

## Original Research Article

# STUDY THE INCIDENCE OF EARLY COMPLICATIONS (ANASTOMOTIC LEAK, SEPSIS, INTRA-ABDOMINAL ABSCESS, POSTOPERATIVE WOUND INFECTION AND DEHISCENCE) AND MORTALITY RATES FOLLOWING INTESTINAL ANASTOMOSIS

Gyan Prakash<sup>1</sup>, Amod Kumar Saroj<sup>2</sup>, Shailja Maurya<sup>3</sup>, Ashish Kanojia<sup>4</sup>, Pooja<sup>5</sup>

<sup>1</sup>Assistant Professor, Department of Surgery, MRA Medical College, Ambedkar Nagar, Uttar Pradesh, India

<sup>2,3,4</sup>Assistant Professor, Department of Pathology, MRA Medical College, Ambedkar Nagar, Uttar Pradesh, India

<sup>5</sup>Assistant Professor, Department of Obstetrics and Gynaecology MRA Medical College, Ambedkar Nagar, Uttar Pradesh, India

Received : 04/05/2026  
Received in revised form : 30/05/2026  
Accepted : 01/06/2026

### Corresponding Author:

**Dr. Gyan Prakash,**  
Assistant Professor, Department of Surgery, MRA Medical College, Ambedkar Nagar, Uttar Pradesh, India.  
Email: gyanprakashverma633@gmail.com

DOI: 10.70034/ijmedph.2026.2.458

Source of Support: Nil,  
Conflict of Interest: None declared

**Int J Med Pub Health**  
2026; 16 (2); 2771-2775

### ABSTRACT

**Background:** To study the incidence of early complications (anastomotic leak, sepsis, intra-abdominal abscess, postoperative wound infection and dehiscence) following intestinal anastomosis and to study mortality rates for intestinal anastomosis.

**Materials and Methods:** The present with study was performed in 50 patients, who presented in emergency with acute abdomen or were admitted as a routine case for a disease that required resection and anastomosis of bowel. All these patients were admitted in the surgical department of S.N Medical College Agra from November 2015 to June 2017. Only those patients who required bowel resection and anastomosis have included in the present study.

**Results:** Greater understanding of the impact of local and systemic factors on anastomotic healing is essential nevertheless anastomotic leakage and dehiscence remain frequent and serious problem associated with high mortality.

**Conclusion:** There is still room for much studies on improving the techniques and factors which influence the gastro-intestinal healing process, to come out with better results and to reduce the morbidity and mortality associated with anastomotic procedures.

**Keywords:** Incidence, Early Complications, postoperative wound infection, dehiscence.

## INTRODUCTION

Intestinal resection and anastomosis done for various pathological causes require an anastomotic method for distal continuity of remaining intestine. It is aspect of alimentary tract surgery that is associated with dangerous life threatening complications. The breakdown of suture line may results peritonitis, fecal fistulation and other fatal septic complication.<sup>[1,2]</sup>

The breakdown of sutured or anastomosed sight results in postoperative peritonitis with fecal septic complication in immediate postoperative period and if overcome may end up with fecal fistula which may need one or more re-laparotomies this naturally

increase morbidity. The anastomotic leakage results in 1/5 to 1/3 of all postoperative associated with gastro intestinal surgery.<sup>[3]</sup>

Patients over 60 years of age have a higher incidence of dehiscence of bowel anastomosis than younger.

The intestinal anastomosis is described to heal by primary or secondary intension. In primary healing there is direct cross linking of collagen fibers and fibers of uniform size with near normal orientation a weave, normal vascularisation and rapid healing of mucosal defect. In secondary healing there is indirect cross linking of collagen fibers with distorted orientation and uneven weave, anastomosis of submucosal vascular plexus with vessels in outer coat and delayed healing of mucosal defect.<sup>[4]</sup>

Double layer anastomosis was believed to be safe but postmortem studied demonstrated areas of necrosis and sloughing of inner layer due to strangulation. Omentum wrapping physically seals the suture line and also promotes neovascularization and granulation tissue formation, controls infection, and provides lymphatic drainage in the peri-anastomotic region.

Here in this dissertation I have made an attempt to determine incidence of early surgical complications of bowel anastomosis in the all patients undergoing intestinal anastomoses for various causes in the department of general surgery at S. N. Medical College, Agra time period between November 2015 to June 2017.

## MATERIALS AND METHODS

The present with study was performed in 50 patients, who presented in emergency with acute abdomen or were admitted as a routine case for a disease that required resection and anastomosis of bowel. All these patients were admitted in the surgical department of S.N Medical College Agra from November 2015 to June 2017. Only those patients who required bowel resection and anastomosis have included in the present study.

All patients undergoing intestinal resection and primary anastomosis during period of study of study by simple random sampling.

### Inclusion Criteria

This study was performed in patients of adult age group i.e. those of 18 years or above age and below 60 years of both sex.

### Exclusion Criteria

1. Below 18 years and above 60 years.
2. Patient undergoing an initial diversion procedure and simple closure of stoma later.
3. Patients undergoing gastrointestinal and biliary-enteric anastomosis.

### Methodology

The proposed study is a prospective hospital based time bound study. The relevant data shall be collected by using following method:

On admission, a proper history was obtained from patient or attendant and the patient was subjected to complete clinical examination.

For the patients who were admitted in emergency, resuscitation was started immediately. Routine and some specific investigations were done in all the patients to reach a clinical diagnosis. Each patient was subsequently explored and exact pathology was

dealt with. In all these patient's resection of diseased of part of the intestine and anastomosis either by single layer or double layer technique was done to restore the bowel continuity.

Protocol used to manage the patients included in study is as follows:

### History and clinical evaluation

### Resuscitation

### Investigations

### Pre-operative Bowel Preparation

### Procedure

### Closure of Abdomen

**Post-operative assessment:** Post operatively all patients were kept nil by mouth and were treated with intravenous fluids, nasogastric suction, intravenous antibiotics, analgesics and supportive treatment; particular attention was paid to any sign that could indicate an anastomotic leakage, such as evidence of intra-abdominal sepsis or prolonged paralytic ileus.

When the aspirate form nasogastric tube decreased and bowel rounds appeared and patient showed no signs of peritoneal irritation, the nasogastric tube was taken out and oral fluids were started. Drain was removed on an average 5 days from the day of operation.

Post-operative investigations like total and differential count, Hb%, serum electrolytes, blood urea and creatinine, drain fluid for culture sensitivity and blood for widal were carried out as per the clinical situation in individual cases.

**Follows –Up:** After complete recovery patients were discharged from hospital and reviewed in follow-up period, every 15 days till 2 months post-operatively for any features of post-operative obstruction or stricture formation, peritoneal sepsis, wound infection and persistent pyrexia.

## RESULTS

The present study was performed on patients in adult age group i.e. above 18 year of age. Most of the patients were in the age group of 40 to 60 years. Out of the 50 patients included in present study 31 were males and 19 were females.

Out of the patients 38 were admitted in emergency and were taken up as emergency cases. 12 patients were admitted as routine cases from the outpatient department. Out of the 12 routine cases 10 were having either single/multiple ileal stricture and 2 cases were of malignancy of the large bowel. In emergency bowel preparation was not done.

**Table 1: Intra-Abdominal Sepsis**

S. No	Intra –Abdominal Sepsis	No of Case	Percentage
1	Present	30	60%
2	Absent	20	40%
	Total	50	100%

Most of the patients who required resection and anastomosis of bowel were having perforation as the underlying pathology. 2 of these patients were

having perforation either single or multiple in the jejunum or ileum. No case of spontaneous perforation of large bowel was found in the study. 5

patients were of penetrating/stab injury abdomen and 2 patients were having blunt trauma of abdomen. 7 of the patients subjected resection and anastomosis were having acute intestinal obstruction at the time of presentation out of these 2 were having stricture as the cause at different levels in ileum and 2 were having gangrenous portion of small bowel on exploration and 2 were diagnosed as case of sigmoid volvulus. 1 patient was having growth in the sigmoid colon. 10 cases were having stricture in the ileum as the preoperative diagnosis, demonstrated as per the special radiological examinations (Barium Swallow and enteroclysis). Gangrenous portion of small bowel was also found in 2 patients who required emergency surgical intervention due to strangulated inguinal hernia. 2 patients operated as routine cases were having malignancy of the large bowel as the cause, proved as pre the pre-operative histo-pathological examination of the colonoscopy biopsy from there. One patient with malignancy of the sigmoid colon presented as cases of acute intestinal obstruction in the emergency.

10 patients were haemodynamically unstable at the time of presentation with blood pressure less than 90 mmHg and were in state of shock. Out of these 6 patients were of perforation peritonitis, 2 were having acute intestinal obstruction with gangrenous bowel, 1 of blunt trauma abdomen with splenic trauma and 1 of penetrating jury abdomen with liver tear. These patients were resuscitated with crystalloids. Colloids and blood as per the individual case. 2 of these patients having perforation

peritonitis required ionotropic support. Patient with perforation peritonitis who presented with shock were having history of abdominal complaints for more than 5 days and were also found to have gross contamination of their peritoneal cavity at the time of exploration.

The factors which may be of relevance in anastomotic healing were also taken into consideration during studies. 10 patients were found have Hb% below 10g%, 38 patients were taken for operative procedure as emergency cases and no pre-operative bowel preparation was done in these cases.

Bowel preparation was done in all the 12 cases operated upon as routine cases. Gross peritoneal sepsis/fecal soiling was found in 30 cases at time of exploration. Intra - operative bowel decompression as done in all the emergency cases with unprepared bowel. 2 patients in the present study were having associated medical problems one was a known diabetic on oral hypoglycemic and the other was asthmatic on oral bronchodilator and steroid therapy. None of the patient was found to have jaundice either pre or post operatively. Omental wrapping of the anastomotic suture line was done in all the case. Post-operative intravenous antibiotic therapy for an average of 5days was given in all these which generally consisted of a third generation cephalosporin or a quinolone and an aminoglycoside with metronidazole. Intra-peritoneal drains were kept in all the patients operated as emergency cases and removed on an average the 5th post-operative day, depending upon amount it was draining.

**Table 2: Post – Operative Complication**

S. No.	Complication	No. of patients	Percentage
1	Pyrexia	17	34%
2	Stitch abscess/wound infection	10	20%
3	Paralytic ileus (> 5 days)	05	10%
4	Burst abdomen (wound dehiscence)	01	2%
5	Fistula formation	03	6%

[Table 2] shown that out of 50 patients 17 patients developed post-operative pyrexia which was of moderate degree and associated with chills and rigors in most cases. 10 patients developed wound

infection and stitch abscess. Burst abdomen developed in a single patient. And delayed appearance of bowel sounds was found in 5 patients. Anastomotic leak was noticed in 3 patients.

**Table 3: Morridity and Anastomotic Dehiscence**

S. No.		No. of cases	Percentage
1	Total number of cases	50	100%
2	Number of anastomotic dehiscence	03	6%
3	Number of patients re-explored because of any complication	03	6%
4	Number of deaths due to anastomotic	00	0%
5	Number of deaths because of other causes	02	4%

[Table 3] show that out of 50 cases anastomotic dehiscence occurred in 3 cases. All of these 3 cases were of perforation peritonitis.

**Cases 1** – This patient 56-year-old male, was a cases multiple ileal perforations, reported 7 days after abdominal symptoms and at time of admission his general condition was very poor, his systolic B.P. was 80 mmHg, Hb% was 7.2 g% and S.

albumin level was 2g% on exploration, the peritoneal cavity was grossly contaminated. An ileo-ileal anastomosis was performed was performed which leaked on very third day of operation. The patient was re-explored on next day and stoma was formed by exteriorizing site of anastomotic leakages and the patient was cured.

**Case II** - this patient a 44-year-old female, a case of stricture at ileo-caecal junction with perforation proximal to it, reported to the ward 6 days after the complaints, she was in state of shock at time of presentation, her Hb% level was 7.8%g% and serum albumin as 2.5% g%, she was successfully resuscitated and was taken for exploration, there was gross contamination of peritoneal cavity, an ileo-colic anastomosis was performed which leaked on the fifth day of operation. She was again explored on the same day and an ileostomy with mucous fistula was formed, and the patient cured.

**Case III** – The patient a 60-year-old male, presented to the ward with a history of 3 days with acute intestinal obstruction. His systolic blood pressure at time of admission was 80 mmHg. He was also anaemic and hypoproteinemic with Hb% level of 7.5g% and serum albumin level of 2.2 g%. He was found to have sigmoid volvulus at exploration and a colo-colic anastomosis and a colostomy with mucus fistula formed and the patient cured.

All the cases who exhibited anastomosis leak were done in emergency cases without bowel preparation. In cases no. I and III the anastomosis was performed

in double layer fashion and in cases. No II the anastomosis was performed by single layer technique. No death occurred due to anastomotic complications. Even though 2 patients died due to poor cardio-respiratory reserve on the very first day after operation.

Patients in the present study were divided into two main groups based on certain parameters and the incidence of complications was compared in both the groups.

**Group – A**

1. Hb% more than 10 g% and serum albumin more than 3 g%
2. Haemodynamically stable
3. Clean peritoneal cavity
4. No associated medical problem

**Group –B**

1. Hb% less than 10 g% and serum albumin less than 3 g%.
2. Hemodynamically unstable
3. Contaminated peritoneal cavity
4. Associate medical problem

Out of patients in the study 28 belonged to group A and 22 to group B

**Table 4: Number of Patents in Both Groups**

S. No.	Complication	No. of patients		Total
		Group A	Group B	
1	Pyrexia	01	16	17
2	Wound infection	02	08	10
3	Wound dehiscence/Burst abd.	00	01	01
4	Fistula formation	00	03	03
5	Death due to anastomoic comp.	00	00	00
6	Death due to other causes	00	02	02

[Table 4] shows this incidence of various wound and anastomosis related complication in both the groups.

**Table 5: Average of Hospital Stay for Complete Recovery.**

S.No.	Day	No. of patients	Percentage
1	8-11 days	35	70%
2	11-15 days	09	18%
3	More than 15 days	04	08%
	Total	50	100%

[Table 5] shows that most of patients were discharged from hospital between 8 to 11 days after operations.

The patients were required to stay more than 11 days because of the either wound sepsis or wound dehiscence and those who were re-explored because of anastomotic dehiscence.

**DISCUSSION**

In the present study, the incidence of anastomotic complications was not quite different from the clinical trials conducted time to time at different places. The patient treated by resection and anastomosis were matched with the previous trials as regards the age, pathology, types of operation performed and other clinical features such as peritoneal sepsis, nutritional status, fecal loading of bowel and fecal soling.<sup>[5,6]</sup>

All the 3 patients in the present studies who were complicated by anastomotic leak were having significant anaemia, hypoproteinemia and hypovolemia at time of presentation. Other it an anastomotic dehiscence, most of other post – operative complication like pyrexia, wound infection and dehiscence was also mostly prevalent in this group of patients. Although no death in the present study can be attributed to as a complication of anastomotic dehiscence but the 2 patients who died in the immediate postoperative period were also having profound hypovolemia at time of their presentation and had to be resuscitated with inotropic support also.<sup>[7,8]</sup>

**CONCLUSION**

In conclusion greater understanding of the impact of local and systemic factors on anastomotic healing is

essential nevertheless anastomotic leakage and dehiscence remain frequent and serious problem associated with high mortality,

Patients most at risk are those who develop physiologic problems that leads to shock hypoxia and the resultant anastomotic ischemia, those with sepsis and unprepared bowel and those with malnourishment

Form this study we also conclude and support for wider use of single layer anastomosis which is easier and quicker to make, maintain a greater lumen, with less tissue trauma and early vascularisation.

A message that should be received by everybody from this study is that there is still room for much studies on improving the techniques and factors which influence the gastro-intestinal healing process, to come out with better results and to reduce the morbidity and mortality associated with anastomotic procedures.

## REFERENCES

1. Kumar A et al. Anterior resection: Anastomotic leaks and strictures. *World J Gastroenterol* 2011 March 21; 17(11): 1475-1479.
2. Dana A. Telem,; Edward H. Chin,; Scott Q. Nguyen,; Celia M. Divino. Risk Factors for Anastomotic Leak Following Colorectal Surgery. *Arch Surg.* 2010;145(4):371-376.
3. Hesp, Lubbers, de Boer and Th.Hendricks. Anastomotic Insufficiency in Small Bowel Surgery - Incidence and Treatment. *Langenbecks Arch Chir* (1986) 368:105-111.
4. Hawley PJ., Hunt TK, Dunphy JE: Aetiology of anastomitic leaks. *AProc Rahul Soc Med* 1970; 63:28-32.
5. Goligher JC, Morris C, McAdams WAF, DeDeombal FT and Johnston DY: A controlled trial of inverting versus everting intestinal suture in clinical large bowel surgery, 58;1971
6. Hamilton JE: A reappraisal of open intestinal anastomosis. *Ann Surg* 165;917:1967.
7. Orr NWM, St. Thoms Hospital London: single layer intestinal anastomosis. *Br J Surg.* 1969; Vol. 56, No. 10, Oct.
8. Mathenson NA, McInotosh anastomosis in the large bowel. *Br. J. Surg.* 1985; 72 (suppl) S104-6.