

Laparoscopic Conservative Management of the Perforated Colic Diverticulitis Stade Hinchey 3 or 4

Arianna Grilli, Sorin Cimpean*, Marie Therese Marechal, Benjamin Cadiere and Gloire A Dieu Byabene

Saint Pierre University Hospital, Belgium

*Corresponding Author: Sorin Cimpean, Saint Pierre University Hospital, Belgium.

Received: July 05, 2019; Published: August 17, 2019

Abstract

Introduction: Diverticulitis is a frequent complication occurring in patients presenting colonic diverticular disease.

Case Presentation: We present two patients with perforated diverticulitis which we have treated successfully with a conservative laparoscopic approach.

Discussion: Nowadays surgical approach for the Hinchey stade 3 or 4 is based on Hartman procedure (HP), an invasive technique associated to high morbidity and mortality rates and patient discomfort related to a permanent stoma formation. For this reason, alternative approaches have been under investigation in the last years and particularly laparoscopic lavage and drainage (LLD) seems to represent a safe alternative to the standard surgical technique.

Conclusion: LLD could probably represent a feasible alternative treatment to radical surgery in selected patients for the patients in which a permanent stoma should be avoided.

Keywords: Hartman procedure (HP); Laparoscopic Lavage and Drainage (LLD)

Introduction

Colonic diverticulitis is a complication of diverticular disease occurring in up to 25% of patients presenting this condition. It occurs more frequently in developed countries and its increasing incidence is probably related to changes in lifestyle [1]. Life-threatening diverticulitis complication is represented by colon perforation followed by a septic condition, often requiring emergency surgery. Hinchey classification is used to describe perforations of the colon due to diverticulitis. Particularly the grade III is represented by a purulent peritonitis and grade IV by a faecal peritonitis [2,3]. Nowadays the surgical approach to grade III/IV perforated diverticulitis is still based on Hartmann's procedure, despite being associated with high morbidity (30 - 50%) and mortality (10 - 20%) rates [4].

During the past decades, several alternatives have been evaluated and even today the management of patients presenting diffuse purulent or feculent peritonitis is evolving. Recently laparoscopic lavage with drainage and antibiotics administration has been proposed as a lesser invasive treatment in order to decrease morbidity and mortality rates and to avoid a stoma [5].

We report two cases of perforated colic diverticulitis successfully managed with laparoscopic lavage and drainage in a first operative time.

Clinical Case

The first patient a 50-year-old man was referred to the Emergency Unit for generalised acute abdominal pain. On physical exam, the abdomen was distended with sensibility in the hypogastric area and in the left iliac fossa, with defence. Blumberg sign was positive. His medical history revealed a previous hospitalization for diverticulitis 2 years before, high blood pressure and chronic obstructive bronchopneumonia condition. Laboratory findings showed leucocytosis: $16 \times 10^3/\mu\text{L}$ (normal range between $3.5 - 11 \times 10^3/\mu\text{L}$) and increased C reactive protein: 343 mg/L (normal range $< 5.0 \text{ mg/L}$). An abdominal CT scan revealed free intraabdominal fluid and air with signs of colonic perforation, stade Hichey 3 (Figure 1).



Figure 1

The second patient is 71-year-old men who present to the Emergency Unit for diffuse abdominal pain showing positive Blumberg sign and fever at initial physical examination. Known comorbidities were ischemic cardiomyopathy, diabetes mellitus type 2 and high blood pressure. Laboratory examination reported leucocytosis: $18 \times 10^3/\mu\text{L}$ (normal range between $3.5 - 11 \times 10^3/\mu\text{L}$) and increased C reactive protein: 312 mg/L (normal range $< 5.0 \text{ mg/L}$). The abdominal CT-scan demonstrated free intra-abdominal air at mesenteric origin and free intraabdominal fluid in with sign of colonic perforation, stade Hinchey 3 (Figure 2).

In both cases we performed a laparoscopic lavage and drainage procedure. The patients were placed in supine position and general anesthesia was induced. A 12-mm trocar was placed in to the abdominal cavity at periumbilical level and a 10-mm and a 30° scope was used. Two 5-mm trocars were introduced in abdominal right flank and the right iliac fossa, for insertion of instruments.



Figure 2

For the first patient, the abdominal cavity was explored and examined and purulent fluid was found in the left parietocolic fold and Douglas' space. The site of perforation was not identified. For the second case the exploration revealed generalizes fecal peritonitis. The site of perforation was identified and sutured using a Silk 2-0 wire. A complete peritoneal lavage was performed for the two patients with saline solution. In the end multiples drainage tubes were placed intraabdominal. In both cases a fluid sample was sent to biological exam. The antibiogram guided the antimicrobial treatment to piperacillin-tazobactam.

The postoperative course was uneventful and the patients were discharged at the 7th postoperative day with restored transit and oral intake.

Discussion

Diverticular disease is a common finding among elderly population, being documented in more than 60% of these subjects. Complicated diverticulitis is developed by almost a quarter of patients, often evolving through colonic perforation and peritonitis [6]. The clinical condition of these patients usually requires a surgical approach and nowadays gold standard is represented by Hartman's procedure. However, this technique is frequently associated to high morbidity rates, exceeding 50%, and a significant mortality risk, ranging from 15% to 20% [7]. As alternative option, lavage and drainage technique has been proposed: a saline solution is used to wash the peritoneal cavity through laparoscopic access and the abdominal cavity is drained. This appears to be a safer option and it permits to avoid the needing for a permanent colostomy which generally is the destiny of those patients who underwent a Hartman's procedure [8].

However, a few studies have been conducted to compare these two approaches and no clear differences seem to emerge from them. The first randomized trial comparing these two procedures was the Ladies trial, LOLA arm [9]. Different cohort of patients enrolled in this trial was treated with lavage and drainage, Hartman's procedure or sigmoidectomy and primary anastomosis respectively in a 2:1:1 fashion, for 87 cases evaluated in intention-to-treat analysis. However, the trial reported a higher rate of morbidity or mortality (35% vs 18%) and was prematurely terminated. The Scandinavian Diverticulitis trial (SCANDIV), a multicenter, randomized study, enrolled 199 patients with 66% of Hinchey 3 subjects [10]. No differences among morbidity or mortality rates were described, while higher rates of

reoperation and missed carcinomas diagnosis were reported. Recently, the “Diverticulitis Laparoscopic Lavage vs resection (Hartman’s procedure) for acute diverticulitis with peritonitis (DILALA)” trial randomized 83 Hinchey 3 diverticulitis patients, reporting, after 12 months of follow-up, lower reoperation rate (28% vs 63%), shorter hospitalization duration (35% reduction) and reduced stoma needing (7% vs 28%) in lavage and drainage group [11,12]. Other ongoing randomized trials, Laparoscopic Lavage for Acute Non Feculant Diverticulitis (LapLAND) and Laparoscopic Lavage Observational Study (LLOS), will probably offer more data to understand whether the clinical benefit resides in one or other approach. LLD procedure is a good option by avoiding a terminal stoma but can expose the patient to a risk of recurrent infection and sepsis and to an increased rate of abscess formation that requests prolonged antibiotic therapies with an augmented risk of inducing bacterial resistance but not resulting in an increased mortality rate [4,13]. Moreover, avoiding laparotomy, the risk of wound infections and incisional hernia is reduced [14]. On the other hand, percutaneous abscess drainage has been recorded as a frequent adverse event after LLD procedure [15]. Another factor limiting LLD indications is that whether the abdominal CT scan or clinical and anamnestic findings are suggestive for a neoplastic localization this procedure loses its curative intent and HP has to be considered as the treatment of choice [13]. For this reason, patients who undergo LLD must necessarily perform a follow-up colonoscopy evaluation: this precaution is necessary to avoid unnoticed colorectal cancer. In fact, in patient with a complicated diverticulitis diagnosis, there is an 11% risk of *undiagnosed cancer* [16,17].

There are many remaining questions regarding this conservative strategy, including whether it may be considered as a definitive treatment or as a bridge to elective resection, which type of patient could be considered as the most appropriate candidate to receive LLD procedure and which clinical and radiological features could represent a predictive factor for a successful outcome [18]. There are also different behaviors toward adhesiolysis if the perforation was not immediately visible. Some authors recommend it in order to debride and drain any localized peritonitis or abscess, while other prefer to leave the colon untouched in order to preserve an eventual sealed perforation [18-20]. Lastly, economic evaluations within the framework of the Ladies (LOLA) and the DILALA trials were conducted. Both studies revealed that LLD seems to be more cost-effective if compared to sigmoid resection, also considering the cost of surgical equipment, and potential complications and re-operations [21,22].

Advantages	Disadvantages
<ul style="list-style-type: none"> • Minimally invasive technique • Shorter duration of surgery [4] • Reduced stoma need [4] • Lesser risk of abdominal hernia [14] • Cost-effective [21,22] • Reduced rate of wound infections [10,11] 	<ul style="list-style-type: none"> • Higher risk of reoperation [4] • Increased rate of abscess formation [4] • Risk of missed colorectal cancer [13] • Diverticulitis recurrence [19]

Table 1: List of advantages and disadvantages of LLD procedure.

In both cases, we decide to proceed in a conservative way to preserve a physiological intestinal function and avoid a terminal stoma. A colonoscopy was programmed in 6-8 weeks and the definitive surgical treatment - the laparoscopic left colectomy, in 3 months.

The most important aspect is that this technique should be considered for the selected patient, especially for the elderly patients with considerable comorbidities. In fact if the evolution of the patients after the LLD is not optimal and the inflammatory syndrome remains important and the patient is septic, the intestinal transit is not present, or the drains remains fecaloid, then we must perform a surgical re-exploration and to perform the Hartmann operation with no delay. This technique we consider that can provide an advantage in the life quality of the patients, due to the absence of the stoma, but the optimal selection of the patients is very important for the good outcome

of the technique. In our experience with this technique we had good results and we could obtain a temporisation with the left colectomy in the second step. We prefer to wait 3 months before the definitive operation. The question remains if during the waiting period the patient present the same symptomatology, if the LLD should be performed or we must go directly to the Hartmann operation. If the clinical context is optimal, this technique must be considered, knowing that it can avoid a stomia and allows to perform later the colic resection and the anastomosis in a non-inflammatory conditions, with better intraoperative conditions and lesser risk of an anastomotic fistula.

Conclusion

LLD is a valid therapeutic option for patients presenting perforated diverticulitis. However, more data are needed to identify the correct patients to be treated with this technique and particularly Hinchey 3 - 4 grade disease have to be further investigated to select the gold standard approach.

Bibliography

1. Ahmed AM., *et al.* "Surgical treatment of diverticulitis and its complications: A systematic review and meta-analysis of randomized control trials". *Surgeon* 16.6 (2018): 372-383.
2. Angenete E., *et al.* "Laparoscopic lavage is superior to colon resection for perforated purulent diverticulitis-a meta-analysis". *International Journal of Colorectal Disease* 32.2 (2017): 163-169.
3. Hinchey EJ., *et al.* "Treatment of perforated diverticular disease of the colon". *Advances in Surgery* 12 (1978): 85-109.
4. Ceresoli M., *et al.* "Laparoscopic lavage versus resection in perforated diverticulitis with purulent peritonitis: A meta-analysis of randomized controlled trials". *World Journal of Emergency Surgery* 11.1 (2016): 42.
5. Theodoropoulos D. "Current Options for the Emergency Management of Diverticular Disease and Options to Reduce the Need for Colostomy". *Clinics in Colon and Rectal Surgery* 31.4 (2018): 229-235.
6. Weizman AV and Nguyen GC. "Diverticular disease: Epidemiology and management". *Canadian Journal of Gastroenterology* 25.7 (2011): 385-389.
7. Ince M., *et al.* "Morbidity and mortality of the Hartmann procedure for diverticular disease over 18years in a single institution". *Colorectal Disease* 14.8 (2012): 492-498.
8. Royo-Aznar A., *et al.* "Reversal of Hartmann's procedure: a single-centre experience of 533 consecutive cases". *Colorectal Disease* 20.7 (2018): 631-638.
9. Vennix S., *et al.* "Laparoscopic peritoneal lavage or sigmoidectomy for perforated diverticulitis with purulent peritonitis: A multicentre, parallel-group, randomised, open-label trial". *The Lancet* 386.10000 (2015): 1269-1277.
10. Schultz JK., *et al.* "Laparoscopic lavage vs primary resection for acute perforated diverticulitis: The SCANDIV randomized clinical trial". *JAMA-Journal of the American Medical Association* 314.13 (2015): 1364-1375.
11. Thornell A., *et al.* "Treatment of acute diverticulitis laparoscopic lavage vs. resection (DILALA): Study protocol for a randomised controlled trial". *Trials* 12.1 (2011): 186.
12. Angenete E., *et al.* "Laparoscopic lavage is feasible and safe for the treatment of perforated diverticulitis with purulent peritonitis: The first results from the randomized controlled trial DILALA". *Annals of Surgery* 263.1 (2016): 117-122.

13. Biffi WL, et al. "What is the current role of laparoscopic lavage in perforated diverticulitis?" *Journal of Trauma and Acute Care Surgery* 82.4 (2017): 810-813.
14. Bartels SAL, et al. "Small bowel obstruction, incisional hernia and survival after laparoscopic and open colonic resection (LAFA study)". *British Journal of Surgery* 101.9 (2014): 1153-1159.
15. Galbraith N, et al. "Laparoscopic Lavage in the Management of Perforated Diverticulitis: a Contemporary Meta-analysis". *Journal of Gastrointestinal Surgery* 21.9 (2017): 1491-1499.
16. Sallinen V, et al. "Risk of colon cancer after computed tomography-diagnosed acute diverticulitis: Is routine colonoscopy necessary?" *Surgical Endoscopy* 28.3 (2014): 961-966.
17. Sharma PV, et al. "Systematic review and meta-Analysis of the role of routine colonic evaluation after radiologically confirmed acute diverticulitis". *Annals of Surgery* 259.2 (2014): 263-272.
18. Cirocchi R, et al. "Laparoscopic Peritoneal Lavage". *Medicine* 94.1 (2015): e334.
19. Bretagnol F, et al. "Emergency Laparoscopic Management of Perforated Sigmoid Diverticulitis: A Promising Alternative to More Radical Procedures". *Journal of the American College of Surgeons* 206.4 (2008): 654-657.
20. Karoui M, et al. "Laparoscopic peritoneal lavage or primary anastomosis with defunctioning stoma for hinchey 3 complicated diverticulitis: Results of a comparative study". *Diseases of the Colon and Rectum* 52.4 (2009): 609-615.
21. Gehrman J, et al. "Health economic analysis of laparoscopic lavage versus Hartmann's procedure for diverticulitis in the randomized DILALA trial". *The British Journal of Surgery* 103.11 (2016): 1539-1547.
22. Vennix S, et al. "Cost analysis of laparoscopic lavage compared with sigmoid resection for perforated diverticulitis in the Ladies trial". *British Journal of Surgery* 104.1 (2017): 62-68.

Volume 6 Issue 9 September 2019

©All rights reserved by Sorin Cimpean, et al.