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BOWEL ANASTOMOSIS: A REVIEW OF PROGNOSTIC OUTCOMES

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INTRODUCTION

Anastomosis of intestine is a union of two ends of different sections of bowel. The technique involves maintain the lumen of bowel after the pathology is removed. Anastomosis is a routine procedure performed frequently and is often performed in an optional environment where benign or malignant GIT lesions are excised. A catastrophic complication of intestinal anastomosis is peritonitis, which causes anastomosis leakage. Anastomosis has high mortality and morbidity even years after the procedure. Proper training and adherence to basic standards are crucial to ensure a positive outcome of intestinal anastomosis. As a result, the health of gastrointestinal surgery may depend more on the factors that contribute to the healing of anastomosis.

OBJECTIVES OF THE RESEARCH

The objectives of this study were to: Identify prognostic factors for anastomotic bleeding after intestinal anastomosis. Investigate early complications (anastomosis bleeding, sepsis, intraperitoneal abscess, surgical site infection, and shedding) after intestinal anastomosis. Investigate mortality from intestinal anastomosis.

WRITTEN REVIEW

Experience from intestinal surgery until the late 19th century was limited to the

treatment of protruding intestines after a stomach injury during wars. Sushrutha, an Indian surgeon in the 6th century BC, wrote the oldest known descriptions of intestinal surgery. He described the removal of swelling of an outdated hernia and used the lower jaws of black ants to compress the edges of intestinal wounds.1 The Arab surgeon of Albucasis (936-1013) was probably the first to use sutures of animal viscera.

Galen (131-201), who performed various abdominal surgeries as a surgeon of Roman gladiators, observed and described the anatomy of small intestine. Duverger described Fabriciusd' Aquapendente, an Italian surgeon, as a bowel correction procedure involving an end-to-end anastomosis. Lanfranc from Milan used the animal's trachea to connect the divided parts of the intestine. Pierre Franco, a 16th-century French surgeon, described his experience in surgical treatment of a compressed groin. He made an incision over the swelling, divided the tapered band, inserted a feather-sized cannula, and returned the intestine to the peritoneum. The end of the intestine into the lumen of the distal segment, securing the joint with sutures. Duverger cut several inches of the necrosis in 1747 by suturing both ends together along the length of the dog's trachea, which passed in the feces 21 days later **[1]**. Mesothelial (serosal) and mucosal healing can occur without scarring. Any deficiency in bowel healing can lead to life-threatening anastomotic disorder, and excessive healing can lead to the formation of stenoses and narrowing of the intestinal cavity **[3]**.

An emerging concept in perioperative nutrition is the use of immunorutrition. Various nutrients are used to regulate the immune system. The-3 fatty acids, amino acids (glutamine and arginine) and RNA nucleotides. This is a new intervention method aimed at reducing the complications of infection **[4]**.

The colonic epithelium receives almost 75% of its energy needs from these fatty acids through metabolism to carbon dioxide, ketones and lipid precursors **[5]**. The color of a viable intestine also changes rapidly when 100% oxygen is inhaled. Intravenous fluorescein injection followed by ultraviolet illumination can be used to assess regional perfusion. A hand-held Doppler ultrasound device in a sterile housing may also be useful for checking arterial flow **[6]**.

The intestinal segment to be removed should be isolated with a sufficient resection margin. The ileum with its blood vessels must be attached and divided into a series. Non-compressed intestinal clamps are attached to the proposed resection site

and arterial clamps are attached sample side. The intestine can be removed with a knife or diathermy. The posterior row is sutured first outside inside. Then anterior is then sutured inside outside **[8]**. Intraoperative complications, such as injury to relevant anatomical structures such as the ureter, spleen, intestine, and duodenum, are related to the surgical technique, unclear anatomical landmarks, and layers due to the disease (e.g., peritonitis). Or massive adhesions), or the patient's habitus (eg obesity). Complications of surgery can be general or specific to surgery and can be classified as early (in the first 30 days) or late (after 30 days) in terms of onset time **[9]**. The morbidity rate after intestinal anastomoses varies from 51.8% **[10-13]**. They can be divided into intraoperative and postoperative complications. Prophylactic antibiotics (intravenous and oral) and mechanical preparation of the intestine are used to prevent infectious complications after bowel surgery **[8]**. Broad-spectrum intravenous antibiotics often contain a combination of second- or third-generation intravenous cephalosporins (cefoxitin or ceftriaxone) with metronidazole. Alternatively, a combination of ciprofloxacin and metronidazole may be used. The best time to take the antibiotic is to start intravenously 1-2 hours before the incision and continue for up to 36 hours. Sufficient attention must be paid to correcting malnutrition and the growth of antibioticsprophylaxis of malnourished patients in elective regime **[14]**. The incidence of anastomosis dehiscence is 0.835% **[10, 12, 15, 16]**. The factors known to contribute to the discharge of anastomosis are hypoalbuminemia **[10, 16]**, old age **[12, 15]**, septic focus in the abdomen, **[18]**, low sodium levels **[10]**, ASA grade (higher is worse), intra and post op blood transfusion **[16]**, and anemia **[11, 20]**. Amit *et al*. reported anastomotic leakage rate 35% after surgery on the small intestine. However, in the absence of infection, the rate of leakage after small bowel anastomosis is <1%. The rate of leakage after elective colorectal surgery is usually 2.6-14% **[12, 15, 16, 18]**.

Methods

This study is a prospective study involving all patients undergoing intestinal resection and anastomosis at the Krishna Institute of Medical Sciences. Data was collected from patients' detailed history, clinical examination, lab reports and radiological studies. A total of 50 patients undergoing resection and anastomosis were examined for various etiology.

GOALS

To recognize risk factors of anastomotic leakage in a case of resection anastomosis. Investigation of the incidence of

complications (anastomotic leakage, intra-abdominal pus/septic foci, sepsis, wound infection and gaping of wound) after intestinal anastomosis. To study mortality rates for intestinal anastomosis. All patients (over 18 years of age) were hospitalized in the surgery wards and underwent intestinal resection and primary anastomosis during the study period at the Krishna Institute of Medical Sciences, Karad. Patients below 18 years of age. Patients who are undergoing an initial diversion procedure and later simple closure of the stoma. Patients undergoing gastrointestinal and biliary anastomosis.

RESULTS

50 patients were selected according to inclusion criteria in this study. The study included patients who underwent both emergency and elective surgery with different indications of intestinal resection and anastomosis during the study duration. These patients were picked for the study using the aforementioned inclusion and exclusion criteria.

In the **Table 1**, out of 50 patients, 46 patients (92%) were operated with end to end anastomosis, 2 patients (2%) were operated with end to side anastomosis and 2 patients (4%) were operated with side to side anastomosis.

Table 2 shows, number of patients aged 60 years and above in this study is 18(36%). The rate of anastomotic leak is 27.77% (5 patients) and p value is 0.459(<.05).

As shown in **Table 3**, a total of 15 patients (30%) had anaemia in this study. The anastomotic leak rate in anaemic patients is 40% (6patients) and p value is 0.044(<.05).

Post operative morbidity was observed in 15(30%) patients. Most frequently observed complication was the Surgical Site Infection (26%). The observed complications were as in **Table 4**.

Table 1: Varieties of anastomosois, their leakage frequency

Type	Frequency	Percent
End to end	46	92%
End to side	2	4%
Side to side	2	4%
Total	50	100%

Table 2: Incidence of anastomotic leak in old age group

Age60&above	AL		Total
	No	Yes	
Yes	13	05	18
No	26	6	32
Total	39	11	50

Table 3: Incidence of anastomotic leak in anaemic patients

ANAEMIA	ANASTOMOTICLEAK		Total
	NoLeak	Leak	
Yes	9	6	15
No	30	5	35
Total	39	11	50

Table 4: Complications observed and number of patients affected

Sr. No.	Complications	Noof patients	Percentage
1.	Surgical Site Infection	13	26%
2.	Anastomotic disruption	11	22%
3.	Septicaemia	7	14%
4.	Acute Renal Failure	3	6%
5.	Respiratory complications	5	10%
6.	Abdominal wound dehiscence (Burst abdomen)	2	4%

DISCUSSION

A dangerous complication of intestinal anastomosis is an anastomotic leak that causes inflammatory peritonitis, which leads to high mortality and mortality. Factors contributing to anastomotic secretion include hypoalbuminemia16, advanced age, the presence of intraabdominal septic focus 17, rectal localization of disease 50, higher ASA grade 19, intra op and post op transfusions 10, and seizures. Anemia8.13. The incidence of anastomotic leaks observed in this comment is 22%. The rate of anastomotic leaks reported varies between 0.8 and 35%. Hypoalbuminemia, colitis, anemia, old age and the use of perioperative steroids is a statistically significant predictive factor. Hypoalbuminemia is very important for the development of anastomotic leaks. Reported mortality rates varied from 17.1 to 18% with increasing patients with previous abdominal operations.

CONCLUSION

Intestinal anastomosis is serious procedure with high post op issues including serious illness and death. Acute small bowel anastomoses and abdominal infections carry a more risk of leaks, inspite of high technical fidelity details during the procedure. The type of anastomosis has no effect on the incidence of leakage of anastomosis. Patients with low serum albumin are at higher risk of developing anastomotic leak, SSI, anemia, and death from intestinal anastomosis. Serum albumin levels are an economic marker of post anastomotic outcome. Thus albumin levels are a tool for post op decision making and prognostic tool. Patients with sepsis due to either abdominal or pulmonary septic foci have poor outcomes. Therefore, in this type of patient, it is recommended that the anastomoses be protected by a gap stoma. In emergencies, malnourished patients (after engaging in primary pathology) should ideally be

considered to develop a temporary stoma to overcome the crisis and stoma closure considered elsewhere. These high risk patients require vigilant observation and a secondary plan for rescue should be in place. Consider internal nutritional optimization before Selective surgery may be helpful in reducing morbidity and mortality.

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