PERFORATED PEPTIC ULCER

LAPAROSCOPIC VS OPEN REPAIR

LIZELLE HUMAN
Fibro-opticians tend to treat the hole in the patient, instead of the patient as a whole
A 58 YR FEMALE PATIENT PRESENT WITH A PERFORATED PEPTIC ULCER....

- As surgeon you need to answer a few questions:

1. Does the patient need surgery?

2. Is an omental plication enough?

3. Is the patient stable enough to undergo definitive treatment? Which definitive surgery is indicated?

4. Should the surgery be done laparoscopic or open?
FOCUS

• 2018

• COMPARABLE

• MINIMAL RISK

• EARLIER RECOVERY

• LESS COMPLICATIONS

• LESS PAIN

• SAFE

• LESS WOUND SEPSIS
Describe 1990
Wide acceptance
Many surgical armamentarium
Smaller incisions, less wound sepsis, possible less surgical stress.....

STILL NOT THE GOLD STANDARD
• Laparoscopic expertise of the surgeon

• Conclusion: more RCT needed....
• Not benefit proven for:
  – Mortality
  – Morbidity
  – Re-operation rate
No significant difference between the primary outcomes:

– Overall post operative complication rate
– Mortality
– Re-operation rate
Laparoscopic versus open repair for perforated peptic ulcer: A meta analysis of randomized controlled trials.

Tan S¹, Wu G², Zhuang Q¹, Xi Q¹, Meng Q¹, Jiang Y¹, Han Y¹, Yu C³, Yu Z⁴, Li N⁵.

• Subcategory laparoscopic evaluation similar
  – Repair site leak rates
  – Intra-operative abscess
  – Post-operative ileus
  – Pneumonia
  – UTI
Advantage: Lower surgical site infections

CONCLUSION:
More high quality RCT needed to further assess the safety and efficacy of laparoscopic repair of peptic ulcer perforations.
Indications for conversion to open repair
INDICATIONS FOR CONVERSION TO OPEN REPAIR:

• Cardiovascular instability

• Relative indications:
  – Ulcer >6mm with friable edges
  – Posterior location
  – Inadequate instrumentation
  – Need for definitive surgery (possible malignancy)

• Prognostic factors resulting in conversion
  – Shock
  – Perforation >24hrs
• Fewer studies comparing open with laparoscopic repair in PUD
• 24 NRS & 5 RCT
  – Pain – subjective –
    – NRS less painful recovery
    – RCT – same conclusion not reached
  – CO₂ peritoneum
    • increase risk for bacteremia, sepsis and bacterial translocation into bloodstream and pneumonia.
    • Benefit of laparoscopic surgery may be neutralized by the disadvantage of a CO₂ pneumoperitoneum
• Similar incidences of:
  – Intra-abdominal abscesses or leaks
  – UTI
  – Difficulty with gastric emptying
  – GIT bleeding
  – Pleural effusions

Mortality associated patient risk
Selection bias – unstable patients - open surgery
More RCT needed
WHY THEN DO I RECOMMEND AN OPEN REPAIR?

PROVEN ADVANTAGE: WOUNDSEPSIS

MINIMAL INVASIVE VS MINIMAL ACCESS...
MINIMAL ACCESS …

• Advantage:
  – Small incision
  – Less wound sepsis

• Pneumoperitoneum
  Chinchau et all
  – Bacterial translocation
  Naesgaard et al
  – Increase pneumonia
  Increase risk if prolonged peritonitis
Physiological effects of a pneumoperitoneum

<table>
<thead>
<tr>
<th>cardiovascular</th>
<th>Respiratory</th>
<th>Others</th>
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<tbody>
<tr>
<td>↓Venous return</td>
<td>↓lung volumes FRC</td>
<td>↓renal function</td>
</tr>
<tr>
<td>↓cardiac output</td>
<td>↑airway resistance</td>
<td>↑risk of regurgitation</td>
</tr>
<tr>
<td>↑SVR</td>
<td>↓pulmonary compliance</td>
<td>↑ICP</td>
</tr>
<tr>
<td>↓BP</td>
<td>↑airway pressure</td>
<td>↓CPP</td>
</tr>
<tr>
<td>Brady/tachycardia</td>
<td>↑risk of barotraumas</td>
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<td></td>
<td>↑V/Q mismatch</td>
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### Metabolic effects of CO₂ insufflation during pneumoperitoneum

<table>
<thead>
<tr>
<th>Respiratory</th>
<th>Cardiovascular</th>
<th>Others</th>
</tr>
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<tbody>
<tr>
<td>• Hypercarbia &amp; Acidosis</td>
<td>• Arrhythmias</td>
<td>• Shoulder pain</td>
</tr>
<tr>
<td>• Pneumothorax</td>
<td>• Hypotension</td>
<td>• Retinal haemorrhage</td>
</tr>
<tr>
<td>• Atelectasis</td>
<td>• Cardiac arrest</td>
<td>• Oliguria</td>
</tr>
<tr>
<td>• Subcutaneous emphysema</td>
<td>• Deep-vein thrombosis</td>
<td>• Transient ischemic attack</td>
</tr>
<tr>
<td>• Pneumomediastinum</td>
<td>• Pulmonary oedema</td>
<td>• Bowel ischemia/oedema</td>
</tr>
<tr>
<td>• Pleural effusion</td>
<td>• Myocardial infarction</td>
<td>• Hypothermia</td>
</tr>
<tr>
<td></td>
<td>• Gas embolism</td>
<td>• Necrotizing fasciitis</td>
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<td></td>
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<td>• Tumour inoculation</td>
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</tbody>
</table>
OPEN IS BETTER…

HIGH RISK PATIENTS

- Shelat et al
- Kuwabara et al

Recommendation:
- Boey score >3
- Age >70
- Perforation >24 hours
IN SUMMARY:

• Further randomized trials are considered essential to determine the relative effectiveness of laparoscopic and open repair of PPU

• Current literature fail to suggest an advantage in laparoscopic surgery for PPU regarding:
  – Abdominal septic complications
  – Pulmonary complications
  – Re-operations
  – Mortality or morbidity

• Only proven difference:
  – Woundsepsis rate
OHMMM! What to do?
WHY THEN DO I RECOMMEND AN OPEN REPAIR?
• No statistically significant difference:
  – Septic intra-abdominal complications
  – Pulmonary complications
  – Post-operative ileus
  – Mortality
WHY THEN DO I RECOMMEND AN OPEN REPAIR?

PNEUMOPERITONEUM WITH CO2 INSUFFLATION HAVE MAJOR METABOLIC AND PHYSIOLOGICAL EFFECT
SURGERY IN A RESOURCE RESTRICTED ENVIRONMENT

- 70 yr female with a perforated peptic ulcer >24 hours, renal impairment, known with cardiac failure…

- High Boey score
DANISH CLINICAL REGISTER OF EMERGENCY SURGERY

• Limiting surgical delay is of paramount importance in treating patients with PPU

• Cohort study including 2668 patients

• Showed that every hour of delay from admission to surgery was associated with an adjusted 2-4% decreased probability of survival compared with the previous hour
In our setting:
A prolonged laparoscopic case might help the patient in front of us to get a better cosmetic result or mobilise earlier…. but at what cost?

Our theatre time is precious, every second count

Every hour of delay might impact on the survival of your next patient

• Alternative options can save life with similar outcomes:
  – ERAS….
  – Vac dressing over high risk wounds….
By doing a laparotomy and omental patch: every intern or doctor that can do a laparotomy can save a life.

By saving a life surgically – a junior doctor might just fall in love with surgery and maybe become the next Charles McBurney
WHY OPEN REPAIR?
MAYBE WE CAN CHANGE THE FUTURE....

I did my first open omentopexy as a second-year intern, and my first laparoscopic repair as a surgery consultant. Should the patient wait for laparoscopic expertise, at what cost? Wasted time determines outcome...

By doing a laparotomy and omental patch:
Every intern or junior doctor that can do a laparotomy can save a life.
By saving a life surgically—a junior doctor might just fall in love with surgery and become a superhero surgeon.

SURGERY
Oh look! They made socks especially for us!
Thank You
Dankie
All human life is precious.
LITERATURE

George A. Antoniou, MD, PhD, Oliver O. Koch, MD, Rudolph Pointner, MD, PhD, and Frank A. Granderath, MD, PhD. Meta-analysis of Laparoscopic Versus Open Repair of Perforated Peptic Ulcer. JSLS. 2013 Jan-Mar; 17(1): 15–22. doi: 10.4293/108680812X13517013317752


Chunhua Zhou,1,2,* Weizhi Wang,1,* Jiwei Wang,1,* Xiaoyu Zhang,1,3,* Qun Zhang,1 Bowen Li,1 and Zekuan Xu.1, An Updated Meta-Analysis of Laparoscopic Versus Open Repair for Perforated Peptic Ulcer. Sci Rep. 2015; 5: 13976. Published online 2015 Sep 9. doi: 10.1038/srep13976


Salomone Di Saverio1*, Marco Bassi1†, Nazareno Smerieri1,6, Michele Masetti1, Francesco Ferrara7, Carlo Fabbrì1, Luca Ansaloni3, Stefania Ghersi7, Matteo Serenari1, Federico Coccolini3, Noel Naidoo4, Massimo Sartelli5. Diagnosis and treatment of perforated or bleeding peptic ulcers: 2013 WSES position paper. World Journal of Emergency Surgery 2014, 9:45 http://www.wjes.org/content/9/1/45


