# Peptic ulcer surgery in the PPI and H. pylori era

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### Introduction

- Global prevalence of PUD has decreased
- Management of PUD largely medical
- Rate of complications unchanged
- Sharp decrease in elective acid reducing surgery
- Complications account for 1/3 upper GI surgery
  - Bleeding
  - Perforation has highest mortality

### Epidemiology

- Incidence of PUD in low to middle income countries is 7 times high income countries
- Presentation in LMICs similar to mid 20<sup>th</sup> century HICs
- PUD responsible for 230 000 deaths a year in LMIC
- Bleeding = 0.27 1.06 per 1000 person years
- Perforation = 0.03 0.3 per 1000 person years

### What are the surgical options? Bleeding ulcers

Oversew or underrunning of the vessel

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- Simple closure
- Closure with omental patch
- Ulcer > 2cm
  - controlled tube duodenostomy
  - jejunal pedicle graft or serosal patch
  - pedicle omental plug
  - partial gastrectomy
  - gastric disconnection





a Primary closure

b Primary closure with omental pedicle flap

e Long tails





C Omental pedicle flap; Cellan – Jones repair d Free omental plug; Graham patch

f Tacking sutures

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Truncal vagotomy and pyloroplasty

Truncal vagotomy and antrectomy

Selective vagotomy

Highly selective vagotomy



- Truncal vagotomy and pyloroplasty
  - Easiest to perform
  - 10-15% failure rate
  - Dumping, diarrhoea, bile reflux,
    - post vagotomy syndrome

Truncal vagotomy and antrectomy

Selective vagotomy

Highly selective vagotomy



Truncal vagotomy and pyloroplasty

#### Truncal vagotomy and antrectomy

- Low recurrence
- Increased morbidity
- Selective vagotomy

Highly selective vagotomy



Truncal vagotomy and pyloroplasty

Truncal vagotomy and antrectomy

- Selective vagotomy
  - Division of gastric branches only
  - Denervates pylorus
  - Rarely performed
- Highly selective vagotomy



Truncal vagotomy and pyloroplasty

Truncal vagotomy and antrectomy

Selective vagotomy

- Highly selective vagotomy
  - Technically challenging
  - High recurrence rate if inexperienced surgeon
  - Denervate proximal stomach bulk parietal cells
  - Leave antrum with nerve supply intact distal branch of the nerve of Laterjet

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### WHAT ARE SURGEONS DOING?

#### USA

Surgical oversew	66%
Gastrectomy	19%
Vagotomy	15%

#### Sub-Saharan Africa

- Vagotomy and drainage 60%
- Primary repair31%
- Resection and reconstruction 6%
- Drainage 3%

### What is the evidence? Bleeding ulcers

- Vagotomy vs. gastrectomy 1993
  - † recurrence with lesser surgery 17% vs. 3%
  - † leak with gastrectomy
  - No difference mortality
- Conservative vs. extensive surgery 1991
  - No difference in rebleed rate or mortality
- Conservative vs. extensive surgery 1995
  - No difference in mortality
  - Conservative surgery associated with ↑ rebleeds

### What is the evidence? Perforated ulcers

- No difference in leak rate or M&M for omental patch
- Simple closure vs. Vagotomy and drainage vs. highly selective vagotomy 1982
  - No difference mortality or postop course
  - ↑ recurrence with lesser surgery
- Simple closure vs. vagotomy and drainage 1985
  - No difference in mortality or complications
  - Recurrence 83% vs. 8%
  - Acid reducing surgery not indicated high risk patient or inexperienced surgeon
- Simple closure vs. vagotomy 1988
  - Better long term results with definitive surgery



### But these studies are old....













### Nokia 3310 Someone dropped their phone

### What is the evidence? Laparoscopy

- Cochrane meta-analysis 2013
  - 92% success rate
  - No difference in complication rates

- Contraindicated
  - Shock on admission
  - Delay in presentation > 24 hours
  - Patients > 70 years old
  - ASA grade III to IV

### What is the evidence? Ulcers

- ACSNSQIP 2014
  - > 1 million patient records
  - 3611 patients 2374 perforation, 775 bleeding
  - Majority simple surgery
  - Bleeding No significant difference post operative morbidity or early rebleeding
    - Mortality significantly better if vagotomy and drainage than local procedure
  - Perforation significantly higher morbidity with resection
    - No difference in mortality
    - No benefit of vagotomy over simple closure

### What is the evidence?

Poor level 1 evidence



### What happened?

### What happened?

#### PPIs

- 85% NSAID/aspirin related ulcers heal 6-8 weeks
- Reduce recurrent bleeding 17.3% to 10.6%

#### H pylori

- 1 year recurrence of PUD is 5% vs. 35% without.
- Eradication with PPI decreased ulcer recurrence after perforation 38.1% to 4.85%

In the era of H pylori eradication and PPIs few surgeons perform acid reducing surgery



### Conclusion

- Laparoscopy is safe in perforated ulcers
- Simple closure best for perforated ulcers
- Some benefit of vagotomy and drainage in bleeding ulcers
- Little indication for resection in perforation or bleeding
- Consider the surgeon's exposure to acid reducing surgery electively when deciding to do definitive surgery emergently