Laparoscopic Lavage and Drainage for Purulent Diverticulitis

Downstate Medical Center
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Acute Diverticulitis

- Patients with acute colonic diverticulitis present with differing severity of disease
- The Hinchey classification is often used to categorize these patients
- The recommended treatment for patients with purulent or fecal peritonitis (Hinchey III and IV) is an urgent sigmoid resection

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>Diverticulitis with pericolic abscess</td>
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<tr>
<td>Stage II</td>
<td>Diverticulitis with pelvic abscess</td>
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<tr>
<td>Stage III</td>
<td>Diverticulitis with purulent peritonitis</td>
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<tr>
<td>Stage IV</td>
<td>Diverticulitis with faecal peritonitis</td>
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</tbody>
</table>
• In this situation, a Hartmann’s procedure is favored by most surgeons

• Colonic resection with a primary anastomosis with or without a defunctioning colostomy is also feasible
However, emergency operations for patients with acute perforated diverticulitis are associated with substantial morbidity (up to 44-52%) and mortality (up to 15%).

Reversal of Hartmann’s procedure is not performed in 25–70% of the patients.

This may be attributable to the fact that reversal is associated with a high morbidity and even mortality.

Renewal of interest in “nonresectional” alternatives for treating perforated diverticulitis has been encouraging.

The driving force has been the continuing poor outcomes associated with “resectional” surgery.

Laparoscopic management of generalized peritonitis due to perforated colonic diverticula

• In 1996, O’Sullivan et al made an observation
  • A significant number of patients undergoing resectional surgery had neither:
    • Perforation macroscopically
    • Or on subsequent pathological assessment
  
• This observation led to the hypothesis that resectional surgery may not be necessary in these cases

Laparoscopic management of generalized peritonitis due to perforated colonic diverticula

- O’Sullivan et al combined this observation with the useful adjunct of laparoscopy

- Proposed laparoscopic lavage as a potential alternative treatment strategy for purulent peritonitis secondary to perforated diverticulitis

Procedure

- Patient was resuscitated with IV fluids
- IV Abx (Metronidazole + Cephalosporin)
- Surgery:
  - 10 mm umbilical port
  - 2nd port in suprapubic or RLQ
  - Peritoneum thoroughly irrigated with warm 0.9% saline until clear
  - Drain was placed in pelvis

Laparoscopic management of generalized peritonitis due to perforated colonic diverticula

- 8 patients with purulent peritonitis from diverticular disease
- Laparoscopic lavage, IV fluids, Abx
- All patients complete recovery
- Follow-up 12-48 months – No patient required surgical intervention
- Alternative to traditional open surgical management

Laparoscopic peritoneal lavage for generalized peritonitis due to perforated diverticulitis

Myers E et al
Br J Surg 2008

- Prospective multi-institutional study
- 100 pts
- Age 62.5
- Follow-up 36 mos
Laparoscopic peritoneal lavage for generalized peritonitis due to perforated diverticulitis

Myers E et al
Br J Surg 2008

- Perforated diverticulitis with generalized peritonitis
- Laparoscopic lavage:
  - 12 mm umbilical port
  - 5 mm x 2 (suprapubic/RLQ) port
  - Lavage 4 lt until clear
Radiological Findings

Laparoscopic peritoneal lavage for generalized peritonitis due to perforated diverticulitis

Myers E et al
Br J Surg 2008

- 8 pts converted to open Hartmann’s procedure  ➔  Hinchey 4
- 92 pts managed with lavage
  - Morbidity 4%
  - Mortality 3%
  - 2 pelvic abscess
  - 2 patients had recurrent diverticulitis

Laparoscopic peritoneal lavage for generalized peritonitis due to perforated diverticulitis

Myers E et al
Br J Surg 2008

Conclusions

• Laparoscopic lavage is a reasonable alternative to traditional open resection
• Approach has low mortality rate
• Elective resection may be unnecessary
• Readmissions uncommon

Laparoscopic peritoneal lavage for perforated sigmoid diverticulitis

Afshar S, Kurer MA
Colorectal Dis 2012

- Search on MEDLINE from PubMed, EMBASE and the Cochrane library
- Twelve relevant studies - non-randomized
- 301 pts, mean age of 57 yrs
- Majority were Hinchey III (68%)
- All pts treated with IV Abx, lap lavage and insertion of drains

Laparoscopic peritoneal lavage for perforated sigmoid diverticulitis
Afshar S, Kurer MA
Colorectal Dis 2012

- Mean conversion rate was 4.9%
- Mean LOS was 9.3 days
- Morbidity was 18.9%
- Mortality was 0.25%
- Subsequent elective resection with primary anastomosis in 51%
### Patient Characteristics

<table>
<thead>
<tr>
<th>References</th>
<th>No. of patients</th>
<th>Mean age</th>
<th>ASA 1</th>
<th>ASA 2</th>
<th>ASA 3</th>
<th>ASA 4</th>
<th>Hinchey classification</th>
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<tr>
<td>O’Sullivan et al.</td>
<td>8</td>
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<td>Da Rold et al.</td>
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<td>Bretagnol et al.</td>
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<td>13</td>
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<td>Mazza et al.</td>
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<td>Lam et al.</td>
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Laparoscopic peritoneal lavage for perforated sigmoid diverticulitis
Afshar S, Kurer MA
Colorectal Dis 2012

Outcomes

<table>
<thead>
<tr>
<th>References</th>
<th>Conversions %</th>
<th>Length of stay (days)</th>
<th>Complications %</th>
<th>Mortality %</th>
<th>Elective resections %</th>
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<td>Mazza et al. [18]</td>
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<td>9.3</td>
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<td>0.25</td>
<td>51</td>
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</table>
Laparoscopic peritoneal lavage for perforated sigmoid diverticulitis

Conclusions

• LPL for perforated sigmoid diverticulitis appears to be an effective alternative to Hartmann’s procedure in selected cases

• It appears to be associated with a significant reduction in length of stay, morbidity and mortality

• Hunchey IV pts or those who fail to improve after LPL should be considered for resectional surgery

• Data from randomized controlled trials are needed to evaluate this treatment strategy

Laparoscopic peritoneal lavage for perforated sigmoid diverticulitis

Criticism

• The majority of the studies reviewed were small retrospective case series

• Significant heterogeneity in patient characteristics, operative and perioperative care

• The inclusion of Hinchey II patients (71/301), improves outcome figures and makes it difficult to make comparisons with the Hartmann’s procedure
Laparoscopic peritoneal lavage for perforated sigmoid diverticulitis

Criticism

• At least some of the patients reported in these studies would have settled with antibiotics alone and without any surgical intervention

• The evidence is weak
The ladies trial: laparoscopic peritoneal lavage or resection for purulent peritonitis\textsuperscript{A} and Hartmann’s procedure or resection with primary anastomosis for purulent or faecal peritonitis\textsuperscript{B} in perforated diverticulitis (NTR2037)

Hilko A Swank\textsuperscript{1}, Jefrey Vermeulen\textsuperscript{2}, Johan F Lange\textsuperscript{2\ast}, Irene M Mulder\textsuperscript{2}, Joost AB van der Hoeven\textsuperscript{3}, Laurens PS Stassen\textsuperscript{4}, Rogier MPH Crolla\textsuperscript{5}, Meindert N Sosef\textsuperscript{6}, Simon W Nienhuijs\textsuperscript{7}, Robbert J Bosker\textsuperscript{8}, Maarten J Boom\textsuperscript{9}, Philip M Kruyt\textsuperscript{10}, Dingeman J Swank\textsuperscript{11}, Willem H Steup\textsuperscript{12}, Eelco JR de Graaf\textsuperscript{13}, Wibo F Weidema\textsuperscript{14}, Robert EGJM Pierik\textsuperscript{15}, Hubert A Prins\textsuperscript{16}, Hein BAC Stockmann\textsuperscript{17}, Rob AEM Tollenaar\textsuperscript{18}, Bart A van Wagensveld\textsuperscript{19}, Peter-Paul LO Coene\textsuperscript{20}, Gerrit D Slooter\textsuperscript{21}, Esther CJ Consten\textsuperscript{22}, Eino B van Duijn\textsuperscript{23}, Michael F Gerhards\textsuperscript{24}, Anton GM Hoofwijk\textsuperscript{25}, Thomas M Karsten\textsuperscript{26}, Peter A Neijenhuis\textsuperscript{27}, Charlotte FJM Blanken-Peeters\textsuperscript{28}, Huib A Cense\textsuperscript{29}, Guido HH Mannerts\textsuperscript{30}, Sjoerd C Bruin\textsuperscript{31}, Quirijn AJ Eijsbouts\textsuperscript{32}, Marinus J Wiezer\textsuperscript{33}, Eric J Hazebroek\textsuperscript{33}, Anna AW van Geloven\textsuperscript{34}, John K Maring\textsuperscript{35}, André JL D’Hoore\textsuperscript{36}, Alex Kartheuser\textsuperscript{37}, Christophe Remue\textsuperscript{37}, Helma MU van Grevenstein\textsuperscript{38}, Joop LM Konsten\textsuperscript{39}, Donald L van der Peet\textsuperscript{40}, Marc JPM Govaert\textsuperscript{41}, Alexander F Engel\textsuperscript{42}, Johannes B Reitsma\textsuperscript{43}, Willem A Bemelman\textsuperscript{1\ast}, Dutch Diverticular Disease (3D) Collaborative Study Group\textsuperscript{1}
Treatment of acute diverticulitis laparoscopic lavage vs. resection (DILALA): study protocol for a randomised controlled trial

Anders Thornell, Eva Angene, Elisabeth Gonzales, Jane Heath, Per Jess, Zoltan Läckberg, Henrik Ovesen, Jacob Rosenberg, Stefan Skullman and Eva Haglind, for the Scandinavian Surgical Outcomes Research Group, SSORG

Abstract

**Background:** Perforated diverticulitis is a condition associated with substantial morbidity. Recently published reports suggest that laparoscopic lavage has fewer complications and shorter hospital stay. So far no randomised study has published any results.

**Methods:** DIllA is a Scandinavian, randomised trial, comparing laparoscopic lavage (LL) to the traditional Hartmann's Procedure (HP). Primary endpoint is the number of re-operations within 12 months. Secondary endpoints consist of mortality, quality of life (QoL), re-admission, health economy assessment and permanent stoma. Patients are included when surgery is required. A laparoscopy is performed and if Hinchey grade III is diagnosed the patient is included and randomised 1:1, to either LL or HP. Patients undergoing LL receive > 3L of saline intraperitoneally, placement of pelvic drain and continued antibiotics. Follow-up is scheduled 6-12 weeks, 6 months and 12 months. A QoL-form is filled out on discharge, 6- and 12 months. Inclusion is set to 80 patients (40+40).

**Discussion:** HP is associated with a high rate of complication. Not only does the primary operation entail complications, but also subsequent surgery is associated with a high morbidity. Thus the combined risk of treatment for the patient is high. The aim of the DILALA trial is to evaluate if laparoscopic lavage is a safe, minimally invasive method for patients with perforated diverticulitis Hinchey grade III, resulting in fewer re-operations, decreased morbidity, mortality, costs and increased quality of life.

**Trial registration:** British registry (ISRCTN) for clinical trials ISRCTN82208287 http://www.controlled-trials.com/ISRCTN82208287
Laparoscopic peritoneal lavage for perforated sigmoid diverticulitis

- Emergent role in the treatment of purulent diverticulitis
- Calculated risk
- Converts an emergency resection to an elective resection
  - or possible no resection
- No randomized trails to date
- Currently 2 randomized trials are being conducted in Europe
- European Association for Endoscopic Surgery consensus statement on ‘Laparoscopy for Abdominal emergencies:
  - Colonic resection remains the gold standard
  - Laparoscopic lavage and drainage may be considered in selected patients
References