



ORIGINAL RESEARCH PAPER

Surgery

COMPARATIVE STUDY OF EARLY ENTERAL FEEDING VERSUS CONVENTIONAL (LATE) ENTERAL FEEDING IN OPERATED PATIENT'S OF BOWEL RESECTION ANASTOMOSIS

KEY WORDS:

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ABSTRACT

Resection anastomosis is one of the commonest procedure that occurs in the tertiary care hospital. With the advent of better technique of anastomosis, an improved postoperative patient care has revolutionarised the system with an aim to provide patient with a quick painless and safe recovery from the surgery as soon as possible, several studies done have concluded that after a surgery optimal nutritional status and maintenance of bowel function contribute towards a rapid wound healing. Such protocol referred to as fastrack surgery challenges the previous belief of patient management by an evidence based multidisciplinary data. This recent data from rehabilitation surgical programmes in abdominal surgery provides a rational basis to investigate and facilitate enforced oral feeding after major abdominal procedures. Despite the significant body of evidence indicating that these protocols lead to improved outcomes, as they challenge the traditional surgical practices, their implementation has been slow. Thus the idea is to abolish the old belief and get rid of the historical concerns (restrictions, traditions) and pathophysiological factors (postoperative ileus, nausea, vomiting, and loss of appetite) which were once considered significant and invoked for not instituting early oral feeding after abdominal procedures. In our study we made an attempt to evaluate the safety of early enteral nutrition and efficient post operative nursing care in operated patients of resection

Summary-The following conclusion were made

- There was no statistically significant difference in terms of anatomic leak in between the two groups
- The study group had an earlier return of bowel function, passage of flatus, passage of stool and removal of drain as compared to the other group which was started on conventional feeding
- There was reduced hospital stay with early enteral feeding group
- Conclusion early enteral feeding is safe and has better outcomes as compared to conventional enteral feeding in patients undergoing resection anastomosis.

Resection anastomosis is one of the commonest procedure that occurs in the tertiary care hospital. With the advent of better technique of anastomosis, an improved postoperative patient care has revolutionarised the system with an aim to provide patient with a quick painless and safe recovery from the surgery as soon as possible, several studies done have concluded that after a surgery optimal nutritional status and maintenance of bowel function contribute towards a rapid wound healing. Such protocol referred to as fastrack surgery challenges the previous belief of patient management by an evidence based multidisciplinary data. This recent data from rehabilitation surgical programmes in abdominal surgery provides a rational basis to investigate and facilitate enforced oral feeding after major abdominal procedures⁽¹⁻⁴⁾. Despite the significant body of evidence indicating that these protocols lead to improved outcomes, as they challenge the traditional surgical practices, their implementation has been slow. Thus the idea is to abolish the old belief and get rid of the historical concerns (restrictions, traditions) and pathophysiological factors (postoperative ileus, nausea, vomiting, and loss of appetite) which were once considered significant and invoked for not instituting early oral feeding after abdominal procedures. In our study we made an attempt to evaluate the safety of early enteral nutrition and efficient post operative nursing care in operated patients of resection

Aim

- 1 To study the advantages and disadvantages of early feeding versus conventional feeding in patients of resection and anastomosis of bowel (small and large)
- 2 To study the outcomes of early feeding in patients of small and large bowel resection anastomosis
- 3 To compare the complication rate of early enteral and late enteral feeding in patients undergoing resection and anastomosis of bowel

- 4 To study factors in which early feeding is better than the conventional feeding in patients of resection anastomosis
- 5 To compare post operative hospital stay of both early as well as patients

Study design - It was a hospital based comparative study in which all patients admitted in all surgery wards at a tertiary care hospital who underwent resection anastomosis during the period of Sept 2017 to SEPT 2019 were included

Inclusion criteria

- Age > 12 and age < 75
- All patient coming to our tertiary care hospital and undergoing resection anastomosis of small or large bowel

Exclusion criteria

- Patient in severe sepsis that include 2 or more of the following criteria are met + organ dysfunction
- 1. Temperature more than or equal to 38 degree Celsius [100.4F] or less than or equal to 36 degree Celsius [98F]
- 2. Heart rate more than or equal to 90 beats per minute
- 3. Respiratory rate more than or equal to 20 breathe per minute or Paco₂ less than or equal to 2 mmHg or mechanical ventilation
- 4. Wbc count more than or equal to 12000/μl or less than or equal to 4000/μl or more than or equal to 10% band forms
- Pre existing disease, including uncontrolled diabetes with its complication such as cardiovascular problem, diabetic retinopathy, chronic renal failure, cirrhosis and inflammatory bowel disease
- Any cause for preclusion of aggressive nutritional support for eg. Severely malnourished patients
- Patient in hypoproteinemia with albumin level less than 2.5
- Poorly nourished patients with BMI less than 14 and BMI

more than 36

- Children below age of 12 and elderly above 75
- Extensive stage IV(metastatic) malignancies with peritoneal deposits

All patients /guardians of the patient included in the study were made to sign an informed written consent prior to procedure and an information sheet ,stating knowledge of their case finding ,clinical data and treatment outcome being put to use for medical research on grounds of non disclosure of their names and personal detail

Methodology of study –This is a hospital based prospective study to be carried out in the department of general surgery at a tertiary care hospital between the period of September 2017 to September 2019

All patients above 12 years and below 75 years of age coming to our tertiary care hospital and undergoing resection anastomosis of bowel were included in study This is a randomised study in which 2 groups were formed out of which, one group was started on early enteral feeding within 6 to 24 hrs.post operatively and other group was kept nil by mouth till 4-5 days post operatively or till patient passes flatus as per the conventional method . All patients undergoing resection anastomosis in our tertiary care hospital durin the time period and who consented for the study were included in this study. All patients underwent 2 layered anastomosis closure.

Randomization was done by randomly generated computer number Both groups were compared to each other with respect of post operative complication rate, most common complication in the group if any and ,average hospital stay.

Conflict of Interest – there is no conflict of interest in this study

Plan of analysis of result

Once the time period of the study was complete, the data was subjected to relevant statistical analysis and the study aims to assess the benefits and complication of early feeding over conventional feeding in patients undergoing anastomosis resection and to enlist the condition where early feeding is superior to conventional feeding Both groups were compared to each other with respect of post operative complication rate, most common complication in the group if any, average hospital stay.

Observation

In the present prospective study of 60 cases of resection anastomosis of bowel [large and small]who were randomly divided in two group of 30 patients each.One group was started on early enteral feeding (GROUP A) while other was started on conventional late enteral feeding (GROUP B).

Table 1) Distribution of mean time to appear bowel sounds.

Time (Days)	Group A (n=30)		Group B (n=30)		P-Value
	Mean	SD	Mean	SD	
Time (Days)	1.53	0.68	3.20	0.76	0.001***

Values are mean and SD, P-value by independent sample t test. P-value<0.05 is considered to be statistically significant. ***P-value<0.001.

The mean ± SD of time to appear bowel sounds among the cases studied in Group A and Group B was 1.53 ± 0.68 days and 3.20 ± 0.76 days respectively. The minimum – maximum time to appear bowel sounds range among the cases studied in Group A and Group B was 1 – 4 days and 1 – 5 days respectively.

Distribution of mean time to appear bowel sounds among the cases studied is significantly higher in Group B compared to

Group A (P-value<0.001).

This was suggestive that patient who were started on early enteral feeding had earlier appearance of bowel sound as compared to those who were started on conventional [late] enteral feeding .

Table 2) Distribution of mean time to pass flatus post operatively.

Time (Days)	Group A (n=30)		Group B (n=30)		P-Value
	Mean	SD	Mean	SD	
Time (Days)	2.30	0.88	4.20	0.80	0.001***

Values are mean and SD, P-value by independent sample t test. P-value<0.05 is considered to be statistically significant. ***P-value<0.001.

The mean ± SD of time to pass flatus among the cases studied in Group A and Group B was 2.30 ± 0.88 days and 4.20 ± 0.80 days respectively. The minimum – maximum time to pass flatus range among the cases studied in Group A and Group B was 1 – 5 days and 2 – 6 days respectively.

Distribution of mean time to pass flatus among the cases studied is significantly higher in Group B compared to Group A (P-value<0.001).

There was early passage of flatus in the early enteral group as compared to those in late or conventional feeding group and the difference was statistically significant

Table 3) Distribution of mean time to pass stools post operatively.

Time (Days)	Group A (n=30)		Group B (n=30)		P-value
	Mean	SD	Mean	SD	
Time (Days)	3.33	0.76	5.33	1.12	0.001***

Values are mean and SD, P-value by independent sample t test. P-value<0.05 is considered to be statistically significant. ***P-value<0.001.

The mean ± SD of time to pass stools among the cases studied in Group A and Group B was 3.33 ± 0.76 days and 5.33 ± 1.12 days respectively. The minimum – maximum time to pass stools range among the cases studied in Group A and Group B was 2 – 5 days and 2 – 7 days respectively.

Distribution of mean time to pass stools among the cases studied is significantly higher in Group B compared to Group A (P-value<0.001).

The patients of early enteral feeding group [group A] had early passage of stools as compared to those in group B who were started on conventional enteral feeding

Table 4) Distribution of mean time to removal of drain post operatively (Drain <50ml serous with clinically per abdomen finding normal and patient passed stools)

Time (Days)	Group A (n=30)		Group B (n=30)		P-value
	Mean	SD	Mean	SD	
Time (Days)	7.10	0.76	7.80	0.41	0.001***

Values are mean and SD, P-value by independent sample t test. P-value<0.05 is considered to be statistically significant. ***P-value<0.001.

The mean ± SD of time to removal of drain among the cases studied in Group A and Group B was 7.10 ± 0.76 days and 7.80 ± 0.41 days respectively. The minimum – maximum time to removal of drain range among the cases studied in Group A and Group B was 6 – 8 days and 7 – 8 days respectively.

Distribution of mean time to removal of drain among the cases studied is significantly higher in Group B compared to Group A (P-value<0.001).

There was early removal of drain in the early enteral feeding

group as compared to those in the conventional feeding group.

Table 5) Inter-group distribution of incidence of anastomotic leak.

Anastomotic leak	Group A (n=30)		Group B (n=30)		P-value
	n	%	n	%	
Absent	30	100.0	26	86.7	0.112 ^{NS}
Present	0	0.0	4	13.3	
Total	30	100.0	30	100.0	

Values are n (% of cases), P-value by Chi-Square test. P-value<0.05 is considered to be statistically significant. NS-Statistically non-significant.

Of 30 cases studied in Group A, none had anastomotic leak. Of 30 cases studied in Group B, 26 (86.7%) did not have anastomotic leak and 4 (13.3%) had anastomotic leak. The distribution of incidence of anastomotic leak among the cases studied did not differ significantly between two study groups (P-value>0.05).

There was no significant difference between the two groups in term of anastomotic leak. This finding of ours abolishes the myth of increased chance of anastomotic leak if the patient is started on early enteral feeding following a resection and anastomosis.

Table 6) Inter-group distribution of incidence of complication such as vomiting, paralytic ileus, surgical site infection and burst abdomen.

Other complication	Group A (n=30)		Group B (n=30)		P-value
	n	%	n	%	
Absent	25	83.3	15	50.0	0.013*
Present	2	16.7	15	50.0	
Total	30	100.0	30	100.0	

Values are n (% of cases), P-value by Chi-Square test. P-value<0.05 is considered to be statistically significant. *P-value<0.05.

Of 30 cases studied in Group A, 25 (83.3%) did not have other complications and 2 (16.7%) had the other complications. Of 30 cases studied in Group B, 15 (50.0%) did not have other complications and 15 (50.0%) had the other complications. The distribution of incidence of other complications among the cases studied is significantly higher in Group B compared to Group A (P-value<0.05).

Table 7) Distribution of mean duration of hospital stay.

Duration of hospital stay (Days)	Group A (n=30)		Group B (n=30)		P-value
	Mean	SD	Mean	SD	
Duration of hospital stay (Days)	7.73	1.67	13.3	2.17	0.0001***

Values are mean and SD, P-value by independent sample t test. P-value<0.05 is considered to be statistically significant. ***P-value<0.0001.

The mean ± SD of duration of hospital stay among the cases studied in Group A and Group B was 7.733 ± 1.67 days and 13.300 ± 2.177 days respectively. The minimum – maximum duration of hospital stay range among the cases studied in Group A and Group B was 7 – 20 days and 14 – 30 days respectively.

Distribution of mean duration of hospital stay among the cases studied is significantly higher in Group B compared to Group A (P-value<0.001).

This was suggestive a reduced hospital stay in group which was started on early enteral feeding as compared to those in group which was started on late feeding.

DISCUSSION

Conventionally patient after resection anastomosis were kept nil by mouth for 4-5 days post operatively or till bowel sounds return. During this post operative period maintenance of adequate nutrition post operatively has always been the priority for successful outcomes of the surgery. It has now been identified that the conventional method has major setback in form of nutritional store depletion and those following the conventional method of feeding are of the opinion that late feeding provided better chance for anastomosed portion for healing making it less prone for leak at the site of anastomosis and decreasing post operative nausea and vomiting but this claim has been challenged on various grounds with no concrete evidence supporting this claim

In recent times various studies which were done identified quite contrary to the previous dictum. The early post operative enteral feeding was associated with

- Reduced number of wound infection and intra abdominal abscesses
- Reduced no of anastomotic leak
- Lower rate of mortality postoperatively
- Reduced hospital stay^[5-9]

CONCLUSION

In the present prospective study of 60 cases of resection anastomosis of bowel [large and small] who were randomly divided in two group of 30 patients each. One group (GROUP A) was started on early enteral feeding while other was started on conventional late enteral feeding (GROUP B)

The following conclusion were made

- There was no statistically significant difference in terms of anastomotic leak in between the two groups
- The study group had an earlier return of bowel function, passage of flatus, passage of stool and removal of drain as compared to the other group which was started on conventional feeding
- There was reduced hospital stay with early enteral feeding group

Summary

We would like to conclude our study with the final points that

- Early enteral feeding is safe and can be practiced to all patient undergoing resection anastomosis of bowel (small as well as large)
- There are less rate of complication with the early enteral feeding than those who undergo conventional feeding only after appearance of bowel sound or passing of flatus
- Early enteral feeding translates into early appearance of bowel sound passage of stools following resection anastomosis of bowel (small and large)
- There was no major contraindication in starting early enteral feeding for patient who underwent resection anastomosis whether be it elective or on emergency basis. Early enteral feeding group could safely be started in all age group patient who undergo resection anastomosis
- The early appearance of bowel sound and passage of stools following resection anastomosis resulted in a significant reduction in hospital stay following such a major surgery

REFERENCES

1. Chen, C. (2012). The Art of Bowel Anastomosis. Scandinavian Journal of Surgery, 101(4), 238-240.
2. Eskicioglu C, Forbes SS, Aarts MA, et al. Enhanced recovery after surgery (ERAS) programs for patients having colorectal surgery: a meta-analysis of randomized trials. J Gastrointest Surg 2009; 13:2321-9.
3. Lassen K, Soop M, Nygren J, et al. Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 2009; 144:961-9.
4. Tavakkolizadeh A, Whang EE, Ashley SW, Zinner MJ. Small intestine. In: Brunicaardi F, Andersen D, Billiar T, et al, eds. Principles of Surgery. 9th ed. New York: McGraw-Hill; 2004:28-1, 2
5. Moore FA, Moore EE, Jones TN, McCROSKEY BL, Peterson VM. TEN versus TPN following major abdominal trauma-reduced septic morbidity. Journal of

- Trauma and Acute Care Surgery. 1989 Jul 1;29(7):916-23
6. Vaishnani B, Bhatt J, Singh R, Juneja I. A Prospective Comparative Study Of Early Versus Traditional Oral FeedingmAfter Gi Surgeries. Int J Res Med. 2016;5(1):28-31.
 7. Thapa PB, Nagarkoti K, Lama T, Maharjan DK, Tuladhar M.Early enteral feeding in intestinal anastomosis. Journal of Nepal health research council. 2011 Nov 21.
 8. Bufo AJ, Feldman S, Daniels GA, Lieberman RC. Early postoperative feeding. Diseases of the colon & rectum. 1994 Dec 23;37(12):1260-5.
 9. Dorai D, Kumar JL, Chitra T, Prasanna G. Effects of early enteral nutrition on patients after emergency and elective gastro-intestinal surgery.