

Stapled Bowel Anastomosis

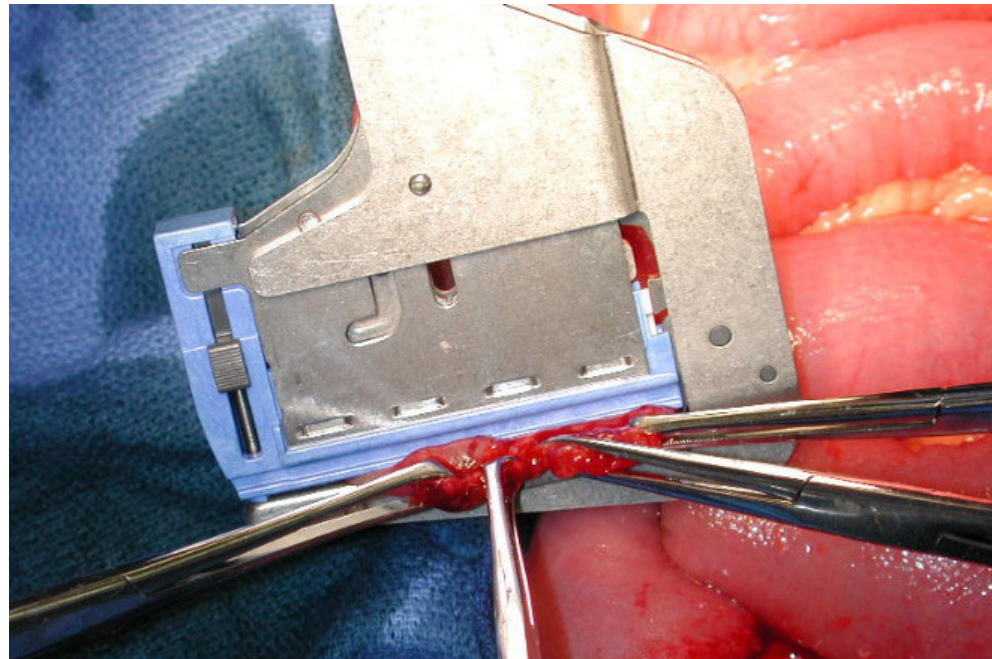
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Intestinal anastomosis

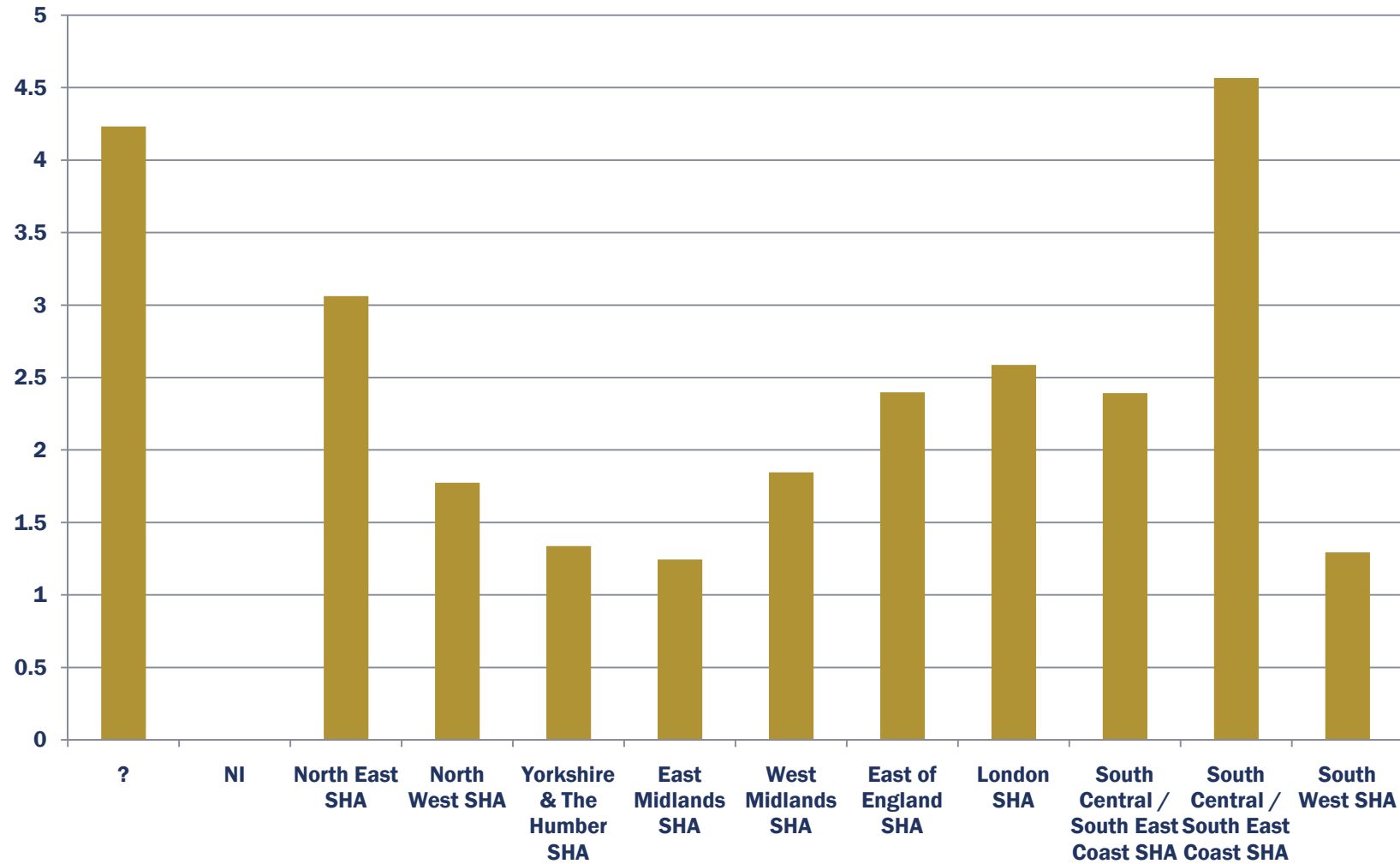
- the basic principles: crucial
 - ◇ Accurate approximation of the bowel
 - ◇ No tension
 - ◇ Good blood supply
 - ◇ 'Clean'
 - ◇ Appropriate use of defunctioning



Principles of Successful Intestinal Anastomosis

- Well-nourished patient with no systemic illness
- No contamination
 - ◇ in the gut
 - ◇ in the peritoneal cavity
- Adequate exposure and access (?lap surgery)
- Well-vascularized tissues
- Absence of tension at the anastomosis
- Meticulous technique
 - ◇ (“it will be alright” never will be!!)
- Surgeon Factor – everyone has varying leak rates

Leak rates by region

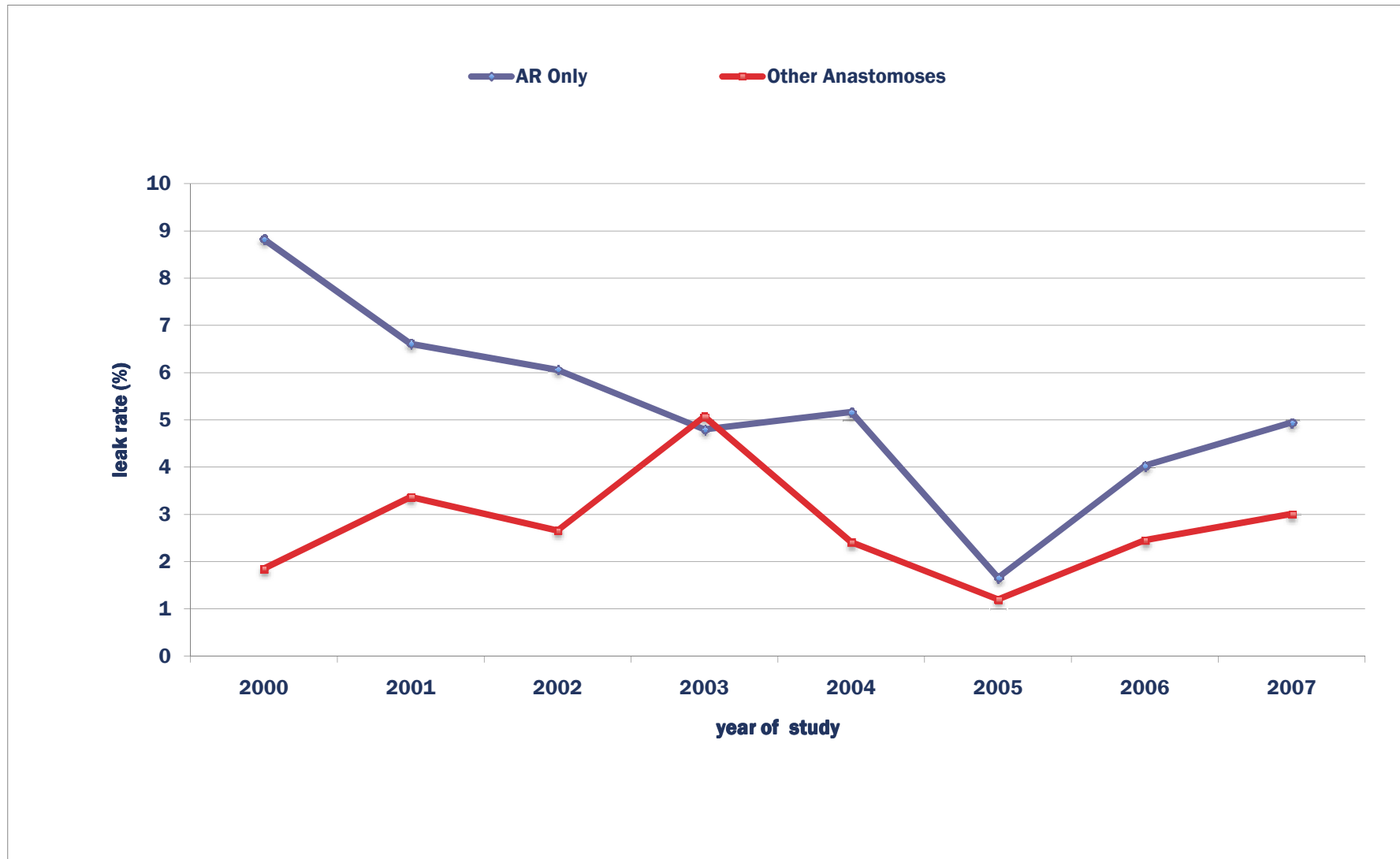


Anastomotic failure

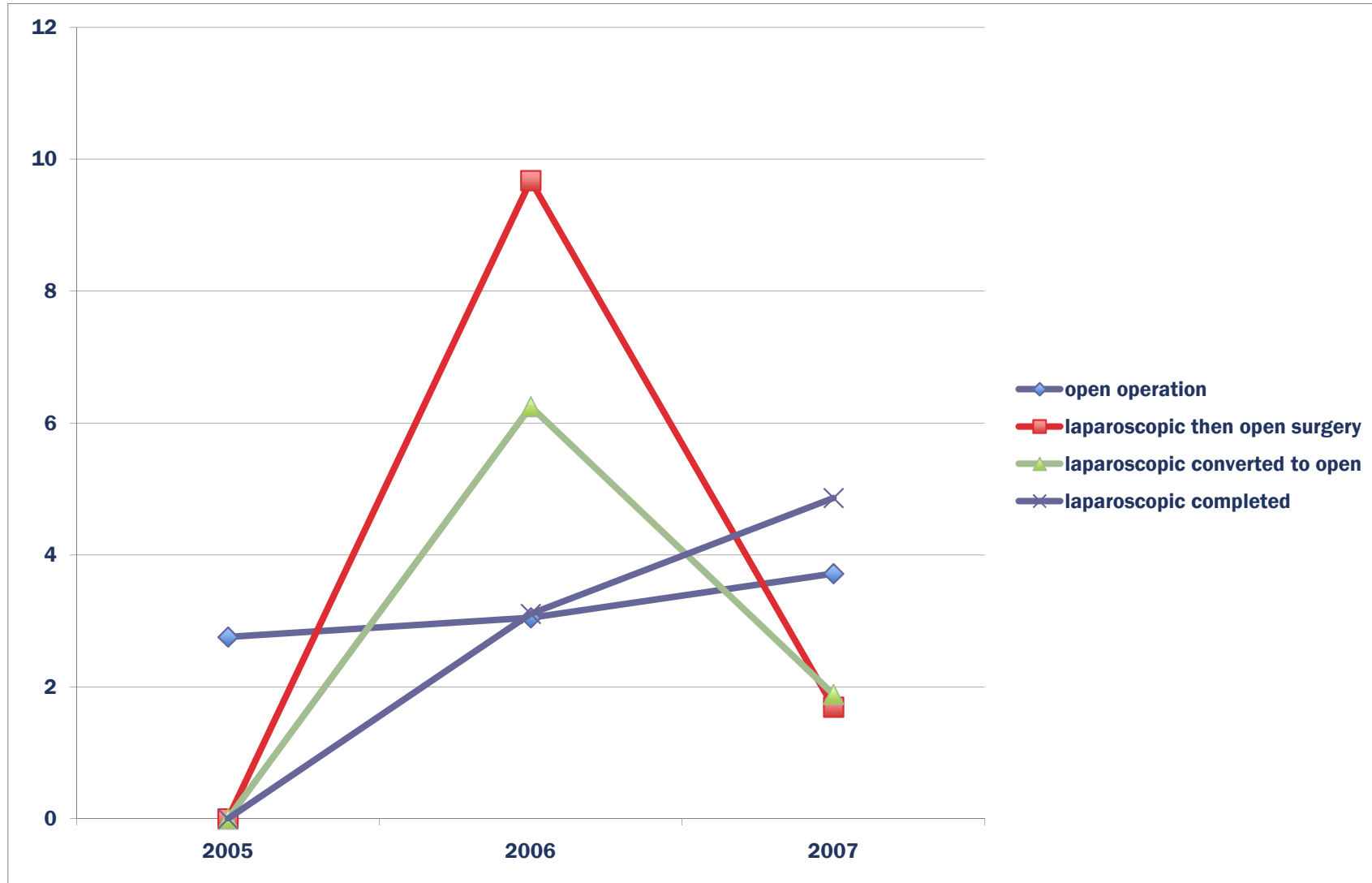
■ Anastomosis failure (leak) rate

- ◇ 1.5~2.2% (small bowel)
- ◇ 3% colon, 5% rectum (Smith – NBOCAP 2009)
- ◇ X3 higher in Crohn's (Tekkis meta-analysis, DCR 2007)
- ◇ Type of anastomosis (stapled/hand sewn)
- ◇ Configuration
- ◇ Emergency or elective procedure (x1.5)
- ◇ Time??
- ◇ increase morbidity & mortality (x10), double the length of hospital stay

Rectal and colonic anastomoses



What about type of surgery?



Stapling: technical issue

Choice of Stapler

- first introduced in 1908 by Hultl;
- Massive Change in surgical practice in last 20-yr
- Types of stapler
 - ◇ Transverse anastomosis (TX) stapler
 - ◇ The gastrointestinal anastomosis (TLC) stapler
 - ◇ The circular, or end-to-end anastomosis (CDH)
 - ◇ For open surgery vs laparoscopic surgery (ATS/ATW)



Choice of Stapler

■ titanium

- ◇ little tissue reaction.
- ◇ not magnetic

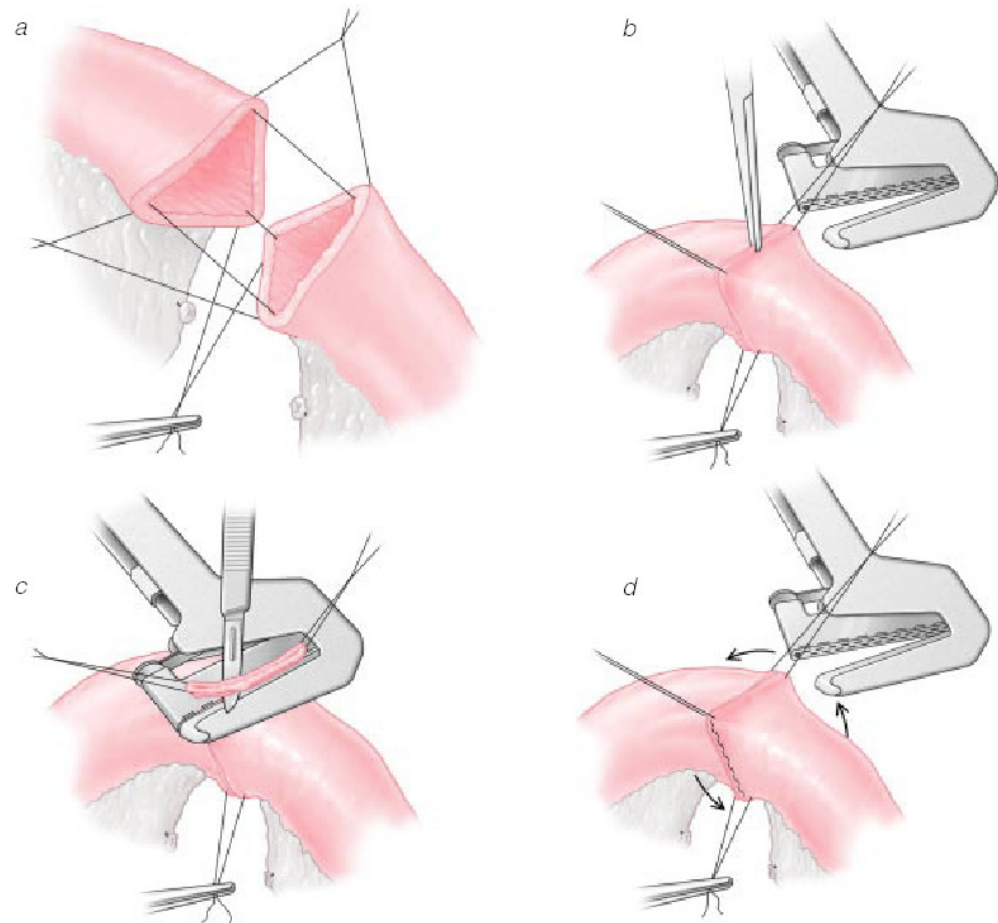
■ Problem

- ◇ Bleeding from edge
- ◇ Linear stapler end to end: everting
- ◇ EEA: enterostomy

■ Staple Height

best blood flow by

1. stapled anastomosis adjusted to the thickness of the bowel wall
>
2. double-layer stapled and sutured anastomosis
>
3. double-layer sutured anastomosis
>
4. tightly stapled anastomosis



S-Stapled versus D-Stapled Anastomoses

- Pig model study
- Small bowel anastomosis
- Killed at 10-days

- Intersecting staple lines are created
- > 90% of the intersecting staple lines contained bent or cut staples
- But the integrity of anastomosis was not compromised in any way, nor was healing adversely affected

Hand Sewn vs. Stapled Anastomosis

Various prospective, randomized trials

- no differences in clinical and subclinical leakage rates, length of hospital stay, or overall morbidity.
- no significant differences were apparent between stapled and hand-sewn anastomoses.
- ...except, stenosis rates are higher in stapled procedures
- possible reduction in anastomotic recurrence rate with stapled

Failure of anastomosis

Contributing Factors

Type and location of anastomosis

■ Location

- ◇ Rectum > Colon
- ◇ L1/3 > M1/3 Rectum
- ◇ SB & colon?

■ Type

- ◇ HS end-end best for propagation of myoelectric waveform

Patient preparation

- Nutrition - good
- Anaemia - bad
- Antibiotics - good
- Bowel Prep – bad
 - ◇ Phosphate enema!

Associated disease and systemic factors

■ Co-morbidity

- ◇ An, DM, Immunosuppression, Radiotherapy, malnutrition with hypoalbuminemia, vitamin deficiency

■ Crohn disease

- ◇ Risk of anastomotic dehiscence(12%)

■ Steroids

- ◇ ↓protein turnover, ↓wound healing, ↑sepsis

■ Blood Loss, recent transfusion

■ Obstruction

Laparoscopic surgery leak rates

Left sided anastomoses

■ Univariate analysis

- ◇ Rectum > colon
- ◇ ↑ operating time
- ◇ Number of stapler firings
- ◇ ↑ diameter of circular stapler

■ Multivariate

- ◇ L > M > U rectum
- ◇ Men + L rectum + ↑ firings = bad news!

Kim J Am Coll Surg,2009

Controversial issues??

Inversion vs. eversion

- No evidence

Nasogastric decompression

- No evidence

Abdominal drain

- No evidence

Trauma

Colonic trauma

- 19 Trauma centres
- Survived 72 hrs
- 297 patients, 2/3 primary anastomosis, 1/3 stoma
- Abdominal complications in ¼
 - ◇ 22% in anastomosed
 - ◇ 27% in stoma
- Independent risk factors for abdominal complications
 - ◇ Severe contamination
 - ◇ Transfuse > 4U blood
 - ◇ Single agent prophylaxis
 - ◇ NO difference in high risk patients
 - ◇ NO difference between anastomosis or stoma
- Technique and lavage

Demetriades et al, J Trauma 2001 May;50(5): 765-75

Conclusions???

Conclusions

■ Emergency surgery

- ◇ Anastomosis is safe if patient status is satisfactory.
- ◇ Leak rate increases in unstable, malnourished, multi transfused & severe contamination.

■ Minimal number of firings in lap surgery

■ Crohn's – side to side is better??

■ HS == Stapled (location)

■ Defunction

■ Good surgical technique is important!