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Original Research Article

A Comparative Study on Nasojejunal Tube Feeding Versus Feeding Jejunostomy Following Pancreaticoduodenectomy in a Tertiary Care Hospital

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Abstract

Introduction: Pancreaticoduodenectomy is a complex surgical procedure frequently associated with significant postoperative morbidity, largely due to malnutrition and delayed recovery. Early enteral nutrition is recommended to improve outcomes; however, the optimal route of enteral feeding remains controversial. Feeding jejunostomy and nasojejunal tube feeding are commonly used methods, each with specific advantages and complications. This study aimed to compare these two feeding strategies following pancreaticoduodenectomy in terms of complications, patient compliance, nutritional outcomes, and hospital stay.

Aims and Objectives: This study aimed to compare nasojejunal tube feeding and feeding jejunostomy in patients undergoing pancreaticoduodenectomy, focusing on complications, patient compliance and tolerance, as well as outcomes such as hospital stay, time to tube removal, and changes in hemoglobin and serum albumin.

Materials and Methods: This observational, descriptive study was conducted in the Department of General Surgery, Medical College and Hospital, Kolkata, over one year after Institutional Ethics Committee approval. Thirty patients aged 30–80 years undergoing pancreaticoduodenectomy were included and divided into two equal groups: Group 1 received nasojejunal tube feeding and Group 2 received feeding jejunostomy. Data regarding demographic variables, hospital stay, feeding tube removal time, feeding-related and tube-related complications, and preoperative and postoperative hemoglobin and serum albumin levels were collected prospectively. Statistical analysis was performed using Microsoft Excel and Python, with a p-value <0.05 considered significant.

Results: The mean hospital stay was shorter in the nasojejunal tube group (13 days) compared to the feeding jejunostomy group (20 days), though the difference was not statistically significant. Feeding tube removal occurred significantly earlier in the nasojejunal group (≈7 days) than in the feeding jejunostomy group (≈42 days). Feeding jejunostomy was associated with a higher incidence of feeding- and tube-related complications. While hemoglobin decline was comparable between groups, serum albumin reduction was significantly less in the nasojejunal tube group.

Conclusion: Nasojejunal tube feeding is a safe, less invasive, and better-tolerated method of enteral nutrition following pancreaticoduodenectomy, with fewer complications and better preservation of nutritional status compared to feeding jejunostomy.

Keywords: Pancreaticoduodenectomy; Nasojejunal tube feeding; Feeding jejunostomy; Enteral nutrition; Postoperative nutrition; Surgical outcomes.

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Introduction

Pancreaticoduodenectomy (PD), commonly referred to as the Whipple procedure, remains the cornerstone surgical treatment for malignant and selected benign conditions involving the periampullary region and the head of the pancreas.[1] Indications for this complex operation include carcinoma of the pancreatic head, periampullary carcinoma, distal cholangiocarcinoma, selected neuroendocrine tumors, intraductal papillary mucinous neoplasms (IPMN), solid pseudopapillary epithelial neoplasms (SPEN), inflammatory head masses, and groove pancreatitis. [2] Despite advances in surgical technique, anesthesia, and perioperative care, PD

continues to be associated with significant morbidity, largely attributable to the extensive nature of the resection and the physiological stress imposed on patients.One of the most important determinants of postoperative outcome following PD is nutritional status. [3] Patients often present preoperatively with weight loss, anorexia, malabsorption, and hypoalbuminemia due to malignancy, biliary obstruction, or chronic pancreatitis. Postoperatively, nutritional challenges are further compounded by loss of the gastric pacemaker, partial pancreatic resection, altered gastrointestinal anatomy, delayed gastric emptying, and prolonged periods of nil per mouth (NPM) to protect newly created anastomoses. [4] Malnutrition in the postoperative period adversely affects wound healing, immune competence, intestinal barrier function, and overall recovery, thereby increasing the risk of complications and prolonging hospital stay.[5] Current guidelines from the European Society for Parenteral and Enteral Nutrition (ESPEN) strongly recommend early enteral nutrition (EN) following major abdominal surgery, particularly in oncological patients. Early EN has been shown to preserve gut integrity, reduce septic complications, and improve clinical outcomes when compared with delayed feeding or exclusive parenteral nutrition. Several randomized controlled trials and meta-analyses have demonstrated that enteral feeding after PD is both safe and feasible and does not increase the incidence of complications such as delayed gastric emptying or pancreatic fistula. [6] Moreover, early enteral feeding may stimulate both endocrine and exocrine pancreatic function and promote bile secretion, thereby facilitating recovery.[7] Despite consensus on the importance of early enteral nutrition, there remains limited evidence regarding the optimal route of enteral feeding following PD. Among the available options, feeding jejunostomy (FJ) and nasojejunal (NJ) tube feeding are the two most commonly employed methods. Feeding jejunostomy, traditionally used for postoperative nutritional support, involves the creation of a jejunal enterotomy and placement of a feeding tube directly into the jejunum. [8]

With the advent of long intestinal tubes and improved intraoperative techniques, nasojejunal feeding has gained popularity as a less invasive alternative, wherein a tube is passed transnasally and positioned in the jejunum distal to the gastrojejunostomy. Both feeding strategies have distinct advantages and drawbacks. Feeding jejunostomy provides a secure route for long-term enteral feeding but requires an additional surgical procedure and is associated with tube-related complications such as infection, leakage, intestinal obstruction, and patient discomfort. [9] Nasojejunal tube feeding avoids an extra enterotomy and is technically simpler, but it may cause nasal and pharyngeal irritation, accidental dislodgement, and patient intolerance. Owing to the lack of conclusive evidence favoring one method over the other, the choice of feeding strategy is often based on surgeon preference and institutional practice.The present study was undertaken to compare nasojejunal tube feeding with feeding jejunostomy following pancreaticoduodenectomy, with particular emphasis on feeding-related complications, patient compliance, biochemical nutritional parameters, and hospital stay, in a tertiary care hospital setting.[10]This study aimed to compare nasojejunal tube feeding and feeding jejunostomy in patients undergoing pancreaticoduodenectomy, focusing on complications, patient compliance and tolerance, as well as outcomes such as hospital stay, time to tube removal, and changes in hemoglobin and serum albumin.

Materials and Methods

Study Design and Setting: This was an observational, descriptive study conducted in the Department of General Surgery, Medical College and Hospital, Kolkata. The study was carried out over a period of one year following approval from the Institutional Ethics Committee.

Study Population and Sample Size: The study included patients aged between 30 and 80 years who underwent pancreaticoduodenectomy at the study institution and received postoperative enteral nutrition either via nasojejunal tube or feeding jejunostomy. A total of 30 patients were enrolled, of whom 15 received nasojejunal tube feeding (Group 1) and 15 received feeding jejunostomy (Group 2).

Inclusion and Exclusion Criteria

Inclusion Criteria

- Patients aged 30–80 years.
- Patients who underwent pancreaticoduodenectomy with intraoperative placement of either a nasojejunal tube or feeding jejunostomy.

Exclusion Criteria

- Patients who already had a feeding jejunostomy or nasojejunal tube placed preoperatively.
- Uncooperative patients or those unwilling to provide informed consent.

Study Variables: Data collected included demographic parameters (age, sex, religion, socioeconomic status), indication for surgery, presence of chronic illness, duration of hospital stay, feeding tube removal time, feeding-related and tube-related complications, and biochemical parameters such as preoperative and postoperative hemoglobin and serum albumin levels.

Study Technique: Data were collected prospectively using a predefined structured questionnaire and from hospital records. Preoperative hemoglobin and serum albumin levels were recorded one day prior to surgery. Postoperative measurements were obtained on postoperative day seven. Patients were followed daily during hospital stay to document complications. Feeding tube removal time was recorded during hospitalization for the nasojejunal tube group and at follow-up (approximately six weeks) for the feeding jejunostomy group.

Statistical Analysis: Statistical analysis was performed using Microsoft Excel and Python programming. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Data were assessed for normality. Paired and unpaired t-tests were used as appropriate to assess differences within and between groups. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: Ethical clearance was obtained from the Institutional Ethics Committee prior to initiation of the study. Written informed consent was taken from all participants. Confidentiality and privacy were strictly maintained, and patient identities were not disclosed.

Results and Analysis

Table 1: Hospital Stay Comparison

Parameter	Nasojejunal Tube (Group 1) (n=15)	Feeding Jejunostomy (Group 2) (n=15)	p-value
Mean Hospital Stay (days)	13.2 ± 2.1	19.8 ± 3.4	0.067
Median Hospital Stay (days)	13	19	0.072

Table 2: Feeding Tube Removal Time

Parameter	Nasojejunal Tube (Group 1)	Feeding Jejunostomy (Group 2)	p-value
Mean Removal Time (days)	7.1 ± 1.3	42.5 ± 6.2	<0.001
Median Removal Time (days)	7	42	<0.001

Table 3: Complications Comparison

Complication	Nasojejunal Tube (Group 1) (n=15)	Feeding Jejunostomy (Group 2) (n=15)	p-value
Overall Complications (n, %)	4 (26.7%)	10 (66.7%)	0.031
Intestinal Colic (n, %)	1 (6.7%)	5 (33.3%)	0.042
Difficulty During Feeding (n, %)	2 (13.3%)	6 (40.0%)	0.048
Peri-tube Leakage (n, %)	0 (0%)	4 (26.7%)	0.032
Tube Site Infection (n, %)	0 (0%)	3 (20.0%)	0.067
Pharyngitis (n, %)	5 (33.3%)	0 (0%)	0.014
Patient Discomfort (n, %)	6 (40.0%)	3 (20.0%)	0.089

Table 4: Nutritional Parameters

Parameter	Nasojejunal Tube (Group 1)	Feeding Jejunostomy (Group 2)	p-value
Mean Hb Decrease (g/dL)	1.2 ± 0.4	1.5 ± 0.5	0.084
Mean Serum Albumin Decrease (g/dL)	0.5 ± 0.2	1.1 ± 0.3	0.021

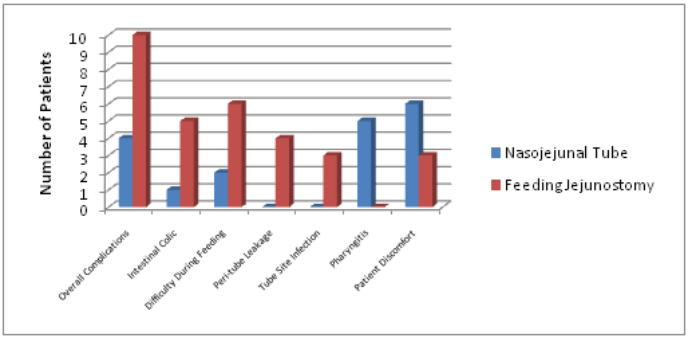

Figure 1: Complications Comparison

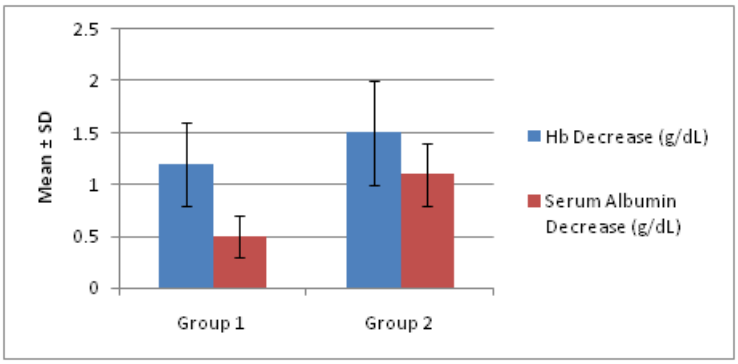

Figure 2: Nutritional Parameters

Hospital Stay: The average duration of hospital stay was approximately 13 days in the nasojejunal tube group and 20 days in the feeding jejunostomy group. The median hospital stay was 13 days for Group 1 and 19 days for Group 2. Although the nasojejunal tube group demonstrated a shorter hospital stay, statistical analysis revealed no significant difference between the two groups ($p > 0.05$). Correlation analysis showed weak associations between hospital stay and demographic variables such as age, sex, religion, and socioeconomic status in both groups, none of which reached statistical significance.

Feeding Tube Removal Time: A marked difference was observed in feeding tube removal time between the two groups. In the nasojejunal tube group, the average and median time to tube removal was approximately 7 postoperative days. In contrast, feeding jejunostomy tubes were removed at a mean of around 42 days postoperatively. This difference reflects the intended longer-term use of feeding jejunostomy compared to nasojejunal tubes.

Complications: A total of 13 types of feeding-related and tube-related complications were evaluated. Patients in the feeding jejunostomy group experienced a higher incidence of complications overall. Intestinal colic, difficulty during feeding, peri-tube leakage, and tube site infection were more commonly observed in the feeding jejunostomy group. Nasojejunal tube feeding was associated with fewer local complications, although pharyngitis and patient discomfort due to the presence of the tube were more frequently reported in this group.

Nutritional Parameters: Both groups showed a postoperative decline in hemoglobin and serum albumin levels. The mean decrease in hemoglobin was slightly greater in the feeding jejunostomy group compared to the nasojejunal tube group; however, this difference was not statistically significant. In contrast, the reduction in serum albumin was significantly greater in the feeding jejunostomy group, indicating better preservation of nutritional status in patients receiving nasojejunal tube feeding.

Discussion

Adequate nutritional support following pancreaticoduodenectomy is essential for optimal recovery and reduction of postoperative morbidity. This study compared nasojejunal tube feeding and feeding jejunostomy, two commonly employed enteral feeding strategies, in terms of complications, nutritional outcomes, and hospital stay.[11-13] The findings suggest that nasojejunal tube feeding is associated with fewer feeding-related and tube-related complications compared to feeding jejunostomy. [14] The less invasive nature of nasojejunal tube placement avoids the need for an additional enterotomy and minimizes surgical trauma, which may explain the lower complication rates observed. [15-17]

Although patient discomfort related to the presence of a nasal tube was common, these issues were generally minor and manageable. Hospital stay did not differ significantly between the two groups, although a trend toward shorter hospitalization was observed in the nasojejunal tube group. Importantly, earlier tube removal in the nasojejunal group reflects faster transition to oral feeding and improved patient compliance. Biochemical analysis demonstrated better preservation of serum albumin levels in the nasojejunal tube group, suggesting more effective nutritional support. [18,19] These findings are consistent with previous studies that have reported comparable or superior outcomes with nasojejunal feeding compared to feeding jejunostomy following major upper gastrointestinal surgery. Overall, the results support the growing preference for nasojejunal tube feeding as a safe, effective, and less invasive method of enteral nutrition following pancreaticoduodenectomy. [20]

Conclusion

This comparative study demonstrates that nasojejunal tube feeding is associated with fewer feeding-related complications, earlier tube removal, and better preservation of serum albumin levels when compared with feeding jejunostomy

following pancreaticoduodenectomy. Although hospital stay did not differ significantly between the two groups, nasojejunal feeding appears to be a safer and more patient-friendly option for postoperative enteral nutrition. Larger studies with longer follow-up are warranted to further validate these findings.

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