LAPAROSCOPIC MODIFIED CELLAN-JONES REPAIR OF PERFORATED ULCERS: A SINGLE CENTER STUDY

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BACKGROUND

Laparoscopic Repair of Perforated Peptic Ulcers

Perforation occurs in 2–10% of patients with PUD and accounts for >70% of deaths associated with PUD, especially among the elderly

Nathanson *et al.* (1990) – first successful laparoscopic suture repair for PPU

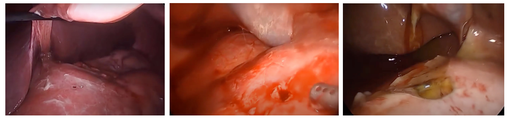
Laparoscopic repair = reasonable option in selected patients with Hx of <24 h, no evidence of hypovolaemic shock, and with small perforation (<8–10 mm) i.e. reserve for low risk patients

Mortality after laparoscopic surgery 5.8% and overall conversion rate PPU 12.4% (Bertleff *et al.,* 2009 randomized trial of lap vs open)

Meta-analysis showed 85% success in laparoscopic approach with reduced wound infection and pain but increased rate of re-operation and leakage (Lau H 2004)

- difficulty in the laparoscopic suturing procedure
- learning curve required

Laparoscopic repair superior to open repair in terms of reduced pain, shorter hospital stay, better cosmetics, wound healing, and lower incidence of incisional hernias.



Perforations of all sizes and shapes encountered

METHODS

- Retrospective observational study of laparoscopic repair of PPU in patients aged 18-90 years old during 2016-2020 at a community teaching hospital by a single surgeon.
- Characterization of laparoscopic repair was achieved in terms of patients' demographics, co-morbidities, intra-operative details, post- operative recovery, and short-term outcomes.

A total of 19 cases were identified, 6 were excluded:

Inclusion Criteria:

- Adult patients between the ages of 18 and 90
- underwent laparoscopic repair for perforated peptic ulcers
- Must qualify for laparoscopic repair i.e. must be hemodynamically stable and can tolerate pneumoperitoneum

METHODS

Exclusion Criteria:

- Hemodynamic instability despite resuscitation
- Open, endoscopic clip repair of perforations
- Adult patients with perforation other than peptic ulcer (i.e. penetrating trauma, PEG tube extraction, perforated diverticulitis)
- Patients less than 18 years of age or older than 90 years old

Postoperative period:

- Continued IVFs, broad-spectrum Abx, IV PPI and analgesics
- NGT removed once bilious output noted i.e. no stricture
- Started on FLD with NGT removal
- Flatus and BMs not required for discharge
- Drains removed prior to discharge from hospital
- Do not perform postop upper GI study
- Discharged with close follow-up system:
  - 3 clinics during the week – patients receive call within 24hr and seen within 72hrs of discharge
- Patients started on empiric triple therapy for *H. pylori* x2 weeks + PPI PRN
- 3 month post op EGD

Intraoperative management:

- Patient placed in French position with legs apart in slight reverse Trendelenburg tilt position
- Trocar placements:
  - 2x 5mm trocars – supraumbilical, R mid-clavicular line
  - 1x 12 mm trocar – L mid-clavicular line
  - Liver retraction with either Nathanson liver retractor in subxiphoid or 5mm trocar in R anterior axillary line
- Surgeon stood between the patient's legs, and the camera operator stood at the patient's left side
- Pneumoperitoneum created by Veress needle (pressure of 12–15 mm Hg)

Modified Cellan-Jones Repair:

1. Evacuation of spilled enteric content
2. 2-0 silk suture for primary repair of perforation regardless of size, in interrupted fashion
   - **Sutures are cut**
3. After primary repair, perform leak test via NGT
4. For patch: omentum vs Falciform ligament
   - 3 new sutures – silk, vicryl, silk
5. Tisseel on top of closed perforation
6. Omentum/falciform used for patch
7. 15F JP drain for abdominal drainage s/p lavage
8. 3mo post op EGD

RESULTS

Preoperative Patient Characteristics and Risk Factors	
Total 13 patients included:	
F:M	53.9 % Male
Mean age	**50.7** ± 8.4 years
Mean BMI	22.3 ± 2.8
ASA class ≥III	53.2%
Hx of PUD	30.7%; no Hx of H. pylori infection or Tx
NSAID use	38.5%
Alcohol abuse	69.2%
Tobacco use	92.3%
Cocaine use	23%

Preoperative Patient Characteristics and Risk Factors	
Previous abdominal Sx	30%
Duration of symptoms ≤12	53.8%
Number of pts with shock	0%
Diagnosis (Clinical signs, radiographic imaging) – preop CT scan	53.8%

Intraoperative Findings	
Site of perforation	69.2% duodenum
Mean size of perforation 1-2cm	76.9%
Patch repair	Omentum or Falciform ligament
Peritoneal Lavage	92.3%
JP drain placement	46%
Mean operative time	**75.2** ± 56.1 minutes
Conversions to open	None

Postoperative Findings	
NGT removal	POD1 – 84.6%
Resumption of oral diet (FLD)	POD2 – 84.6%
Opioid analgesics use	46% for <3 days
Mean Length of stay (LOS)	**3.8** ± 1.7 days
Morbidity	15.4%
30-day mortality	None

CONCLUSIONS

- Laparoscopic repair is a feasible method for repair of PPU, even in high-risk patients (large ulcer size, high ASA scores, multiple RFs)
- Minimized postoperative pain and reduced consumption of analgesics (i.e. reduction in size of incisions)
- Reduction in hospital stay
- Reduced incidence of postoperative complications including chest infections and ileus
- No incidences of postop leaks

NEXT STEPS:

- Educating colleagues regarding increased use and feasibility of laparoscopic repair of PPU in appropriately selected patients
- Increase sample size
- Randomizing patients to irrigation vs no irrigation and comparing postop outcomes and complications i.e. ileus
- Further comparative research with open approach is needed to validate findings

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