the gastric wall. In the end the probe was withdrawn from the parietal side of the contra incision. Difficulties were noticed in patients with obesity and in patients who had undergone surgeries before. Category of major and minor complications, early and late occurrence of postoperative time were classified according to the Dindo-Clavien scale. The morbidity, mortality rates and incidence of patients who were succeeded from a second-line surgical gastrostomy were investigated.

**RESULTS**

Totally 200 patients were comprised in this study in which 135 (68%) were males and the remaining 65 (32%) were females. The mean age of the patients in this study was 63 years. Surgical gastrostomy by laparotomy was performed in the patients using Witzel technique. The surgery was done with local anesthesia in 108 (54%) patients and general anesthesia was used in 92 (46%) patients with duration of 67 ± 27 and 79 ± 38 minutes [Table 1].

**Table 1: Indications, 30 days mortality rate and morbidity rate for minor, major and early complications**

| Indications | Effective (%) | Minor complications | Major | 30-days Mortality |
|---|---|---|---|---|
| **Gastrostomy for Enteral Nutrition** | | | | |
| Lung tumors | 22 | 5 | 4 | 7 |
| Neurological diseases | 85 | 15 | 10 | 6 |
| Oto-rhino-laryngeal tumors | 40 | 0 | 0 | 9 |
| Other general diseases | 8 | 1 | 1 | 1 |
| Various abdominal diseases | 15 | 2 | 1 | 2 |
| TOTAL | 170 (85%) | 23 (13%) | 16 (9%) | 25 (15%) |

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| | | | | |
|---|---|---|---|---|
| **Gastrostomy for Gastric Decompression** | | | | |
| Airways diseases | 6 | 0 | 1 | 0 |
| Peritoneal carcinomatosis | 10 | 4 | 1 | 3 |
| Abdominal diseases | 9 | 3 | 1 | 2 |
| Other general diseases | 5 | 0 | 0 | 1 |
| TOTAL | 30 (15%) | 7 (14%) | 3 (5%) | 6 (16%) |
| TOTAL | 200 (100%) | | | |

Surgical gastrostomy for enteral nutrition was done in 170 (85%) patients and surgical gastrostomy for gastric decompression was done in 30 (15%) patients.

The rate of early complication was found to be 9.5% with 19 patients and the rate of late complications was found to be 15.5% with 31 patients respectively. Late complications were not observed in the patients who died during the 30 days post surgery [Table 2].

**Table 2: Type of complication and late complication rate**

| | **Total Effective** | **Late Complications** |
|---|---|---|
| **Minor Complications** | **31** | **15** |
| Tube site infection | 20 | 8 |
| Gastric tube removal | 4 | 1 |
| Gastric tube obstruction | 3 | 2 |
| Gastric tube breakage or leakage | 1 | 1 |
| Intra abdominal secondary displacement | 2 | 2 |
| Parietal hematoma | 1 | 1 |

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| | | |
|---|---|---|
| **Major Complications** | **19** | **11** |
| Bleeding of gastric area | 8 | 4 |
| Aspiration pneumonia | 2 | 2 |
| Gastro-esophageal reflux | 3 | 1 |
| Peristomal hernia | 2 | 1 |
| Peritonitis | 2 | 1 |
| Digestive perforation | 1 | 1 |
| Incisional hernia | 1 | 1 |

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With respect to Dindo-Clavien classification, among the 50 complications including the minor and major category, 25 patients experienced standard management excluding operational or pharmacological treatment and required radiological interventions and endoscopic interventions. Antibiotics were used in 8 patients in Grade 2.

In Grade 3, 7 patients experienced re-intervention and finally 6 patients from Grade 5 died regrettably (2 patients died from bleeding of gastric area, 3 patients died due to aspiration pneumonia and 1 patient died from peritonitis).

**Table 3: Rate of complication according to Dindo-Clavien's classification**

| Grade | Effective |
|---|---|
| 1 | 25 |
| 2 | 8 |
| 3 | 10 |
| 4 | 1 |
| 5 | 6 |

## DISCUSSION

Surgical gastrostomy is usually performed in delayed emergencies when the essential diagnosis is not agreed and is investigated in various cases [13]. The Witzel procedure is an easy and convenient technique which engages for an easy replacement of the feeding tube [14, 15]. Mostly the type of complication is responsible for the 30-day mortality rate. Patients with lung tumors had high mortality rates usually in an advanced stage of the disease [16].

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The disadvantage is that surgical gastrostomy may worsen the respiratory failure for the patients with lung tumors.

Surgical gastrostomy performed for enteral nutrition shows low morbidity rates with both minor and major categories of complications. From the time of the 19th century till the present, many researchers have been done to conclude and compare the results of various endoscopic, surgical and radiological gastrostomy techniques and usually the show results are comparable since each special area supports its preferred procedures [17].

The indication rates differ from 7.2 to 44% for endoscopic technique, 4.8 to 17% for the radiological techniques. And the 30-day mortality rate for endoscopic technique was 0.43 to 18% and the 30-day mortality rate for radiological technique was 0.2 to 16%. Since the study populations and methodology cannot be compared it is important to properly investigate these results.

The main limitation is that the nature of the study was retrospective on a single surgical procedure, the data for other incidence rates, indications for all endoscopic and radiological techniques were not available. Also the assessment on the morbidity and mortality rates of the patients who underwent surgeries was not able to be performed.

## CONCLUSION

The Witzel technique of gastrostomy can be used in a large number of cases with different diseases and it also yields an acceptable level of Morbidity and 30- day mortality rates. As said the main limitation is that the nature of the study was retrospective on a single surgical procedure and so it was not possible to get incidence rates data for the other types of gastrostomies from the same centre for comparing and finding the superior technique. More studies are needed to be done that may focus on randomized groups for the superior technique which may be surgical, endoscopic or radiologic procedure in patients in delayed emergency requiring surgical gastrostomy.

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## REFERENCES


1. Anselmo CB, Tercioti Junior V, Lopes LR, Coelho Neto J de S, Andreollo NA. Surgical gastrostomy: current indications and complications in a university hospital. Rev Col Bras Cir; 40(6): 458-62, 2013 Nov-Dec.
2. Bankhead RR, Fisher CA, Rolandelli RH. Gastrostomy tube placement outcomes: comparison of surgical, endoscopic, and laparoscopic methods. Nutr Clin Pract; 20(6): 607-12, 2005 Dec.
3. Gauderer MW, Ponsky JL, Izant RJ. Gastrostomy without laparotomy: a percutaneous endoscopic technique. J Pediatr Surg; 15(6): 872-5, 1980 Dec.
4. Gauderer WLM. Experience with a hybrid, minimally invasive gastrostomy for children with abnormal epigastric anatomy. Journal of Pediatric Surgery(2008) 43,2178-2181.
5. Grant JP.Comparison of percutaneous endoscopic gastrotomy with Stamm gastrostomy.Ann Surg, 1988;207(5):598-603.
6. Ho HS, Ngo H. Gastrostomy for enteral access. A comparison among placement by laparotomy, laparoscopy, and endoscopy.Surg Endosc; 13(10): 991-4, 1999 Oct.
7. Ljungdahl M, Sundbom M. Complication rate lower after percutaneous endoscopic gastrostomy than after surgical gastrostomy: a prospective, randomized trial.Surg Endosc; 20(8): 1248-51, 2006 Aug.
8. 14. Vanis, N, Saray A, Gornjakovic S, Mesihovic R. Percutaneous endoscopic gastrostomy (PEG): retrospective analysis of a 7-year clinical experience. Acta Informatica Medica.Vol. 20 Nr. 4 Página: 235 - 7
9. Saitua F, Acuna R, Herrera P.Percutaneous endoscopic gastrostomy: The technique of choice? Journal of Pediatric Surgery.Vol. 38 Nr. 10 Página: 1512 – 1515.

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10. Samii AM, Suguitan EA. Comparison of operative gastrostomy with percutaneous endoscopic gastrostomy.Mil Med; 155(11): 534-5, 1990 Nov.
11. Sangster W, Cuddington GD, Bachulis BL. Percutaneous endoscopic gastrostomy.Am J Surg; 155(5): 677-9, 1988 May.
12. Pisano G, Calo PG, Tatti A, Farris S, Erdas E, et al. (2008) Surgical gastrostomy when percutaneous endoscopic gastrostomy is not feasible: Indications, results and comparison between the two procedures. Chir Ital 60: 261-266.
13. Ljungdahl M, Sundbom M (2006) Complication rate lower after percutaneous endoscopic gastrostomy than after surgical gastrostomy: a prospective, randomized trial. Surg Endosc 20: 1248-1251.
14. Valverde A (2007) Gastrostomies chirurgicales. EMC (Elsevier Masson SAS Paris), Techniques Chirurgicales- Appareil digestif 40-280.
15. Dindo D, Demartines N, Clavien PA (2004) Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. Ann Surg 240: 205-213.
16. Anselmo CB, Junior VT, Lopes LR, Neto JC, Andreollo NA (2013) Surgical gastrostomy: current indications and complications in a university hospital. Rev Col Bras Cir 40: 458-462.
17. Bergstrom LR, Larson D, Zinmeister AR, Sarr MG, Silverstein MD (1995) Utilization and Outcomes of surgical gastrostomies and jejunostomies in an era of percutaneous endoscopic gastrostomy: a population-based study. Mayo Clin Proc 70: 829-836.