ANASTOMOTIC LEAK

- a major postoperative complication, increasing incidence of ileus, wound infection, peritonitis, abscess, and sepsis (among other complications) post-operatively
- increased mortality
- prolonged hospital stay
- increasingly, a metric based on which surgical centers compared to each other

Magnitude of the problem

- reported leak rate of up to 20% for low anastomoses (e.g. low anterior resection)
- mortality of complications of leakage from 6-22%
- complications of leakage account for nearly *one-third* of post-operative deaths in colorectal surgery (Alberts, et al., 2003)

Definitions

- no single accepted definition for anastomotic leak
- characterized by peritonitis (localized or generalized), fecal or purulent drainage from wound or drain, presence of abscess or fever
- categories of leak: radiographic vs. minor clinical vs. major clinical
    - distinction relevant for prognosis, implications for treatment

Risk factors

- Age
- Obesity
- Level of anastomosis
    - Increased incidence of leaks below 5 cm in rectum
- Nutritional status

Clinical findings

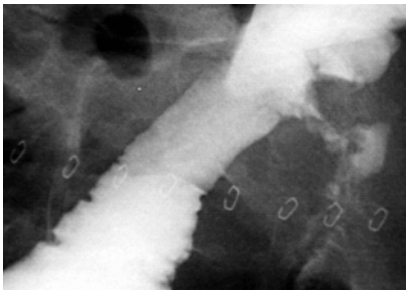
- typically occurs at 5-7 days, but range may be much wider

	With anastomotic leakage (n = 39)		Without anastomotic leakage (n = 616)		
Postoperative course	n	%	n	%	p Value
Fever > 38°C	7/37	19	30/616	5	< 0.001
Oliguria: urine output < 1,000 mL/24 h	9/24	38	63/335	19	< 0.02
Diarrhea	14/39	36	77/616	13	< 0.001
Postoperative ileus > day 4	19/39	49	108/616	18	< 0.001
Uremia > 8 mmol/L	7/18	39	15/229	6	< 0.001
Creatinine > 110 μmol/L	4/18	22	15/229	7	< 0.02
Leukocytosis: WBC > 12,000/mm^3	5/8	63	17/78	22	< 0.02
Abdominal drain > 400 mL/fluid day 3	10/21	47	53/271	20	< 0.01
Nasogastric aspiration > 1,000 mL day 3	24/39	61	268/616	43	NS

- Alves et al., 1999
    - 71% with leak exhibited at least one of above features before POD #5
    - two signs increased risk to 18%; predicted leak with 31% sensitivity and 92% specificity (PPV 18%, NPV 94%)

- three signs increased risk to 67%; predicted leak with 21% sensitivity and 99% specificity (PPV 67%, NPV: 95%)
- reoperation after day 5 resulted in death in 22% versus 0% with reoperation before day 5

Diagnosis



- contrast enema
- CT
- both with water-soluble enteric contrast
- contrast radiography detected 55% of leaks;
- CT detected 89%

Avoiding anastomotic leak

- principles of good anastomoses
  - adequate blood supply up to and including edge of the anastomosis
  - absence of tension on the anastomosis
  - absence of tension on blood supply to anastomosis
  - proper technical placement of sutures or staples
  - adequate matching of luminal diameters
- defunctioning proximal stoma
  - Pakkastie et al, 1997
    - similar combined clinical and radiological leak rate in 38 patients undergoing LAR
    - half randomized to receive defunctioning colostomy
    - 50% reduction in the *clinical* leak rate (16% vs 32%) in patients with a defunctioning colostomy
    - difference not statistically significant due to the small numbers in trial
    - ? fecal diversion given poor outcome in some patients who experience dehiscence
    - ? higher incidence of anastomotic strictures in diverted patients
- stapled versus hand-sewn anastomosis
  - MacRae and McLeod, 1998
    - meta-analysis of 13 RCT assessing hand-sewn and stapled colon and rectal anastomoses
    - no difference in leak rate between groups
  - Cochrane review
    - 9 trials involving 1233 patients
    - insufficient evidence to demonstrate any superiority of stapled over hand-sewn techniques in colorectal anastomoses
    - no difference, regardless of level of anastomosis

Anastomosis in Hinchey III/IV peritonitis

- Regenet et al, 2003
  - 60 patients undergoing laparotomy for diverticulitis with Hinchey III/IV peritonitis

    - non-randomized (operation selected by attending surgeon but *not* based on intraoperative findings)
        - Hartmann's procedure (HP) vs resection with intraoperative colonic lavage with primary anastomosis (PAIL)
        - selection bias
    - higher complication rate (wound infection, stoma complications) and hospital stay in HP vs PAIL groups
    - similar mortality rates
    - numbers to small to permit subgroup analysis (i.e. Hinchey III vs IV)
- Salem and Flum, 2004
    - review of 98 published studies (1957-2003)
    - similar findings
        - mortality 19.6% HP vs 9.9% PA (+/- IL)
        - wound infection 29.1 % vs 9.6%
        - stoma complication + anastomotic leak (HP reversal)14.6% vs anastomotic leak 13.9%
        - within PA group, complication rates were lowest in patients undergoing PAIL or PA with proximal stoma
    - suggests PA at least as good as HP
    - consider, however:
        - no RCTs among all studies reviewed
        - most PA studies were at much later dates, and patients benefited from better access to care, better antibiotics, and more intense critical care interventions

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