

Comparison of Open versus Laparoscopic Repair for the Treatment of Hollow Viscus Perforation

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Abstract

Background: Acute abdomen is severe abdominal pain. It occurs suddenly. The present study was conducted to compare open versus laparoscopic repair for the treatment of hollow viscus perforation. **Subjects and Methods:** The present study was conducted on 72 patients of both genders. All patients were divided into 2 groups. In group I patients, laparoscopic repair was performed and in group II patients, open repair was performed. Variables such as time taken for resumption of daily activities and operative time were recorded in all patients. **Results:** Abdominal distension occurred before pain in 10 in group I and 9 in group II patients, after pain in 6 in group I and 5 in group II and with pain in 20 in group I and 22 in group II patients. Vomitus was bilious seen 17 in group I and 16 in group II and no vomiting 19 in group I and 20 in group II patients. Fever was seen in 22 in group I and 17 in group II, history of drug intake was seen 17 in group I and 19 in group II, history of alcohol intake was seen in 13 in group I and 18 in group II patients, smoking in 20 in group I and 14 in group II and tobacco usage 15 in group I and 9 in group II patients. Diagnosis was gastric perforation seen in 7 in group I and 8 in group II, ileal perforation seen 3 in group I and 4 in group II and duodenal perforation seen 26 in group I and 24 in group II patients. The difference was significant ($P < 0.05$). **Conclusion:** Authors found that Laparoscopic repair group had lower surgical time and early resumption of daily activities as compared to open surgery group.

Keywords: Laparoscopic repair, perforation, Operative.

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Introduction

Acute abdomen is severe abdominal pain. It occurs suddenly. There are various causes for acute abdomen, of which hollow viscus perforation is the most common reason of acute abdominal pain and is comprised of approximately 5 to 10% of all emergency admission.^[1] It demands an immediate surgical intervention. The reason for increased morbidity and mortality among patients with acute abdomen is overlooked diagnosis and late intervention.^[2]

This condition had significantly reduced due to improved medical as well as diagnostic facilities. Among various risk factors for perforation, smoking, use of non-steroidal anti-inflammatory drugs (NSAIDs) and other over-the-counter analgesics are the main risk factors. Laparoscopy has become increasingly popular.^[3] In the starting, laparoscopy was mainly used for elective surgery, as the influence of the pneumoperitoneum on the acute abdomen with peritonitis was not clear. However, the advantages of laparoscopy in relation to the acute abdomen as an indicative aid have been recognized, and since then its therapeutic potential also seem to be advantageous in the field of surgery.^[4]

Prompt and effective treatment is crucial to deal with cases of hollow viscus perforation. Open repair is also most common and popular approach; however, the use of laparoscopic repair for surgery seems to be an efficient

substitute procedure. It has its numerous advantages.^[5]

Studies have shown that perforations can be closed safely with laparoscopy. However, whether treatment of perforation by laparoscopic approach is better than conventional open repair is undecided.^[6] Some authors recommended that laparoscopic repair of perforations is clearly practicable and helpful in terms of significant lower mean duration of hospital stay.^[7] The present study was conducted to compare open versus laparoscopic repair for the treatment of hollow viscus perforation.

Subjects and Methods

The present study was conducted in the department of general surgery. It comprised of 72 patients of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study. Exclusion criteria was patients with inflammatory bowel syndrome, malignancy, patients with connective tissue disorders, coagulopathies, renal failure, liver failure, and substance abuse and those not giving consent.

Data such as name, age etc. was recorded. A thorough clinical examination was performed in all patients. All patients were divided into 2 groups. In group I patients, laparoscopic repair was performed and in group II patients, open repair was performed. Patients were subjected to

routine blood investigations such as complete blood count, total leukocyte count, differential count, platelet count, blood grouping and random blood sugar level. Renal function tests, serum creatinine and urine tests were also performed. X-ray erect abdomen was taken.

Variables such as time taken for resumption of daily activities and operative time were recorded in all patients. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Distribution of patients

Groups	Group I	Group II
Method	Laparoscopic repair	Open repair
Number	36	36

[Table 1] shows that each group had 36 patients. In group I patients, laparoscopic repair was performed and in group II patients, open repair was performed.

Table 2: Assessment of parameters

Variables	Group I (36)	Group II (36)	P value
Abdominal distension			
Distension before pain	10	9	0.02
After pain	6	5	
Distension with pain	20	22	
Vomitus			
Bilious	17	16	0.91
No vomiting	19	20	
Fever	22	17	0.12
History of drug intake	17	19	0.93
History of alcohol intake	13	18	0.14
Smoking	20	14	0.17
Tobacco usage	15	9	0.05
Diagnosis			
Gastric perforation	7	8	0.01
Ileal perforation	3	4	
Duodenal perforation	26	24	

Table 3: Operative parameters

Variables	Group I (36)	Group II (36)	P value
Surgical time taken (Minutes)			
90-100	17	1	0.01
101-110	11	4	
111-120	8	8	
121-130	0	0	
131-140	0	6	
141-150	0	7	
>150	0	10	
Time for resumption of daily activities (Days)			
3	0	6	0.01
4-7	7	5	
8-14	29	0	
15-21	0	25	

[Table 2] shows that abdominal distension occurred before pain in 10 in group I and 9 in group II patients, after pain in 6 in group I and 5 in group II and with pain in 20 in group I and 22 in group II patients. Vomitus was bilious seen 17 in group I and 16 in group II and no vomiting 19 in group I

and 20 in group II patients. Fever was seen in 22 in group I and 17 in group II, history of drug intake was seen 17 in group I and 19 in group II, history of alcohol intake was seen in 13 in group I and 18 in group II patients, smoking in 20 in group I and 14 in group II and tobacco usage 15 in group I and 9 in group II patients. Diagnosis was gastric perforation seen in 7 in group I and 8 in group II, ileal perforation seen 3 in group I and 4 in group II and duodenal perforation seen 26 in group I and 24 in group II patients. The difference was significant (P<0.05).

[Table 3, Figure 1a & 1b] shows that in 8 patients in group I and group II surgical time taken was 111-120 minutes, 11 patients in group I and 4 in group II had 101-110 minutes, 11 patients in group I had 90-100 minutes, 6 patients in group II had 131-140 minutes, 7 had 141-150 minutes and 10 had >150 minutes in group II. The difference was significant (P<0.05). Time for resumption of daily activities was 3 days seen in 6 patients in group II, 4-7 days seen in 7 patients in group I and 5 in group II, 8-14 days seen 29 patients in group I and 15-21 days seen in 25 patients in group II. The difference was significant (P<0.05).

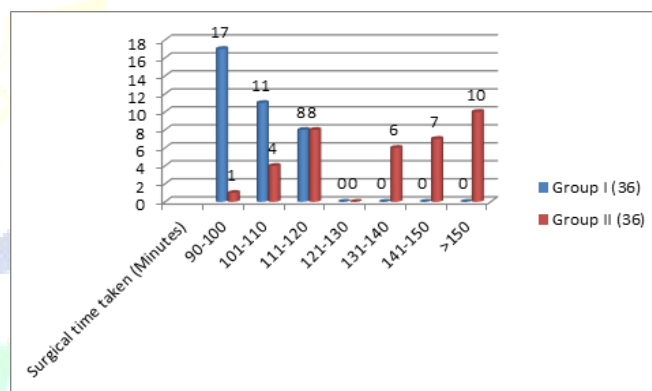


Figure 1a: Surgical time taken (Minutes)

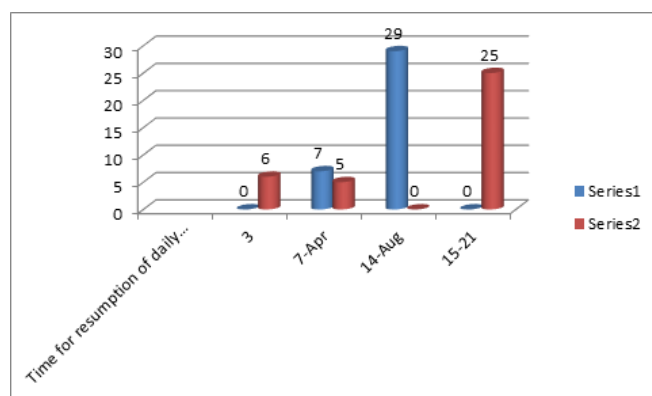


Figure 1b: Time for resumption of daily activities (Days)

Discussion

Hollow viscus perforation is the most serious and life threatening to the patient. It is the most challenging and complicated task for the surgeons.^[8] Thorough understanding of disease pattern, early diagnosis, and timely surgical intervention aids the surgeon in managing these

cases.^[9] The present study was conducted to compare open versus laparoscopic repair for the treatment of hollow viscus perforation.

In this study, in group I patients, laparoscopic repair was performed and in group II patients, open repair was performed. Each group had 36 patients. Koujalagi et al,^[10] in their study 60 patients with hollow viscus perforation undergoing either laparoscopic (group A = 30) or open repair (group B = 30) were included. The mean ages of groups A and B were 48.30 ± 18.23 and 49.30 ± 15.27 years, respectively, with male preponderance. In clinical characteristics, duration of vomiting and total leukocyte count ($p = 0.032$) were associated significantly with incidence of hollow viscus perforation. The mean Mannheim peritonitis index score was comparable in groups A and B (22.07 ± 4.65 vs. 21.47 ± 5.39). The mean duration of surgery was significantly low in group A (105.13 ± 9.57 min) compared to group B (141.67 ± 20.19 min). The mean duration of resumption of daily activities was significantly low in group A (4.53 ± 0.73 days) compared to group B (11.87 ± 2.93 days). Laparoscopic repair is a beneficial procedure for the management of hollow viscus perforation in terms of lower surgical time and early resumption of daily activities.

We found that abdominal distension occurred before pain in 10 in group I and 9 in group II patients, after pain in 6 in group I and 5 in group II and with pain in 20 in group I and 22 in group II patients. Vomitus was bilious seen 17 in group I and 16 in group II and no vomiting 19 in group I and 20 in group II patients. Fever was seen in 22 in group I and 17 in group II, history of drug intake was seen 17 in group I and 19 in group II, history of alcohol intake was seen in 13 in group I and 18 in group II patients, smoking in 20 in group I and 14 in group II and tobacco usage 15 in group I and 9 in group II patients.

Zedan et al,^[11] included 50 patients with perforated duodenal peptic ulcer which were divided into two groups: group A (25 patients) for laparoscopic procedure, and group B (25 patients) for open repair. In group A, 21 patients underwent successful laparoscopic surgery, and 4 patients were converted to laparotomy, and in group B, 24 patients were evaluable, and 1 patient died on the fourth postoperative day not related to surgical cause. Operating time was significantly longer in the laparoscopy group, 145 ± 8.4 versus 110 ± 13 min. Patients who underwent laparoscopic repair were associated with lower morbidity, with P-value less than 0.05. No significant difference was found regarding leak or intra-abdominal abscess. Hospital stay was significantly shorter in the laparoscopic group, 6.9

± 2.2 versus 8.9 ± 3.3 days. Patients who underwent laparoscopic procedure resumed normal activity earlier than the patients in the laparotomy group.

We found that diagnosis was gastric perforation seen in 7 in group I and 8 in group II, ileal perforation seen 3 in group I and 4 in group II and duodenal perforation seen 26 in group I and 24 in group II patients. Bertleff et al,^[12] revealed that laparoscopic closure of a perforated peptic ulcer is as safe as conventional open correction. The authors reported that the operating time was significantly longer in the laparoscopy group (75 vs. 50 minutes).

The limitation of the study is small sample size.

Conclusion

Authors found that Laparoscopic repair group had lower surgical time and early resumption of daily activities as compared to open surgery group.

References

1. Arulselvan A. Comprehensive study of hollow viscus perforation and its management. IOSR J Dent Med Sci 2016; 1:1-4.
2. Tim HT, Swarupjit G, Ranjit KM, Jatasankar M, Dharmendra D. Clinicopathological study on hollow Viscus perforation. J Pharm Biomed Sci 2015; 5:100-103.
3. Gopalakrishna K. Clinical study of perforations of small bowel. J Endocrinol Metab Disord Diabetes South Afr 2016; 5:4154-4160.
4. Dorairajan L, Gupta S, Deo S, Chumber S, Sharma L. Peritonitis in India—a decade's experience. Trop Gastroenterol 1994; 16: 33-38.
5. Rao M, Samee AA, Khan S. Hollow viscus perforation: a retrospective study. Intern J Sci Res 2015; 6:3250-3254.
6. Kaiser AM, Katkhouda N. Laparoscopic management of the perforated viscus. Semin Laparosc Surg 2002; 9:46-53.
7. Robertson G, Wemyss-Holden S, Maddern G. Laparoscopic repair of perforated peptic ulcers. The role of laparoscopy in generalised peritonitis. Ann R Coll Surg Engl 2000; 82:6-10.
8. Siow SL, Mahendran HA, Wong CM, Hardin M, Luk TL. Laparoscopic versus open repair of perforated peptic ulcer: improving outcomes utilizing a standardized technique. Asian J Surg 2016; 41(2):136-142.
9. Lunevicius R, Morkevicius M. Systematic review comparing laparoscopic and open repair for perforated peptic ulcer. Br J Surg 2005; 92:1195-1207.
10. Koujalagi RS, Kenawadekar R, Gogate AS, Sunil TN. A 1-Year Randomized Controlled Study to Compare Laparoscopic Repair vs. Open Repair for the Treatment of Hollow Viscus Perforation. Indian Journal of Surgery. 2019 Aug 1;81(4):320-5.
11. Zedan AS, Lolah MA, Badr ML, Ammar MS. Laparoscopic versus open repair of perforated duodenal peptic ulcer: a randomized controlled trial. Menoufia Med J 2015;28:62-8.
12. Bertleff MJ, Halm JA, Bemelman WA, van der Ham AC, van der Harst E, Oei HI, Smulders J, Steyerberg E, Lange JF. Randomized clinical trial of laparoscopic versus open repair of the perforated peptic ulcer: the LAMA Trial. World J Surg 2009; 33: 1368-1373.

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