POSTOPERATIVE NASOGASTRIC DECOMPRESSION IS NOT WARRANTED IN ELECTIVE CLOSURE OF GUT STOMAS AND BILIOENTERIC ANASTAMOSIS: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Objective: *To compare the outcome of postoperative nasogastric decompression versus no nasogastric decompression in cases of elective closure of gut stomas and bilioenteric anastamosis.*

Material and Methods: *This randomized trial was conducted from 01-01-2006 to 31-10-3006 at Lady reading Hospital, Peshawar on 119 patients admitted for stomal closure or Bilioenteric anastamosis. Group A included 58 patients subjected to postoperative nasogastric decompression and group B included 61 patients not subjected to postoperative nasogastric decompression. Out of 119 patients, 61 (Group A=30; Group B=31) patients underwent gut stomas closure and 58 patients (Group A=28; Group B=30) underwent Bilioenteric Anastamosis. Pediatric age group, oesophagogastric disease, emergency procedures and pre-operative co-morbid conditions were excluded.*

Results: *The male to female ratio in group A was 4:1 and in group B was 2.85:1. The morbidity between group A (60.0%) and group B (48.38%) was insignificant (p>0.05). No mortality was observed during hospital stay in both groups. Length of hospital stay was 7.93+1.27 days in group A versus 6.54+0.85 days in group B. The number of nasogastric reinsertions was in 6 patients; three in either group with a delay of 2.6 days for duration of 3.1 days. Abdominal distension was observed in 12 (60%) cases of stomal closure in group A versus 7 (22.5%) in group B. In patients undergoing bilioenteric anastamosis the mean stay in group A was no more than group B.*

Conclusion: *Increase hospital stay and complication rates were observed in patiants receiving nasogastric decompression compered to those without NG tubes.*

Key Words: *Nasogastric decompression, Stomal closure, bilioenteric anastamosis, Morbidity.*

INTRODUCTION

Levin M[1] first described a single lumen nasogastric tube in an era of surgical practice where little was known about preoperative management and fluid therapy. Paine et al[2] and his colleagues first popularized the use of nasogastric tube for prophylactic decompression. Gerber[3,4] then described its routine use in decompression for elective surgical procedures in the late 50's. Gastric intubations via the nasal passage (i.e. nasogastric route) is a common procedure that provides access to the stomach for diagnostic and therapeutic purposes. The placement of nasogastric tubes can be uncomfortable for the patient if the patient is not adequately prepared with anesthesia to the nasal passages and specific instructions on how to cooperate with the operator are not explained before the procedure[5-7]. The routine use of nasogastric tube for decompression in conjunction with surgery began from the early part of the twentieth century[2,4]. It is believed that nasogastric tube helps decrease the contents and thus reduces and prevents abdominal distension. Nasogastric decompression and its use in elective procedures is not recommended by results from various studies[8-10]. In 1995, Cheatham et al[11] concluded in a meta-analysis of the literature published up to 1993 that the routine use of nasogastric intubations after elective surgery did

DEMOGRAPHIC DATA OF STOMAL CLOSURE

No. of patients	Nasogastric Tube (group A) (n=30)	No Nasogastric Tube (group B) (n=31)
Mean age (years)	35.06	35.38
Sex (M:F)	4:1	2.85:1

Table 1

not reduce the risk of ileus and aspiration. To avoid nausea, vomiting, or abdominal distention in 1 patient, at least 20 patients had to be treated with routine nasogastric intubations. If nasogastric intubations were not used routinely but only selectively, patients experienced substantially fewer postoperative complications, such as pneumonia, atelectasis, and fever[12,13]. The purpose of our study was to compare the outcome in patients admitted for elective closure of gut stomas or those who had a bilioenteric anastamosis; with and without the use of a nasogastric tube in the post operative period.

MATERIAL AND METHODS

This prospective study was conducted at Department of Surgery, Postgraduate Medical institute, Lady Reading Hospital, Peshawar, on 119 patients over a period of 10 months between 1st January 2006 and 31st October 2006. Randomization was done by card method. Elective cases of closure of gut stomas and procedures that included a bilioenteric anastamosis were included. These patients were randomized into 2 groups:

GROUP A included those patients that were subjected to nasogastric decompression

GROUP B included those patients that were NOT subjected to nasogastric decompression.

The exclusion criterion was pediatric age group, oesophagogastric disease, emergency procedures and pre-operative co-morbid conditions.

Group A patients (those selected to receive decompression postoperatively) were passed a nasogastric tube preoperatively with application of

OPERATIVE AND POST OPERATIVE DATA OF CASES OF STOMAL CLOSURE

Operative and Post Operative Data	Nasogastric Tube (group A) (n=30)	No Nasogastric Tube (group B) (n=31)
Length of Stay (days)(s.d.)	7.93(1.27)	6.54(0.85)
Duration of ileus (days)	3.26(0.72)	2.87(0.88)
Oral feeding (days)	4.6(1.11)	3.58(.907)
Nasogastric reinsertions	06	-
Delay(days)	2.6	
Duration (days)	3.1	
Nausea	12	14
Vomiting	04	11
Abdominal distension	12	07
Elevated temperature	18	07
Discomfort to NGT		
None	20	
Moderate	08	
severe	02	
Wound infection	11	09
Stools passed		
<5th POD*	17	23
>5th POD	13	08
Pulmonary complications	04	05
Fistula formation	02	-
Re operated	03	02
Complication rate(%)	60%	48.38%

**POD= Post operative day*
s.d.= Standard deviation

Table 2

2% lignocaine gel and position ascertained[14]. The patency of the tube was monitored till the removal of the tube. Optimum size of the tube for decompression was 16-18 Fr. Intake and Output charts of each patient was maintained. In cases of elective closure of gut stomas, patients received bowel preparation with hyper osmotic solution (10% mannitol) the day before surgery in short frequent intervals orally. Distal wash per stoma was done with an inflated Foley's catheter with isotonic saline. Enema per rectum was introduced to all patients twice 6-8 hours apart the night before surgery. This routine was practiced in the two groups. Patients who had bilioenteric anastamosis were given intravenous antibiotics, vitamin K and hyperosmotic intravenous fluids pre operatively. They were also evaluated for clotting abnormalities. All patients were investigated with full blood counts, chest radiography, electrocardiography, a random sample of blood glucose, blood urea, urine routine examination and a loopogram was compulsory in cases of elective closure of gut stomas pre operatively. Rest of the pre operative investigations were requested according to indication decided by the attending surgeon. Post operatively all the patients received prophylactic antibiotics, intravenous fluids, pain management and those prone to develop deep vein thrombosis were given LMWH with regular monitoring (international normalized ratio). Patients were nil by mouth till the subsidence of ileus and passage of flatus. Patients were discharged after exclusion of all active complaints and impending complications. A 4 week follow up was planned for all patients in the outpatient department. Re-insertion of a nasogastric tube was done in those developing symptoms post operatively; mainly abdominal distension. This decision was taken by the attending surgeon. Chest radiography was performed on the first post operative day on all patients to exclude pulmonary complications (eg. Atelectasis.). Quantity chart on the 24 hour collection of nasogastric aspirate was maintained alongside urine output and loss through drains. Patients with complaints of nausea, vomiting and distention were noted according to the day of appearance of symptoms. Grading of discomfort related to the presence of nasogastric tube was noted post operatively as none, moderate or severe. Pneumonia and atelectasis (pulmonary complications) were taken as medical complications. Surgical complications included wound infection and dehiscence, fistula formation, intra abdominal collection of fluid and fever. The data was assessed in each group and standard deviation expressed. Suitable error of proportions equated. Variables were analyzed by the Chi-square test. P value of less than 0.05 was taken to be significant. Statistical evidence was retrieved using SPSS[R] 10.0 version software.

RESULTS

In the 10 month study 119 patients were selected who fulfilled the criteria for inclusion. No cases were dealt by minimal access surgery and all operated by conventional means. Data from two groups was analyzed separately.

Elective Closure of Gut Stomas

In those patients undergoing elective closure of gut stomas 30 patients were subjected to nasogastric decompression (group A) versus 31 patients who were not subjected to nasogastric decompression (group B). In both cases the duration of anesthesia, blood loss and choice of surgical procedure were similar. The mean age was similar in both groups. Majority of patients were male. In group A the male: female ratio was 4:1 and in group B the male: female ratio was 2.85:1 (Table 1).

Over all 5 (11.9%) cases were malignant; four of whom were amongst group A and one case from group B. Metastasis was seen in two patients; one from either group. Post operative data showed insignificant greater length of stay in group A which was 7.93$\pm$1.27 days versus 6.54$\pm$0.85 days in group B (table 2). P value in this case was greater than 0.05, taken to be insignificant.

The duration of ileus in both groups was similar with 3.26$\pm$0.72 days in group A versus 2.87 $\pm$0.88 days in patients from group B.

First permission to liquids was 4.6$\pm$ 1.11 days delayed in those from group A versus 3.58 $\pm$0.907 days in group B. Six patients, all from group A were reinserted a nasogastric tube with a mean delay of 2.6 days for a mean duration of 3.1 days. Vomiting was seen in 4 (13.3%) patients from group A versus 11 (35.5%) patient from group B. Twelve patients (40%) in group A developed abdominal distension while seven (22%) in group B developed abdominal distension. Fever postoperatively was observed in 18 (60%) patients from group A versus 7 (22%) patients in the other group.

Wound infection was similar in both groups with slightly higher percentage in those from group A. Stools passed in 13 (43.3%) patients from group A after the fifth post-operative day where as in those from group B eight (25.8%) patients passed stools after the fifth post-operative day. Amongst a list of medical and surgical rate of complication no significant difference was seen in either group.

Bilioenteric Anastamosis

Fifty eight patients in this group were

PROCEDURES IN THE STUDY AND THEIR RANDOM DISTRIBUTION

Procedure	With nasogastric tube (Group A) (n=58)	Without nasogastric tube (Group B) (n=61)
Loop Ileostomy closure	10 (17.2%)	21 (34.4%)
Double-barreled ileostomy closure	02 (3.4%)	01 (1.6%)
Loop colostomy closure	06 (10.3%)	04 (4.9%)
Double-barreled colostomy closure	03 (5.2%)	05 (8.2%)
Ileotransverse stomal closure	04 (6.9%)	-
Hartmann's reversal	05(8.6%)	-
Whipple's procedure	03 (5.2%)	01 (1.6%)
Cholecystojejunostomy	18 (31%)	17 (27.9%)
Choledochoduodenostomy	03(5.2%)	09 (14.8%)
Cholecystectomy+ choledochoduodenostomy	02(3.4%) 02(3.4%)	03 (4.9%) -
Cholecystectomy+cystogastrostomy		

Table 5

randomized pre operatively; twenty eight of them received nasogastric decompression (group A) and thirty did not (group B). The mean age was similar and in both groups the female ratio was higher than males (table 3). Majority of the operations were palliative in either group (19 cases versus 15 cases respectively).The mean length of stay was 7.35 days (s.d. = 1.02) in those from group A versus 7.6 days (0.81) in the other group (table 4). The duration of ileus was similar but the first permission to fluids was delayed in group A (4.5 days (1.0) versus 2.9 days (0.51) respectively). There was no patient who needed re insertion of a nasogastric tube from either groups and all six of the patients that did develop abdominal distension (group A) settled shortly. Five patients developed wound infection of which 3 belonged to group A. First flatus/stools passed was significantly early in those from group A. The rate of pulmonary complications in both groups was similar.

In patients of elective closure of gut stomas a number of procedures were under taken (table 5). These included ileostomy closure and colostomy closures. In patients who had bilioenteric anastamosis majority of the procedures were palliative. Cholecystojejunostomy was the most frequent procedure done.

DISCUSSION

Out of the many indications and uses of the nasogastric tube, its role in nasogastric decompression for peri operative surgical management has been significant. But recently there have been queries regarding its routine use in elective procedures[15-18]. It is supposedly a major factor in prolonging recovery from ileus as seen in a study by Nelson et al[19] whose study shows the prolongation of duration to return of bowel sounds thus increasing stay of the patient in hospital. Some studies show this duration to be substantially significant in those with a nasogastric tube ; possibly due to decreased or delayed ambulation[20]. Several insignificant findings have been noted to define the role of nasogastric tube in routine use. The length of stay in both groups was similar as seen in a study by Reissman et al[21]. Its use shows no significant benefit in reducing the duration of ileus. Yet the complication rate is very similar if not greater than in patients not receiving nasogastric decompression [22]. Frequency of fever was significantly more in cases who had a nasogastric tube as was seen in other studies [11]. Amongst the group of patients receiving nasogastric suction that were admitted for stomal closure, 6 patients (20%) were had to have reinsertion of nasogastric tube after removal postoperatively. After reinsertion the nasogastric tube was kept for a mean duration of 3.1 days comparable to a study by Pessaux P et al[23].

The pulmonary complications was not observed as seen in a study by Cheatham ML et al[11] where a significant increase in cases of pneumonia post operatively was seen following use of a nasogastric tube. Wound infection seems to be slightly higher in the group A but is not significant this is in contrast to the finding s of Pessaux P et al[23] whose recent study shows greater number of wound infections in those not having a nasogastric tube. This study on the other hand resembles the results of a meta-analysis comprising results from 37 trials over the last few decades by Cheatham ML et al[11].

The over all surgical complication rates for each group (nasogastric tube and no-nasogastric tube) was compared and was higher in those cases where the patient was subjected to nasogastric decompression (group A). This is evident from studies based on similar concepts for other elective procedures[24].

A greater proportion of re operations were observed with those patients receiving nasogastric suction (group A). Re operation was observed in 5 patients from group A versus one in those from group B; higher than most studies[11]. A high number of malignant lesions observed in the cases of bilioenteric anastamosis yielded two mortalities in the post operative follow up (4 weeks). Similar are the results of most studies with no effect on the mortality rate[25].

CONCLUSION

The routine use of nasogastric tube post operatively for decompression in cases of stomal closures and bilioenteric anastamosis is justified unless there is nausea, vomiting or abdominal distension.

REFERENCES

1. Levine M. A new gastroduodenal catheter. Am Surg 1921; 76:1007.
2. Paine JR, Carlson HA, Wangensteen OH. The post operative control of distension, nausea and vomiting. A clinical study with reference to the employment of narcotics, cathartics and nasal catheter suction-siphonage. JAMA 1933; 100: 1910.
3. Gerber A, Rogers FA, Smith LL. Treatment of Paralytic ileus with out the use of nasogastric suction. Surg Gynecol Obstet 1958; 107: 247-50.
4. Gerber, An appraisal of paralytic ileus and the necessity for post operative gastrointestinal suction. Surg Gynecol Obstet 1963; 117: 294-6.
5. Dees G. Difficult nasogastric tube insertions. Emerg Med Clin N Am 1989; 7:177–82.
6. Nehru VI, Al Shammari HJ, Jaffer AM. Nasogastric syndrome: The unilateral variant. Med Princ Prac 2003; 12: 44–6.
7. Cullen L, Taylor D, Taylor S, Chu K. Nebulized lidocaine decreases the discomfort of nasogastric tube insertion: a randomized, double-blind trial. An Emerg Med 2004;44:131-7.
8. Jamieson WG, DeRose G, Harris KA. Routine nasogastric decompression after abdominal surgery? Can J Surg 1992;35:577-8.
9. Ibrahim AA, Abrego D, Issiah IA, Smith DW. Is postoperative proximal decompression a necessary complement to elective colon resection? South Med J 1977; 70:1070-1.
10. Cheadle WG, Vitale GC, Mackie CR, Cuschieri A. Prophylactic postoperative nasogastric decompression. A prospective study of its requirement and the influence of cimetidine in 200 patients. Ann Surg 1985 ; 202:361–6.
11. Cheatham ML, Chapman WC, Key SP, Sawyers JL. A meta-analysis of selective versus routine nasogastric decompression after elective laparotomy. Ann Surg 1995;221:469-78.
12. Hafner CD, Wylie JH, Brush BE. Complications of gastrointestinal intubation. Arch Surg 1961; 83: 147-60.
13. Manning BJ, Winter DC, McGreal G, Kirwan WO, Redmond HP. Nasogastric intubation causes gastroesophageal reflux in patients undergoing elective laparotomy. Surgery 2001;130:788-91.
14. Davis JW. Nasogastric intubation. In: Benumof JL, ed. Clinical procedures in anesthesia and critical care. Philadelphia:JB Lippincott 1992:823.
15. Clevers GJ, Hendriks AV, Smout AJ, Akkermans LM, Van Vroonhoven TJ. Prospective randomized study on the necessity for routine nasogastric intubation after major abdominal surgery. Dig Surg. 1991; 8:177-81.
16. Nathan BN, Pain JA. Nasogastric suction after elective abdominal surgery: a randomised study. Ann R Coll Surg Engl 1991;73:291-4.
17. Petrelli NJ, Stulc JP, Rodriguez-Bigas M, Blumenson L. Nasogastric decompression following elective colorectal surgery: a prospective randomized study. Am Surg 1993;59:632-5.
18. Argov S, Goldstein I, Barzilai A. Is routine use of the nasogastric tube justified in upper abdominal surgery? Am J Surg1980 ; 139:849-50.
19. Nelson R, Edwards S, Tse B. Prophylactic nasogastric decompression after abdominal surgery. Cochrane Database Syst Rev 2005:CD004929.
20. Olesen KL, Birch M, Bardram L, Burcharth F. Value of nasogastric tube after colorectal surgery. Acta Chir Scand 1984; 150: 251-3.
21. Reissman P, Teoh TA, Cohen SM, Weiss EG, Wexner SD. Is early feeding safe after elective

colorectal surgery.Ann Surg 1995; 222: 73.

22. Barnes A D, Williams J A. Post-operative gastric drainage tubes. In: "After Vagotomy." Williams JA and Coe AD, Editors London Butterworths 1969:293-305.
23. Pessaux P, Regimbeau JM, Dondero F, Plasse M, Mantz J, Belghiti J. Randomised clinical trial evaluating the need for routine nasogastric decompression after elective hepatic resection. BrJ Surg 2007; 94: 297-303.
24. Isbister WH. Is postoperative gastric decompression really necessary? Am J Surg 1970; 120:511.
25. Montgomery RC, Bar-Natan MF, Thomas SE, Cheadle WG. Postoperative nasogastric decompression: a prospective randomized trial. South Med J 1996;89:1063-6.

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