



Surgical therapeutic management of perforated peptic ulcer

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ABSTRACT

Perforated peptic ulcer is an emergency should be readily corrected by surgical approach to reduce potential damage and the risk of mortality associated with the extension frame. The option of handling most commonly used by surgeons is laparotomy, however, there is evidence pointing to approach laparoscopically like a viable, safe and with good results for their treatment. Therefore, it is appropriate to evaluate the data about each management and minimally invasive procedure, laparoscopy if overcomes the open surgical approach regarding the laparotomy regarding the treatment of patients with this condition.

Keywords: peptic ulcer perforated; laparoscopic surgical procedure; operative surgical procedure; conversion to open surgery, surgery, laparoscopy.

INTRODUCTION

The imbalance between the organic mechanisms of defense and factors of aggression, being the *Helicobacter pylori* infection and the use of anti-inflammatory drug (NSAID) are the main causes, configures the pathogenesis of peptic ulcer (UP) [1].

H. pylori infection and nonsteroidal antiinflammatory drug (NSAID) usage contribute to a great majority of cases; thus, nonoperative management of the disease is indicated in nearly all cases, with the exceptions of hemorrhage, perforation, obstruction, and refractory disease [2]. Direct *Helicobacter* treatment and eradication is paramount because complete mucosal healing occurs less than 0.5% of the time with persistent infection. Other notable sources implicated in benign disease include smoking, steroid usage, and Zollinger-Ellison syndrome [3]. Decades ago the practice of elective surgeries to correct this type of ulcer was common, however, with the advancement of conservative clinical treatment from the eradication of *H. pylori* and acid control, mainly through the use of H₂ blockers and Proton pump inhibitors (Ppis), the rate of performing these surgeries decreased considerably in the last three decades, becoming the clinical management enough to treat [4]. So, the surgical approaches current therapies are directed to cases of refractory peptic ulcer perforated and bleeding (PUP) [2,5] and its fundamental goals: treat or prevent complications of ulcer; reduce the secretion of acid to allow healing of the ulcer and tempering their recurrence; and minimize postoperative sequelae related to operation [6].

Although good results in clinical management of peptic ulcer disease, emergency surgeries have increased drilling [1,3]. It is estimated that 2% to 10% of patients with gastric or duodenal peptic ulcer perforation shall in the course of his life, being disproportionately greater mortality risk in the elderly [3]. Between 5-10% are the values of incidence and mortality of perforated peptic ulcer and the mortality increases by 50% if the drilling last for more than 24 hours [4,5]. Overall, the annual incidence rate of peptic ulcer disease (PUD) is 0,1% to 0,3%, resulting in nearly 300.000 new cases diagnosed each year; approximately one third of these are gastric ulcers. The advent of pharmacologic therapy to address acid hypersecretion and treat *Helicobacter pylori* infection is the primary reason for reduction in the need for elective surgical intervention [7].

Currently the standard surgical treatment for the PUP is the laparotomy [8], however, recognizes a number of deficiencies in this procedure with regard to a larger incision, considerable pain during the post-operative period and slow recovery. By these implications, laparoscopy is a surgical approach to therapeutic option [9]. In this context, Mouret *et al.* published in 1990 the first results on the performance of laparoscopy for correction of perforated peptic ulcer. The conclusion of the study showed that laparoscopy is a good choice of surgical approach and its benefits the reduction of problems with respect to the surgical wound and adhesions [5, 8-10], besides being related to improved and expanded view of the lesion, minor surgical incision, less pain during the post-operative and faster return of patient activities compared to findings post laparotomy [3,11].

The purpose of this article is to define from review of medical literature evidence-based effectiveness of laparoscopy to laparotomy in front surgical treatment of the patient with peptic ulcer perforated in order to understand which type of approach shows how most effective option. Quality of care, sepsis care bundles, and postoperative monitoring need further assessment. Adequate trials with low risk of bias are urgently needed to provide better evidence. We summarise the evidence for perforated peptic ulcer management and identify directions for future clinical research.

MATERIALS AND METHODS

Using the databases PubMed, Scopus, Scielo and Web of Science with the following keywords: peptic ulcer perforated; laparoscopic surgical procedure; operative surgical procedure; conversion to open surgery; surgery; laparoscopy. 40 articles were selected in English and Spanish, published from 2004 to 2015, of which 25 were used in this review, including the most recent meta-analysis on the subject, randomized clinical studies, as well as prospective and retrospective studies on the topic.

RESULTS

A German prospective study conducted between January 1996 and December 2010 in the Department of surgery of the University Schleswig-Holstein used 184 patients who underwent open or laparoscopic surgery of gastric or duodenal peptic ulcer. As a result has been that patients undergoing laparoscopy had a stay in ICU significantly shorter and shorter hospitalization period when compared to patients at which laparotomy (average 9 days versus 13 days). 20 originally patients undergoing laparoscopy needed surgical conversion to laparotomy, being 70% of the time due to severe peritonitis that generated deep swelling of small intestine, merely viewing via laparoscopic camera and reduced the intra-abdominal space, 15% by cannot find the location of the ulcer and other 15% as a result of septic shock with acute respiratory distress syndrome. However, it was evidenced that the conversion itself resulted in greater morbidity and mortality compared to the option of the open approach. Another finding of the study was that patients who underwent laparotomy compared to those who were approached by laparoscopic had a significantly higher incidence of minor complications involving transitional heart, lungs or kidneys, but that, however, does not require a surgical reabordagem [6].

From a retrospective analysis of surgery for perforated peptic ulcer conducted between January 2002 and March 2012 at University Hospital del Mar, Barcelona, differences were not observed in the immediate post-operative period laparotomy and laparoscopy as surgical option for the treatment of PUP with relation to the speaking time of nasogastric tube (48 hours versus 48h) and the time of resumption of oral ingestion (72 versus 72h) [4].

The Dutch trial, LAMA (Laparoscopische Maagperforatie, translating = Laparoscopic gastric Perforation), conducted between March 1999 and July 2005, found himself as a result of the difference in post-operative opioid doses and variations in visual analogue scale (EVA) of pain among patients in which it was performed laparoscopy and undergoing laparotomy. The scores marked on EVA in the days 1, 3 and 7 of the post-operative was significantly lower in the group with the laparoscopic approach was held, inferring from such that the results of less postoperative pain are favorable to laparoscopy [5].

The first meta-analysis on the surgical treatment open or laparoscopically as therapeutic approach to peptic ulcer perforated, published in 2004, found that the biggest benefits offered laparoscopy in the short term with respect to less pain during the post-operative and minor complications in the surgical wound. In 2005, including two randomized clinical trials and non-randomized studies, another meta-analysis was performed and showed that laparoscopy when compared to laparotomy was related to benefits as less use of analgesics in post-operative, minor period of hospitalization, lower risk of infection of the surgical wound and lower rate of mortality. Among the disadvantages, greater duration of the surgical procedure and higher incidence of suture dehiscence of the drilling location. In 2013, if meta-analysis was repeated, this time including 4 randomized clinical trials with 289 patients, showing that both the laparotomy as laparoscopy have morbidity and mortality and similar reoperation rates [3].

In the most recent meta-analysis, published in 2015, with regard to intraoperative findings and post-operative surgery, there is evidence that patients who underwent laparoscopic returned to a normal diet as soon as compared to undergoing laparotomy and the post-op pain, evaluated by counting the days of use and dosage of painkillers, has shown that laparoscopy is associated with less pain and therefore lowest dose and use of pain-killing drugs. With respect to morbidity and mortality, the meta-analysis showed that there is a lower rate of postoperative complications in the laparoscopic group, as well as less minor surgical complications, such as: surgical wound complications, any case of bleeding, pancreatitis, pneumonia, urinary tract infection, paralytic ileus, difficulty of gastric emptying and stricture of anastomosis. In addition to this evidence, it is concluded that the reoperation rate and the operative time, ranging from the opening of the abdominal incision closure, are similar between the laparotomy and laparoscopy, this is the best expertise and resourcefulness about surgical laparoscopic procedure by surgeons today [3].

DISCUSSION

The location of a gastric ulcer determines the preferred treatment modality, with the classification system proposed by Johnson typically used to define each type. Type I ulcers, located along the lesser curvature, are the most common. Ulcer types II and III are associated with acid hypersecretion, and thus, vagotomy is recommended when surgical intervention is necessary. Lesions along the lesser curvature near the gastroesophageal junction are type IV. Type V disease is diffuse and associated with NSAID usage. Giant ulcers, often located along the greater curve, have a greater tendency to harbor malignant disease. Only 10% of benign ulcers are located on the greater curvature. The surgical management is described in detail for each ulcer type [8,12].

The laparoscopic surgery currently appears, in general, as a viable approach for the patient because of the numerous benefits that it promotes, mainly because it is a minimally invasive procedure that is associated with the lower postoperative complications, having established his practice in performing cholecystectomy and appendectomy, for example [13,14]. In recent years, the approach via laparoscopy for the treatment of peptic ulcer perforated won more popularity among the laparoscopic gastrointestinal procedures, being commonly performed to correct simple ulcer suture PUP, with or without patch, this may increase the gastroepiploic safety of synthesis [9,15-17]. Laparoscopy compared to laparotomy, also allows the DPL ("toilet" peritoneal) and detection of additional diseases, however, without causing major trauma of abdominal wall [3, 5,18].

Laparoscopy preserves a greater integrity of the anterior abdominal wall when compared to open approach, lower abdomen trauma described as fundamental to the early mobilization of the patient and an adequate respiratory function [6,19]. In addition, because it is a minimally invasive procedure, it is possible to maintain the secretory function, as well as the peritoneal liquid circulation in the peritoneum. With that, with a peritoneal regenerative process less compromised compared to what happens post laparotomy, laparoscopy an attractive procedure according to the results provided [20-22].

One of the risks relating to the laparoscopic surgery concerns the pneumoperitoneum for CO₂ leads to increased intra-abdominal pressure intraoperatively and is related to increased risk of bacteremia and sepsis due to the increased chance of bacterial translocation of peritoneal cavity into the bloodstream, increasing the occurrence of pneumonia in patients submitted to this approach. However, the benefits outweigh the risk of laparoscopy [3,5,23]. The main reason of reoperation post surgical correction of perforated peptic ulcer is the suture dehiscence, being that the applicant in group of patients undergoing laparoscopy. It is believed that this occurs because the laparoscopic suture be harder to be performed, especially depending on the state of the edges of the ulcer, which are usually infiltrated and crumbly, and be more complicated tie suture knots correctly, so that there is a greater probability of disruption. It takes into account in this procedure the surgeon's experience in laparoscopic procedures. In these particular cases of PUP, due to lower demand due to the incidence of this disease, the experience by the number of procedures is limited [3-5,9]

Regarding the cost of laparoscopy can classify it as a viable approach, considering a potential cost-cutting from its results, since the patient has a shorter hospital stay, less consumption of painkillers and early return to industrial activities [10,24]. Regarding morbidity and mortality by comparing open and laparoscopic approach, to date there is no difference between the result of both [3,8].

The post surgical aesthetic result is a benefit from the laparoscopic procedure often mentioned in literature. Currently, the patients are aware of this advantage and sometimes argue in favour of the realization of the laparoscopic procedure as an option of surgical intervention [5,25].

The analysis of the literature on the treatment of peptic ulcer perforated shows that laparoscopy was chosen in younger patients without Comorbidities and with a score of Boey 0 and 1 [10]. The score of Boey is a clinical Predictor of postoperative mortality index and morbidity that ranges from 0 to 3, and corresponds to a sum of pre operative risk factors, such as shock on admission, ASA (American Society of Anesthesiologists) grade III-V and duration of symptoms for more than 12:00am. The evaluation of the wing between I and II also was another commonly found among patients undergoing laparoscopic intervention in relation to the open approach [3, 4].

In virtue of the young patients known to have a better post surgical recovery and considering the least amount of comorbidities and clinical patients unrest with PUP undergoing laparoscopy, the results in favour of this approach can demonstrate a bias with regard to their best result when compared to laparotomy [17,25]. Thus, despite being a viable procedure laparoscopy and that offers a number of advantages [4], a consensus between laparoscopy and laparotomy on surgical approach of the patient with perforated peptic ulcer was not established, requiring more study [3].

CONCLUSION

No single procedure satisfies all the goals of surgical correction of peptic ulcer, or any operation is applicable to all clinical environments. The laparoscopic approach in handling the PUP is a considerable choice by the numerous benefits mainly related with the quality of post-operative. However, the current evidence does not support fully this procedure exceed the results achieved through the laparotomy, standard surgical approach. Soon, the studies conclude that laparoscopy is a viable option and possible depending on the clinical condition of the patient and the surgeon's experience in the treatment of perforated peptic ulcer. In this way, the process less morbid that will properly manage the problem of the patient must be used in each case.

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