

ORIGINAL

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ANASTOMOTIC LEAK AFTER SMALL GUT SURGERY



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ABSTRACT... faisalblodhi@hotmail.com **Background:** Anastomotic leak after gastrointestinal surgery is an important postoperative event that leads to significant morbidity and mortality. Postoperative leak rates are frequently used as an indicator of the quality of surgical care provided. **Objective:**(1).To define factors associated with leakage of small gut anastomosis. (2) To find technique of small gut anastomosis associated with lowest risk of anastomotic dehiscence. **Study Design:** Retrospective, Descriptive **Duration:** 02 Years (May 2003 to May 2005) **Material and Methods:** This study was conducted at Surgical Unit-II, Allied Hospital, Punjab Medical College, Faisalabad from Dec 2003 to May 2005. A total number of 36 cases were included in this study comprising of both adult male and female patients developing anastomotic dehiscence following resection and end to end anastomosis of small gut. **Results:** Peritonitis was the risk factor identified in 69% of the patients. Hypovolemic shock both preoperatively and in the immediate postoperative period was noted in 56% cases while 83% of the patients with anastomotic dehiscence had haemoglobin concentration less than 10g%. High concentration of blood urea was noted in 42% of the cases. It turned to normal as soon as the hypovolemia was corrected in these cases. Small gut anastomosis done in emergency setting (75% cases) was associated with increased risk of anastomotic dehiscence as compared to the dehiscence noted in 09 cases (25%) operated on elective list. Three different techniques were used for small gut anastomosis. The rate of anastomotic leakage ranged from 19-45%. **Conclusion:** Peritonitis, hypovolaemia and low hemoglobin alone or in combination are associated with increased risk of small gut anastomotic leakage especially after emergency surgery. Single layered extramucosal interrupted anastomosis was associated with less risk of dehiscence than the full thickness and continuous extramucosal anastomosis.

Key Words: Intestinal anastomosis, anastomotic leak, small gut anastomosis, anastomotic dehiscence

INTRODUCTION

Leakage from an anastomosis in the gastrointestinal tract is a major complication that is often associated with increased morbidity, mortality and prolonged hospital

stay. The frequency and consequences of anastomotic failure vary according to the site within the gastrointestinal tract. Anastomotic breakdown is the most important early complication after oesophageal

anastomosis with a reported incidence of 53 per cent¹. It is also a serious complication after pancreatic surgery because dehiscence of anastomoses with autodigestion and destruction of surrounding tissue from leaking pancreatic juice is associated with a high mortality rate².

Dehiscence after small gut and colorectal anastomoses increases the perioperative mortality rate due to peritonitis and septicaemia³. Anastomotic leak may be due to certain underlying risk factors which are recognized to work alone or in combination².

Anastomotic leak may be used as an indicator of the quality of surgical care, and comparisons of leak rates may be made between and within surgical centres⁴. However, the accuracy of such comparisons depends on the use of standard definitions and methods of measurement.

MATERIAL AND METHODS

This retrospective study was conducted at Surgical Unit-II, Allied Hospital, Punjab Medical College, Faisalabad from May 2003 to May 2005. A total number of 36 cases were included in this study comprising of 16 male and 20 female patients developing anastomotic dehiscence following resection and end to end anastomosis of small

gut. Their clinical workup was reviewed in detail with special reference to the risk factors responsible for anastomotic dehiscence. Study was based on the 'standard' definition of anastomotic leak proposed by the UK Surgical Infection Study Group (SISG)⁵.

Leak was defined as 'the leak of luminal contents from a surgical join between two hollow viscera. The luminal contents may emerge either through the wound or at the drain site, or they may collect near the anastomosis, causing fever, abscess, septicaemia, metabolic disturbance and/or multiple-organ failure.

INCLUSION CRITERIA

All the adult patients developing small gut anastomotic leakage

EXCLUSION CRITERIA

- * Age less than 12 years
- * Intra abdominal malignancy
- * Patients with Multiple Organ Dysfunction Syndrome (MODS)
- * Patients receiving external beam radiation
- * Patients on cytotoxic / immuno-suppressive therapy

Table-I.

Primary pathology	Cases operated in emergency	Cases operated on elective list	Total
Intestinal tuberculosis	3	6	9
Typhoid perforation	7	-	7
Firearm injury	6	-	6
Blunt abdominal trauma	2	3	5
Septic abortion	4	-	4
Strangulated paraumbilical hernia	2	-	2
Strangulated inguinal hernia	3	-	3
Total	27(75%)	9 (25%)	36

RESULTS

All the patients diagnosed to have small gut anastomotic leak were operated either in emergency or on the elective

list. Emergency laparotomy was performed in 27 (75%) cases and elective exploration was performed in 09 (25%) cases presenting with small gut involvement

requiring resection and end to end anastomosis. The primary pathology associated with small gut injury/involvement in these patients is shown in (Table I).

Age in years	No of cases
12-20	4
21-30	16
31-50	8
51-70	8
Total	36

All the patients included in this study were more than 12 years of age (Table II) with youngest being of 14 years and oldest of 68 years. Peritonitis was the risk factor identified in 69% of the patients (Table III). Hypovolemic shock both preoperatively and in the immediate postoperative period was noted in 56% cases while 83% of the patients with anastomotic dehiscence had haemoglobin concentration less than 10g%.

Risk factor	No of Cases	%age
Peritonitis	25	69
Low haemoglobin (<10g%)	30	83
Hypovolaemia	20	56
Raised blood urea	15	42
Multiple factors	28	78

High concentration of blood urea was noted in 42% of the cases and was due to dehydration as it turned to normal as soon as the hypovolemic was corrected in these cases. None of these patients developed renal failure and their creatinine levels remained in normal range.

Small gut anastomosis done in emergency setting (75% cases) was associated with increased risk of anastomotic dehiscence as compared to the dehiscence noted in 09 cases (25%) operated on elective list (Table I). Three

different techniques were used for small gut anastomosis. The rate of anastomotic leakage ranged from 19-45% (Table IV).

Anastomotic Technique	No of cases	%age
Full thickness single layered interrupted	25	45
Single layered extra mucosal interrupted	7	19
Double layered	13	36
Total	36	100

DISCUSSION

Leakage from an anastomosis in the gastrointestinal tract is a major complication that is often associated with increased morbidity, mortality and prolonged hospital stay. Anastomotic leak may be due to certain underlying risk factors which are recognized to work alone or in combination. Anastomotic leak may be used as an indicator of the quality of surgical care, and comparisons of leak rates may be made between and within surgical centres⁴. However, the accuracy of such comparisons depends on the use of standard definitions and methods of measurement. This study was based the standard definition of anastomotic leak proposed by the UK Surgical Infection Study Group (SISG)⁵.

Small gut anastomosis performed for emergency cases was associated with increased risk of leak as compared to elective cases. Abdominal trauma (penetrating / blunt) was associated, in majority of the cases, with hypovolaemic shock. Similarly hypovolaemia was noted in majority of the cases with strangulated hernias. The state of hypovolaemia has been noted in multiple studies to cause a compromised splanchnic circulation. The compromised splanchnic blood flow results in ischaemia at the site of anastomosis with an increased rate of leak in the postoperative period⁶.

Peritonitis was the risk factor identified in 69% of the patients. Localized or diffuse peritonitis has been identified as a major risk factor for anastomotic

dehiscence⁷. All such patients have septicemia and may be in a state of systemic inflammatory response with a large number of inflammatory mediators in their circulation at the time of surgery. These mediators cause inflammation at the site of anastomosis and make it friable and prone to subsequent leak⁸.

High concentration of blood urea was noted in 42% of the cases and was due to dehydration as it turned to normal as soon as the hypovolemic was corrected in these cases. None of these patients developed renal failure and their creatinine levels remained in normal range.

Low haemoglobin concentration (less than 10g %) was noted in 83% of the patients with anastomotic dehiscence. Fall in haemoglobin leads to decreased oxygen carrying capacity of blood which causes relative ischaemia at the site of newly established anastomosis⁹.

The risk factors identified in this study were shown to effect the ultimate outcome of the surgical intervention both in isolation or in combination. In majority of the patients (28%) with anastomotic dehiscence more than one risk factor was noted to be responsible. Most of the patients had peritonitis and hypovolaemia in combination. Septic shock, low haemoglobin concentration and hypovolaemic shock, alone or in combination, have been identified to be associated with increased risk of postoperative complications including anastomotic dehiscence and development of multiple organ dysfunction syndrome¹⁰.

Different studies have shown extra-mucosal anastomosis as the safest technique for small gut^{11,12}. Single layered extramucosal interrupted anastomosis was associated with less risk of dehiscence than the full thickness and continuous extramucosal anastomosis in this study.

CONCLUSION

Peritonitis, hypovolaemia and low hemoglobin alone or in combination are associated with increased risk of small gut anastomotic leakage especially after emergency surgery. Single layered extramucosal interrupted anastomosis is associated with less risk of dehiscence than the full thickness and continuous extramucosal anastomosis.

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