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Original Research Article

Comparative Study of Laparoscopic Versus Open Repair in Peptic Ulcer Perforation: A Rural Tertiary Care Experience

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Abstract

Aim: To compare short-term outcomes of laparoscopic versus open repair of peptic ulcer perforation (PPU) in a rural tertiary hospital.

Method: This prospective study was conducted at Bankura Sammilani Medical College, West Bengal, from March 2021 to August 2022. Total Fifty-two patients underwent simple closure with omental patch, where 26 underwent laparoscopic repair and 26 underwent open surgical repair. Operative time, analgesic requirement, naso-gastric tube duration, resumption of oral feeds, hospital stay, antibiotic requirement, postoperative complications, and return to work were compared and anlysed.

Result: The mean operative time was shorter in the laparoscopic group (64.6 ± 5.0 min) as compared to open repair (85.6 ± 5.2 min, $p < 0.001$). Analgesic requirement, nasogastric tube duration, and hospital stay were also reduced with laparoscopic repair. 15.4% Wound gap occurred only in the open surgical repair group.

Conclusion: Laparoscopic repair of PPU is safe, feasible, and associated with faster recovery and fewer wound complications compared to open repair, even in rural tertiary care settings.

Keywords: Peptic Ulcer Perforation; Laparoscopic Repair; Open Repair; Omental Patch.

Introduction

Peptic ulcer perforation remains a surgical emergency with mortality rates up to 20% [1,2]. Though, Open Graham's omental patch repair is the traditional approach, however, minimally invasive laparoscopic repair also also showing increasing trends [3,4].

Laparoscopic surgery results less post-operative complication like, reduced pain, shorter hospital stay, and fewer wound related complications[5–7].

However, the concerns persist regarding operative duration, risk of leakage, and feasibility in resource-limited rural settings like us [8,9]. So, this study aimed to compare outcomes of laparoscopic repair of PPU and open repair of PPU in a rural tertiary care hospital.

Methods

This prospective comparative study was conducted in the Department of General Surgery, Bankura Sammilani Medical College, from March 2021 to August 2022.

A total of 52 patients with clinically and radiologically confirmed PPU were selected. Selected Patients underwent either laparoscopic repair (n=26) (Fig-1) or open repair (n=26) (Fig-2) with simple closure and omental patch. Patients over 14 years with PPU were included in this study. However, patients refusing consent, malignant ulcers, traumatic/iatrogenic perforations, recurrent/stomal ulcers, or requiring definitive ulcer surgery were excluded from the study. Data like, demographics, operative time, analgesic duration, nasogastric tube duration, oral feeding, hospital stay, antibiotic use, complications, and return to work were collected and analyzed. Independent t-tests were used for continuous variables; chi-square/Fisher's exact test for categorical variables. SPSS v27 was used for analysis. $p< 0.05$ was considered significant.

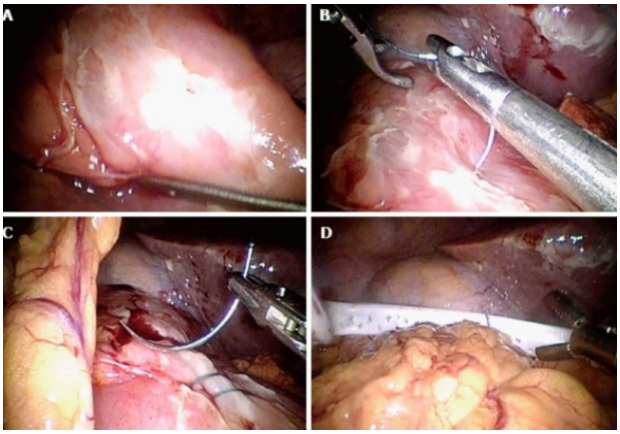

Figure 1:

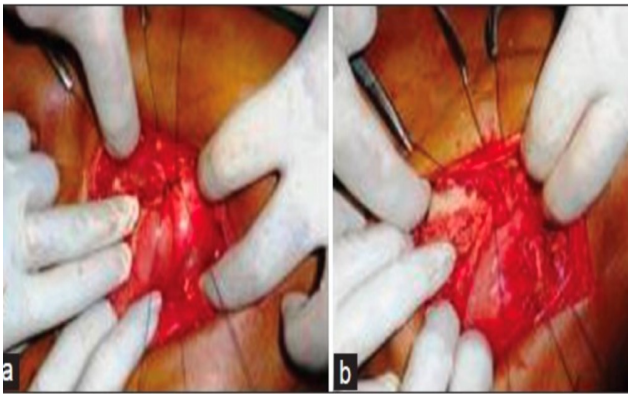

Figure 2:

Results

The mean age was 41.1 years (range 18–62), and males constituted 80.8%. The two groups were comparable in baseline demographics (Table 1).

Table 1: Demographic characteristics

Parameter	Laparoscopic (n=26)	Open (n=26)	p-value
Mean age(years)	40.8 ± 6.0	41.3 ± 5.3	0.72
Age≤ 40 years	13 (50%)	13 (50%)	1.00
Male	21 (80.8%)	21 (80.8%)	1.00
Female	5 (19.2%)	5 (19.2%)	1.00

Duodenal perforation was the most common site (71.2%) in this study and prepyloric and gastric gastric perforation seen in 25% and 3.8% cases (Table 2).

Table 2: Site of perforation distribution

Site of perforation	Laparoscopic (n=26)	Open (n=26)	Total (n=52)
Duodenal	19 (73.1%)	18 (69.2%)	37 (71.2%)
Prepyloric	6 (23.1%)	7 (26.9%)	13 (25.0%)
Gastric	1 (3.8%)	1 (3.8%)	2 (3.8%)

Mean operative time was significantly shorter in the laparoscopic group (64.6 ± 5.0 min) as compared with the open group (85.6 ± 5.2 min; $p < 0.001$). The laparoscopic group had a substantially reduced requirement for postoperative analgesia (3.5 ± 1.0 vs. 6.0 ± 1.2 days; p = 0.002). Nasogastric tube (NGT) duration was also shorter in the laparoscopic group (2.0 ± 0.5 vs. 3.5 ± 0.8 days; p = 0.001). Time to oral feeding was significantly earlier among patients, who underwent laparoscopic repair (2.5 ± 0.7 vs. 4.0 ± 1.0 days; p = 0.001). Shorter hospital stay (5.0 ± 1.2 vs. 7.5 ± 1.5 days; p = 0.003) and reduced antibiotic requirement (5.2 ± 1.0 vs. 7.1 ± 1.3 days; p = 0.004) were also seen in laparoscopic group. Patients undergoing laparoscopic repair resumed normal activities significantly earlier (14.0 ± 3.0 vs. 21.0 ± 4.0 days; p = 0.002) (Table-3).

Table 3: Comparison of operative and postoperative outcomes

Parameter	Laparoscopic (n=26)	Open (n=26)	p-value
Operative Time(min)	64.6 ± 5.0	85.6 ± 5.2	<0.001
Analgesic requirement(days)	3.5 ± 1.0	6.0 ± 1.2	0.002
Nasogastric tube duration(days)	2.0 ± 0.5	3.5 ± 0.8	0.001
Oral feed resumption(days)	2.5 ± 0.7	4.0 ± 1.0	0.001
Hospital stay(days)	5.0 ± 1.2	7.5 ± 1.5	0.003
Antibiotic requirement(days)	5.2 ± 1.0	7.1 ± 1.3	0.004
Return to work(days)	14.0 ± 3.0	21.0 ± 4.0	0.002

Overall complication rates were lower in the laparoscopic group. Wound gap was observed exclusively in the open group (15.4%, p = 0.037) and Pelvic abscess (11.5%), burst abdomen (7.7%) were also observed in the open group(Table 4).

Table 4: Postoperative complications

Complication	Laparoscopic (n=26)	Open (n=26)	p-value
Wound gap	0 (0%)	4 (15.4%)	0.037
Pelvic Abscess	0 (0%)	3 (11.5%)	0.074
Burst abdomen	0 (0%)	2 (7.7%)	0.149

Discussion

This prospective study showed evidence that laparoscopic repair of PPU is good surgical practice in a rural based tertiary care centre and confers significant benefits over conventional open repair. We observed lesser time in laparoscopic repair which is not supported by some other studies [1,3]. Reduced analgesic requirement and earlier oral intake were seen in the laparoscopic group which was supported by other studies [2,3]. Our study showed mean hospital stay in laparoscopic repair 5.0 days and7.5 days in open repair of PPU.

Some other study also showed similar result [4,5]. We have observed in this study early return to work after laparoscopic repair as compared to open repair with less antibiotic requirement. This finding was also supported by some other study [6,7,9]. Wound-related morbidity was lower with laparoscopic repair, other studies showed similar result [10,11, 12, 13].

Conclusion

Laparoscopic repair of PPU is a safe and effective surgical procedure as compared to open repair, with reduced morbidity and faster recovery. It should be considered as preferred procedure in emergency repair of PPU of suitable patient, even in resource-limited rural hospitals.

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