

Early enteral feeding using nasojejun tube after gastric cancer surgery is safe and effective: a single unit experience from cancer hospital

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Abstract

Introduction: Patients are kept nil per oral (NPO) after surgery for gastric cancer and all patients receives intravenous fluids till oral feed is commenced. There is established benefit of enteral nutrition after surgery for gastric cancer. Early oral feeding comes with lots of hesitation for execution, so to offer benefits of early enteral nutrition and to avoid early oral feeding, nasojejun tube (NJ) feeding can be used as alternative to feeding jejunostomy (FJ) and also total parenteral nutrition (TPN) can be avoided. The aim of this study is to present our experience of early enteral feeding using NJ tube and to convey the message that early feeding using NJ tube is safe, effective and has less complications.

Methods: This is a retrospective study of patients operated between April 2019 to March 2022, who had nasojejun tube placed at the time of surgery. NJ tube was placed in the efferent limb of jejunum. Feeding was started from post operative day 1 and gradually progressed over days. NJ tube was removed after adequate oral intake.

Results: Sixty patients were eligible for final analysis. Median age of patients was 61 years, IQR (53-69). Thirty-three patients underwent D2-subtotal gastrectomy, 16 underwent D2-total gastrectomy and 10 underwent gastro-jejunostomy. Median time for discharge is 12 days, IQR (12-14). The median time for NJ removal is 10 days, IQR (9-12). Thirty-four patients reported complications related to NJ feed, all were minor and easily manageable.

Conclusion: NJ tube feeding offers the advantages of early enteral feeding after gastric cancer surgery. It is technically easy to use and should be advocated for its simplicity, low costs and great advantages as compared to FJ and TPN.

Keywords: Naso-jejunal tube feeding, early enteral feeding, gastrectomy

Introduction

Patients are classically kept nil per oral (NPO) for few days after surgery for gastric cancer. Patients receive intravenous fluids while NPO, some surgeons start total parenteral nutrition

(TPN) till oral feeding is commenced however early enteral feeding has been encouraged for various benefits.¹ Most of the reports clearly showed benefits of early enteral nutrition in terms of decreased hospital stay, less infection,

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decreased cost, better maintenance of nitrogen balance and even decreased morbidity and mortality.²

There is always a fear of anastomotic disruption, ileus with subsequent vomiting after delivering feed proximal to the anastomosis.³ One way to avoid this fear is to deliver feed distal to anastomosis using a tube so that patients can get the benefit of enteral feeding and in the same time avoid possible anastomotic disruption.⁴ Feeding distal to anastomosis can be done either by feeding jejunostomy (FJ) or by nasojejunal (NJ) tube. Unlike NJ tube feeding, FJ is sometimes associated with major complications, with increased hospital stay, minimal increase in operative time, morbidity like peri-tubal bile leak, infections and even mortality.⁵ A study from India concluded that NJ route is the easiest technique, relatively safe, non-inferior to FJ for nutritional supplementation and less time taking with minor complications.⁶

The aim of our study is to present our protocol of early enteral feeding using NJ tube and to convey the message that early feeding using NJ tube is simple, safe, cheap, easily manageable and has less complications.

Methods:

It is the retrospective study of patients who had NJ tube placed at the time of surgery for gastric cancer treatment. Patients who underwent open surgery in the single unit of Department of Surgical Oncology at Bhaktapur Cancer Hospital from April 2019 to March 2022 were taken in a study. NJ tube was placed during primary surgery in the efferent limb of jejunum after gastrectomy or after bypass gastrojejunostomy (GJ). We used NJ tube

(Freka Tube 15Fr, 100cm Fresenius Kabi, Germany) which was inserted via a nostril before taking the anterior sutures for gastrojejunostomy and is guided into the efferent limb of jejunum and tip was placed distal to jejunojunction. All reconstructions are retro-colic, anterior, hand-sewn Roux-en-Y gastrojejunostomy. NJ insertion was done after completion of hand sewn anastomosis in case of total gastrectomy. Guidewire was then removed and flushed with 20ml saline to ensure, there is no coiling or kinking of tube. Flushing was done twice immediately after insertion and before closing the abdomen. Tube was sutured to columella of nose using prolene 4-0 at the end of surgery and re-enforced using adhesive tape.

Feeding was started from first post operative day and increased progressively over days as per tolerance. Oral rehydration solution (WHO formula) was given on first post operative day (POD), 100ml/hour for 3 to 5 times. We used easily available preparations like soup, milk mixed with raw eggs, fruit juice and ORS for NJ feeding. Intravenous fluid was decreased as NJ feeding was increased and medications was also given via NJ tube after grinding to powder. Feeding was administered using gravity bag by relatives under supervision of nursing staff. Diet chart was modified in the morning round and given to relative. Oral was started on 6th POD and gradually increased as tolerated. NJ was removed after patient tolerated oral feed. Nasogastric tube was not kept after gastrectomy but was kept after bypass gastrojejunostomy, in bypass both tubes was inserted through same nostril.

Clinical profile of patients, time of removal of NJ tube, problems during the administration of

feed, complications if any were retrieved from the patient file.

Results

Sixty-one patients were eligible for study among which 51 patients underwent gastrectomy and 10 patients underwent gastrojejunostomy within the study period. The median age of the patients was 61years, IQR (53-69), among them 26 were female and 36 were male patients.

Fifty-one patients underwent gastrectomy (33 underwent D2-subtotal gastrectomy, 16 underwent D2 total gastrectomy and 2 underwent subtotal gastrectomy with paraaortic lymph node dissection) and 10 underwent GJ, 1 patient was excluded from analysis as he underwent subtotal gastrectomy with en-bloc right hemicolectomy so NJ tube was not kept for feeding.

Table 1: Time for removal of NJ tube

S No	Procedures	NJ removal time (days), median
1	D2-subtotal gastrectomy	10 days, IQR (9-12)
2	D2-total gastrectomy	9 days, IQR (10-12)
3	Gastrojejunostomy	9 days, IQR (11-12)

NJ tube was placed for feeding in 50 patients after gastrectomy and 10 patients after gastrojejunostomy. The maximum amount of feed used is in the range of 1200 to 1500ml per day with some IV fluid supplementation.

The median time for discharge is 12 days, IQR (12-14) and median time for removal of NJ tube is 10 days, IQR (9-12). The median time for NJ

removal after individual procedure is as follows:

There are 34 complications related to NJ tube, which are all minor and easily manageable (Table 2). Most common complication of using NJ tube was irritation and discomfort in throat, which resolved after removal of tube.

Table 2: Complications with nasojejun tube feeding (n=34).

	Complications	(n=34)
1	Accidental pulling of tube	3
2	Intermittent clogging	2
3	Irritation in throat and neck	19
4	Nasal skin ulceration	1
5	Displacement	0
6	Need for post op TPN	0
7	Not able to use	1
8	Intolerance to feed/ occasional GI upset	8

Discussion

Conventionally patients are kept nil per oral with maintenance intravenous fluids after surgery for gastric cancer till oral diet is commenced. Some surgeons use TPN however, TPN comes with complications related to catheter, metabolic imbalance, liver function derangement, impairments of host defense mechanism and it is also expensive.⁷ Over many years it has been proved by many studies that early enteral feeding is acceptable, to be initiated early whenever possible and has many advantages. One of the earliest studies related to enteral nutrition dates back to 1979 AD, where Sagar et al concluded that patients with enteral nutrition did significantly better than conventional group clinically, metabolically

and lost less weight.⁸ A meta-analysis from India in 2009 concludes that early enteral nutrition after major digestive surgery is an old advance that is now in fashion.² We have used NJ tube in our patients for initiation of early enteral feeding.

A patient with good nutritional status has more chances to have a smooth recovery after gastric cancer surgery and they will be better prepared to start adjuvant treatment on time and likely to tolerate it.⁹ Early post operative feeding improves nutritional outcomes and decreases morbidity and mortality.¹

Many nutritional interventions have been developed to improve nutritional status before and after surgery such as TPN, NJ feeding, FJ feeding and introduction of early oral intake. The optimal delivery route for nutrition involves the use of enteral nutrition while avoiding total parenteral nutrition.¹⁰ A study comparing EN and TPN in post gastrectomy patients concluded that EN reduces treatment cost, length of hospital stay, a cheaper way of providing nutrition and prevents intestinal atrophy.¹¹ Appetite stimulant like megestrol acetate or the hormone ghrelin has also been suggested for nutritional benefit, however they are not routinely used.¹⁰ A study by Mohammad et al in their comparative study between different routes of enteral nutrition concluded that, NJ feeding was associated with fewest and less serious complications.¹² All of our patient had NJ feeding for its simplicity and benefits, we have not used FJ, TPN and appetite stimulant in our patient. We were able to avoid possible complications and costs of TPN in all of our patients and offer benefit of early enteral nutrition.

A meta-analysis done by Shrikhande et al from India concluded that early post-operative enteral nutrition irrespective of route is considered superior to total parenteral nutrition and apart from reducing infectious complications, was seen to better maintain stable metabolic activity.²

There are reports of feasibility and safety of early oral feeding with no increase in post operative complications after gastrectomy.¹³ However, the benefits of such early oral enteral feeding are uncertain.¹⁴ Even if the studies showed the feasibility and safety of early enteral feeding, this may not be sufficient to convince the surgeon to start early oral feeding. There is a fear of disruption of anastomosis and ileus with subsequent vomiting and aspiration. We are not yet confident to start early oral feeding and have used NJ tube feeding to offer benefit of enteral feeding to our patients. Enteral feeding may be effective because, unlike early oral feeding, it can be forcibly administered regardless of patient preference. We have started oral enteral feeding from 6th post operative day and gradually increased to full diet within 2-3 days as per tolerance.

There are not many studies which discusses on using NJ tube for early post operative enteral feeding. A study from Japan recommend placement of jejunostomy tube if oral nutrition is likely to be impaired, such as advanced-age undergoing total gastrectomy, patients with severe preoperative malnutrition, who are expected to lose body weight after surgery and in patients at high risk for post-operative complications.¹⁵ They have a protocol of starting oral enteral nutrition on 1st POD. The idea of placement of FJ is to start enteral

nutrition which we are doing by inserting NJ tube and avoiding FJ tube placement.

The use of NJ tube has certain advantages over the use of FJ tube. We have some minor and easily manageable complications related to NJ tube (Table 2). Three patients had accidental pulling of tubes after 6th POD. NJ placement is easy, safe and takes not much time. The cost of NJ tube is one thousand Nepalese currency which is far less than the cost of TPN. Apart from minor complications there are reports of major complications including mortality from FJ tube and moreover patients with FJ tube who had complications had prolonged hospital stay with increased use of resources, thereby increases the overall costs.⁶ The time for removal of NJ tube varies between 6th to 15th POD according to various studies depending upon protocol whereas time to removal of FJ tube is prolonged, around 6th week.⁶ The median time for NJ tube removal in our study is 10days, IQR (9-12). We have not done FJ after gastrectomy in any of our patients.

This article is to highlight the ease and simplicity of using NJ tube to offer the already established benefits of early enteral feeding after surgery for gastric cancer. There are limitations of study like; we have not analysed metabolic, biochemical effects and benefits in terms of decreased morbidity of using enteral nutrition nor we have seen the cost benefits in comparison with TPN.

Conclusion

NJ tube feeding offers the advantage of early enteral feeding after gastric cancer surgery. It is technically easy to place, safe, cheap, easily manageable and has only minor complications.

It is a simple alternative to avoid TPN and FJ feeding.

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