



Surgery

A CLINICAL STUDY OF RESECTION AND ANASTOMOSIS OF BOWEL IN OUR CLINICAL PRACTICE

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ABSTRACT In this study, the incidence of Intestinal Resection and Anastomosis in our practice, its various etiologies and factors determining healing of an anastomosis. The different techniques used in the sutured bowel anastomosis among various surgeons were compared to determine which was the superior and has the least anastomotic leak, along with identifying the most ideal suture material for the techniques in 50 patients undergoing bowel resections and anastomosis for different etiologies at Santhiram medical college, Nandyal

KEYWORDS :

INTRODUCTION:

The creation of a join between two bowel ends is an operative procedure that is of central importance in the practice of a general surgeon, it is the most common surgical procedure, especially in the emergency setting and is also commonly performed in the elective setting when resections are carried out for benign or malignant lesions of the gastrointestinal tract, done by the present day General Surgeon. A disastrous complication of intestinal anastomosis is anastomotic leak resulting in peritonitis, which is associated with high morbidity and mortality. Proper surgical technique and adherence to fundamental principles is imperative to ensure successful outcome after intestinal anastomosis¹

Safety in gastrointestinal surgery depend to a large extent on the technical expertise of the operating surgeon in the intestinal anastomosis. The main one is creation of a tension-free join with good apposition of the bowel edges in the presence of an excellent blood supply.

AIMS AND OBJECTIVES:

1. Incidence of intestinal resections and anastomosis in Santhiram medical college and general hospital, Nandyal and various causes leading to it.
2. To study the important factors which determine the healing of Gastrointestinal tract after an anastomosis and verify their significance in healing of anastomosis.
3. To study various suture methods (sutures/staples) used for anastomosis at different anatomical locations and thus determine the most ideal suture material for these techniques in our study.

MATERIALS AND METHODS:

This study involved all the patients undergoing intestinal resection and subsequent anastomosis for various causes in the department of General surgery at Santhiram medical college and general hospital, Nandyal. A total of 50 patients between August 2020 and July 2021 have been studied

Inclusion criteria :

- All the patients undergoing intestinal resections for various causes requiring an anastomosis for distal continuity of bowel.

Exclusion criteria:

- All the gastro intestinal anastomosis [ex. Gastro jejunostomy and gastro duodenostomy]
- All the biliary and enteric anastomosis/ pancreatico-enteric anastomosis
- Patients with malignancy who have undergone pre-operative radiotherapy and chemotherapy.
- Steroid dependent patients

Methods for collection of Data

- Direct interview with patient and obtaining detailed history.
- Thorough clinical examination
- Cases will be selected consequently based on inclusion and exclusion criteria.
- Appropriate investigations performed over the patients.
- Routine investigations: Blood-Complete hemogram, RBS, B.Urea, S.Creatinine, HIV, HBsAg.
- Relevant : Radiological – X ray abdomen, ultrasound of abdomen, CT scan abdomen

RESULTS:

Tab1: Sex Incidence of study population

| | No. of cases | percentage |
|--------|--------------|------------|
| Male | 32 | 64 |
| female | 18 | 36 |

The male to female ration around 1.7:1

Tab 2: age & sex incidence

| Age in years | male | femlae |
|--------------|------|--------|
| 16-30 | 8 | 4 |
| 31-45 | 13 | 6 |
| 46-60 | 5 | 3 |
| >60 | 6 | 5 |

Table-3 : malignant Causes for Intestinal Resection and Anastomosis

| Type of malignancy | No. of cases |
|--------------------|--------------|
| Ca.colon | 7 |
| Ca.caecum | 2 |
| Ca.sigmoide | 2 |
| Ca.rectum | 1 |

Tab4: : Etiology of Intestinal Obstruction

| Etiology of intestinal obstruction | No. of cases |
|------------------------------------|--------------|
| Adhesions with gangrene of bowel | 6 |
| Intussusception | 4 |
| Sigmoid volvulus | 2 |
| Ileal stricture | 4 |
| bands | 2 |

Table-5: Intestinal tuberculosis as a cause for resection and anastomosis

| Abdominal TB | No. of cases | Percentage |
|--------------------|--------------|------------|
| Ileo caecal kochs | 3 | 75 |
| TB hepatic flexure | 1 | 25 |

Table-6: Strangulated Hernia as a cause for resection and anastomoses

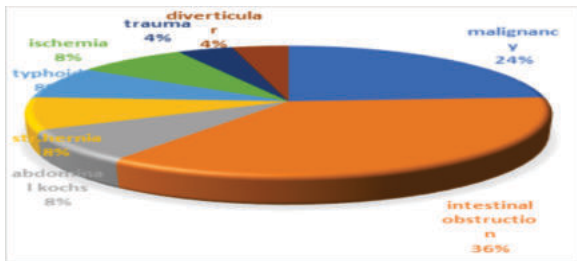
| Strangulated hernia | No. of cases | percentage |
|---------------------|--------------|------------|
| | | |

| | | |
|---------------------------------|---|----|
| Str.inguinal hernia | 2 | 50 |
| Str.recurrent incisional hernia | 2 | 50 |

Table-7: Enteric fever pathology

| | |
|------------------------------------|-------------|
| Enteric fever pathology | No.of cases |
| Ileal perforation with peritonitis | 4 |
| Jejunal perforation | 0 |

Tab 8: Etiologies of resection& anastomosis



Tab9: Relevance of Emergency and Elective Surgery to the development of Leak

| | | |
|-----------------------|-------------|-------|
| Resection&anastomosis | No.of cases | leaks |
| Emergency | 37 | 13 |
| elective | 13 | 0 |

Tab10: Small bowel&large bowel anastomosis

| | |
|--------------------------------|------------|
| Anastomosis | No.of case |
| jejunal | 4 |
| Ileal | 14 |
| Jejuno-ileal | 4 |
| Left hemicolectomy | 1 |
| AR with E-E-A | 2 |
| Segmental resection with E-E-A | 3 |

Tab 11: : Anastomoses between Small and Large Bowel

| | |
|--|-------|
| Type of anastomosis | Cases |
| Right hemicolectomy | 9 |
| Segmental resection with E-E-A | 8 |
| Ileal resection with E-E-A+ileo-transverse S-S-A | 3 |
| Duodeno-DC E-E-A | 2 |

Tab12: risk factors for leak

| | |
|------------------|----------------|
| Risk factors | No of patients |
| Anaemia | 28 |
| Hypoproteinaemia | 19 |
| Peritonitis | 17 |
| Septicaemia | 5 |
| Uraemia | 7 |
| Old age | 20 |

Tab 13: Two layer anastomoses & leak

| | | |
|------------------------|--------------|-------|
| | No. of cases | Leaks |
| Interrupted+continuous | 4 | 2 |
| Both interrupted | 8 | 3 |
| Both continuous | 8 | 2 |

Tab14: : Suture Materials Used

| | | |
|--------------------------------|-------------------------|------------------|
| | No of anastomotic cases | Cases with leaks |
| SMALLBOWEL ANASTOMOSIS | | |
| Vicryl&silk | 12 | 5 |
| Vicryl alone | 10 | 2 |
| LARGE BOWE LANASTOMOSIS | | |
| Vicryl&silk | 2 | 1 |
| Vicryl alone | 4 | 1 |
| Silk alone | 2 | 1 |
| SMALL&LARGE BOWEL | | |
| Vicryl alone | 8 | 1 |
| Vicryl&silk | 12 | 2 |

Tab15:mortality

| | |
|---------------|------------|
| Mortality | percentage |
| Leak group | 83 |
| Nonleak group | 17 |

DISCUSSION:

Resection and anastomoses of the intestines is a common surgical

procedure it is still at times associated with morbidity in the form of anastomotic leak, stricture formation, fecal fistula and diverticulum and at times mortality due to the associated septic complications. Baviskar³ et al study on resection and anastomosis of small bowel showed the incidence of 58% in males 42% in females. Our study has similar sex incidence with that of baviskar³ et al

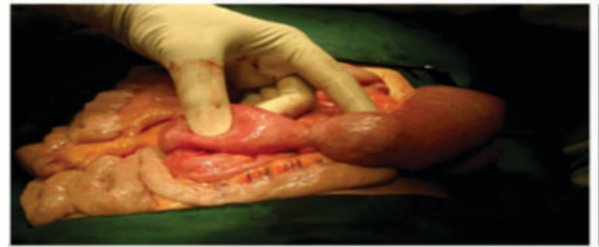


Figure-3 : Ileal stricture

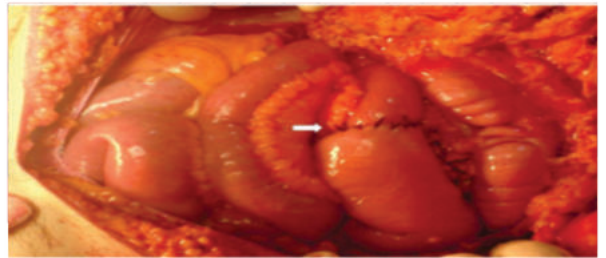


Figure-5: Ileotransverse End to end anastomosis



Figure-8: Rectosigmoid anastomosis



Figure-6: End to side anastomosis of small intestine



Figure-7: End to side anastomosis (two layered)



Figure-9 : End to end anastomosis

TAB: Age wise incidence in various studies

| Age group | Baviskar 3 et al | Present study |
|-----------|------------------|---------------|
| 16-30 yrs | 26% | 24% |
| 31-45 yrs | 28% | 38% |
| 45-60 yrs | 28% | 16% |
| >60 yrs | 18% | 22% |

Tab: comparison percentages of obstruction, perforation, malignancy as causes in various studies

| Study | obstruction | perforation | malignancy |
|---------------------------------|-------------|-------------|------------|
| Baviskar et al ³ | 64% | 22% | 8% |
| Mc Entee et al ⁴ | 34% | 18% | 26% |
| Niyaz ahmed et al ⁵ | 60% | 6% | 30% |
| Nelson ellis et al ⁶ | 36% | 8% | 30% |
| Present study | 36% | 8% | 24% |

In this study there were various causes for the resection were, 18 cases of intestinal obstruction operated in Emergency setting post operative adhesions (20%) and intussusception(22.2%) were the most common causes followed by strictures, bands, volvulus and ileal knots. Abdominal Koch's (4 patients and 8%) also being the common cause in India. In this series a majority of the resections done for intestinal obstruction were done for gangrenous bowel with the patient already in septicemia and with other metabolic derangements².

The second common cause for undergoing resection of the intestine was malignancy 12 cases (24%). All these 12 patients were operated after adequate staging of the disease radiologically and concluding that these tumours were operable. Palliative resections with the use of a permanent bypass procedure in the form of an enterocutaneous ostomy were excluded from the study. Colonic malignancy was the major cause for the resections here accounting for a total of 7 cases (70% of all the malignancy).

The other causes like Inflammatory Bowel Disease, Mesenteric Ischaemia, Trauma, Diverticular disease, Appendicular disease and congenital bands accounted for 10 patients.

Tab:comparison of leak rates with othe studies

| Study | Leak rates |
|-------------------------------|------------|
| Baviskar et al ³ | 28% |
| Neil hyman et al ⁷ | 2.7% |
| Present study | 26% |

Tab:comparison of correlation of leak with risk factors

| s.no | Risk factors | Bielecki et al ⁸ | Present study |
|------|-----------------|-----------------------------|---------------|
| 1 | Anemia | 6% | 35% |
| 2 | hypoproteinemia | 2% | 36.8% |
| 3 | Peritonitis | 12% | 38% |
| 4 | Septicemia | 20% | 57% |
| 5 | Uremia | 18% | 40% |
| 6 | Old age | 10% | 40% |

Baviskar et al³ in their study showed 3% incidence of leaks among the single layer anastomoses group, and 32% incidence of leaks among the double layer (I+C) anastomoses group. This is almost comparable to our study, which had no leaks among single layer anastomoses group. Our study also had highest incidence (50%) of leak rates among double layer anastomoses group (I+C) Bokey et al⁹ in their study also had significant mortality among the leak group, implicating that development of anastomotic leak had significant impact on morbidity and mortality. The mortality rate among the non leak group is 10%, which is almost comparable to our study. The probable reason for higher mortality rate in our study is the small sample size (n=50), and 74% of the cases of resection and anastomoses are done on emergency basis on an unprepared bowel.

CONCLUSION:

In the present era, even with better understanding of the impact of local and systemic factors on anastomotic healing, dehiscence and leakage remains frequent and serious problem associated with high morbidity and mortality.

Hence, this prospective analysis was aimed to study the incidence of intestinal resection and anastomoses, to determine important factors and their significance in the healing of the anastomosis along with identifying the most ideal suture material for these techniques in our practice.

- Minimal leaks were observed in the group of patients who were anastomosed with vicryl suture material alone.
- Mortality was observed in 3 patients in the leak group. At 6 month follow up none of them developed anastomosis related complications like stenosis, diverticulum

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