



Clinical Burden Related to Surgically Placed Feeding Enterostomy. A Single Center Study

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Received: July 10, 2021

Published: July 26, 2021

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Abstract

Objective: To determine the incidence and severity of postoperative complications following surgically placed feeding enterostomy.

Introduction: Enteral nutrition is more advantageous compare to other forms of nutritional supplements. Enteral feeding tube placement is a relatively common general surgery procedure but there has been little standardization in their surgical technique and postoperative care. The aim of this study is to review indications, complications, and clinical burdens related to feeding tube placement and its long-term use.

Materials and Methods: Head and neck and upper gastrointestinal cancer patients presented in Sindh institute of urology and transplantation's Oncology center from November 2017 till October 2020 were reviewed retrospectively. Details reviewed from patient's files at the time of initial admission and subsequent follow ups during study period. All data was collected as per Proforma requirement in retrospective manner while maintaining strict confidentiality protocol according to institutional Ethical review board protocol. Collected data was analyzed for results using SPSS version 23.0.

Results: During this study period, a total of 116 patients underwent feeding enterostomies in our institute. Male patients were 51.7% and mean BMI was 17.86 ± 2.43 . The mean age at the time of surgery was 44.22 ± 14.02 years.

Out of total 63 patients (54.3%) develop complications. According to Clavein dindo classification 28.4% minor while 25.8% major complications were noted.

Subgroup analysis showed that complications were more common in the feeding jejunostomy group with a statistically significant P-value.

Conclusion: Understanding the clinical burden and complications related with feeding tubes will help in minimizing associated morbidity and mortality. Feeding gastrostomy because of low clinical burden and complications should be preferred over feeding jejunostomy where possible.

Keywords: Feeding Enterostomy; Cancer; Complication; Clavein Dindo Classification

Introduction

Perioperative and long-term nutritional support directly impact survival and outcome in cancer patients. The critical role of adequate nutrition is well established in the cancer population.

The cachectic metabolic syndrome and loss of skeletal muscles in cancer patients predispose this population to a high risk of post-operative morbidities, delay recovery, and even mortality [1,2].

The risk of poor nutritional status and its consequences can be managed using enteral and parenteral nutrition. The benefits of enteral nutrition on healing, immune function, and nutritional built-up of cancer patients compared to other forms of nutritional supplements have been well established and most clinicians would agree that when feasible it is preferable over parenteral nutrition [3,4].

Enteral nutrition can be established using natural orifices (nose/mouth) for a shorter duration or percutaneous for long-term access. For the long-term nutritional management of head and neck and upper gastrointestinal cancer patients feeding enterostomy (gastrostomy/jejunostomy) is the preferable route [5,6].

Although that enteral feeding tube placement is a relatively common general surgery procedure and most clinicians encounter challenging issues related to enteral tube management, there has been little standardization in their surgical technique and postoperative care [7-9].

Aim of the Study

This study's aim is to review indications, complications, and clinical burdens related to feeding tube placement and its long-term use.

Materials and Methods

A retrospective study was conducted in the Sindh Institute of urology and transplantation GI surgery department on patients with head and neck and upper GI cancers. All patients received in the Hanifa Suleiman Oncology center fulfilling inclusion criteria from November 2017 till October 2020 enrolled in the study. The Clinical record of all patients was retrieved from the Hanifa Suleiman Oncology clinic registry, GI clinic patient's registry, and hospital Record room. Variables mentioned in the questionnaire were all collected and stored with a given MR number maintaining data security and confidentiality. Approval for the study and exemption letter was obtained from Institutional Review Board (IRB) and the ethical review committee (ERC).

Details collected at initial admission of the patient in GI ward for surgery include patient age, gender, height, weight, Body mass index, total hospital stay which was recorded from the date of admission till the date of discharge, primary tumor, the procedure performed (feeding gastrostomy or feeding jejunostomy), treat-

ment intent of primary cancer. Patient's first follow up in GI OPD recorded for the postoperative course and any further follow up visit in Outpatient or Emergency department for tube related complications were reviewed from files and severity of complication assessed according to Clavein dindo classification, need for readmission, and mortality associated with tube related complications was also reviewed. Subgroup analysis of the surgical procedures in terms of hospital stay, Outpatient and Emergency department visits, readmissions, mortality, and tube-related complications was also performed.

Statistical analysis

All data collected were analyzed using SPSS version 23.0. Frequencies and percentages were computed for categorical variables and postoperative complications while mean \pm standard deviation for quantitative variables. Chi-square or Fisher's Exact Test was used to determine the association between groups. An unadjusted odds ratio with 95% confidence interval was employed to assess the direction and magnitude of association between variables. Significance based on p-value < 0.05 .

Results

During this study period, a total of 116 patients underwent feeding enterostomies in our institute. Among these surgeries 61 (52.5%) were gastrostomies and 55 (47.4%) were jejunostomies. Male patients were 60 (51.7%) and mean BMI was 17.86 ± 2.43 (range 13.32 - 27.04 kg/m²). The mean age at the time of surgery was 44.22 ± 14.02 years (range 12 - 85 years). The mean hospital stay for this surgical intervention was 4.27 ± 3.2 days (range 2 - 17 days). All patients included in the study were presented with the diagnosis of cancer in which 52 patients (44.8%) had head and neck cancer while 51 patients (44.0%) had esophageal and 13 patients (11.2%) had gastric cancer. Indication for feeding tube placement was according to multidisciplinary team meeting recommendations where 24 tubes (20.7%) were placed with palliative intent and 92 tubes (79.3%) were placed with curative intent (surgery/definite chemoradiotherapy).

Clinical burden and complications related to feeding tubes are summarized in table 1. Out of 116 feeding enterostomies, 63 patients (54.3%) develop complications during the follow-up period. According to Clavein dindo classification, 33 patients (28.4%) had minor while 30 patients (25.8%) had major complications. The most frequent complication encountered was wound infection

in 34 patients (29.3%) followed by GI symptoms in 25 patients (21.6%) which include nausea, vomiting, diarrhea, and/or abdominal bloating. Feeding tubes related mortality was observed in 3 patients (2.6%).

Clinical burden		N = 116	(%)
Morbidity	Yes	63	54.3%
Mortality	Yes	3	2.6%
ER visit	Yes	19	16.4%
OPD visit	Yes	25	21.6%
Readmission	Yes	12	10.3%
Reoperation	Yes	3	2.6%
Clevien dindo classification based morbidity	None	48	41.4%
	Minor	33	29.3%
	Major	30	29.3%
Procedure Related Complications		N = 116	%
Wound Infection	Yes	34	29.3%
Intra-Abdominal Collection	Yes	5	4.3%
Peritonitis /Sepsis	Yes	9	7.8%
Peristomal Leak	Yes	20	17.2%
Tube Replacement	Yes	11	9.5%
Tube Block/Dislodge	Yes	15	12.9%
GI Symptoms	Yes	25	21.6%

Table 1: Clinical burden associated with feeding enterostomies.

Subgroup analysis between feeding gastrostomy and feeding jejunostomy (Summarized in table 2) showed morbidities (40.9% vs. 69%. OR 0.311, P-Value 0.002) prolong hospital stay (5% vs. 16.3%. OR 3.78, P-Value 0.042), ER visits (9.8% vs. 23.6%. OR 0.35, P-Value 0.039) and OPD visits (11.4% vs. 32.7% OR .26, P-Value 0.05) statistically significant.

Parameters		Gastrostomy n = 61 (52.5%)	Jejunostomy n = 55 (47.4%)	P-Value	Odd Ratio 95% CI
Gender	Male	37 (60.6)	23 (41.8)	0.033	2.14 (1.02-4.50)
	Female	24 (39.3)	32 (58.1)		
ER visit	Yes	6 (9.8)	13 (23.6)	0.039	0.35 (0.12-1.00)
OPD visit	Yes	7 (11.4)	18 (32.7)	0.05	0.26 (0.10-0.70)

Readmission	Yes	4 (6.50)	8 (14.5)	0.135	0.41 (0.11-1.45)
Hospital stay	< 4 Days	58 (95.0)	46 (83.6)	0.042	3.78 (0.96-14.77)
	> 4 Days	3 (5)	9 (16.3)		
Morbidity	Yes	25 (40.9)	38 (69.0)	0.002	0.311 (0.14-0.66)
Mortality	Yes	1 (1.6)	2 (3.6)	0.46	0.44 (0.039-5.01)
Complication	Yes	25 (40.9)	38 (69.0)	0.002	0.311 (0.14-0.66)
Wound infection	Yes	15 (24.5)	19 (34.5)	0.166	0.61 (0.27-1.38)
Peristomal leak	Yes	8 (13.1)	12 (21.8)	0.16	0.54 (0.21-1.44)
Tube block	Yes	2 (3.2)	13 (23.6)	0.001	0.11 (0.02-0.51)
Tube replacement	Yes	4 (6.5)	7 (12.7)	0.20	0.48 (0.13-0.511)
Intra-abdominal collection	Yes	3 (4.9)	2 (3.6)	0.54	1.37 (0.22-8.52)
Peritonitis/Sepsis	Yes	4 (6.5)	5 (9.0)	0.43	0.70 (0.17-2.75)
GI Symptoms	Yes	8 (13.1)	17 (30.9)	0.017	0.33 (0.13-0.86)
Reoperation	Yes	2 (3.2)	1 (1.8)	0.539	1.83 (0.16-20.76)

Table 2: Comparison feeding gastrostomy vs feeding jejunostomy.

Discussion

Cachexia associated malnutrition in cancer patients warrant nutritional support. Parenteral and enteral nutrition are the two available sources but because of line related issues and need for long term nutritional support enteral nutrition is preferred over parenteral nutrition in cancer patients. In our institute due to limited resources surgically placed enteral feeding tubes are preferred over endoscopically or radiologically placed feeding tubes.

In this study we focused on surgically placed enteral tube related complication and clinical burden on health care professionals. The study demonstrated that 63 patients (54.3%) develop tube related complications which is consistent with the available data [10]. The most common complication in our study was wound infection in 29.3% patients and GI symptoms in 21.6% patients. This high complication rate can be justified keeping in view cancer

related cachexia, underlying comorbidities and general clinical condition of these patients [11,12]. Enteral feeding tubes are helpful in these patients to maintain nutritional requirements especially where oral intake is compromised like head and neck and upper GI track cancers [13].

This study suggested that tube related complications are not life threatening as total mortality was 2.6% but 54.3% morbidities with ER and OPD visits of 16.4% and 21.6% respectively highlights the fact that clinical burden and health care resources utilization is significant. This burden not only affects health care professional but also compromise patients' quality of life, delay specific cancer related treatment as well as psychologically affect patient attendants.

Sun Z., *et al.* and Minarich MJ., *et al.* reported in their respective studies that surgically placed feeding jejunostomies have more complications in term of prolong hospital stay and frequent follow up visits in ER and OPD as well as tube related issues. Our study also reported the similar results and supported that feeding gastrostomies are far more better than jejunostomies in term of postoperative complications [14,15]. On the basis of similar results from our study and international data we recommend where possible feeding gastrostomies should be favored over feeding jejunostomies for nutritional support however to validate this concept a prospective study with large number of patients should be considered.

Our study has several limitations as it is a single centered retrospective study with recall bias for data collection. Furthermore, there is no fixed protocol in our institute for surgical technique, tube management and follow up of these patients that may influence the development of postoperative complications. In addition, patients may visit nearby hospital if they develop any complication and in such cases these complications will not be recorded in our system.

Our recommendations are for a prospective study with large number of patients. Golden AB., *et al.* also concluded the similar results and recommendations that clinical burden can be improved with patient and attendants education regarding tube management, developing a standardized feeding tube protocol which include standardized surgical technique, tube management and a proper follow up design and for which an institutional level patient care program should be initiated. So that tube related morbidities can be addressed earlier and managed accordingly hence avoid-

ing serious complications. This will help to evaluate benefit versus morbidity related with this procedure [16].

Conclusion

Understanding the clinical burden and complications related with surgically placed feeding tubes is crucial as it will help in earlier identification and management of these issues and thus minimize associated morbidity and mortality.

Because of low clinical burden and complication feeding gastrostomy should be preferred over feeding jejunostomy where possible.

Acknowledgement

Special thanks to DR Muhammad Arsalan Khan Consultant HBP surgeon Sindh Institute of Urology and Transplantation for his valuable input regarding motivation and support for writing this article.

Conflict of Interest

Nothing to disclose.

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Volume 4 Issue 8 August 2021

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