

Surgical outcomes of laparoscopic surgery for duodenal ulcers at Viet Tiep Hospital

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ABSTRACT

Objectives: Evaluation of the surgical outcomes of laparoscopic surgery to suture perforated duodenal ulcers. **Subjects and methods:** Cross sectional descriptive research method, on 30 patients with perforated duodenal ulcers treated by simple endoscopic suturing of the perforation at Viet Tiep Hospital from January 2024 to April 2025. **Results:** The average age is 51.37 ± 14.48 , the youngest is 21 years old, the oldest is 84 years old. Perforation rate of soft ulcer margin 93.3%, callous fibrosis 6.7%, perforation size <10mm 93.3%, >10mm 6.7%. Surgeons sutured simple perforations with 100% success. Surgery had no complications, surgical complications and post operative death. The average hospital stay was 7.05 ± 2.55 days. **Conclusion:** Laparoscopic surgery to suture perforated duodenal ulcers is a safe method, the duration of flatus after surgery is short, with short hospital stay, low rate of post-operative complications, and no mortality.

Keywords: Perforated duodenal ulcers, peritonitis, laparoscopic surgery to suture perforated ulcers.

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INTRODUCTION

Perforated duodenal ulcer is a complication of peptic ulcer disease, with an incidence of approximately 2.5% [1]. The consequence of perforation is the leakage of food and digestive enzymes into the peritoneal cavity, leading to generalized peritonitis. If presentation is delayed, this may result in septic shock and a high risk of mortality. According to several studies, delayed surgical intervention for perforated duodenal ulcer carries a mortality rate of 5–10% [2]. With the current trend toward minimally invasive surgery aimed at reducing surgical trauma and improving cosmetic outcomes, laparoscopic surgery has become increasingly preferred. Many studies have demonstrated that laparoscopic simple closure of perforated duodenal ulcer offers several advantages, including shorter hospital stay, less postoperative pain, earlier

return of bowel function, and faster recovery [3], [7]. Consequently, laparoscopic simple closure has become a treatment option widely adopted by surgeons in institutions equipped with laparoscopic surgery facilities and trained personnel. At Viet Tiep Hospital, numerous studies over the past decades have evaluated both open and laparoscopic surgical approaches for perforated duodenal ulcer. Results have demonstrated the effectiveness of laparoscopic surgery in managing this condition. Therefore, we conducted the study entitled: “Surgical outcomes of laparoscopic surgery for duodenal ulcers at Viet Tiep hospital”, with the objective of assessing the early results of laparoscopic simple closure of duodenal perforation at our hospital from January 2024 to April 2025.

MATERIALS AND METHODS

Study Subjects

The study included 30 patients with perforated duodenal ulcer who underwent laparoscopic simple closure at Viet Tiep Hospital between January 2024 and April 2025.

Inclusion criteria

Confirmed diagnosis of perforated duodenal ulcer.

Onset of perforation <24 hours (calculated from the onset of sudden severe abdominal pain to the time of surgery).

Emergency laparoscopic simple closure performed.

ASA I, II, or III (according to the American Society of Anesthesiologists, 2021)

Complete medical records available at Viet Tiep Hospital

Exclusion criteria

Patients with perforated duodenal ulcer were excluded if they had:

- Complications such as pyloric stenosis or gastrointestinal bleeding.
 - Severe comorbidities with ASA > III (according to the American Society of Anesthesiologists, 2021).
 - History of multiple abdominal surgeries.
- Duodenal perforation secondary to malignancy (confirmed by histopathology)

Methods

Study design: A combined retrospective and prospective, descriptive cross-sectional case series without control group.

Sample size: 30 patients.

Study period: January 2024 – April 2025.

Study site: Viet Tiep hospital.

Data Analysis

Data were analyzed using SPSS software version 27.0.

RESULTS

Table 1. General characteristics of patients

No	Characteristics	Results (n=30)
1	Age (years)	51,37±14,48
2	Male/Female ratio	3/1
3	Time from onset to surgery (hours)	6,97±2,75
4	Subdiaphragmatic free air on X-ray	80%
5	Abdominal CT scan	21/30 (70%)
Boey score		
6	Boey 0	24 (80%)
	Boey 1	6 (20%)
	Boey 2 và 3	0

Comment: The mean age of the patients was 51.37 ± 14.48 years, with a male-to-female ratio of 3:1. The mean time from onset of abdominal pain to surgery was 6.97 ± 2.75 hours, ranging from a minimum of 1 hour to a maximum of 48 hours. Subdiaphragmatic free air was detected on X-ray in 80% of cases, while abdominal CT scan was performed in 21/30 patients (70%). All patients had a Boey score of 0 or 1 (100%).

Table 2. Intraoperative outcomes

No.	Characteristics	Results (n=30)
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Size of perforation	
1	<5mm 6 (20%)
	5-10mm 22 (73,3%)
	>10mm 2 (6,7%)
Peritoneal status	
2	Localized peritonitis 17 (56,7%)
	Generalized peritonitis 13 (43,3%)
Ulcer margin characteristics	
3	Soft margin 28 (93,3%)
	Callous fibrosis 2 (6,7%)

Comment: Perforations ≤ 10 mm accounted for 93.3%. Localized peritonitis was present in 56.7%. Soft ulcer margin was observed in 93.3%.

Table 3. Postoperative outcomes

No.	Characteristics	Results (n=30)
1	Operative time (mins)	50,05 ± 15,58
Surgical techniques for closure		
	Cruciate mattress suture	18 (60%)
	Simple interrupted suture	12 (40%)
Drain placement		
	Subhepatic only	4 (13,3%)
	Subhepatic + Douglas pouch	26 (86,7%)

Comment: The mean operative time was 50.05 ± 15.58 minutes. Perforations were closed using cruciate mattress suture in 60% of cases (18 patients), and simple interrupted sutures in 40%. Two postoperative drains (subhepatic and Douglas pouch) were placed in 86.7% of cases, while only 4 patients (13.3%) had a single subhepatic drain.

- Conversion to open surgery: None of the cases required conversion to open surgery.
- Intraoperative accidents: No intraoperative accidents were recorded.

Table 4. Postoperative Treatment Outcomes

No.	Characteristics	Results
1	Time to first flatus (days)	1,47±0,4 (1-5)
2	Time to discontinue analgesics (days)	2,08±0,97 (1-6)
3	Length of hospital stay (days)	7,05±2,55 (5-14)
Complications		
	Trocar site infection	1 (3,3%)
	Pleural effusion	0 (0%)
5	Death	0

Comment: The mean time to first flatus was 1.47 ± 0.4 days (earliest: 1 day, latest: 5 days). Analgesics were discontinued after a mean of 2.08 ± 0.97 days (range: 1–6 days). The mean

hospital stay was 7.05 ± 2.55 days (range: 5–14 days). Postoperative complication occurred in one case (3.3%), consisting of trocar site infection. No mortality was recorded.

DISCUSSION

Our study showed that laparoscopic repair of perforated duodenal ulcers achieved a high success rate (100%), with no cases requiring conversion to open surgery. Laparoscopic repair of perforated duodenal ulcers has been increasingly adopted worldwide due to its advantages in early postoperative recovery [7].

All patients in our study presented with a single perforation located in the duodenal bulb. Soft ulcers accounted for 93.3%, while sclerotic ulcers were observed in 2 cases (6.7%). Our findings are consistent with those reported by Ichikawa et al., with soft ulcers accounting for 88.3% [4], and by Pham Tuan Dat, who reported 84.9% [5].

Regarding perforation size: perforations with a diameter ≤ 10 mm were found in 28 patients (93.3%). In these cases, closure was performed using either X-shaped or simple interrupted sutures, depending on the surgeon's experience and technical skill. Perforations >10 mm were observed in 2 patients (6.7%), both of whom underwent simple interrupted suturing with stable postoperative outcomes. These results are comparable to those of Ichikawa et al., where perforations of 5–10 mm accounted for 87.5% [4], and to Pham Tuan Dat, who reported perforations ≤ 10 mm in 88.4% [5]. In our study, localized peritonitis accounted for 56.7%, while diffuse peritonitis was observed in 43.3%. The rate of diffuse peritonitis was higher than that reported by Tran Nguyen Bao Tuan (26.8%) [1].

The mean operative time in our study was 50.05 ± 15.58 minutes. Quah reported a mean operative time of 51.9 ± 23.3 minutes [9], and

Pham Tuan Dat reported 54.3 ± 16.5 minutes [5]. Recent studies have shown no significant difference in operative time between laparoscopic and open surgery [10]. As laparoscopic repair becomes a routine procedure, operative time has been shortened due to increased surgical experience. La Van Phu also found no significant difference in operative time between open and laparoscopic surgery [3].

The use of abdominal drainage remains controversial, with some authors recommending no drainage, others placing a single subhepatic drain, and some placing two drains (subhepatic and Douglas pouch), or even more [8]. In our study, two drains (subhepatic and Douglas pouch) were placed in 86.7% of cases (26 patients), while only 13.3% (4 patients) had a single subhepatic drain).

The mean time to restoration of gastrointestinal transit was 1.47 ± 0.4 days, earlier than reported by Tran Nguyen Bao Tuan (2.8 ± 0.7 days) [1] and Pham Tuan Dat (2.65 ± 0.72 days) [5].

5. Conclusion

Through our study of 30 patients with perforated duodenal ulcers treated by laparoscopic repair at Viet Tiep Hospital, we found that laparoscopic repair is a safe and effective method. It allows for earlier mobilization and recovery, shorter time to first flatus and hospital stay compared with open surgery, with a low postoperative complication rate and no mortality. Therefore, laparoscopic repair should be considered as an appropriate treatment option.

The mean hospital stay was 7.05 ± 2.55 days, indicating that laparoscopic repair facilitates rapid recovery and earlier return to daily activities. Similar results have been reported by La Van Phu (7.6 days) [3] and Reibo (6.7 ± 1.8 days). Ichikawa et al., in a study of 616 patients treated laparoscopically compared with 1846 patients undergoing open repair, demonstrated shorter hospital stays, and lower rates of wound infection, complications, and mortality in the laparoscopic group. Reibibo et al., in a study of 61 patients (38 open repair, 23 laparoscopic repair), also reported shorter hospital stays with laparoscopic surgery (7.1 vs. 13.9 days) [6].

The low postoperative complication rate may be due to favorable patient selection, with patients undergoing laparoscopic repair generally in better condition, with less severe systemic involvement, and presenting earlier. In our study, one patient (3.3%) developed a trocar site infection postoperatively, which was managed with antibiotics and close monitoring, with favorable evolution. There were no cases of mortality. La Van Phu reported no significant difference in complication rates between open and laparoscopic groups [3]. Hoang Thanh Binh reported an overall complication rate of 2.5%, with no mortality and no anastomotic leakage.

CONCLUSION

Through our study of 30 patients with perforated duodenal ulcers treated by laparoscopic repair at Viet Tiep Hospital, we found that laparoscopic repair is a safe and effective method. It allows for earlier mobilization and recovery, shorter time to first flatus and hospital stay compared with open surgery, with a low postoperative complication rate and no mortality.

Therefore, laparoscopic repair should be considered as an appropriate treatment option.

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