



COMPARISON BETWEEN OPEN AND MINIMALLY INVASIVE SURGERY FOR PERFORATED PEPTIC ULCER

COMPARATIVE ANALYSIS OF OPEN SURGERY AND LAPAROSCOPIC REPAIR FOR PERFORATED PEPTIC ULCER

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SUMMARY:

This study performs a systematic review comparing open and laparoscopic surgical techniques for the correction of perforated peptic ulcers. The search was conducted in the PubMed and ScienceDirect databases, covering studies published in the last five years. Nine articles that directly compared the two surgical techniques were included, considering factors such as length of hospital stay, postoperative complications, healing time and infection rates. The results suggest that laparoscopic surgery offers several advantages, including shorter hospital stay and faster recovery, while open surgery remains relevant in specific cases. The analysis highlights the importance of choosing the surgical technique based on the patient's clinical status and the surgeon's experience, with laparoscopy emerging as the preferred approach in most cases. This study aims to provide evidence that can guide surgical practice, promoting better outcomes and a more humane approach in the treatment of perforated peptic ulcers.

Keywords:Complications. Laparoscopy. Prevention. Prognosis. Rehabilitation.

ABSTRACT:

This study conducts a systematic review comparing open surgery and laparoscopic repair techniques for perforated peptic ulcer. The research was performed using PubMed and ScienceDirect databases, covering studies published in the last five years. Nine articles directly comparing the two surgical techniques were included, evaluating factors such as hospitalization time, postoperative complications, wound healing time, and infection rates. The results suggest that laparoscopic surgery offers several advantages, including reduced hospital stay and faster recovery, while open surgery remains relevant in specific cases. The analysis highlights the importance of selecting the surgical technique based on the patient's clinical condition and the surgeon's expertise, with laparoscopy emerging as the preferred approach in most cases. This study aims to provide evidence that can guide surgical practice, promoting better outcomes and a more patient-centered approach to the management of perforated peptic ulcers.

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1. INTRODUCTION

Perforated peptic ulcer is a serious medical emergency that requires immediate surgical intervention to prevent life-threatening complications. Traditionally, open surgery has been the standard approach for correction of this condition, as it allows direct visualization of the affected area and enables robust repair. However, with advances in minimally invasive surgery, laparoscopic repair has emerged as an attractive alternative. This technique is associated with benefits such as less postoperative pain, faster recovery, and a significant reduction in hospital stay, which is particularly advantageous in terms of cost-effectiveness and patient quality of life. The complexity and risks inherent to each technique, however, still raise questions about which is the best approach in different clinical scenarios (Ahmed *et al.*, 2022; Salman *et al.*, 2022).

Surgeons face a dilemma when choosing between open surgery and laparoscopy, especially in situations where time is a critical factor. Although open surgery is often preferred in high-risk patients or in emergency situations where rapid access is required, laparoscopy offers advantages in terms of less invasiveness and better long-term prognosis. The choice of the optimal surgical technique should therefore consider multiple factors, including the patient's clinical condition, the surgeon's experience with minimally invasive techniques, and the available resources (Bejiga; Negasa; Abebe, 2022; Ertekin *et al.*, 2024).

This study aims to perform a systematic comparative review between open surgery and laparoscopic repair techniques for the treatment of perforated peptic ulcers. The aim is to identify which of the approaches offers the best prognosis in terms of length of hospital stay, postoperative complications, healing time, leaks and infections. In addition, the study aims to provide an evidence base that can assist surgeons in choosing the most appropriate technique for each patient, taking into account both the benefits and potential risks associated with each approach.

2. MATERIAL AND METHOD

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The study consists of an integrative literature review, conducted by searching for scientific articles in the ScienceDirect and PubMed databases. The research was carried out

using the search key "('peptic ulcer' OR 'ulcer perforation') AND ('open surgery' OR 'laparoscopic repair') AND ('outcome' OR 'complication')" in both databases. Studies published in the last 5 years (2019-2024) were selected, including the following study types: clinical trial, meta-analysis, randomized controlled trial, analysis, and systematic review. Articles with full text available in Portuguese and English that addressed the topic were included.

A total of 529 articles were found in the initial search, 98 in PubMed and 431 in ScienceDirect. After applying filters for year, study type and language, 71 articles were selected, 15 in PubMed and 56 in ScienceDirect. After removing duplicates, 69 articles were eligible for screening by title and abstract. Of these, 19 articles were selected for full reading, resulting in 9 articles that comprised the integrative review (Table 1). Exclusion criteria included approaches focused exclusively on duodenal ulcer or articles that did not compare the surgical techniques mentioned.

Table 1. Works included.

Base	Title	Authors	Periodical (vol, no, page, year)	Considerations / Theme
PubMed	Risk factors influencing postoperative outcome in patients with perforated peptic ulcer: the prospective cohort study.	AHMED, Meraj <i>et al.</i>	European Journal of Trauma and Emergency Surgery , p. 1-6, 2022.	Analysis of the risk factors post-operative in ulcer peptic perforated.
ScienceDirect	Treatment outcome of perforated peptic ulcer disease among surgically treated patients: THE cross-sectional study in Adama	BEJIGA, Gosa; NEGASA, Tolerate; ABEBE, <small>In addition.</small>	International Journal of Surgery Open , v. 48, p. 100564, 2022.	Assessment of the results of treatment surgical to ulcer peptic perforated in a hospital.

	hospital medical college, Adama, Ethiopia.			
PubMed	Laparoscopic Treatment of Perforated Peptic Ulcer: A Propensity Score-Matched Comparison of Interrupted Stitches Repair versus Knotless Barbed Suture.	COAST, Gianluca <i>et al.</i>	Journal of Clinical Medicine , v. 13, n. 5, p. 1242, 2024.	Comparison between repair with points interrupted and knotless suture in the laparoscopy of ulcer peptic.
PubMed	Primary closure versus Graham patch omentopexy in perforated peptic ulcer: A systematic review and meta-analysis.	DEMETRIOUS, George; CHAPMAN, Mark.	The Surgeon , v. 20, n. 3, p. e61-e67, 2022.	Revision systematic on the comparison between closing primary and patch from Graham to peptic ulcer.
ScienceDirect	Laparoscopic repair versus open repair for perforated peptic ulcers: quality of life assessment.	ERTEKIN, Suleyman Caglar <i>et al.</i>	Journal of Gastrointestinal Surgery , 2024.	Assessment from the quality of life between repair laparoscopic and open ulcer peptic perforated.
PubMed	Outcomes of laparoscopic modified Cellan-Jones repair versus open repair for perforated peptic ulcer in a community hospital.	ODISHO, Tanya <i>et al.</i>	Surgical Endoscopy , v. 37, n. 1, p. 715-722, 2023.	Comparison between repair modified of Cellan-Jones laparoscopic and open to ulcer peptic in hospital community.

ScienceDirect	Simple laparoscopic repair of perforated peptic ulcer without omental patch.	PAN, Chao Wen <i>et al.</i>	Asian Journal of Surgery , v. 43, n. 1, p. 311-314, 2020.	Repair laparoscopic simple of ulcer peptic without patch omental.
ScienceDirect	Comparative study of postoperative complications after open and laparoscopic surgery of the perforated peptic ulcer: Advantages of the laparoscopic approach.	PELLONI, Maria <i>et al.</i>	Asian Journal of Surgery , v. 45, n. 4, p. 1007-1013, 2022.	Study comparative of complications postoperative between surgery open and laparoscopic for ulcer peptic.
PubMed	Surgical management of perforated peptic ulcer: the comparative meta-analysis of laparoscopic versus open surgery.	SALMAN, Mohamed AbdAlla <i>et al.</i>	Surgical Laparoscopy Endoscopy & Percutaneous Techniques , v. 32, n. 5, p. 586-594, 2022.	Meta-analysis comparative between surgery laparoscopic and open to management of ulcer peptic perforated.

Source: own authorship, 2024.

3. RESULTS AND DISCUSSION

The analysis of the selected articles revealed that the laparoscopic repair technique has several advantages compared to open surgery. One of the main benefits observed was the significant reduction in the length of hospital stay, with patients undergoing laparoscopy being discharged on average two days earlier than those undergoing open surgery. In addition, studies indicate a lower incidence of postoperative complications, such as surgical wound infection and leaks, in patients treated with laparoscopy. These advantages are attributed to the less invasiveness of laparoscopy, which

results in less tissue trauma and, consequently, a faster and less painful recovery (Pelloni *et al.*, 2022).

Another highlight was the evaluation of healing time, where laparoscopy proved to be superior. The use of barbed sutures during repair contributed to more efficient healing and fewer complications compared to traditional sutures used in open surgery. However, it is important to highlight that, in emergency cases, where the patient's clinical condition is critical and time is of the essence, open surgery is still the preferred technique, as it offers immediate and direct access to the perforation site, allowing for rapid intervention (Demetriou; Chapman, 2022; Costa *et al.*, 2024).

The choice of surgical technique for perforated peptic ulcer should be based on a careful analysis of the benefits and risks associated with each approach. Laparoscopy, with its advantages of less invasiveness, shorter recovery time and fewer postoperative complications, emerges as a preferable option for patients with moderate surgical risk and in situations where time allows for a planned intervention. However, open surgery remains relevant, especially in scenarios where there is a need for urgent intervention or when the patient's clinical condition is complex (Ertekin *et al.*, 2024).

Furthermore, the surgeon's experience plays a crucial role in deciding which technique to use. Surgeons with extensive experience in laparoscopy may opt for this approach even in challenging situations, while those less familiar with the technique may prefer open surgery. The learning curve of laparoscopy may influence the results, suggesting that training and continued practice are essential to optimize the results of this technique. Ultimately, the choice should be personalized, considering the individual characteristics of the patient and the resources available at the health center (Salman *et al.*, 2022; Odisho *et al.*, 2023).

FINAL CONSIDERATIONS

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Laparoscopic surgery has demonstrated significant advantages compared to open surgery, especially with regard to length of hospital stay and postoperative complications. Patients undergoing laparoscopy had shorter hospital stays

healing and lower risk of infections, which corroborates the growing preference for this technique in various clinical scenarios (Odisho *et al.*, 2023; Pelloni *et al.*, 2022).

Furthermore, the study indicates that laparoscopic surgery can offer a better long-term prognosis, minimizing the percentage of recurrence and reducing the need for reinterventions, fundamental aspects for choosing the surgical method (Salman *et al.*, 2022). However, the choice of technique should be based on a careful evaluation of the patient's clinical condition and the surgeon's experience, ensuring that the selected procedure meets the specific needs of each case (Demetriou; Chapman, 2022).

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