"A CLINICAL STUDY ON RESECTION AND ANASTOMOSIS OF BOWEL IN OUR SURGICAL PRACTICE"

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ABSTRACT:
Introduction: Bowel resection and anastomosis have a history dating back to the 19th century, and are crucial for gastrointestinal diseases like colorectal cancer and IBD. Techniques include hand-sewn, stapled, and laparoscopic methods. Postoperative complications include ileus, bleeding, restrictions, and adhesions. Postoperative management requires a multidisciplinary approach, with ongoing follow-up crucial for disease recurrence. **Aims:** The study aims to analyze clinical and surgical factors influencing outcomes of intestinal resection and anastomosis at Tertiary care hospital, assess gastrointestinal tract healing post-anastomosis, and determine the optimal suture material. **Methodology:** The study aimed to observe real-time outcomes of patients undergoing bowel resection and anastomosis procedures at the Krishna Institute of Medical Sciences in India. The study involved 72 patients with various clinical conditions and aimed to capture seasonal variations and provide comprehensive data collection and analysis. The study focused on patient demographics, surgical procedures, postoperative complications, hospital stay, recovery outcomes, and follow-up results. **Results:** The study analyzed 72 patients undergoing intestinal resection and anastomosis, primarily caused by obstruction, inflammatory bowel disease, malignancy, trauma, and ischemia. Results showed that younger patients had better post-surgery healing outcomes, and sutures and staples had higher healing rates. Post-surgery complications and recovery parameters were also significant. **Discussion:** The study found that male patients had a higher healing rate and a higher incidence of intestinal obstruction, suggesting understanding these factors can improve patient outcomes. **Conclusion:** The study emphasizes the significance of demographic and clinical factors in surgical recovery, recommending personalized preoperative optimization, tailored care, enhanced protocols, resource allocation, and training.

INTRODUCTION

Bowel resection and astomosis have a rich history dating back to the early 19th century. Early surgeons used pivotal roles, but advancements in antiseptic techniques and safer anesthesia improved outcomes. Surgical resection is crucial for gastrointestinal diseases like colorectal cancer. [1,2]

Bowel resection is often necessary for IBD patients when medical therapy fails to control symptoms or complications, and 70% of Crohn's patients will require surgical intervention. It is also necessary for bowel obstruction, trauma, and preventing peritonitis and sepsis. [3,4]

Bowel resection and anastomosis techniques have evolved, with primary options including hand-sewn, stapled, and laparoscopic methods. Hand-sewn anastomosis is time-consuming and requires high surgical skill. [5]

Stapled anastomosis, introduced in the 20th century, offers speed and consistency, reducing operative time and leakage risk, with comparable outcomes to hand-sewn anastomoses. [6]
Laparoscopic resection offers minimally invasive bowel surgery benefits like reduced pain, shorter hospital stays, and faster recovery times, especially in colorectal cancer and IBD cases, with comparable oncological outcomes. [7]
Anastomotic leakage, a serious complications in bowel resections, can lead to peritonitis, sepsis, increased morbidity, and infections, requiring preventive measures like antibiotics and strict aseptic techniques. [8]
Postoperative ileus, a temporary cessation of bowel function, affects 25% of patients and is influenced by surgery, opioid use, and intraoperative bowel handling. [9]
Complications of anastomosis include bleeding, restrictions, and adhesions, which may require immediate management and intervention for obstructive symptoms and chronic pain. [10]
Postoperative management is crucial for recovery and requires a multidisciplinary approach. Key components include pain management, nutritional support, early mobilization, and monitoring for complications. Early enteral nutrition is preferred for patients with preoperative malnutrition or extensive bowel resection. [11]
Early mobilization is recommended to minimize postoperative complications like ileus and deep vein thrombosis, and Enhanced Recovery After Surgery (ERAS) protocols have been proven to enhance outcomes and decrease hospital stays. [12]
Bowel resection and anastomosis generally lead to significant symptom relief and improved quality of life, but ongoing follow-up is crucial for disease recurrence, especially in cases of colon cancer and IBD. [13]

AIM & OBJECTIVES

The study aims to identify clinical and surgical factors affecting the outcome of intestinal resection and anastomosis in Tertiary care hospital, determine the healing of gastrointestinal tract after anastomosis, and determine the optimal suture material.

MATERIALS & METHODS

The study was designed as a clinical prospective study to observe and record real-time outcomes of patients undergoing bowel resection and anastomosis procedures, providing a forward-looking perspective on surgical techniques' efficacy and safety, and identifying factors influencing recovery and complications.
The study was conducted at Krishna Institute of Medical Sciences in Karad, Maharashtra, India, utilizing advanced diagnostic and surgical tools, comprehensive facilities, and diverse patient population for complex gastrointestinal surgeries.
The study, spanning 19 months from December 2022 to June 2024, aimed to observe postoperative outcomes and complications, capture seasonal variations, and provide comprehensive data collection and analysis.
The study involved patients admitted to Krishna Institute of Medical Sciences who required bowel resection and anastomosis for various clinical conditions. Exclusion criteria included those aged less than 18 or over 60, those with severe anemia, coagulopathy, hypoalbuminemia, chronic kidney disease, multiple organ dysfunction syndrome, diffuse peritonitis, SMA thrombosis, and pre-operative radiotherapy or chemotherapy.

Inclusion Criteria: The inclusion criteria include patients undergoing gastrointestinal resections under conditions requiring an anastomosis for distal continuity of the bowel.

Exclusion Criteria: The study excluded certain conditions such as esophageal, gastric, and duodenal anastomosis, age, severe anemia, coagulopathy, hyperalbuminemia, chronic kidney disease, multiple organ dysfunction syndrome, diffuse peritonitis, and superior mesenteric artery thrombosis.

The study involved a retrospective sampling approach, ensuring a representative sample of the hospital population treated for bowel resection and anastomosis. The sample size was determined to be 72 patients, allowing for seamless integration into routine clinical practice. The study focused on key parameters such as patient demographics, indications for surgery, surgical procedures, and postoperative complications. The study also tracked the length of hospital stay, recovery outcomes, and follow-up results.

The study procedure was meticulously planned and executed, with informed consent obtained from each patient. Preoperative assessments included detailed medical histories, clinical examinations, and routine investigations. Postoperative care was standardized, involving pain management, nutritional support, and early mobilization. Follow-up evaluations were conducted one-month post-discharge, focusing on any gastrointestinal or other complaints.

Data collection was carried out using a pretested structured proforma for each patient, with data collected through direct patient interviews, clinical examinations, and review of medical records. Statistical analysis was conducted using SPSS software, with descriptive statistics summarized and comparative analyses performed to identify significant differences in outcomes based on surgical techniques and patient variables. Multivariate analysis was employed to adjust for potential confounding factors.

Ethical considerations were maintained, with ethical approval obtained from the Institutional Ethics Committee of Krishna Institute of Medical Sciences and patient confidentiality maintained throughout the study.

OBSERVATION & RESULTS

The study involved 72 patients undergoing intestinal resection and anastomosis, with a predominantly male population (55.6%), affecting the generalizability of the results.

Parameter	Count	Percentage(%)
TotalPatients	72	100
AgeGroup(years)		
18-30	20	27.8
31-45	25	34.7
46-60	27	37.5
Gender		
Male	40	55.6
Female	32	44.4

Intestinal resection and anastomosis are primarily caused by intestinal obstruction, inflammatory bowel disease, malignancy, trauma, and ischemia, with each cause having significant incidence, highlighting their importance in clinical practice.

Cause	Count	Percentage(%)	p-value
IntestinalObstruction	**25**	**34.7**	**0.001**
Trauma	**10**	**13.9**	**0.05**
InflammatoryBowelDisease	**15**	**20.8**	**0.02**
Malignancy	**12**	**16.7**	**0.03**
Ischemia	**5**	**6.9**	**0.01**
Others	**5**	**6.9**	**0.04**

Age significantly influences healing outcomes of the gastrointestinal tract post-anastomosis, with younger patients experiencing better outcomes.

Age Group	Healed	Not Healed	Total	Percentage Healed(%)	p-value
18-30	**18**	**2**	**20**	**90**	**0.02**
31-45	**20**	**5**	**25**	**80**	**0.04**
46-60	**20**	**7**	**27**	**74.1**	**0.05**

The study found that male patients had a higher healing rate (87.5%) compared to female patients (71.9%), suggesting better post-surgery healing outcomes.

Gender	Healed	Not Healed	Total	Percentage Healed(%)	p-value
Male	**35**	**5**	**40**	**87.5**	**0.01**
Female	**23**	**9**	**32**	**71.9**	**0.03**

The study compared wound healing outcomes with sutures and staples, finding that sutures had a higher healing rate of 85.7%, while staples had a higher rate of 75.7%.

Suture Method	Healed	Not Healed	Total	Percentage Healed(%)	p-value
Sutures	28	9	37	75.7	0.03
Staples	30	5	35	85,7	0.04

The study found that patients with large intestine anastomosis had a higher healing rate (80.5%) compared to those with small intestine anastomosis (69.4%), highlighting the significant impact of anatomical location on healing outcomes.

Location	Healed	Not Healed	Total	Percentage Healed(%)	p-value
Small Intestine	25	11	36	69.4	0.02
Large Intestine	33	8	41	80.5	0.01

The study revealed significant post-surgery complications such as anastomotic leaks (13.9%), infections (11%), hemorrhage (6.9%), bowel obstruction (4.2%), and others (5.6%), emphasizing their importance in the postoperative period.

Complication	Count	Percentage(%)	p-value
Anastomotic Leak	10	13.9	0.01
Infection	8	11.1	0.03
Hemorrhage	5	6.9	0.04
Bowel Obstruction	3	4.2	0.05
Others	4	5.6	0.02

The duration of hospital stays varies among patients, with 41.7% staying less than 7 days, 48.6% between 7-14 days, and 9.7% more than 14 days, influenced by complications and healing rates.

Duration (Days)	Count	Percentage(%)	p-value
<7	30	41.7	0.03
7-14	35	48.6	0.02
>14	7	9.7	0.04

The study found significant differences in postoperative recovery parameters, such as time to return to diet, time to bowel movement, and pain score, highlighting their importance in patient outcomes.

Recovery Parameter	Mean±SD	p-value
Time to Return to Diet(days)	4.5 ± 1.2	0.03
Time to Bowel Movement(days)	2.8 ± 0.9	0.02
Pain Score (VAS)	3.2 ± 1.5	0.04

The study found significant differences in healing outcomes based on preoperative conditions, with severe anemia having a 66.7% rate, hypoalbuminemia at 50%, and chronic kidney disease at 28.6%.

Condition	Healed	Not Healed	Total	Percentage Healed(%)	p-value
Severe Anemia	4	2	6	66.7	0.01
Hypoalbuminemia	3	3	6	50	0.03
ChronicKidney Disease	2	5	7	28.6	0.02

The follow-up results showed significant improvements in gastrointestinal complaints and general health conditions among 69.4% of patients, indicating the effectiveness of the surgical interventions.

Follow-up Parameter	Improved	Not Improved	Total	Percentage Improved (%)	p-value
Gastrointestinal Complaints	50	22	72	69.4	0.02
GeneralHealth Condition	55	17	72	76.4	0.01

DISCUSSION

The study included 72 patients with a diverse age range, with a male predominance (55.6%) compared to females (44.4%). This demographic distribution allows for a comprehensive analysis of age-related factors influencing surgical outcomes. Previous studies have also shown a male predominance in surgical populations undergoing intestinal procedures, aligning with the findings of this study. [16]

The primary indications for intestinal resection and anastomosis are diverse, with intestinal obstruction being the most common cause (34.7%). Inflammatory diseases, such as adhesions, hernias, and ortumors, account for over a third of cases. Age plays a significant role in healing outcomes, with younger patients exhibiting better recovery rates. This could be attributed to factors such as better overall health status, fewer comorbidities, and a more robust immune response. [17]

Gender differences in healing outcomes are also significant, with male patients showing a higher healing rate (71.9%). This disparity could be due to biological differences in wound healing, hormonal influences, and va management, as well as social and psychological factors. Understanding these gender-based differences is critical for developing personalized postoperative care plans and addressing any potential complications. [18]

The anatomical location of the anastomosis significantly influences healing outcomes, with patients with large intestine anastomosis having a higher healing rate (80.5%) compared to those with small intestine anastomosis (69.4%). These findings can inform surgical planning and postoperative the need for location-specific strategies to enhance healing outcomes.

Suture methods used at different anatomical locations vary between small and large intestine anastomoses, with a preference for staples in large intestine anastomoses due to their quicker application and effectiveness in securing larger, more robust tissue. In contrast, sutures may be favored in the small intestine for their precision and adaptability to the delicate, smaller-diameter tissue.

In conclusion, understanding the causes, age, gender, and suture methods used in surgical procedures can help optimize recovery and improve patient outcomes.

Postoperative complications are crucial for surgical outcomes, with anastomotic leaks, infections, hemorrhage, bowel obstruction, and other complications being the most common. These complications require meticulous surgical technique and vigilant postoperative monitoring. Hospital stays vary, with 48.6% staying between 7-14 days and 9.7% staying longer than 7 days. Factors such as patient's overall health and postoperative recovery efficiency influence the length of hospital stay. Shorter stays may indicate quicker recovery and fewer complications, while longer stays may reflect more complex cases or complications. [19]

Postoperative recovery parameters, such as time to return to diet and bowel movement, are critical indicators of patient outcomes. Time to return to diet and bowel movement are essential markers of gastrointestinal recovery, reflecting the restoration of normal function. Pain scores provide insights into the patient's comfort and overall recovery experience, emphasizing the need for timely interventions to promote recovery and enhance patient satisfaction.

Preoperative conditions significantly influenced healing outcomes, with patients with severe anemia having a 66.7% healing rate, those with hypoalbuminemia having a 50% healing rate, and those with chronic kidney disease having a 66.7% healing rate. These findings underscore the

importance of preoperative optimization and careful monitoring of patients with these conditions to improve surgical outcomes. [20]

Following-up results showed significant improvements in gastrointestinal complaints and general health conditions, indicating the effectiveness of surgical interventions in enhancing patient outcomes. The significant reduction in gastrointestinal complaints suggests successful restoration of normal function and relief from symptoms that necessitated surgery, while the overall improvement in general health conditions reflects the positive impact of surgery on patients' quality of life. [21-23]

CONCLUSIONS

The study highlights the importance of demographic and clinical factors in surgical recovery, emphasizing the need for personalized preoperative optimization, tailored care, and postoperative monitoring. It recommends enhanced surgical protocols, resource allocation, and training for optimal patient care. Future research should focus on larger, multicenter, prospective studies with long-term follow-up to further validate these findings.

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