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Is There A Role for Routine Nasogastric Intubation in Elective Subtotal Gastrectomy for Gastric Malignancy?

KEYWORDS: Nasogastric intubation, subtotal gastrectomy, gastric malignancy

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ABSTRACT ***OBJECTIVES:***

Nasogastric decompression has been routinely used in most major abdominal operations to prevent the consequences of postoperative ileus. The aim of this study was to assess the necessity for routine nasogastric decompression after subtotal gastrectomy for gastric malignancy.

METHODOLOGY:

A prospective randomized clinical trial included 53 patients undergoing elective subtotal gastrectomy. The patients were randomized to a group with nasogastric tube ("Routine NG" Group, n = 25) or to a group without a nasogastric tube ("No NG" Group, n = 28). Duration of return of gastrointestinal function, postoperative course, and complications were assessed and recorded.

RESULTS:

No statistically significant differences were found with respect to postoperative mortality or morbidity between the groups. Passage of flatus was delayed in the "routine NG" group. Incidence of vomiting was higher in the "no NG" group, although it did not attain statistical significance. Moderate to severe discomfort caused by the tube was observed in 52% of patients in the routine NG Group. Delayed insertion of a nasogastric tube was not necessary in the group with no NG tube.

CONCLUSIONS:

The above results suggests that routine NG tube placement is not necessary in gastric surgery especially after subtotal gastrectomy and this procedure can be safely performed without routine nasogastric decompression.

Introduction

Levin initially introduced prophylactic nasogastric intubation in 1921, and Wangensteen and Paine popularized its use in the treatment of acute intestinal obstruction and postoperative ileus during the 1930s(1).Until relatively recently, nasogastric decompression was routinely used in most major intra-abdominal operations.

Nasogastric intubation was thought to decrease postoperative ileus, wound and respiratory complications, reduce the incidence of anastamotic leaks after gastrointestinal surgery, lessen the chance of surgical site infection and fascial dehiscence, and help with earlier return of bowel function, and earlier hospital discharge. However, the necessity of nasogastric decompression following elective abdominal surgery has been increasingly questioned over the last several years(2)(3). Many clinical studies have suggested that this practice does not provide any benefit but could increase patient discomfort and respiratory complications among other complications(4)(5). Furthermore, meta-analyses have concluded that routine nasogastric decompression is no longer warranted after elective abdominal surgery(6)(7).

After gastrectomy, nasogastric or nasojejunal decompression has been considered necessary to prevent postoperative ileus and anastomotic leak and also for the detection of Gastro-jejunal anastamotic bleeding(8). It has been considered differently from other abdominal surgeries in the context of prophylactic nasogastric decompression due to the proximal anastomoses and effect of perigastric lymphadenectomy. A nasogastric tube was also believed to aid in the early detection of gastrojejunal anastamotic bleeding. It is for this reason; the nasogastric tube is usually left in place for a few days after the procedure. Few studies have critically assessed this common practice. Three prospective studies from Taiwan and Korea have suggested that there is no need for a nasogastric tube after gastrectomy for gastric cancer(9)(10)(11).

The aim of this study, therefore, was to evaluate, in a prospective randomized trial, the necessity for a nasogastric tube after subtotal gastrectomy.

Methodology

After institutional review board and ethical committee approval, 53 patients from April 2009 to September 2010 undergoing elective subtotal gastrectomy for gastric malignancy were included in this study. Informed consent was obtained from the patients before they were recruited into the study. Patients who underwent emergency surgery, and patients below 18 years of age were excluded. The extent of gastric resection was a subtotal gastrectomy with R0 resection and a D1 or D2 lymph nodal clearance. Digestive continuity was restored by a Roux-en-Y gastrojejunostomy. The gastrojejunostomy anastomosis was performed hand sewn using a single layered continuous 3-0 polypropylene suture. All patients had a 14- or 16-French nasogastric tube inserted by the anesthetist at the beginning of the procedure. At the end of the operation, each patient entered into the study was randomized either to a group with a nasogastric tube (Routine "NG group") or to a group without a nasogastric tube ("No NG" Group). For the randomization a computer-generated random number table was used. The derivation of the random number table was based on 20% of blocks of 2, 40% of blocks of 4

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and 40% of blocks of 6 using the seed 12345. The sample size was calculated using standard formula. The power of the study (1-beta) was 80% and significance level (alpha) was 5%. A sample size of 88 patients was calculated with 44 patients in each arm.

All patients above the age of 18 years undergoing elective subtotal gastrectomy for gastric malignancy including gastric outlet obstruction were included in the study. Emergency subtotal gastrectomy and radiated patients were excluded. At the end of the operation, the anesthetist would open the opaque, sealed brown envelope and unfold the paper sheet within, thereby revealing the determined allotment. In the "routine NG" Group the nasogastric tube was left in place on continuous drainage for at least 48 hours postoperatively or until passage of flatus or stool whichever occurred later. In the "No NG" Group the tube was removed at the end of the operation before transferring to the recovery room. Postoperative oral intake was restricted for all patients until the passage of flatus or return of bowel sounds in the absence of abdominal distension, nausea, or vomiting as appropriately decided by the surgical team and then progressed to normal diet when liquid diet was tolerated for more than 24 hours.

In the "routine NG" Group, the tube was removed after the passage of flatus, and patients were allowed fluids approximately 6 hours later. Diet was instituted in the same stepwise fashion from sips of fluids to normal diet. A planned nasogastric tube reinsertion/ insertion was done only if they developed repeated episodes of vomiting or persistent abdominal distension. All patients received two doses of perioperative antibiotic prophylaxis with a third generation cephalosporin and a subcutaneous injection of low molecular weight or unfractionated heparin sodium as deep venous thrombosis prophylaxis. The postoperative analgesia was standardized with intravenous administration of diclofenac 50 mg twice daily, paracetamol 1 gm. thrice daily and tramadol 50 mg thrice daily for the first three post-operative days, while avoiding morphine and epidural analgesia. The postoperative course of each patient was closely monitored. The day of passage of flatus and oral food intake, the duration of nasogastric decompression and the length of hospital stay were recorded. Mortality, abdominal complications (generalized peritonitis, deep abscesses, obvious anastomotic leaks, wound complications), pulmonary complications (pneumonia, atelectasis), postoperative fever, nausea, and vomiting, tube insertion or reinsertion, and discomfort from the tube were noted. Perioperative mortality was defined as deaths within the first 30 days after surgery or during the original hospital stay if longer. Anastamotic leak was defined as a proven leak using water-soluble contrast radiographic examination, or a leak of clinical significance necessitating reoperation. Postoperative fever was defined as two body temperatures greater than 38 degree Celsius taken at least 12 h apart, starting more than 24 h after operation. Surgical wound infection was defined as culture proven infection or as clinically determined by the surgical team. Surgical wound dehiscence was defined as parting of rectus sheath requiring reoperation as assessed by the treating surgical team. Vomiting was taken as significant if the quantity of vomitus was above 50 ml in each episode. Anastamotic bleed was defined as coffee ground gastric aspirate or coffee ground vomitus with deteriorating hematocrit and clinical signs suggesting a bleed. The degree of discomfort from the tube, as reported by the patient, was graded on a scale from 0 to 3 (absence of discomfort, mild, moderate, or severe discomfort).

The postoperative outcome parameters, which were evaluated included, Time to passage of flatus and passage of stools (days), time to initiation of regular diet (days) and postoperative duration of hospital stay (days). Categorical variables were compared within groups using the *v*2 test and Yates Fisher exact test as appropriate. Normally distributed Continuous variables were analyzed by Student's t-test, whereas non-normally distributed continuous variables were analyzed by the Mann-Whitney test. All statistical analyses were performed using SPSS. A p value < 0.05 was considered statistically significant.

Results & Discussion

The study group included 53 patients, 38 males and 15 females, with a mean age of 53.02 years. There were 25 patients enrolled in "routine NG" Group and 28 in "no NG" Group. Baseline characteristics in the two groups are summarized in *Table 1*. The two groups were comparable with respect to age and sex distribution, type of disease, and duration of operation performed. When comparing the "NG group" to the "No NG groups", the mean time to passage of flatus and stools was 4 days vs. 3 days respectively and the time to regular oral intake was similar (4 days) in both groups. Duration of postoperative hospital stay was similar in both groups. In the routine NG Group, 31 patients (52%) complained of moderate to severe discomfort caused by the presence of the tube as shown in *Table 2*.

Table 1
Baseline characteristics

Variables	"Routine NG"	"No NG"	p - value
Number of patients	25	28	
Mean Age (SD) years	56.96(11.29)	49.5(10.97)	0.0183
Sex			
Male (%)	16(64)	22(78.57)	
Female (%)	9(36)	6(21.43)	0.240
Histopathology			
Moderately Differentiated Adenocarcinoma (%)	11(44)	10(31.7)	
Poorly Differentiated Adenocarcinoma (%)	14(56)	14(50)	
GIST (%)	0(0)	4(14.29)	0.143
Comorbidities			
Nil (%)	14(56)	23(82.4)	
Diabetes Mellitus (%)	4(16)	2(7.4)	
Hypertension (%)	4(16)	1(3.57)	
COPD (%)	0(0)	1(3.57)	
Seizure Disorder (%)	3(12)	1(3.57)	0.164

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Comorbidities Present Absent	11 (44) 14 (56)	5 (18) 23 (82)	0.03
TN Staging			
T1 T2 T3	3 7 15	3 8 13	0.910
N0 N1 N2	6 13 6	8 8 8	0.418
Median Duration of operation in Hours (IQR)*,	4 (3-4)	3 (3-4)	0.3098

***IQR** – Interquartile range

Table 2
Outcomes

Variables	"Routine NG"	"No NG"	p - value
Median Time to flatus (IQR)*, days	4 (3-5)	3 (3-5)	0.0097
Median Time to stools (IQR)*, days	6 (5-7)	6 (5-6)	0.3164
Median Time to regular feeds (IQR)*, days	4 (4-5)	4 (4-4.5)	0.067
Mean Duration of hospital stay (SD)#, days	7 (7-9)	7 (6.5-8)	0.2538
Comfort score			
0 (%)	6(24)		
1 (%)	6(24)		
2 (%)	8(32)		
3 (%)	5(20)		

*IQR – Interquartile range, #SD – Standard deviation

As shown in *Table 3*, no significant difference in postoperative complications was observed between the groups. There was no mortality in either group. The incidence of vomiting was higher in the No NG Group than in the routine NG Group (21.43% versus 12%), but this difference did not reach statistical significance. Nasogastric tube insertion in the "No NG" group or reinsertion in the "routine NG" group after removal was not required in any of the patients. Presence of NG tube postoperatively had detected gastrojejunostomy bleed in one patient who underwent reexploration.

Table 3
Morbidity

Complications	"Routine NG" Number (%)	"No NG" Number (%)	p - value
Fever	3(12)	2(7.14)	0.546
Vomiting	3(12)	6(21.43)	0.361
Pneumonia	1(4)	0	0.285
Wound dehiscence	1(4)	1(3.57)	0.935
Surgical site infection	1(4)	1(3.57)	0.935
Duodenal stump leak	1(4)	0	0.285
GI bleed	2(8)	0	0.127
Overall complications	12(48)	10(35.57)	

One patient in the routine "NG group" had pneumonia postoperatively. There was one patient with duodenal stump blowout in the routine "NG group". This patient had postoperative fever and was found to have bile leak from the main abdominal wound on the fifth postoperative day following which he was reexplored and underwent peritoneal lavage, feeding jejunostomy and intraperitoneal drains were placed. Although there was a slightly increased overall incidence of morbidity in the "routine NG" group (12 Vs. 10), this difference was not statistically significant. There was one patient in whom anastamotic bleeding was detected postoperatively on whom a relaparotomy was done and drainage procedure along with a feeding jejunostomy was done. In this patient, the placement of NG had detected gastrojejunostomy bleed due to the presence of altered blood in the NG tube. He required a laparotomy due to decreasing hematocrit and worsening clinical parameters indicating an ongoing gastrojejunostomy anastomotic bleed. Another patient who was discharged and was in the routine NG group was readmitted on the eighth postoperative day with complaints of coffee ground vomitus and deteriorating hematocrit. However this patient was managed conservatively and was transfused 1 unit of packed red cells after which her condition improved and required no further intervention. These were the 2 patients who were in the NG group and were recorded to have gastrojejunostomy anastamotic bleed.

Conclusions

Subtotal gastrectomy can be safely performed without routine nasogastric decompression. Moderate to severe patient discomfort after routine postoperative NG decompression was a significant problem seen in 52% of the patients. Although incidence of postoperative vomiting was slightly higher in the "No NG" group, this difference did not attain statistical significance.

Limitations

Sample size was not achieved. Lack of standardization of intraoperative opioids would have influenced the incidence of postoperative nausea and vomiting.

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