COMPARISON OF FREQUENCY OF ANASTOMOTIC LEAK IN EARLY VERSUS DELAYED ORAL FEEDING AFTER ELECTIVE COLOSTOMY CLOSURE

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ABSTRACT

Background: Colostomy is an artificial opening made in the large gut to divert faeces and flatus to the exterior

OBJECTIVE: To compare the frequency of anastomotic leak in early versus delayed oral feeding after elective colostomy closure.

MATERIAL AND METHODS: This randomized controlled study was conducted in Surgical department Hayatabad Medical Complex Peshawar from June 2012 to June 2014 after taking permission from local ethical and research committee.

RESULTS: A total of 298 patients of colostomy closure were observed, which were divided in two equal groups. Overall male to female ratio was 1.21:1. The overall average age of the patients was 39.33 years +13.52SD. Anastomotic leak wise distribution shows that early oral feeding have anastomotic leak in 8(5.4%) patients while in late oral feeding group anastomotic leak was observed in 20(13.4%) patients which showed that anastomotic leak was low in early oral feeding group than late oral feeding group (p-value=0.017).

CONCLUSION: Early oral feeding is as safe as late oral feeding after elective colostomy closure in terms of postoperative leak.

KEY WORDS: Early feeding, Safety, Late feeding, colostomy, Anastomotic leak

INTRODUCTION:

The mortality and morbidity from large bowel surgery often exceeded 20% mainly attributed to sepsis over the past century. However, it has decreased substantially since then mainly due to modern surgical techniques and improved peri-operative care[1]. The repair by suture or resection of diseased colon is one of the most important skills in general surgery. Untreated or treated improperly these conditions cause significant morbidity in terms of intra-abdominal infection or death from generalized peritonitis[2].

Intestinal anastomosis is frequently performed as emergency and elective procedures due to traumatic rupture, benign or malignant perforations or obstruction and in some other inflammatory conditions[3]. The traditional approach to start post-operative feeding following bowel anastomosis has been to await the resolution of post-operative ileus. During this period, patient remains with nasogastric tube for decompression of bowel. However, adequate nutrition has always been a major goal in post-operative period and now it is being increasingly recognized that withholding oral feeds for few days after surgery leads to nutrition depletion and its consequences.

A nil by mouth (NBM) approach after gut anastomosis surgery has been well known for many years due to transient paralytic ileus. There is no evidence that that bowel rest and nothing by mouth are beneficial for healing of wounds and anastomotic integrity. Indeed, the evidence is that luminal nutrition may enhance wound healing and increase anastomotic strength, with reduction in peri-operative infection, better maintenance of nitrogen balance and shorter hospital stay[4]. Early enteral nutrition (EN) has become very popular and received increasing attention in recent years[5]. Some claims that early enteral feeding has better results than delayed enteral feeding in term of wound and respiratory infections, hospital stay, mortality and vice versa.

Anastomotic leak is the most important complication following colorectal resection and anastomosis[6]. The complications of early and delayed enteral feeding have been reported with controversies. Some claims that early enteral feeding has better results than delayed enteral feeding in terms of wound and respiratory infections, hospital stay, mortality and vice versa[7].

Ahmad Dag et al has reported the superiority of early enteral feeding and observed that the rate of wound infection (5.05% vs 7.00%), mean hospital stay (5.55 vs 9.0) days, and anastomotic leakage (2.02% vs 6.00%) were less in the early feeding group[8]. In his study by Abid et al[7], showed anastomotic leak in one patient (3.57%) in early group as compared to nine

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patients (32.1%) in delayed oral feeding group after elective gut anastomosis which was statistically significant (p=0.012). In contrast, Chatterjee Set al has showed that in early feeding group the rate of nausea and vomiting (20% vs 13.33%), wound infection and dehiscence (25% vs 13.33%), respiratory tract infection (16.67% vs 8.33%), anastomotic leakage (13.33% vs 5%) and mortality (6.67% vs 1.67%) was more than delayed oral feeding group[9].

The objective of my study is to compare the frequency of anastomotic leak in early versus delayed oral feeding after elective colostomy closure.

ANASTOMOTIC LEAK:

Anastomotic leak was diagnosed clinically by the presence of all of the signs and symptoms of abdominal pain, raised pulse (100/min) and temperature (100F°), abdominal tenderness, absent bowel sounds and leaks apparent on gastrointestinal contrast studies (gastrograffin) or gut contents either discharging from the wound or the anastomosis site (on re-exploration).

HYPOTHESIS:

Early oral feeding after elective colostomy closure is superior than delayed oral feeding in terms of anastomotic leak.

MATERIAL AND METHODS

This randomized controlled study was conducted in Surgical department Hayatabad Medical Complex Peshawar from June 2012 to June 2014. Inclusion criteria included patients between 15 - 70 years age who underwent colostomy closure irrespective of gender and aetiology and patients with chronic liver, renal or heart diseases, those with diabetes mellitus and who were using steroids were excluded from the study.

After approval of my study from by the Institutional Ethical Committee, patients were admitted through out -patient department and the study purpose was explained to the patients. Informed written consent were taken from those who agreed to participate in the study and were divided into two equal groups with early oral feeding (Group A) and delayed oral feeding (Group B) by lottery method. All patients included in the study were subjected to complete history taking, thorough physical examination and routine pre-operative investigation including complete blood picture, random blood sugar, coagulation profile, serum urea and creatinine, serum electrolytes, ALT, AST, ECG and chest x-ray if needed. Distal loopogram were done to exclude obstruction distal to anastomosis.

All the patients were put on next elective operation theatre list. No pre- operative gut preparation were done in both groups and patients in each group were undergone colostomy closure under general anaesthesia by single interrupted extra mucosal technique using vicryl 2/0 under strict aseptic conditions. A single dose of 1.5 gram cefuroxime and single 100 ml metronidazole infusion were given to all patients at the time of anaesthesia induction and were continue for the first 48 hours post-operatively. A closed drainage system was applied and N/G was passed in both groups.

In the group A patients, N/G were removed on first post-operative day morning and oral liquids (30ml/hr) were started and in case of nausea and vomiting, the volume were decreased. Those who tolerated liquids were started on free oral liquids at the second day followed by soft diet at third day, then normal diet at fourth day and then lastly were planned discharge at the fifth day. While in group B patients, N/G tube were removed on 3rd post-operative day. Patients were then started on oral liquids and the gradually shifted from soft semisolid diet to normal solid diet.

All patients were monitored post-operatively for signs of anastomotic leak and information about the anastomosis was recorded on pre designed proforma up to the 2 weeks post-operatively. Effectiveness were determined if there were no anastomotic leak till 2 weeks post-operatively. Confounders and bias were controlled by strictly following exclusion criteria.

DATA ANALYSIS PROCEDURE:

The data were entered into SPSS version 11 for windows. Descriptive statistics were used to calculate mean ± SD of age. Frequencies and percentages were calculated for categorical variables like gender and anastomotic leak. Effectiveness were stratified among age and gender to see the effect modification. Chi-square test was used to compare the effectiveness of both the procedures and p-value ≤ 0.05 were considered significant. All results were presented as tables and graphs. Post-stratification chi-square test were also applied.

RESULTS

A total of 298 patients of colostomy closure were observed, which were divided in two equal groups. Patients in one group were managed by early oral feeding and another group of patients were going through late oral feeding.

Gender wise distribution shows that 83(55.7%) were male and 66(44.3%) were female in early oral feeding group with male to female ratio was 1.25:1 while late oral feeding group contains 80(53.7%) male and 69(46.3%) female with male to female ratio was 1.16:1. Overall male to female ratio was 1.21:1. Sex distribution among the groups was insignificant with p-value=0.408 (Table 1).

Average age was 38.75 years+ 13.82SD in early oral feeding group and included 17(11.4%) patients having less than 20 years, 40(26.8%) patients 21-35 years, 55(36.9%) patients 36-50 years and 37(24.8%)

Table 1: Gender wise comparison of both the groups

		Group		Total	p-value
		Early oral feeding	Late oral feeding		
Gender	Male	83	80	163	0.408
		55.7%	53.7%	54.7%	
	Female	66	69	135	
		44.3%	46.3%	45.3%	
Total		149	149	298	
		100.0%	100.0%	100.0%	

Table 2: Age wise distribution in both the groups

		Group		Total	p-value
		Early oral feeding	Late oral feeding		
Age (in years)	<= 20.00	17	15	32	0.237
		11.4%	10.1%	10.7%	
	21.00 - 35.00	40	27	67	
		26.8%	18.1%	22.5%	
	36.00 - 50.00	55	69	124	
		36.9%	46.3%	41.6%	
	51.00+	37	38	75	
		24.8%	25.5%	25.2%	
Total		149	149	298	
		100.0%	100.0%	100.0%	

Table 3: Safety wise distribution in both the groups

		Group		Total	p-value
		Early oral feeding	Late oral feeding		
Postoperative leak	Yes	8	20	28	0.017
		5.4%	13.4%	9.4%	
	No	141	129	270	
		94.6%	86.6%	90.6%	
Total		149	149	298	
		100.0%	100.0%	100.0%	

patients having age more than 50 years. While late oral feeding group have average age of 39.91 years +13.25SD and included 15(10.1%) patients in less than or equal to 20 years, 27(18.1%) in 21-35 years, 69(46.3%) in 36-50 years and 38(25.5%) patients have age more than 50 years of age. The overall average of the patients was 39.33 years +13.52SD. The age distribution among the group was also insignificant with p-value 0.237. (Table 2).

Postoperative anastomotic leak wise distribution showed that early oral feeding showed no anastomotic leak in 141(94.6%) patients and 8(5.4%) patients have anastomotic leak while late oral feeding group have no anastomotic leak in 129(86.6%) patients and anastomotic leak in 20(13.4%) patients which shows that anastomotic leak was highly significant in both the procedure with p-value=0.017 (Table 3).

Age wise distribution in both the groups showed that anastomotic leak was greater in old age group and decreases with the decrease of age. The patients

Table 4: Age wise distribution of safety in both the groups

		Group							
		Early oral feeding				Late oral feeding			
		Postoperative leak				Postoperative leak			
		Yes		No		Yes		No	
		Count	%	Count	%	Count	%	Count	%
Age (in years)	<= 20.00	0	0%	17	12.1%	1	5.0%	14	10.9%
	21.00 - 35.00	5	62.5%	35	24.8%	4	20.0%	23	17.8%
	36.00 - 50.00	1	12.5%	54	38.3%	6	30.0%	63	48.8%
	51.00+	2	25.0%	35	24.8%	9	45.0%	29	22.5%
	p-value	**0.096**				**0.144**			

Table 5: Gender wise distribution of safety in both the groups

		Group							
		Early oral feeding				Late oral feeding			
		Postoperative leak				Postoperative leak			
		Yes		No		Yes		No	
		Count	%	Count	%	Count	%	Count	%
Gender	Male	2	25.0%	81	57.4%	9	45.0%	71	55.0%
	Female	6	75.0%	60	42.6%	11	55.0%	58	45.0%
	p-value	**0.072**				**0.402**			

having age less than or equal to 20 years showed no anastomotic leak in 17(12.1%) in early feeding group while 14(10.9%) in late oral feeding group. We can see that safety in both the group when stratified among the age, it shows insignificant. (Table 4)

When anastomotic leak was stratified among the gender in both the groups it showed insignificance in both the group gender. (Table 5)

DISSCUSSION

Traditionally after abdominal surgery, the passage of flatus or bowel movement has been the clinical evidence for starting an oral diet. It is customary to keep the patients "nil by mouth" after gastrointestinal anastomosis till patient passes flatus. However, adequate nutrition has always been a major goal in postoperative care and now it is being increasingly recognized that withholding oral feeds for few days after surgery in such cases leads to nutritional depletion and its consequences. In the past few years, some studies have examined the role of early feeding after gastrointestinal anastomosis and found that it improved immunocompetence, decreased septic complications, improved wound healing and possibly improved anastomotic strength[10,11].

The mean age of the patients in early oral feeding group was 38.75 years+ 13.82SD years and 39.91 years +13.25SD years in the late oral feeding group and was comparable. In our study we got 33% cases with penetrating abdominal injuries in which colostomy was constructed and is very comparable to the other studies of Sajjad and Safirullah et al[12].

Early oral feeding is an essential part of fast track surgery which has evolved as a result of coordinated effort to combine recent evidence based advances in the modern care of surgical patients[13]. Fast track rehabilitation or enhanced recovery after surgery is a multimodal program aiming at enhancing postoperative recovery and outcome[14,15]. Several groups around the world have confirmed the benefits of this combined anesthetic and surgical approach for perioperative care and demonstrated reduced hospitalization, potential complication and cost[16,17,18].

In the present study out of 8 patients in early feeding group and 21 cases of late feeding group who had postoperative anastomotic leak, intraabdominal drainage was done in 2 patients in early group and 4 patients in late group. However drain was not able to pick up anastomotic leak in any of the case and in all the cases anastomotic leak manifested as fecal discharge from main abdominal wound.

Oral feed was started within 24 hours of surgery and it was well tolerated in 94.6% cases of early oral feeding group. Remaining 8 cases (5.4%) could not tolerate with early oral feeds. Oral feeding had to be

withheld for 2-3 days with nasogastric decompression in 2 cases (8%) and one patient (4%) could continue to tolerate feed in small quantities. The tolerance to early oral feed in the present study is comparable to the results of previous studies. However another important observation is that the tolerance to oral feeds is same in present as well as most of the previous studies despite the fact that early oral feed was started within 24 hours in the present study while in all other studies, oral feed was started within 24-72 hours of surgery. This indicates that oral feed can safely be started in first 24 hours of surgery with good tolerance because effect of anesthetic gases is over by that time.

One other study shows that the 12% cases in the control group and 8% cases in study group had anastomotic leak which was comparable ($p>0.05$). In group A, out of 2 cases of intestinal leak first patient having relapse of enteric enteritis required 2 surgeries after the leak was detected. The second case in group A was found to have iatrogenic leak proximal to site of anastomosis. In group B one case of transverse colectomy and end to end anastomosis had postoperative anastomotic leak. All the cases of intestinal leak after surgery in both the groups were managed by creating stoma except 1 case in group A in which the leak was managed conservatively. Improved nutritional status in study group cases might have helped in decreasing wound sepsis, lesser anastomotic leaks and better wound healing. In the past also various workers have observed that wound healing as well as anastomotic strength improves in cases of early oral feeding[19,20].

Lewis et al, in his meta-analysis of 11 studies along with some other studies have examined the role of early feeding after gastrointestinal anastomosis and found that it improved immunocompetence, decreased septic complications, improved wound healing and possibly improved anastomotic strength[19,21].

In other similar studies in the past, feeding was started 48-72 hours following operation and patients tolerated feed[22,23]. The tolerance to early oral feed in the present study is comparable to the results of previous studies. In a study conducted by Stewart et al[24], tolerance to early oral feed is much less (65%) in comparison to other studies, possibly due to the fact that feed was started within 4 hours of surgery when residual effect of anesthetic drugs is still present. This indicates that oral feed can safely be started within 24 hours of surgery with good tolerance because effect of anesthetic drugs is over by that time. The results of meta-analysis of 11 studies by Lewis et al[20] have also shown that incidence of wound infection is 3-30% in early fed group. In the past,various workers have observed that wound healing as well as anastomotic strength improves in patients of early oral feeding[19,20].

CONCLUSION

In conclusion, it can be said that the conventional wisdom of withholding enteral feeds for prolonged periods to coincide with the appearance of peristaltic sounds might not stand the test of time and early feeding is beneficial to the patients. However further large volume studies will be required to justify such an approach.

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