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General Surgery

STUDY OF FACTORS AFFECTING EMERGENCY RESECTION ANASTOMOSIS

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ABSTRACT Exploratory Laparotomy is one of the commonly performed procedure in the General surgery emergency with resection anastomosis a frequently performed procedure. Alongwith the anatomical and technical knowledge of the procedure the knowledge of the various parameters guarding the adequacy of the anastomosis is extremely important for favourable outcome. This study was undertaken in view of assessing these parameters for a successful anastomotic uptake to reduce the morbidity & improve the overall results.

KEYWORDS : Resection anastomosis, leakage, emergency

Introduction

Gastrointestinal anastomosis is one of the most commonly observed procedure in the emergency surgical setup. With the advent of newer suture materials and techniques in the anastomotic procedures yet anastomotic complication of leakage to a surgeon has been one of the constantly dreaded entity with significant morbidity and mortality. Though the bowel has been attributed with an excellent blood supply which is a pre requisite for joining two raw surfaces, numerous factors govern the anastomosis like the patient profile, operative technique, the suture material used to the surgeon performing the procedure. Assessment of the adequacy of the procedure bears heavily on patient monitoring and vital parameters only which can at times incapacitate the surgeon and make him wait with anticipation and pray for the anastomosis to be successful without causing complication of leakage. This constant search for newer techniques has opened new horizons in the field of anastomosis. Bowel approximation from the ancient use of simple stenting materials to the present day intestinal staplers with betterment of the technique everyday has been backed by studies comparing the efficiency of the newer techniques and has raised debatable findings regarding their use. Inspite of laparoscopy and staplers having taken over the open procedures considerably, hand sewn intestinal resection anastomosis still holds a place in the operative armoury.

The reason of this study to be undertaken is to discuss the various parameters of emergency intestinal resection anastomosis and the complications and a step towards reducing them in future.

The study included all the patients requiring resection & anastomosis with the exclusion of cases who had undergone the procedure previously in any other hospitals & with a primarily jeopardised blood supply due to trauma.

Material & Methods

A longitudinal study of 79 patients was undertaken in a tenure of 2 years admitted in the emergency setup.

Preoperatively patient was investigated to confirm the diagnosis with X-ray /Ultrasound or CT scan of the abdomen. No bowel preparation was performed as the procedures were done in emergency.

Intraoperative the anastomosis in the present study were performed by open hand sewn method with use of 2-0 silk round bodied and inner continuous layer and outer interrupted seromuscular layer. The anastomosis was confirmed by on table leakage of any bile or faecal matter contents avoiding any significant narrowing of the lumen. The bowel vascularity was rechecked with the bowel colour, pulsations of the supplying artery and regular peristalsis before the procedure was undertaken. The presence of any distal obstructing pathology was confirmed before performing the procedure. A thorough peritoneal wash was given to all the patients irrespective of the amount of contamination of the abdominal cavity.

Post operatively the patients were monitored with blood parameters of Complete blood count, Renal function tests, Serum electrolytes and Albumin levels was done at regular intervals of time. A close watch on temperature, Pulse, Blood pressure, Ryle's tube aspiration volume, abdominal girth and the volume and the nature of the intraabdominal drain was observed. Presence of faecal matter or bilious content in the drain was considered as failure of anastomosis and accordingly decision for re exploration was taken.

Results

The mean age group for the study was 41.92 years & Majority of the patients were from the 15-30 years age group. Males constituted 70.88% (56) of the patients in this study & females constituted 29.12% (23) of the patients in this study.

The mean haemoglobin percentage was 9.25 gm%. The lowest haemoglobin recorded was 6.1 gm% and highest being 11.2 gm% in this study.

Majority of the patients belonged to the group of serum albumin concentration less than 3.5 gm% constituting 56 patients. The rest 23 had serum albumin concentration more than 3.5gm%.

Co-existent Diabetes Mellitus with Hypertension was the commonly observed condition in this study. Pulmonary conditions were the second most commonly observed comorbid condition in this present study of patients. 2 cases of HIV were also observed in the study, which were diagnosed preoperatively as a routine investigation before surgery. (Table 1)

Table.1 Comorbid conditions of the patients undergoing resection anastomosis

Sr. No	Co-Morbid Conditions	No. of Patients
1	Pulmonary conditions(COPD, Consolidation)	4
2	Hypertension	3
3	Diabetes	4
4	Diabetes and Hypertension	8
5	HIV	2
6	No Co-Morbid conditions	34

Maximum patients in this study had no contamination of the peritoneal cavity which were 42 in number. Contamination in total was found in 37 patients in the form of Infected fluid, bile or faecal matter.

The most common condition in this study for which patients

underwent surgery was for carcinoma of the colon in the large intestine. In small intestines the most common indication of surgery was tubercular ileal stricture with obstruction. (Table.2)

Table 2. Pathology in the intestines

Sr. No	Pathology	No. Of Patients
1	Tubercular jejunal stricture with obstruction	1
2	Jejunalstricture unknown cause	2
3	Jejunal Diverticulum with perforation	1
4	Jejunal perforation	1
5	Tubercular ileal stricture with obstruction	10
6	ileal stricture unknown cause	2
7	Ileal perforation cause unknown	3
8	Enteric ileal perforation	8
9	Meckels diverticulitis	1
10	Ileal obstruction with gangrene caused by bands	4
11	Ileal obstruction with gangrene caused by post op adhesions	8
12	Mesenteric vascular thrombosis	3
13	Gangrenous Appendicitis	8
14	Strangulated Inguinal Hernia	5
15	Carcinoma Colon with obstruction	14
16	Colonic perforation	1
17	Sigmoid Volvulus	2
18	Intussusception	4
19	Inflammatory bowel disease with perforation	1

Amongst the complications wound infection was a commonly observed entity in 53 (67.08%) of the patients. Fever was the second commonly observed distressing factor for the patient present in 39 (49.36%) patients. Pulmonary complications were present in 28 (35.44%) of the patients. Anastomotic leakage was seen in 14 (17.72%) patients. The mortality rate for this study was 9 patients (11.39%).

Hospital stay directly or indirectly affects the quality of life and the income of patient which has been observed in various studies. The mean duration of stay was 17.75 days and the maximum patients were discharged in the first 10 days and 11-20 days range. The maximum stay of a patient was 58 days and minimum stay of 2 days both of which expired due to complications.

Re-exploration was carried out in 11 out of the 14 anastomotic leak patients which was 13.92% of the patients. The most commonly performed procedure was Reanastomosis with a proximal diverting stoma of 9 patients. 2 patients received only proximal diversion as an urgent re-explorative procedure.

Discussion

The youngest person on which Emergency resection anastomosis was performed was of 17 years & the eldest being 86 years. Kulah B reported a higher rate of mortality of 24% alongwith higher percentage of complications in his study in higher age group[1]. Blansfield JA reported a higher amount of pulmonary complications comprising 11% in the higher age group [2].

The overall mortality rate was 30.76% in the age group more than 60 years and 7.5% in the group below 60 years. Pulmonary complications were observed to be higher i.e 69.23% in higher age group than the lower age group which was 28.78%. The anastomotic leak was observed to be 46.15% in above 60 years patients and 12.12% in below 60 years age patients. As observed in the other studies the percentage of complications of mortality rate and anastomosis failure was considerably higher in the elderly age group.

Lipska MA[3] Rudinskaite G[4] in his case study of 541 patients of emergency resection anastomosis reported that males have a increased risk for anastomotic leak as compared to the female gender

Proteins being the basic structure of our body required for the wear and tear of the body tissue are the building blocks both at the macroscopic and the microscopic levels. Amit Nair,Dinkar R Pai S Jagdish[5] studied the anastomosis failure of 74 patients in their study which they found to be 35% and established a strong association of hypotension and hypoalbuminemia with anastomotic failure. In this study the anastomosis failure rate was observed consistent with other studies of low serum albumin levels. The mortality was seen to be higher amongst the group of lower serum albumin levels.

Though the intestines perform the same function of absorption, digestion and excretion of the food yet small and the large intestine show a gradual considerable difference in their anatomical framework, blood supply, distensibility, anastomosing capacity and resectability.

A varied observations were noted in different studies done till date in terms of mortality and post operative complications. In this study a total of 51 cases of small intestine anastomosis and 28 large intestine anastomosis was dealt with. The anastomotic leakage rate is 17.72% in our study which is slightly higher for large intestine than small intestine, being 21.42% and 15.68% respectively. The combined mortality was 11.39% in the study group.

The study of Amit Nair,Dinkar R Pai,S Jagdish[5] have described the deleterious effects of hypovolaemia, hyponatremia and hypoalbuminemia on the anastomotic healing and resulted in 35% of the anastomotic failures, however study by Schrock[6] reported mild degree of hypovolemia does not affect the healing.

In the present study the anastomotic failure rate was noted to be 57.89% in the inotropic group in comparison to 5% in the non-inotropic group.

In this study out of the total 14 patients of anastomotic leak only 11 required re-exploration and rest 4 were given Conservative line of management. Resection anastomosis with proximal functioning stoma was the most common procedure taken after re-exploration performed in 9 out of the 11 cases. The mortality increased significantly after the re-exploration amounting to 45.45% combined and individually 50% for small intestine and 40% for large intestine of the total patients re-explored.

The total overall mortality after re-exploration was observed to be 6.32 %.

The factors like hypoprotienemia, hypotension, age, peritoneal cavity contamination which were studied for the association and its impact over the outcome of the anastomosis showed a strong relation and focussed management of these conditions can improve the results significantly.

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