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| Search completed by:  | Ann Darling |

**Search details**

Anastomotic leak in patients undergoing colorectal resection

**Resources searched**

Bandolier, Cochrane Library, NHS Guidance, TRIP, Medline, Embase, NHS Evidence – Cancer Collection

*Database search terms*: colectomy, anastomosis surgical, postoperative complications, anastomotic leak

*Google search string*: colorectal resection, anastomosis, anastomotic leak, signs or symptoms or interventions, guidance

**Summary**

Only 1 guideline found, but useful information contained in the published research.

**Guidelines**

*Guidelines for the management of colorectal cancer*

3rd ed. 2007 Association of Coloproctology of Great Britain and Ireland see page 34.

**Evidence-based reviews**

1. **Covering ileo- or colostomy in anterior resection for rectal carcinoma** 2010.
2. **Stapled versus handsewn methods for ileocolic anastomoses** 2008

3. Review: bowel preparation before elective colorectal surgery increases anastomotic leakage more than no preparation 2006

## Published research

1. **Ghost ileostomy: real and potential advantages.**
   
   **Author(s):** Miccini M, Amore Bonapasta S, Gregori M, Barillari P, Tocchi A

   **Citation:** American Journal of Surgery, October 2010, vol/is. 200/4(e55-7), 0002-9610;1879-1883 (2010 Oct)

   **Publication Date:** October 2010

   **Abstract:** Loop ileostomy is created to minimize the clinical impact of colorectal anastomotic leak. However, a lot of complications may be associated with ileostomy presence and with its reversal. Moreover, patients hardly accept the quality of life resulting from ileostomy. We describe a simple technique (ghost ileostomy) to combine all the advantages of a disposable ileostomy without entailing its complications in patients submitted to low rectal resection. In case of uneventful postoperative course, the ghost ileostomy prevents all complications related to defunctioning ileostomy. At the same time, in case of anastomotic leakage, the ghost ileostomy is easily and safely converted into a defunctioning ileostomy. Copyright Copyright 2010 Elsevier Inc. All rights reserved.

   **Source:** MEDLINE

2. **Assessing outcomes following surgery for colorectal cancer using quality of care indicators.**

   **Author(s):** Vergara-Fernandez O, Swallow CJ, Victor JC, O’Connor BI, Gryphe R, MacRae HM, Cohen Z, McLeod RS

   **Citation:** Canadian Journal of Surgery, August 2010, vol/is. 53/4(232-40), 0008-428X;1488-2310 (2010 Aug)

   **Publication Date:** August 2010

   **Abstract:** BACKGROUND: We sought to assess the feasibility of applying Cancer Care Ontario’s quality of care indicators to a single institution’s colorectal cancer (CRC) database. We also sought to assess their utility in identifying areas that require improvement.METHODS: We included patients who had surgery for CRC between 1997 and 2006 at Mount Sinai Hospital, Toronto, Ont. We excluded patients who had transanal excisions, carcinoma in situ or recurrences that required pelvic exenteration, as well as those whose information was incomplete. We obtained data from a prospective database and verified the data with hospital and office charts. We evaluated trends over a 10-year period using the
Cochran-Armitage trend test. RESULTS: During the study period there were 1005 surgical procedures performed in 987 patients with a mean age of 65.6 (standard deviation 15) years; the male:female ratio was 1:2. The most frequent tumour sites were the rectum and sigmoid colon (68%). Over the 10-year period, 9 indicators improved, including the proportion of patients with CRC identified by screening ($p < 0.001$), the proportion of patients who received preoperative liver imaging ($p = 0.05$), the proportion of rectal cancer patients who received preoperative pelvic imaging ($p = 0.04$), the proportion of patients with stage II or III rectal cancer who received radiotherapy ($p = 0.03$), the proportion of surgical specimens with more than 12 lymph nodes ($p < 0.001$), the proportion of pathology reports that included quantitative distal ($p = 0.004$) and radial ($p < 0.001$) margin measurements, the proportion of patients with an anastomotic leak ($p = 0.03$), the proportion of patients who received a colonoscopy 1 year after surgery ($p < 0.001$) and the proportion of operative reports that were complete ($p < 0.001$). CONCLUSION: The use of quality of care indicators to assess the quality of colorectal surgery is feasible. This study provides benchmarks that can be used to assess changes in the quality of CRC care at our institution.

Source: MEDLINE

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3. Anastomotic-vaginal fistula (AVF) after anterior resection of the rectum for cancer—occurrence and risk factors.

Author(s): Matthiessen P, Hansson L, Sjodahl R, Rutegard J

Citation: Colorectal Disease, April 2010, vol./is. 12/4(351-7), 1462-8910;1463-1318 (2010 Apr)

Publication Date: April 2010

Abstract: OBJECTIVE: The aim of the study was to assess recto-vaginal fistula (RVF) after anterior resection of the rectum for cancer with regard to occurrence and risk factors. METHOD: All female patients [median age 69.5 years, Union Internationale centre le Cancer (UICC) cancer stage IV in 10%] who developed a symptomatic RVF ($n = 20$) after anterior resection of the rectum for cancer from three separate cohorts of patients were identified and compared with those who developed conventional symptomatic leakage ($n = 32$), and those who did not leak ($n = 338$). Patient demography and perioperative data were compared between these three groups. Fourteen patient-related and surgery-related variables thought to be possible risk factors for RVF (anastomotic-vaginal fistula) were analysed. RESULTS: Symptomatic anastomotic leakage occurred in 52 (13.3%) of 390 patients. Twenty (5.1%) had an anastomotic-vaginal fistula (AVF) and 32 (8.2%) conventional
leakage (CL). Patients with AVF required unscheduled re-operation and defunctioning stoma as often as those with CL. AVF was diagnosed later and more often after discharge from hospital compared with CL. Patients with AVF had lower anastomoses and decreased BMI compared with those with CL. Risk factors for AVF in multivariate analysis were anastomosis < 5 cm above the anal verge (P = 0.001), preoperative radiotherapy (P = 0.004), and UICC cancer stage IV (P = 0.005). Previous hysterectomy was a risk factor neither for AVF nor for CL.

**CONCLUSION:** Anastomotic-vaginal fistula forms a significant part of all symptomatic leakages after low anterior resection for cancer in women. Although diagnosed later, the need for abdominal re-operation and defunctioning stoma was not different from patients with CL. Risk factors for AVF included low anastomosis, preoperative radiotherapy and UICC cancer stage IV.

**Source:** MEDLINE

4. **Diagnosis of gastrointestinal anastomotic dehiscence after hospital discharge: Impact on patient management and outcome.**

**Author(s):** Telem DA, Sur M, Tabrizian P, Chao TE, Nguyen SQ, Chin EH, Divino CM

**Citation:** Surgery, January 2010, vol./is. 147/1(127-33), 0039-6060;1532-7361 (2010 Jan)

**Publication Date:** January 2010

**Abstract:** BACKGROUND: Anastomotic leaks are inevitable complications of gastrointestinal surgery. Early hospital discharge protocols have increased concern regarding outpatient presentation with anastomotic leaks. METHODS: One hundred anastomotic leaks in 5,387 intestinal operations performed at a single institution from 2002 to 2007 were identified from a prospectively maintained database. Statistical analysis was conducted by the unpaired t test, Chi-square test, and analysis of variance. RESULTS: Overall anastomotic leak with a rate of 2.6% for colonic and 0.53% for small bowel anastomoses. Mean time to anastomotic leak diagnosis was 7 days after operation. Twenty-six patients presented after discharge, with mean time to diagnosis 12 days versus 6 days for inpatients (P<.05). Patients presenting after hospital discharge were younger, had lesser American Society of Anesthesiologists (ASA) scores, and were more likely to have colon cancer and less likely to have Crohn's disease. Ninety-two patients required operative management, of whom 81 (90%) underwent diversion. No difference in management, intensive care unit (ICU) requirement, duration of stay, or mortality between inpatient versus outpatient diagnosis was demonstrated. Follow-up at mean of 36 months demonstrated no difference in readmission, reoperation, or mortality rate between outpatient and inpatient diagnosis. Restoration of gastrointestinal continuity was achieved in 61-67% in the outpatient and 59% in the inpatient group (P=NS). CONCLUSION: Outpatient presentation delays diagnosis but does not alter management or clinical outcome, or decrease the probability of ostomy reversal. Prolonging hospital stay to capture
patients who develop anastomotic leak seems to be unwarranted. For patients requiring operative management, we recommend diversion as the safest option with a subsequent 61% reversal rate. Copyright (c) 2010 Mosby, Inc. All rights reserved.

**Source:** MEDLINE

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Available in print at Louth County Hospital Medical Library

Available in print at Pilgrim Hospital Staff Library

5. **Incidence of anastomotic leak in patients undergoing elective colon resection without mechanical bowel preparation: our updated experience and two-year review.**

**Author(s):** Harris LJ, Moudgill N, Hager E, Abdollahi H, Goldstein S

**Citation:** American Surgeon, September 2009, vol./is. 75/9(828-33), 0003-1348;0003-1348 (2009 Sep)

**Publication Date:** September 2009

**Abstract:** Mechanical bowel preparation before elective colon resection has recently been questioned in the literature. We report a prospective study evaluating the anastomotic leak rate in patients undergoing elective colorectal surgery without preoperative mechanical bowel preparation. One hundred fifty-three patients undergoing elective colon resection from July 2006 to June 2008 were enrolled into this Institutional Review Board-approved study. All patients were operated on by a single surgeon at a single institution. No patients received mechanical bowel preparation. Of the 153 patients enrolled, 51.6 per cent had a colorectostomy, 32 per cent had an ileocolostomy, 10.4 per cent had a colocolostomy, 5.2 per cent had an ileoanal anastomosis, and 0.6 per cent had an ileorectostomy performed. A total of eight patients (5.2%) developed an anastomotic leak. Of these patients, four required reoperation, three were managed with percutaneous drainage, and one was managed with antibiotics alone. Five of the eight patients who developed an anastomotic leak had significant preoperative comorbidities, including neoadjuvant radiation therapy, diabetes mellitus, end-stage renal disease, prior anastomotic leak, and tobacco use. Elective colon resection can be performed safely without preoperative mechanical bowel preparation. Vigilance for anastomotic leak must be maintained at all times, especially in
patients with comorbidities that predispose to anastomotic leak.

Source: MEDLINE

Full Text: Available in fulltext at EBSCO Host


Author(s): Abbas MA

Citation: Journal of the Society of Laparoendoscopic Surgeons, July 2009, vol./is. 13/3(420-4), 1086-8089;1086-8089 (2009 Jul-Sep)

Publication Date: July 2009

Abstract: Acute postoperative anastomotic complications following colorectal resection include leak and obstruction. Often an operation is necessary to treat these complications. The role of endoluminal procedures to treat these complications has been limited. This article illustrates that such an approach is technically feasible and can be used to treat some colorectal anastomotic complications.

Source: MEDLINE

7. Cyclo-oxygenase 2 inhibitors and the risk of anastomotic leakage after fast-track colonic surgery.

Author(s): Holte K, Andersen J, Jakobsen DH, Kehlet H

Citation: British Journal of Surgery, June 2009, vol./is. 96/6(650-4), 0007-1323;1365-2168 (2009 Jun)

Publication Date: June 2009

Abstract: BACKGROUND: Anastomotic leakage occurs after 3-6 per cent of colonic resections. The influence of analgesic agents is largely unknown. This study determined the rate of anastomotic leakage in a series of patients who had colonic surgery over a 9-year period with or without use of a cyclo-oxygenase inhibitor for postoperative analgesia. METHODS: Patients with anastomotic leakage following a standard fast-track proctocol between April 1997 and May 2006 were identified from a prospective, consecutive database. During this period there were two changes in perioperative management: cessation of preoperative oral bowel preparation in August 2002 and the use of celecoxib for postoperative analgesia between May 2003 and November 2004. Rates of anastomotic leakage during the various periods were determined and compared. RESULTS: Some 28 (5.6 per cent) of 502 patients had an anastomotic leak. The incidence of leakage increased significantly during the period of celecoxib use (15.1 per cent), versus 3.3 and 1.5 per cent respectively before and after celecoxib use (P < 0.001). Leakage rates were similar with or without oral bowel preparation.
(3.5 versus 1.7 per cent respectively; P = 0.346) when celecoxib was not used. CONCLUSION: A detrimental effect of celecoxib on anastomotic healing is suggested, and requires further evaluation. (c) 2009 British Journal of Surgery Society Ltd.

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Author(s): Brisinda G, Vanella S, Cadeddu F, Mazzeo P

Citation: Journal of the American College of Surgeons, June 2009, vol./is. 208/6(1152-3; author reply 1153-4), 1072-7515;1879-1190 (2009 Jun)

Publication Date: June 2009

Source: MEDLINE

9. Contained anastomotic leaks after colorectal surgery: are we too slow to act?

Author(s): Damrauer SM, Bordeianou L, Berger D

Citation: Archives of Surgery, April 2009, vol./is. 144/4(333-8; discussion 338), 0004-0010;1538-3644 (2009 Apr)

Publication Date: April 2009

Abstract: HYPOTHESIS: Contained and free anastomotic leaks, which occur in a small percentage of patients after colorectal surgery, are different clinical entities and consequently should be managed differently. DESIGN: Retrospective medical record review. SETTING: Academic medical center. PATIENTS: Patients who underwent colectomy with primary anastomosis (N = 4019) between January 1, 1992, and December 13, 2004, were eligible for participation in the study. Fifty-eight patients (1.5%) with an anastomotic leak demonstrated by communication between the collection and the gastrointestinal tract were identified. Twenty-eight of the patients had free leaks and 30 had contained leaks. MAIN OUTCOME MEASURES: Time to presentation, symptoms at presentation, rates of reexploration, and in-hospital mortality. RESULTS: Baseline characteristics, presenting symptoms, physical examination findings, and laboratory values were similar between patients with contained and free leaks. Almost all patients with free leaks were taken directly to the operating room, whereas those with contained leaks were initially more likely to be treated nonoperatively. However, 24 of the 28 patients with contained leaks (86%) ultimately required surgical intervention. In-hospital mortality was the same in both groups (18%
in the contained leak group and 17% in the free leak group). CONCLUSIONS: In patients with contained leaks who have documented communication between the abscess cavity and the bowel, there is no difference in the rate of operative management or morbidity and mortality when compared with those with free leaks. This finding suggests that the categorization of leaks as free or contained may not be justified and argues for early operative intervention even in patients with contained leaks.

Source: MEDLINE

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Author(s): Eberhardt JM, Kiran RP, Lavery IC

Citation: Diseases of the Colon & Rectum, March 2009, vol./is. 52/3(380-6), 0012-3706;1530-0358 (2009 Mar)

Publication Date: March 2009

Abstract: PURPOSE: This study was designed to analyze the impact of anastomotic leak and intra-abdominal abscess on cancer recurrence and survival in patients who underwent resection for colorectal cancer. METHODS: Data for patients who underwent resection for colon or rectal cancer were retrieved from a prospective colorectal cancer database. Patients with inflammatory bowel disease, familial adenomatous polyposis, hereditary nonpolyposis colorectal cancer, palliative resection, or perioperative mortality were excluded. Patients with postoperative anastomotic leak or intra-abdominal abscess were matched at a 1:2 ratio to patients from the same database who had no leak or abscess. Matched characteristics were age, gender, cancer stage, tumor histology, and operation occurring within three years of each other. Survival and cancer recurrence at five-year follow-up were evaluated with the Kaplan-Meier method and log rank test. RESULTS: In patients with colon cancer, comparison of the 59 patients with a leak or an abscess with 118 matched controls showed no differences in demographic or treatment characteristics, recurrence, or mortality. In patients with rectal cancer, comparison of the 97 patients with a leak or an abscess with 194 matched controls showed that at five-year follow-up the complication group had higher rates of overall mortality (46.8 vs. 28.9, P < 0.01), cancer-specific mortality (28.7 percent vs. 18.0 percent, P = 0.03), overall recurrence (28.6 vs. 15.7, P = 0.01) and local recurrence (11.0 percent vs. 5.0 percent, P = 0.04). CONCLUSION: Anastomotic leak and intra-abdominal abscess were not associated with worsened 5-year survival or recurrence in patients who underwent resection for colon cancer. However, these
complications were associated with increased overall and cancer-specific mortality and increased overall and local recurrence in patients who underwent resection for rectal cancer.

Source: MEDLINE

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Available in print at Grantham Hospital Staff Library

11. Early predictors of anastomotic leaks after colectomy.

Author(s): Bellows CF, Webber LS, Albo D, Awad S, Berger DH

Citation: Techniques in Coloproctology, March 2009, vol./is. 13/1(41-7), 1123-6337;1128-045X (2009 Mar)

Publication Date: March 2009

Abstract: BACKGROUND: An anastomotic leak after colorectal surgery is associated with significant morbidity and decreased survival. Our aim was to identify the early predictors of anastomotic leaks.METHODS: The records of patients undergoing restorative resection for colorectal disease from January 2000 to November 2005 were reviewed. Demographics, clinical events, and laboratory parameters were recorded.RESULTS: A total of 311 patients were included. An anastomotic leak was identified in 25 patients (8%). A leak was suspected and diagnosis confirmed at a mean of 10+/1 days postoperatively. More respiratory and neurological events occurred in patients with an anastomotic leak (p<0.001). These events occurred early in the postoperative course and were usually the first signs and symptoms of a leak. More patients with a leak had absence of bowel activity by postoperative day 6 compared to patients without a leak (p<0.0001). Elevations of the white blood cell count or temperature were a late finding.CONCLUSION: The earliest clinical predictors of an anastomotic leak are pulmonary and/or neurological. Awareness of these findings might help in early diagnosis and treatment of an anastomotic leak.

Source: MEDLINE

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12. Anastomotic leak in colorectal surgery: A review

Author(s): Essani R., Bergamaschi R.

Citation: Gastroenterologia Polska, 2009, vol./is. 16/2(123-127), 1232-9886 (2009)

Publication Date: 2009
Abstract: Anastomotic leak is a major complication of colorectal surgery, leading to significant morbidity and mortality. This article focuses on definitions of anastomotic and subclinical leaks, risk factors associated with anastomotic leaks, relevance of surgical rituals, and use of imaging studies in diagnosing leaks. Surgeon skill is one of the most important determinants of clinical anastomotic leakage after colorectal surgery. Other factors known to affect anastomotic healing include: blood supply, steroids, contaminated wound, and nutrition. Although a surgeon makes a decision about technique or a clinical judgment based largely upon personal preference and perception of a particular advantage, surgical rituals such as handsewn vs. stapled anastomosis, use of pelvic drains, creation of defunctioning ileostomy are reviewed based on the literature available. Computed tomography (CT) imaging has been reported to be effective in identifying patients with anastomotic leaks and can detect intra-abdominal and perianastomotic abscesses, which can mimic the signs and symptoms of an anastomotic leak. However, watersoluble contrast enema seems superior to CT for diagnosis of anastomotic leak. Copyright 2009 Cornetis.

Source: EMBASE


Author(s): Beunis A, Pauli S, Van Cleemput M

Citation: Acta Chirurgica Belgica, July 2008, vol./is. 108/4(474-6), 0001-5458;0001-5458 (2008 Jul-Aug)

Publication Date: July 2008

Abstract: OBJECTIVE: To report a minimal invasive technique for repairing an anastomotic leakage with Transanal Endoscopic Microsurgery (T.E.M.) without creating a protective ostomy. SUMMARY: There are a large number of techniques for the management of anastomotic leakage after colorectal surgery. Depending on the size and location of the disruption, a protective ileostomy, a permanent colostomy or even reintervention for drainage or closure of the leak may be indicated. In most cases the patient faces the morbidity associated with a new intervention, a prolonged hospital stay and a future operation for closure of the stoma. In the present case a 56-year-old man underwent a laparoscopic rectosigmoid resection after two episodes of diverticulitis in six months. An end-to-end circular stapled anastomosis was constructed. Unfortunately 8-days postoperatively an anastomotic leak occurred. Attempts to close the tear nonsurgically with colonoscopy and clipping failed. A minimally invasive reintervention with transanal endoscopic microsurgery (T.E.M.) was performed without creation of an ileostomy. One week postoperatively a gastrografin bowel study showed no leakage. To our knowledge, this technique has not yet been reported without the
simultaneous construction of a stoma. CONCLUSION: We describe a possible minimally invasive technique to avoid laparotomy and/or the creation of a derivative stoma in the management of anastomotic leakage. Hospital stay is not significantly prolonged, future reintervention for closure of stoma is avoided and sphincter function is preserved.

Source: MEDLINE


Author(s): Tsujinaka S, Kawamura YJ, Konishi F, Maeda T, Mizokami K

Citation: ANZ Journal of Surgery, June 2008, vol./is. 78/6(461-5), 1445-1433;1445-2197 (2008 Jun)

Publication Date: June 2008

Abstract: BACKGROUND: Although routine pelvic drainage in colorectal surgery has not been justified in randomized controlled trials, nevertheless, many surgical institutes routinely use pelvic drains after anterior resection. Some reports have focused mainly on the effect of a pelvic drain on anastomotic complications. The purpose of this study was to assess the effectiveness of pelvic drainage in the management of anastomotic leak following anterior resection. METHODS: One hundred and ninety-six patients who underwent elective anterior resection for rectal cancer between April 2001 and June 2006 were included. Surgery was carried out with total or tumour-specific mesorectal excision depending on the anastomotic level. Pelvic drainage was established in all patients using a silastic drain in a closed, gravitational method. RESULTS: Anastomotic leaks occurred in 21 (10.7%) patients. Changes in drain content suggesting an anastomotic leak were observed in 15 (71.4%) patients, 11 of whom remained asymptomatic. Anastomotic leaks were resolved by conservative treatment with the existing drain in 10 (47.6%) patients and the other 11 (52.4%) required further surgical interventions. In patients who developed anastomotic leaks, the pelvic drain was kept in place for a median duration of 52 days (range 32-169 days). Complications related to the drain included stitch abscess in five patients, herniation of the omentum in two and bowel perforation due to the drain in one patient. CONCLUSION: Pelvic drainage may act as an early detector of anastomotic leaks and reduce the need for reoperation in selected patients undergoing rectal cancer surgery.

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15. Standardized algorithms for management of anastomotic leaks and
related abdominal and pelvic abscesses after colorectal surgery.

**Author(s):** Phitayakorn R, Delaney CP, Reynolds HL, Champagne BJ, Heriot AG, Neary P, Senagore AJ, International Anastomotic Leak Study Group

**Citation:** World Journal of Surgery, June 2008, vol./is. 32/6(1147-56), 0364-2313;0364-2313 (2008 Jun)

**Publication Date:** June 2008

**Abstract:** BACKGROUND: The risk factors and incidence of anastomotic leak following colorectal surgery are well reported in the literature. However, the management of the multiple clinical scenarios that may be encountered has not been standardized. METHODS: The medical literature from 1973 to 2007 was reviewed using PubMed for papers relating to anastomotic leaks and abdominal abscess, with a specific emphasis on predisposing factors, prevention strategies, and treatment approaches. A six-round modified Delphi research method was utilized to find consensus among a group of expert colorectal surgeons and interventional radiologists regarding standardized management algorithms for anastomotic leaks. RESULTS: Management scenarios were divided into those for intraperitoneal anastomoses, extraperitoneal (low pelvic) anastomoses, and anastomoses with proximal diverting stomas. Management options were then based on the clinical presentation and radiographic findings and organized into three interconnected algorithms. CONCLUSIONS: This process was a useful first step toward establishing guidelines for the management of anastomotic leak.

**Source:** MEDLINE

**Full Text:** Available in fulltext at EBSCO Host

16. **Is a minor clinical anastomotic leak clinically significant after resection of colorectal cancer?**

**Author(s):** Tytherleigh MG, Bokey L, Chapuis PH, Dent OF

**Citation:** Journal of the American College of Surgeons, November 2007, vol./is. 205/5(648-53), 1072-7515;1879-1190 (2007 Nov)

**Publication Date:** November 2007

**Abstract:** BACKGROUND: There are few reports comparing the variety and frequency of postoperative complications between patients with a major clinical leak requiring emergency abdominal reoperation and those with a minor leak diagnosed from clinical signs and managed expectantly without reoperation. This study examined the association between severity of leakage and 18 other postoperative complications, postoperative mortality, and length of
postoperative hospital stay. STUDY DESIGN: Data were drawn from a comprehensive, prospective hospital registry of 1,507 colorectal cancer resections involving an anastomosis from January 1995 to December 2006. Differences were evaluated by two-tailed Fisher's exact test, Student's t-test, or Mann-Whitney U test. RESULTS: Leaks occurred in 54 patients (3.6%; 95% CI, 2.7% to 4.7%), comprising 21 major (1.4%; 95% CI, 0.9% to 2.1%) and 33 minor leaks (2.2%; 95% CI, 1.5% to 3.2%). Patients with a leak were significantly (p < 0.01) more likely than those without to have 11 of 18 other surgical and medical complications considered, although with few differences in complication rates between those with major and minor leaks. As compared with patients without leak, those with a leak (major or minor) had several of these complications rather than just one (p < 0.001) and greatly prolonged hospital stay (p < 0.001). Postoperative mortality was higher after major leaks than after minor leaks (4 of 21 and 0 of 33, respectively, p = 0.019). CONCLUSIONS: A minor leak is not trivial. Apart from the fact that major clinical leakage necessitates urgent reoperation, there were few other differences between major and minor clinical leaks in the frequency of other complications.

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17. The 'modified triple staple' technique: a variant stapling technique for anastomosis after low anterior resection.

Author(s): Balaji NS, Macklin CP, Fawole S, Aster AS, Rao VS, Moore PJ, Ahmad SM

Citation: Surgeon Journal of the Royal Colleges of Surgeons of Edinburgh & Ireland, August 2007, vol./is. 5/4(199-201), 1479-666X;1479-666X (2007 Aug)

Publication Date: August 2007

Abstract: INTRODUCTION: Stapled techniques of coloanal anastomosis in anterior resection have gained widespread acceptance over hand anastomosis. We believe a modification of the 'triple staple technique' has ergonomic advantages over existing stapling methods and present our technique and experience here.METHODS: Fifty consecutive patients underwent anterior resection with a concomitant defunctioning ileostomy in 44 (86%) patients. A modified triple staple technique of side to end coloanal anastomosis was performed without the need of a purse string suture on the proximal and the distal segments.RESULTS: There were no major intra-operative complications. 2/50 (4%) clinical leaks and 2/37 (5.4%) radiological leaks were noted. A combined leak rate of 4/50 (8%) was reported. The incidence of anastomotic stricture encountered was 1/50 (2%). CONCLUSION: The modified triple staple technique for side to end anastomosis in anterior resection
has ergonomic advantages and comparable safety to the existing techniques of stapling coloanal anastomosis. We believe this technique can be widely adopted as an added alternative to the current techniques of stapled anastomosis after anterior resection.

Source: MEDLINE

Full Text:
Available in fulltext at EBSCO Host

18. Anastomotic leak following mesorectal excision for rectal cancer: True incidence and diagnostic challenges

Author(s): Nesbakken A., Nygaard K., Lunde O.C., Blucher J., Gjertsen O., Dullerud R.

Citation: Colorectal Disease, November 2005, vol./is. 7/6(576-581), 1462-8910;1463-1318 (Nov 2005)

Publication Date: November 2005

Abstract: Objective: Anastomotic leakage is a potentially serious complication of low anterior resection which may be accompanied by clinical symptoms (clinical leak) or may be silent (subclinical leak). In this study the true incidence of the complication was evaluated, and the diagnostic accuracy of clinical symptoms, conventional rectal radiography (CRR) and computed tomography (CT) was compared. Patients and methods: Fifty-six consecutive patients were included in a prospective trial. Clinical parameters were recorded and CRR and CT performed 6-10 days postoperatively or earlier if a leak was suspected. Endoscopy was performed three months postoperatively. Results: Based on all available information including late endoscopy, 5 (9%) patients had clinical leak and five a leak that was asymptomatic during the hospital stay. Clinical assessment, CRR and CT during the hospital stay had an accuracy of 82%, 93% and 94%, respectively, and a sensitivity of 50%, 60% and 57%, respectively. The specificity of clinical assessment was 89%, whereas both CRR and CT had a specificity of 100%. Conclusion: The incidence of anastomotic leakage seemed acceptable when compared with other series. Fifty per cent of the leaks were silent. CRR and CT may be false negative and immediate treatment should be started if clinical signs are highly suggestive of leak, irrespective of radiological findings CT was not more accurate than CRR in detecting anastomotic leak. 2005 Blackwell Publishing Ltd.

Source: EMBASE

Full Text:
Available in fulltext at EBSCO Host
Available in print at Grantham Hospital Staff Library

**Author(s):** Murrell ZA, Stamos MJ

**Citation:** Clinics in Colon & Rectal Surgery, November 2006, vol./is. 19/4(213-6), 1530-9681;1530-9681 (2006 Nov)

**Publication Date:** November 2006

**Abstract:** Anastomotic leak is a dreaded complication of colorectal surgery, with many potential causes. This complication carries with it a reported mortality ranging from 6 to 39%. Early diagnosis is key for the prevention of mortality. Here, we discuss the causes of an anastomotic leak and its signs and symptoms. Moreover, we explore the various modalities of diagnosis and treatment options. Most important, we discuss when a patient needs to be taken to the operating room and what procedure should be performed given various intraoperative findings.

**Source:** MEDLINE

**Full Text:**

Available in fulltext at National Library of Medicine

20. Anastomotic leakage after lower gastrointestinal anastomosis: men are at a higher risk.

**Author(s):** Lipska MA, Bissett IP, Parry BR, Merrie AE

**Citation:** ANZ Journal of Surgery, July 2006, vol./is. 76/7(579-85), 1445-1433;1445-1433 (2006 Jul)

**Publication Date:** July 2006

**Abstract:** BACKGROUND: Anastomotic leakage is the most important complication specific to intestinal surgery. The aim of this study was to review the anastomotic leakage rates in a single Colorectal Unit and to evaluate the risk factors for anastomotic leakage after lower gastrointestinal anastomosis.METHODS: A total of 541 consecutive operations involving anastomoses of the colon and rectum that were carried out between 1999 and 2004 at a single colorectal unit were reviewed. Data concerning 35 variables, relating to patient, tumour and surgical factors, were recorded. Outcomes with respect to anastomotic leakage and mortality were recorded. Data were analysed using univariate and multivariate analyses and odds ratios (OR) calculated.RESULTS: The overall rate of anastomotic leakage was 6.5% (35 of 541). The most frequently carried out operations were right hemicolectomy and anterior resection of the rectum, with leak rates of 2.2 and 7.4%, respectively. Univariate analysis showed that male gender (OR = 3.5), previous
abdominal surgery (OR = 2.4), Crohn's disease (OR = 3.3), rectal cancer < or =12 cm from the anal verge (OR = 5.4) and prolonged operating time (OR = 2.8) were factors significantly associated with anastomotic leakage. Male gender, a history of previous abdominal surgery and the presence of a low cancer remained significant after multivariate analysis. The risk of anastomotic leakage increased when two or more risk factors were present (P < 0.01). The overall mortality was 3.7% and was higher in patients with anastomotic leakage (14.3%; P = 0.01). CONCLUSIONS: Male gender, previous abdominal surgery and low rectal cancer are associated with increased anastomotic leakage rates. These have important implications during preoperative patient counselling and decision-making regarding defunctioning stoma formation.

Source: MEDLINE

Full Text:
Available in fulltext at EBSCO Host


Author(s): Wong NY, Eu KW

Citation: Diseases of the Colon & Rectum, November 2005, vol./is. 48/11(2076-9), 0012-3706;0012-3706 (2005 Nov)

Publication Date: November 2005

Abstract: PURPOSE: Defunctioning ileostomy or colostomy is still routinely performed after low anterior resection in the belief that diverting the fecal stream will prevent anastomotic dehiscence. However, an ileostomy is not without morbidity for the patient. This study aims to determine if a diverting stoma is really necessary after a low anastomosis. METHODS: All low or ultralow anterior resections done in this department were performed by consultant-grade surgeons in a standardized manner. The patients were all monitored closely after surgery for clinical signs of an anastomotic leak. There were 1078 patients who underwent elective low or ultralow anterior resections in a ten-year period between 1994 and 2004. Twelve of them were irradiated before surgery; they were excluded from the study. During a seven-month period from February 2004 through August 2004, 324 patients who underwent such procedures were not defunctioned. These were compared with 742 patients who were previously defunctioned with a proximal stoma. The results were analyzed using the Pearson chi-squared test. RESULTS: Thirteen (4 percent) patients who were not defunctioned developed a clinical anastomotic leak, whereas the leak rate for those who were defunctioned was 3.8 percent. There was no statistical difference demonstrated. Ninety-five percent of patients who developed a leak required surgical intervention; the remaining 5 percent could be dealt with by radiologic drainage. The overall mortality rate for anastomotic
leak in this department is 7.3 percent. CONCLUSION: A diverting stoma does not reduce postoperative anastomotic leak rate. Rather, it reduces the otherwise catastrophic effects of an anastomotic leak such as fecal peritonitis and septicemia. An ileostomy carries certain morbidity and also adds to the cost of the entire operation. Therefore, it should not be performed routinely. Instead, it should be performed selectively in patients with poorly prepared bowels, coupled with a distal limb washout, and in patients with significant comorbidities who can ill afford the complications of a leak.

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22. Anastomotic leakage is predictive of diminished survival after potentially curative resection for colorectal cancer.

Author(s): Walker KG, Bell SW, Rickard MJ, Mehanna D, Dent OF, Chapuis PH, Bokey EL

Citation: Annals of Surgery, August 2004, vol./is. 240/2(255-9), 0003-4932;0003-4932 (2004 Aug)

Publication Date: August 2004

Abstract: OBJECTIVE: The aim of this study was to determine whether anastomotic leakage has an independent association with overall survival and cancer-specific survival. SUMMARY BACKGROUND DATA: There are many known prognostic indicators following surgery for colorectal cancer (CRC). However, the impact of anastomotic leakage has not been adequately assessed. METHODS: Consecutive patients undergoing resection between 1971 and 1999 were recorded prospectively in the Concord Hospital CRC database. Total anastomotic leakage was defined as any leak, whether local, general, or radiologically diagnosed. Patients were followed until death or to December 31, 2002. The association between anastomotic leakage and both overall survival and cancer-specific survival was examined by proportional hazards regression with adjustment for other patient and tumor characteristics influencing survival. Confidence intervals (CI) were set at the 95% level. RESULTS: From an initial 2980 patients, 1722 remained after exclusions. The total leak rate was 5.1% (CI 4.1-6.2%). In patients with a leak, the 5-year overall survival rate was 44.3% (CI 33.5-54.6%) compared to 64.0% (CI 61.5-66.3%) in those without leak. In proportional hazards regression-after adjustment for age, gender, urgent resection, site, size, stage, grade, venous invasion, apical node metastasis and serosal surface involvement-anastomotic leakage had an independent negative association with overall survival (hazard ratio [HR] 1.6, CI 1.2-2.0) and cancer-specific survival (HR 1.8, CI 1.2-2.6). CONCLUSION: Apart from its immediate
clinical consequences, anastomotic leakage also has an independent negative association with survival.

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23. The circular stapling device as a risk factor for anastomotic leakage.

Author(s): Folkesson J, Nilsson J, Pahlman L, Glimelius B, Gunnarsson U

Citation: Colorectal Disease, July 2004, vol./is. 6/4(275-9), 1462-8910;1462-8910 (2004 Jul)

Publication Date: July 2004

Abstract: AIM: To investigate the relation between the type of circular stapler and anastomotic leak in rectal cancer surgery. BACKGROUND: During the past decades results from rectal cancer surgery have improved considerably regarding risk of local recurrence and survival. Two main paradigm changes are considered to be the cause for this: the introduction of total mesorectal excision (TME) and the increasing use of radiotherapy. However, rectal cancer surgery is associated with an unacceptably high frequency of complications of which anastomotic leak is one of the most severe ones. The hypothesis was raised that the choice of stapler influenced the leakage rates. METHODS: A questionnaire was sent to all departments of surgery (n = 66) performing rectal cancer surgery in Sweden to determine the choice of circular stapler when performing anterior resection for rectal cancer. These data were linked to the Swedish Rectal Cancer Registry for the period 1995-99. RESULTS: A total of 3316 patients had an anterior resection. The choice of circular stapling device was determined in 70% of the cases. When stapler A was used, the leakage rate was 11% whereas it was 7% when stapler B was used (P = 0.0039). In the cases where it was impossible to determine which stapler had been used the leakage rate was 8%. CONCLUSION: Quality control is an important part of medicine and the present study suggests that it also must include surgical instruments. A prospective randomised study is needed to confirm the results.

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24. Risk factors for anastomotic leakage after left-sided colorectal resection with rectal anastomosis.

Author(s): Makela JT, Kiviniemi H, Laitinen S

Citation: Diseases of the Colon & Rectum, May 2003, vol./is. 46/5(653-60), 0012-3706;0012-3706 (2003 May)

Publication Date: May 2003

Abstract: PURPOSE: To identify the risk factors for anastomotic leakage after left-sided colorectal resections with rectal anastomosis. METHODS: Forty-four patients with anastomotic leakage identified from a computer-generated database were compared with 44 control patients standardized for gender, age, and operative indication. RESULTS: The mean hospital stay was significantly prolonged in the leakage group, which resulted in a higher total cost of hospital treatment. The preoperative variables significantly associated with anastomotic leakage included malnutrition, weight loss, hypoalbuminemia, cardiovascular disease, two or more underlying diseases, and use of alcohol. The surgery-related factors that turned out to be significant were The American Society of Anesthesiologists physical status, operation time greater than two hours, multiple blood transfusions, intraoperative contamination of the operative field, and a short distance of the anastomosis to the anal verge. Obesity, body mass index, diabetes, smoking, serum hemoglobin, serum creatinine, serum bilirubin, bowel preparation, mode of antibiotic prophylaxis, type of anastomosis, technique of stapling, size of stapler used, and use of drain were nonsignificant variables. Malnutrition, weight loss, use of alcohol, intraoperative contamination, long operation time, and multiple blood transfusions remained significant in logistic regression model. Eighty-six percent of the patients with three or more risk factors of anastomotic leakage belonged to the leakage group. CONCLUSIONS: Patients with multiple risk factors have higher risk for anastomotic leakage. When patients have three or more risk factors, the creation of a protective stoma should be considered in cases with a low rectal anastomosis, and all these patients should be carefully monitored postoperatively for signs of possible leak.

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PURPOSE: Anastomotic leakage is the main cause of death after anterior resection. If it causes a single abscess, it may be successfully cured by percutaneous drainage, but in case of extensive peritoneal infection (multiple abscesses and generalized peritonitis), it is associated with a 40 to 60 percent mortality. This study aimed at evaluating aggressive, one-stage surgical management in such cases.

METHODS: All patients referred to our surgical intensive care unit during the past ten years with generalized, multilocular, intra-abdominal sepsis after anterior resection were reviewed. There were 32 patients, with a mean age of 65 years, among which 15 (47 percent) were referred from other institutions. The mean Acute Physiology and Chronic Health Evaluation II score on admission was 18. All patients underwent a laparotomy with complete peritoneal exploration, intraoperative lavage, fecal diversion, capillary drainage of the pelvis excluding the rectal stump or the leaking anastomosis from the peritoneal cavity, and primary closure of the abdomen. A Hartmann's operation was done in 22 cases, and conservation of the anastomosis with proximal colostomy was done in 10 cases. The choice was based on the size of the leak, the viability of the colon, and the site of the anastomosis.

RESULTS: Four patients died (12 percent), and five patients (16 percent) had recurrent sepsis. When the anastomosis had been conserved, restoration of continuity was achieved in all cases. After Hartmann's operation 8 patients of 19 survivors kept a permanent stoma; 7 had undergone a low anterior resection.

CONCLUSIONS: Extensive intra-abdominal infection after anterior resection may be efficiently controlled by a surgical approach combining peritoneal debridement, fecal diversion, and capillary drainage of the pelvis. Intestinal continuity may be restored after diversion stoma or Hartmann's procedure after high anterior resection. This is not the case after a Hartmann's operation after a low colorectal anastomosis, and this procedure should be avoided whenever possible.

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Boccola MA, Buettner PG, Rozen WM, Siu SK, Stevenson AR, Stitz R, Ho YH.

CONCLUSION: In this prospective study, advanced tumour stage, distal site, and need for postoperative blood transfusion were associated with increased rates of anastomotic leakage. In addition to their high risk of immediate postoperative morbidity and mortality, both localized and generalized leaks had similarly negative impacts on overall, cancer-related, and disease-free survival.