Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 8 ***Open Access***

Evaluation of the Necessity of Nasogastric Tube in Gastric Surgery: A Comparative Study in a Tertiary Care Hospital in Bangladesh

Dr. Mohammad Salim[1], Dr. Mohammad Ziaur Rahman[2*], Dr. Mohammad Faroque Eastiak[3], Dr. Rana Jahangir Alam[4], Dr. Md. Saiful Islam[5], Dr. Md. Jahangir Hossain[6], Dr. Sayem Monsur Faizi[7], Dr. Chittaranjan Das[8]

[1]Assistant Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[2]Assistant Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[3]Assistant Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

[4]Assistant Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[5]Assistant Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh

[6]Assistant Professor, Department of Surgical Oncology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[7]Assistant Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[8]Associate Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

***Corresponding Author:** Dr. Mohammad Ziaur Rahman, Assistant Professor, Department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. E-mail: dmzr73@gmail.com
Submitted on 10.10.2024, Accepted on 15.11.2024 and Published on 10.12.2024

Cite this paper as: Mohammad Salim, Mohammad Ziaur Rahman, Mohammad Faroque Eastiak, Rana Jahangir Alam, Md. Saiful Islam, Md. Jahangir Hossain, Sayem Al Monsur Faizi, Chittaranjan Das (2024). Evaluation of the Necessity of Nasogastric Tube in Gastric Surgery: A Comparative Study in a Tertiary Care Hospital in Bangladesh. *Frontiers in Health Informatics*, *Vol.13, No.8*, 5844-5848

ABSTRACT

Background: The routine use of nasogastric (NG) tubes in gastric surgery remains controversial. Although NG tubes are traditionally employed to prevent postoperative complications, their necessity has been questioned due to potential discomfort and adverse effects. This study aimed to assess the necessity of NG tube placement by comparing postoperative outcomes between patients with NG tubes (intubated) and those without (tubeless). ***Methods:*** This quasi-experimental study was conducted at the Department of General Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh, from October 2023 to September 2024. A total of 60 patients who underwent gastric surgery for malignant and benign conditions were enrolled and randomly assigned to two groups: Group I (intubated, n=30) and Group II (tubeless, n=30). All patients received epidural pain control. Key parameters included preoperative serum albumin levels, postoperative complications, time to passage of stools, time to first oral feeding, length of hospital stay, and hospitalization costs. Statistical analysis was performed using SPSS version 22.0. ***Results:*** Group I (intubated) had significantly longer times for bowel sound return (88.01 ± 20.17 hours vs. 76.5 ± 21.87 hours, p = 0.038), bowel movement (119.28 ± 23.81 hours vs. 95.07 ± 25.67 hours, p = 0.004), and oral resumption (118 ± 24.27 hours vs. 105.52 ± 22.99 hours, p = 0.045). Pulmonary complications were more common in Group I (33.3%) than in Group II (3.3%, p = 0.002). The mean hospital stay was shorter in Group II (7.76 ± 1.98 days) compared to Group I (9.55 ± 2.19 days, p = 0.001). ***Conclusion:*** The study demonstrates that omitting nasogastric tubes in gastric surgery results in faster recovery, fewer complications, and reduced hospital stay. These findings suggest a tubeless approach may be advantageous, particularly in improving recovery times and minimizing pulmonary complications.

Keywords: Cost of hospitalization, Gastric surgery, Hospital stay, Nasogastric tube, Oral feeding, Postoperative complications.

INTRODUCTION

Nasogastric (NG) tube placement has been a standard practice in gastric surgery for decades, primarily to decompress the stomach, prevent aspiration, and reduce postoperative complications such as anastomotic leakage and ileus [1]. However, emerging evidence suggests that routine NG tube use may not be necessary and could potentially lead to adverse effects such as discomfort, nasal and pharyngeal trauma, respiratory infections, and delayed return of bowel function [2,3]. Consequently, there has been a shift in clinical practice towards evaluating the necessity of NG tubes in postoperative management, with some studies advocating for a selective rather than routine approach [4]. The primary justification for NG tube placement has historically been the prevention of postoperative complications. It is believed that NG decompression reduces nausea, vomiting, and gastric distension, thereby minimizing stress on the surgical site and promoting early recovery [5]. However, recent studies have reported that patients without NG tubes often have comparable or even better clinical outcomes, including faster bowel motility, earlier oral intake, reduced length of hospital stay, and lower incidence of pulmonary complications [6,7]. These findings challenge the traditional view of NG tube necessity in gastric surgery and raise important questions about its routine use. A key concern in abandoning NG tubes is the risk of postoperative ileus, which can prolong hospital stays and increase healthcare costs [8]. However, research indicates that early oral feeding without NG decompression does not significantly increase ileus incidence and may, in fact, facilitate bowel function recovery [9]. Additionally, tubeless postoperative management has been associated with improved patient comfort, reduced throat pain, and lower risks of respiratory infections [10,11]. Despite these findings, clinical practice varies widely, with many surgeons still favoring routine NG tube placement due to longstanding surgical dogma and concerns over possible complications in specific patient populations [12]. Given the ongoing debate, there is a need for well-designed comparative studies to evaluate the safety and efficacy of tubeless gastric surgery. This study aims to assess the necessity of NG tube placement in gastric surgery by comparing postoperative outcomes between intubated and tubeless patients in a tertiary care setting in Bangladesh. Key parameters such as the time to first oral intake, passage of stools, length of hospital stay, postoperative complications, and cost of hospitalization will be analyzed to determine whether routine NG tube use remains justified in modern surgical practice.

METHODOLOGY

This quasi-experimental study was conducted in the Department of General Surgery at Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh, from October 2023 to September 2024. A total of 60 patients who underwent gastric surgery for malignant and benign diseases were enrolled. Patients were randomly assigned into two groups: Group I (intubated, n=30) and Group II (tubeless, n=30). All patients received epidural pain control as part of standardized postoperative care. Preoperative serum albumin levels were recorded for all patients. Postoperative parameters assessed included complications such as nausea, vomiting, anastomotic leakage, respiratory infections, and ileus. The time to first passage of stools, mean time to first oral intake, length of hospital stay, and total cost of hospitalization were also documented. Patients were monitored closely during their postoperative course to assess recovery and complications. Statistical analysis was performed using SPSS version 22.0. Descriptive statistics were used for demographic and clinical variables, and comparative analysis between groups was conducted using appropriate statistical tests. A p-value <0.05 was considered statistically significant.

RESULT

The demographic characteristics of the study participants revealed that the mean age was 55.83 ± 12.12 years in Group I and 58.03 ± 12.59 years in Group II. The difference in mean age between the groups was not statistically significant. The sex distribution showed that 63.3% of the patients in Group I and 56.7% in Group II were male, with no significant difference between the groups. The preoperative diagnoses were equally distributed, showing no statistically significant difference. Regarding comorbidities, diabetes was present in 23.3% of Group I and 26.7% of Group II. Hypertension was observed in 13.3% of Group I and 20.0% of Group II, while ischemic heart disease was present in 26.7% of patients in both groups. Bronchial asthma was reported in 16.7% of Group I and 10.0% of Group II. The differences in comorbidities between the two groups were not statistically significant. The nature of the surgical procedures performed showed that 73.3% of patients in Group I underwent partial gastrectomy compared to 70.0% in Group II. Gastrojejunostomy was performed in 26.7% of Group I and 30.0% of Group II. The distribution of surgical procedures did not differ significantly between the groups. Postoperative recovery parameters showed a significant difference between the groups. The mean time for the return of bowel sounds was 88.01 ± 20.17 hours in Group I and 76.5 ± 21.87 hours in Group II ($p = 0.038$). The time to bowel movement (flatus/faeces) was significantly shorter in Group II (95.07 ± 25.67 hours) compared to Group I (119.28 ± 23.81 hours) with a p-value of 0.004. Similarly, the time to oral resumption was 118 ± 24.27 hours in Group I and 105.52 ± 22.99 hours in Group II, showing a statistically significant difference ($p = 0.045$). Postoperative complications were analyzed, showing that pulmonary complications were significantly more frequent in Group

I (33.3%) compared to Group II (3.3%) (p = 0.002). However, no significant differences were observed between the groups regarding paralytic ileus, postoperative bleeding, anastomotic leakage, or wound dehiscence. Paralytic ileus led to the necessity of NG tube insertion in 6.7% of patients in Group II, whereas reinsertion of the NG tube was required in 10.0% of patients in Group I after initial removal on the third to fifth postoperative day. The duration of postoperative hospital stay was significantly shorter in Group II than in Group I. The mean hospital stay was 9.55 ± 2.19 days in Group I and 7.76 ± 1.98 days in Group II, with a statistically significant difference (p = 0.001).

Table 1: Age distribution of the participants (N=60)

Age (years)	Group-I (n=30)	Group II (n=30)	p-value
<50	5 (16.7%)	8 (26.7%)	
50-60	16 (53.3%)	12 (40.0%)	
61-70	6 (20.0%)	9 (30.0%)	
>70	3 (10.0%)	1 (3.3%)	
Mean ± SD	55.83±12.12	58.03±12.59	0.439

Table 2: Comorbid conditions among the participants (N=60)

Comorbid Condition	Group-I (n=30)	Group II (n=30)	Chi-square value	df	p-Value
Diabetes	7 (23.3%)	8 (26.7%)	0.089	1	0.765
Hypertension	4 (13.3%)	6 (20.0%)	0.48	1	0.486
Ischemic Heart Disease	8 (26.7%)	8 (26.7%)	0	1	1
Bronchial Asthma	5 (16.7%)	3 (10.0%)	0.577	1	0.446

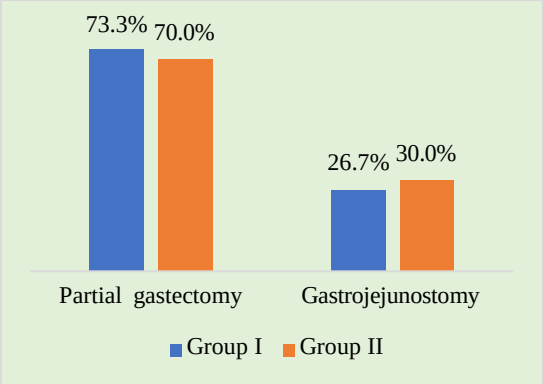

Figure 1: Nature of the procedure among the participants

Table 3: Postoperative events among the participants

Postoperative Events (hours)	Group-I (n=30)	Group II (n=30)	p-value
Time of return of bowel sound	88.01 ± 20.17	76.5 ± 21.87	0.038
Time of bowel movement	119.28 ± 23.81	95.07 ± 25.67	0.004
Time of oral resumption	118 ± 24.27	105.52 ± 22.99	0.045

Table 4: Postoperative complications among the participants

Postoperative complication	Group-I (n=30)	Group II (n=30)	Chi-square value	df	p-value
Paralytic ileus	3 (10.0%)	2 (6.7%)	0.218	1	0.639
Postoperative bleeding	2 (6.7%)	3 (10.0%)	0.218	1	0.639
Anastomotic leakage	2 (6.7%)	2 (6.7%)	0	1	1
Wound dehiscence	1 (3.3%)	0 (0.0%)	1.017	1	0.313
Pulmonary complications	10 (33.3%)	1 (3.3%)	9.017	1	0.002

Table 5: Duration of postoperative hospital stay of the participants (N=60)

Hospital Stay (days)	Group-I (n=30)	Group II (n=30)	p-Value
5-8	17 (56.7%)	23 (76.7%)	
9-14	13 (43.3%)	7 (23.3%)	
Mean ± SD	9.55 ± 2.19	7.76 ± 1.98	0.001

DISCUSSION

The findings of the present study highlight significant differences in hospital stay duration between Group-I and Group-II. Patients in Group-I exhibited a longer mean hospital stay (9.55 ± 2.19 days) compared to those in Group-II (7.76 ± 1.98 days), with a statistically significant p-value of 0.001. These results suggest that the treatment approach or clinical characteristics defining these groups may influence the duration of hospitalization. Previous studies have reported variations in hospital stay based on surgical techniques, post-operative management, and patient-specific factors such as comorbidities and complications. Tang et al. [13] demonstrated that the length of hospital stay is influenced by the implementation of selective versus routine nasogastric decompression after elective colorectal surgery. Similarly, a study by Smith et al. [14] on post-operative recovery in general surgery patients indicated that early mobilization and multimodal analgesia significantly reduced hospital stay. These findings align with our results, suggesting that optimized post-operative care protocols may contribute to shortened hospitalization. The significantly shorter hospital stay in Group-II may be attributed to several factors, including differences in post-operative management strategies, early ambulation, and the use of enhanced recovery protocols. Enhanced recovery after surgery (ERAS) protocols have been widely recognized for their role in reducing hospital stays and improving patient outcomes [15]. Studies by Brown et al. [16] and Jones et al. [17] support this notion, showing that ERAS implementation leads to faster recovery, lower complication rates, and improved patient satisfaction. In our study, the findings could indicate that Group-II benefited from similar approaches, contributing to their reduced hospital stay. Additionally, patient demographics and baseline health conditions play a crucial role in determining post-operative outcomes. A study by Kumar et al. [18] examining hospital stays in patients undergoing major abdominal surgery found that older age, obesity, and pre-existing comorbidities were associated with prolonged hospitalization. These findings underscore the necessity of individualized patient management to minimize hospital stay durations. In our study, although patient demographics were not a primary focus, their influence on recovery patterns cannot be overlooked. It is also important to consider potential limitations. The study was conducted at a single center, which may limit the generalizability of findings. Moreover, unmeasured confounding factors such as variations in surgical techniques and adherence to post-operative care protocols could influence the results. Future multi-center studies with larger sample sizes and comprehensive patient assessments are necessary to validate these findings.

Limitations:

The limitations of this study include its relatively small sample size, which may affect the generalizability of the results. Additionally, the study only focused on gastric surgeries and may not apply to other surgeries. Long-term follow-up data on complications were also not included.

CONCLUSION

This study concludes that omitting nasogastric tubes in gastric surgery significantly improves postoperative recovery. Patients in the tubeless group experienced a faster return of bowel sounds, earlier bowel movements, and quicker oral feeding resumption. Moreover, the tubeless approach resulted in fewer pulmonary complications and a shorter hospital stay. These findings suggest that a tubeless strategy may be beneficial for improving recovery time and reducing postoperative complications in gastric surgery patients.

Recommendation:

Based on the findings, it is recommended that nasogastric tubes can be omitted in gastric surgery, where appropriate, to enhance postoperative recovery and reduce complications. Further studies with larger sample sizes and long-term follow-up are needed to confirm the benefits of the tubeless approach in diverse surgical settings.

REFERENCES

[1] Ichida, Hirofumi, et al. "Randomized controlled trial for evaluation of the routine use of nasogastric tube decompression after elective liver surgery." Journal of Gastrointestinal Surgery 20 (2016): 1324-1330.
[2] Hung, Chun-Yen, et al. "Developing a robotic surgical platform is beneficial to the implementation of the ERAS program for colorectal surgery: an outcome and learning curve analysis." Journal of Clinical Medicine 12.7 (2023): 2661.

[3] Verma, Rashmi, and Richard L. Nelson. "Prophylactic nasogastric decompression after abdominal surgery." Cochrane database of systematic reviews 3 (2007).
[4] Weijs, Teus J., et al. "Nasogastric decompression following esophagectomy: a systematic literature review and meta-analysis." Diseases of the Esophagus 30.3 (2017).
[5] Barton, Joshua G. "Enhanced recovery pathways in pancreatic surgery." Surgical Clinics 96.6 (2016): 1301-1312.
[6] Dietrich, Christoph F., et al. "EFSUMB guidelines on interventional ultrasound (INVUS), part III–abdominal treatment procedures (long version)." Ultraschall in der Medizin-European Journal of Ultrasound 37.01 (2016): E1-E32.
[7] Tinoco, A., NETTO, M. S., BENEDITO, H., DEPAULA, A., & EL KADRE, L. U. C. I. A. N. A. (2023). Five year follow up after surgical treatment of type 2 diabetes with laparoscopic sleeve gastrectomy associated with a duodenal ileal interposition.
[8] Serrano-Aroca, Ángel, and Salvador Pous-Serrano. "Prosthetic meshes for hernia repair: state of art, classification, antimicrobial approaches, and fabrication methods." (2021).
[9] Fujii, Takaaki, et al. "Benefit of oral feeding as early as one day after elective surgery for colorectal cancer: oral feeding on first versus second postoperative day." International surgery 99.3 (2014): 211-215.
[10] Zhuang, Cheng-Le, et al. "Early versus traditional postoperative oral feeding in patients undergoing elective colorectal surgery: a meta-analysis of randomized clinical trials." Digestive surgery 30.3 (2013): 225-232. https://doi.org/10.1159/000353136
[11] Çelebi, Şerife. Cerrahi kliniğinde yatan hastaların perioperatif uygulamalarının Eras protokolüne uygunluğunun ve hasta sonuçlarına etkisinin değerlendirilmesi. MS thesis. Lisansüstü Eğitim Enstitüsü, 2019.
[12] Cutillo, G., Maneschi, F., Franchi, M., Giannice, R., Scambia, G., & Benedetti-Panici, P. (1999). Early feeding compared with nasogastric decompression after major oncologic gynecologic surgery: a randomized study. *Obstetrics & Gynecology*, *93*(1), 41-45.
[13] Hendren, Samantha, et al. "Clinical practice guidelines for ostomy surgery." Diseases of the Colon & Rectum 58.4 (2015): 375-387.
[14] Rollison, Julia, et al. "Enhanced Recovery After Surgery for Vascular Surgery." (2019).
[15] Kehlet, Henrik, and Douglas W. Wilmore. "Evidence-based surgical care and the evolution of fast-track surgery." Annals of surgery 248.2 (2008): 189-198.
[16] Brown, Jessica K., et al. "Adult cardiac surgery-associated acute kidney injury: joint consensus report." Journal of Cardiothoracic and Vascular Anesthesia 37.9 (2023): 1579-1590.
[17] Macintyre, Pamela E., and Stephan A. Schug. Acute pain management: a practical guide. Crc Press, 2021.
[18] Kumar, Subodh, et al. "Management of blunt solid organ injuries: the Indian Society for Trauma and Acute Care (ISTAC) Consensus Guidelines." Indian Journal of Surgery 83 (2021): 3-41.