Expectant management of perforated duodenal ulcer

Kings County Hospital
Sylvia S. Kim, MD
Operative management
perforated duodenal ulcer
Perforated duodenal ulcer

- 5-10% DU patients
- Operative mortality 5%
  - Over 30% some groups
  - Elderly
  - Shock
  - Comorbid disease
  - Perforation >24 hours
Simple closure

- Graham patch 1937
- High rate of relapse with simple closure
  - 50-80%
  - May require subsequent surgery for intractable symptoms or recurrent complication
Definitive acid-reduction

• Vagotomy and antrectomy
  – Billroth I or II

• Vagotomy and drainage
  – Pyloroplasty or gastrojejunostomy

• Proximal gastric vagotomy
  – “Highly selective vagotomy”
Morbidity PUD surgery

• Early
  – Duodenal stump leak
  – Anastomotic leak
  – Afferent loop obstruction
  – Gastric outlet obstruction
  – Gastric atony
  – Efferent loop obstruction

• Long-term
  – Reflux esophagitis
  – Alkaline reflux gastritis
  – Dumping syndrome
  – Late postprandial hypoglycemia
  – Gallstones
  – Anemia
  – Gastric remnant cancer
## Results of common ulcer operations

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Mortality</th>
<th>Recurrence</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV + A</td>
<td>0.6-1.8%</td>
<td>1-2%</td>
<td>13-29%</td>
</tr>
<tr>
<td>TV + Drainage</td>
<td>0.5-1.4%</td>
<td>5-15%</td>
<td>11-26%</td>
</tr>
<tr>
<td>HSV</td>
<td>0.1-0.3%</td>
<td>5-16%</td>
<td>3-8%</td>
</tr>
</tbody>
</table>

TV = Truncal vagotomony  
A = Antrectomy  
HSV = Highly selective vagotomy

*Current surgical management of duodenal ulcers*

*Surgical Clinics of North America, 1992*
Patch vs. TV+D vs. HSV

- Is addition of definitive acid-reducing surgical procedure safe?
- Which procedure do you use?
- 101 “medically fit” patients with chronic ulcer randomized
  - Simple closure 35
  - TV + drainage 32
  - Closure + HSV 34

Immediate definitive surgery for perforated duodenal ulcers: a prospective controlled trial

Patch vs. TV+D vs. HSV

• “Medically unfit”
  – Age > 70
  – Shock
  – Comorbidities
  – Duration > 24 hours
  – Gross contamination
  – Lack of technical ability

*Immediate definitive surgery for perforated duodenal ulcers: a prospective controlled trial*

Patch vs. TV+D vs. HSV

- No hospital death
- No wound infection or abscess
- Minor postoperative complications
  - Pneumonia in 4 patients
- 39 months follow up
  - Endoscopic assessment

*Immediate definitive surgery for perforated duodenal ulcers: a prospective controlled trial*

Patch vs. TV+D vs. HSV

- All but one recurrence were symptomatic
- Half of relapses required reoperation

<table>
<thead>
<tr>
<th>Procedure</th>
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<tr>
<td>Simple closure</td>
<td>63.3%</td>
</tr>
<tr>
<td>TV + drainage</td>
<td>11.8%</td>
</tr>
<tr>
<td>Closure + HSV</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

*Immediate definitive surgery for perforated duodenal ulcers: a prospective controlled trial*

HSV + patch closure

- Retrospective review 93 patients perforated pyloroduodenal ulcer
- HSV + omental patch closure
- Follow-up 2-21 years

Perforated pyloroduodenal ulcers: Long-term results with omental patch closure and parietal cell vagotomy

HSV + patch closure

• Results for HSV + patch closure
  – One perioperative mortality
  – Recurrence rate 3.7%
  – Reoperative rate 1.9%
  – 89/93 (96%) patients Visick I or II

• Choice of treatment for patients who are candidates for definitive surgery

Perforated pyloroduodenal ulcers: Long-term results with omental patch closure and parietal cell vagotomy

Definitive acid-reduction

- Immediate acid reducing procedure for select patients with perforation
- Does not increase morbidity or mortality
- Technically difficult
  - Fewer experienced at HSV
Expectant management perforated duodenal ulcer
History

- Advocated by Taylor in 1940s-1950s
  - Observation that nearly half patients taken to OR found to have spontaneously sealed
  - Treated with IVF, active nasogastric aspiration and serial exams

Guest lecture: The nonsurgical treatment of perforated peptic ulcer

Taylor H. Gastroenterology, 1957
History

• 1957 Taylor reported on 256 cases
  – 235 successfully managed nonoperatively
• Mortality rate 11% compared to surgical mortality rate at that time nearly 20%
• Failed to gain popular support

Guest lecture: The nonsurgical treatment of perforated peptic ulcer

Taylor H. Gastroenterology, 1957
Prospective trial

- Only one prospective, randomized trial
- 83 patients entered into study
  - 2 groups comparable age, comorbidities, duration perforation
  - Diagnosis by clinical history sudden epigastric pain and rigid, tender upper abdomen on exam
  - Free air on upright CXR in 71/83
  - Trial observation n=40
  - Immediate surgery n=43

_A randomized trial of nonoperative treatment for perforated peptic ulcer_

Prospective trial

• Conservative management
  – IVF resuscitation
  – NGT decompression
  – IV antibiotics
  – IV H2 blocker
  – UGIS
  • 38/40 patients had study
  • Leakage NOT absolute indication for OR

_A randomized trial of nonoperative treatment for perforated peptic ulcer_

Prospective trial

• “Improvement”
  – Evaluation by surgeon
  – Decrease in HR, temp, and abdominal tenderness
  – Advance in general well being

• If insufficient, patient went to OR

A randomized trial of nonoperative treatment for perforated peptic ulcer

A randomized trial of nonoperative treatment for perforated peptic ulcer

Prospective trial

- Overall morbidity and mortality rates similar
  - 2 deaths in each group

<table>
<thead>
<tr>
<th></th>
<th>Nonoperative</th>
<th>Operative</th>
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</thead>
<tbody>
<tr>
<td>Morbidity</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>Mortality</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

A randomized trial of nonoperative treatment for perforated peptic ulcer

Prospective trial

- Overall M+M similar
  - Delay in treatment from error in diagnosis did not increase morbidity
- Hospital stay 35% longer with nonoperative
- Who are best candidates for expectant management?

A randomized trial of nonoperative treatment for perforated peptic ulcer

Retrospective review

• Long-standing history selective nonoperative therapy LA County-USC Medical Center

• Retrospective study 1979-1988

• Emphasize UGIS to “unblind” the surgeon in evaluating sealed perforation

• Chronicity of disease used to select patients for definitive ulcer surgery

*Nonoperative treatment of perforated duodenal ulcer*

*Berne T, et al. Archives of Surgery, 1989*
Diagnosis Perforated DU

“Chronic”
- Suitable surgical candidate
  - Surgical closure and definitive rx
- Poor surgical candidate
  - UGIS
    - Sealed
      - Nonoperative rx
    - Leak
      - Surgical closure and definitive rx

“Acute”
- UGIS
  - Sealed
    - Nonoperative rx
  - Leak
    - Surgical closure

Nonoperative treatment of perforated duodenal ulcer

Retrospective review

• “Chronic” disease
  – History ulcer sx > 3 months
  – Prior endoscopic or GI series documenting ulcer
  – Duodenal scarring on UGIS

Nonoperative treatment of perforated duodenal ulcer

Retrospective review

• Conservative management
  – IVF resuscitation
  – NGT decompression
  – IV antibiotics and H2 blockers
  – Demonstrated seal on UGIS

• Indications for surgery
  – Peritonitis progresses
  – No evidence regression by 12 hours

Nonoperative treatment of perforated duodenal ulcer

Retrospective review

• 294 patients with perforated duodenal or prepyloric ulcer
• 259 treated with immediate surgery
• 35 initial observation
  – All had free air and diffuse peritonitis
  – 2 failed to improve and had surgery

Nonoperative treatment of perforated duodenal ulcer

Retrospective review

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<tr>
<td>Mortality</td>
<td>3.0%</td>
<td>6.2%</td>
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</table>

- Using their algorithm, only one mortality in the expectant management group
  - Woman with metastatic breast cancer treated palliatively
- One major complication
  - Abscess later requiring percutaneous drainage

*Nonoperative treatment of perforated duodenal ulcer*

Berne T, et al. *Archives of Surgery, 1989*
The role for expectant management

• Can be applied to select patients without increased morbidity or mortality

• Where does it fit in the current decision-making algorithm?
  – Advances in medical management PUD
  – *H. pylori* treatment
H. pylori and perforated DU

• Prevalence H. pylori infection perforated DU 70%
  – Reports range markedly 0-100%
• H. Pylori infection correlates with recurrence
• Treatment of H. Pylori infection reduces recurrence

Effect of H. Pylori eradication on ulcer recurrence after simple closure of perforated duodenal ulcer: retrospective and prospective randomized controlled studies

Kate V.  British Journal of Surgery, 2001

H. Pylori status and endoscopy follow-up of patients having history of perforated duodenal ulcer

Chu KM.  Gastrointestinal Endoscopy, 1999
H. pylori and perforated DU

- Treating for H. pylori after simple closure reduces recurrence
- 99 patients treated with simple patch repair
- 48 treated with PPI alone
- 51 treated for H. pylori
  - Bismuth, metronidazole, tetracycline + omeprazole

_Eradication of Helicobacter pylori prevents recurrence of ulcer after simple closure of duodenal ulcer perforation: a randomized control trial_

Enders K. Annals of Surgery, 2000
**H. pylori and perforated DU**

- Early endoscopy at 8 weeks showed similar rates of healing.
- One year follow up endoscopy showed increased recurrence in patients on PPI alone.

<table>
<thead>
<tr>
<th>Recurrence</th>
<th>$H. \text{ pylori}$ treated</th>
<th>$H. \text{ pylori}$ untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 (4.8%)</td>
<td>16 (38.1%)</td>
</tr>
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</table>

One patient still HP+

*Eradication of Helicobacter pylori prevents recurrence of ulcer after simple closure of duodenal ulcer perforation: a randomized control trial*

Enders K. *Annals of Surgery, 2000*
**H. pylori** and perforated DU

- Attempts to distinguish between acute and chronic ulcer based on duration of symptoms may now be obsolete.
- Should *H. pylori* status be the dominant clinical determinant?
Perforated duodenal ulcer: An alternative therapeutic plan

Suitable surgical candidate

No HP or Failed rx HP

Suitable surgical candidate

Perforated DU

HP unknown

Failed rx HP

UGIS

Sealed

Nonoperative rx

Surgical closure and definitive rx

Leak

Surgical closure

Evaluate HP

Treat HP

Consider definitive surgery

Types of vagotomy

- Truncal Vagotomy
- Selective Vagotomy
- Highly Selective Vagotomy
Drainage procedures

- Heineke-Mikulicz pyloroplasty
- Longitudinal incision closed transversely
Drainage procedures

- Finney pyloroplasty
- 6-10 cm incision across pylorus to approximate antrum to duodenum
Drainage procedures

- Jaboulay pyloroplasty
- Lateral gastroduodenostomy bypassing pylorus
Drainage procedures

- Gastroenterostomy
  - gastrojejunostomy
- Extensively scarred duodenum
Candidates for definitive surgery

- 259 patients with perforated ulcer
  - Simple closure 183
  - TV + drainage 12
  - HSV 64
- No risk factors

Risk stratification in perforated duodenal ulcers
Candidates for definitive surgery

- **Risk factors**
  - Major medical illness
  - Preoperative shock
  - Longstanding perforation (>24 hours)

*Risk stratification in perforated duodenal ulcers*

Candidates for definitive surgery

- Mortality rate correlated with number of risk factors

<table>
<thead>
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<th># risk factors</th>
<th>Mortality</th>
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<tbody>
<tr>
<td>0</td>
<td>0 %</td>
</tr>
<tr>
<td>1</td>
<td>10 %</td>
</tr>
<tr>
<td>2</td>
<td>45.5 %</td>
</tr>
<tr>
<td>3</td>
<td>100%</td>
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Risk stratification in perforated duodenal ulcers

Patch repair vs. TV + drainage

• 65 patients with perforated duodenal ulcer
  – “High-risk” patients excluded

• 2 treatment groups
  – Simple closure 33
  – TV + drainage 32

• Follow-up 12-80 months

*Surgical treatment of perforated duodenal ulcer: a prospective trial between simple closure and definitive surgery*

Patch repair vs. TV + drainage

• 1/3 relapses after simple closure required second definitive operation

• Recurrence after TV + drainage secondary to incomplete vagotomy

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<td>85%</td>
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<td>TV + drainage</td>
<td>8%</td>
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Surgical treatment of perforated duodenal ulcer: a prospective trial between simple closure and definitive surgery

Patch repair vs. TV + drainage

- Patch alone high recurrence rate
- Role for simple closure
  - High-risk patients
  - Surgeon inexperience

*Surgical treatment of perforated duodenal ulcer: a prospective trial between simple closure and definitive surgery*

Application of results

- Protocol for nonoperative management
- Excluded perforation > 24 hr
- 49 patients initial period observation
  - 41 treated without surgery
  - 8 patients required surgery
- 21 patients immediate surgery

Evaluation of a protocol for the non-operative management of perforated peptic ulcer

Application of results

- Similar morbidity and mortality
- Only ~50% patients without surgery had follow-up endoscopy after discharge

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<td>14%</td>
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*Evaluation of a protocol for the non-operative management of perforated peptic ulcer*

Perforated duodenal ulcer: An alternative therapeutic plan

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Suitable surgical candidate

Surgical closure and definitive rx

Perforated duodenal ulcer: An alternative therapeutic plan

Perforated duodenal ulcer: An alternative therapeutic plan

Perforated DU

No HP or Failed rx HP

- Suitable surgical candidate
  - Surgical closure and definitive rx
- Poor surgical candidate
  - UGIS

HP unknown

Perforated duodenal ulcer: An alternative therapeutic plan

Perforated DU

No HP or Failed rx HP

Suitable surgical candidate

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Sealed

HP unknown

Perforated duodenal ulcer: An alternative therapeutic plan

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Nonoperative rx

Leak

Surgical closure

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Perforated duodenal ulcer: An alternative therapeutic plan

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Nonoperative rx

Surgical closure and definitive rx

Poor surgical candidate

UGIS

Sealed

Leak

Surgical closure

Perforated duodenal ulcer: An alternative therapeutic plan

Suitable surgical candidate
- Surgical closure and definitive rx

Poor surgical candidate
- UGIS
  - Sealed
    - Nonoperative rx
  - Leak
    - Surgical closure

HP unknown
- UGIS
  - Sealed
    - Nonoperative rx

Perforated duodenal ulcer: An alternative therapeutic plan

Perforated duodenal ulcer: An alternative therapeutic plan

HP unknown

Failure of HP

No HP or Failed rx HP

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Perforated duodenal ulcer: An alternative therapeutic plan

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Evaluate HP

Perforated duodenal ulcer: An alternative therapeutic plan

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Treat HP

HP -

Surgical closure