Incidence and risk factors of anastomotic leaks

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Anastomotic leakage after colorectal surgery is a major and potentially life-threatening complication:

Early consequences:

- Increase mortality
- Increase morbidity
- Increase Hospita stay
- Increase cost

Late consequences

- Increase local recurrence
- Decrease overall and disease free survival
- Affect functional outcome

Anastomotic leakage

Anastomotic leakage should be defined as:

- A communication between the intra and extraluminal compartments owing to defect of the integrity of the intestinal wall at the anastomosis between the colon and rectum or the colon and anus.
- Leakage originating from neorectal reservoir (J-pouch) should be considered an anastomotic leakage
- Pelvic abscess in the proximity of the anastomosis should be considered an anastomotic leakage

Rahbari et al surgery 2010

Incidence

Colorectal anastomotic leak	
prevalence	0.5% and 21%
incidence of clinically significant	1% and 12%
Low colorectal resections	10% to14%
Rates of morbidity and mortality	12% and 27%.
Hospital stay	36 and 39 days

Koianka et a, lAnn Surg2013

Risk factors for Anastomotic leakage (AL)

Potentially modifiable risk factors:

- Obesity
- Medication
- Nutrition and Hypoalbuminaemia
- Mechanical Bowel Preparation
- Radiotherapy
- Preoperative antibiotics and selective decontamination of the digestive tract
- Alcohol
- Smoking

McDermott et al ,March 2016, Association of Surgeons of Great Britain and Ireland

Obesity

- Many studies have shown obesity to independently increase the risk of AL
- Central obesity, such as waist circumference and waist-hip ratios may be more sensitive than BMI in predicting AL

Kartheuser AH et alAnn Surg. 2013

Medication

- Corticosteroids: Prolonged use may increase AL
- Bevacizumab: (VEGF inhibitor) Should be stopped and not restarted for at least 28 days either side of surgery (manufacturer advice)

- Golub R et al Journal of the American College of Surgeons1997
- http://www.gene.com/download/pdf/avastin_prescribing.pdf

Nutrition and Hypoalbuminaemia

- Malnutrition and a serum albumin concentration of <35g/L increases the risk of AL
- Hypoalbuminaemia
  - Systemic inflammatory response secondary to necrotic or perforated tumours
  - Sepsis
- Treatment of the cause not preoperative administration of albumin to temporarily increase serum albumin concentration decrease the risk of AL
- If can not be corrected operative strategy should be modified

Mechanical Bowel Preparation

Several randomized trials have shown that avoidance of mechanical bowel preparation does not appear to have resulted in increased AL rate

Guenaga KF et al The Cochrane database of systematic reviews 2011

Bretagnol F et al Ann Surg. 2010

178 patients

CONCLUSIONS:

This first randomized trial demonstrated that rectal cancer surgery without MBP was associated with higher risk of overall and infectious morbidity rates without any significant increase of anastomotic leakage rate. Thus, it suggests continuing to perform MBP before elective rectal resection for cancer.

Radiotherapy

CONCLUSIONS:

Male sex, low anastomosis, preoperative chemoradiation, advanced tumor stage, perioperative bleeding, and multiple firings of the linear stapler increased the risk of AL after laparoscopic surgery for rectal cancer. A diverting stoma might be mandatory in patients with 2 or more of the risk factors identified in this analysis.

Park JS et al, Ann Surg. 2013

CONCLUSIONS:

We did not observe that preoperative CRT increased the risk of postoperative AL after LAR in patients with rectal cancer, using propensity score matching analysis.

Chang JS et al, Ann Surg. 2014

Alcohol

Ethanol consumption in excess of recommended levels (>105g alcohol per week) is associated with an increased risk of AL

Sorensen LT et al The British journal of surgery 1999

Smoking

Tobacco smoking, both current and historical, is associated with an increased risk of AL

Bisgard AS et al, Diseases of the colon and rectum 2013

Preoperative antibiotics and selective decontamination of the digestive tract (SDD)

- A systematic review has indicated that SDD reduces anastomotic leak ratesfrom 7.4% to 3.3%
- This finding has also been replicated in a recent study of over 8,000 colorectal resections, demonstrating both lower surgical site infection and anastomotic leak rates in the treatment group

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Non-modifiable risk factors

Gender and age

History of Radiotherapy

Diabetes

Co-morbidity

Elective vs. Emergency Surgery

Tumour factors

Gender and Age

Male gender increases the AL rate in both colonic and rectal anastomosis

Nachiappan S et al world J sur 2015

Prospective studies have demonstrated that increasing age is associated with an increase risk of AL

Choy Py et al Cochrane Database Syst Rev.2011

Diabetes

Two studies have demonstrated that diabetes is associated with higher risk of AL (ileo colic anastomosis and low anterior resection)

Neutzling CB et al Cochrane Database Syst Rev. 2012

Beard JD et al Br J Surg.1990

But other study didn’t find any difference in AL rate but higher mortality in the AL group

Marusch F et al Dis Colon Rectum.2002

Co-morbidity

Increase in AL rate:

- Pulmonary disease
- Vascular disease
- Renal disease
- ASA of greater than 2

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History of Radiotherapy

Patients previously treated with radiotherapy, e.g. radiotherapy for cervical or prostate cancer have AL rates documented to be as high as 36%

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Elective vs. Emergency Surgery

The risk factors:

- Haemodynamic instability
- Shock
- Inotrope requirements
- Hypoalbuminaemia

Tumour factors

- Distal anastomoses

(infraperitoneal rectum have the highest anastomotic leak rates)

- Tumour size >3cm
- Advanced tumour stage
- Distant metastases

Intraoperative factors

Technical Aspects

Hand sewn vs. stapling anastomosis in :

- Left colonic and rectal anastomosis No difference
- Ileo colic meta analysis in Cochrane review was in favor of stapling techniques

Karliczek A, et al Colorectal Dis. 2006

Warschkow R et al Ann Surg. 2012

Intraoperative factors

Poor operative technique:

- Tension
- Operative duration of greater than 4 hours
- Intraoperative contamination
- Blood loss
- Hypoxia
- Use of vasopressors

THANK YOU


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