

COMPARATIVE STUDY OF LAPAROSCOPIC AND OPEN SURGICAL METHOD IN MANAGEMENT OF PEPTIC ULCER PERFORATION

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Abstract

Background: Comparative study of laparoscopic and open surgical method in management of peptic ulcer perforation

Methods: The present study was conducted in patients presented with perforation peritonitis to the emergency department in G.G.S medical college and hospital, a tertiary care hospital in Faridkot, Punjab in which comparison of the clinical outcome between laparoscopic and open surgical methods for treatment of Gastro duodenal perforation was study.

Results: Mean operative time of laparoscopic repair group was higher (158.2±0.64 min) in comparison to open repair group (70.8±0.42 min). In the present study post-operative pain score was assessed in each and every patient using Visual analogue scale. On post-operative day 1, mean VAS for OR Group was significantly higher in comparison to LR Group. Later on postoperative day 3, Majority of patients of in LR group had a highest score of 1-4 while in OR group was score 5-7. Next on postoperative day 5, again mean VAS for LR patients was less in comparison to OR Group.

Conclusion: As this is the first kind of study in our geographical area in which role of alcohol proved to be an important risk factor. Laparoscopic approach for repair of perforated peptic ulcer may offer significant advantage over open repair approach with lesser post-operative pain, lesser postoperative complications like wound infections, comparable reperforation rates and lesser duration of hospital stay.

Keywords: Laparoscopic, Open, Repair

Introduction

Since the eradication of *Helicobacter pylori* the incidence of peptic ulcer disease has decreased considerably and the definitive surgical procedures are rarely performed these days. But correspondingly the incidence of perforated peptic ulcer disease has not reduced significantly. The *Helicobacter Pylori* infection, smoking, fasting during Ramadan, use of non-steroidal anti-inflammatory drugs and past history of peptic ulcer are all statistically significant contributing factor for perforation.¹ The perforated peptic ulcer disease is a surgical emergency and the conventional surgical management has been laparotomy with either simple closure or omentum patch. The surgical technique has not changed but the minimal access approach has been increasing used for the closure of perforated peptic ulcer. Since the first successful laparoscopic closure of a perforated peptic ulcer, several prospective and retrospective studies have shown better results compared to open approach.²

Material and Methods

Study Setting

The present study was conducted in the Department of General Surgery of the GGS Medical College & Hospital, Faridkot, Punjab from March 2018 to August 2019

Study Population

Patients with perforation peritonitis who presented to emergency department in Guru Gobind Singh Medical College and Hospital, Faridkot, were included in the study.

Inclusion Criteria

Patient presented to emergency with:

1. Clinical and radiological signs of gastroduodenal perforation were included in the study.
2. Patients who were willing to participate in the study.
3. Age group of the patients between 15-70 yrs.

Exclusion Criteria

1. Patient age less than 15 yr and more than 70 yr.
2. Presentation more than 72 hours.
3. Shock with SBP < 90 mmHg which did not improve after hydration with 2 lit RL solution.
4. Respiratory distress.
5. Cardiac disorder.
6. Contra indication for laparoscopic surgery.

Study design

Hospital based prospective study

Sample size

60 consecutive patients were included in the study and by using randomization software were divided into two groups GROUP –A and GROUP–B.

GROUP-A

Laparoscopic perforation repair GROUP-B

Open perforation repair SAMPLINGTECHNIQUE

Non probability convenient sampling

Statistical Analysis

Statistical testing was conducted with the statistical package for the social science system version SPSS 17.0. Continuous variables were presented as mean \pm SD or median if the data was unevenly distributed. Categorical variables were expressed as frequencies and percentages. The comparison of normally distributed continuous variables between the groups were performed using Student's t test.

Results**Table 1: Socio-Demographic profile**

Variable	Group A (N=30) (Laparoscopic Repair)	Group B (N=30) (Open Repair)	P-value
Mean age \pm SD	46.9 \pm 9.87	46.8 \pm 10.51	>0.05
M : F	26:4	27:3	>0.05

Both groups were comparable

Table 2: Outcome

	Group A (N=30) (Laparoscopic repair)	Group B (N=30)(Open repair)
Operative time in minutes	158.2 \pm 0.64	70.8 \pm 0.42
Post-operative pain day 1	4.83 \pm 1.89	6.06 \pm 1.22
Post-operative pain day 3	3.66 \pm 1.31	4.56 \pm 1.61
Post-operative pain day 5	3.53 \pm 1.88	4.0 \pm 1.36

Mean operative time of laparoscopic repair group was higher (158.2 \pm 0.64 min) in comparison to open repair group (70.8 \pm 0.42 min). In the present study post-operative pain score was assessed in each and every patient using Visual analogue scale. On post-operative day 1, mean VAS for OR Group was significantly higher in comparison to LR Group. Later on postoperative day 3, Majority of patients of in LR group had a highest score of 1-4 while in OR group was score 5-7. Next on postoperative day 5, again mean VAS for LR patients was less in comparison to OR Group.

Table 3: Post-operative complications

Postoperative	Group A(N=30) (Laparoscopic repair)		Group B (N=30) (Open Repair)	
Wound Infection (N, %)	4	13.3	12	40
Abdominal septic Complications (N, %)	5	16.6	11	36.6
Respiratory Complications (N, %)	8	26.6	2	6.6
Re-Exploration (N, %)	4	13.3	3	10
Mortality	0	0	0	0

Discussion

Perforated peptic ulcer is a common abdominal emergency and the surgical treatment is essential in most cases. It is a common medical condition worldwide with a reported annual incidence between 0.03% to 0.19%. It used to be a disorder mainly of younger patients (predominantly males), but recently the age of patients is increasing. The management of perforated peptic ulcer (PPU) has evolved greatly in the past three decades. With the discovery of *Helicobacter pylori* (HP) and advances in ulcer medications, followed by eradication of HP and the administration of proton pump inhibitors has become the standard treatment in most centers

Operation time is a featuring parameter in the studies comparing laparoscopic and open surgery. Varied results are available in literature regarding operation time.

Mean operative time of laparoscopic repair group was higher (158.2 \pm 0.64 min) in comparison to open repair group (70.8 \pm 0.42 min). This may be a tribute to the learning curve, performing a copious intra-abdominal lavage and meticulous surgical closure can be time-consuming.

In consensus with our study Lee DJ *et al*⁸³ in their study also reported that operation time was significantly longer in laparoscopy. They were of the opinion that operation time depends on the hardness of the intra corporeal saturation and requirement of longer time for optimal irrigation with laparoscopic devices.

In the present study post-operative pain score was assessed in each and every patient using Visual analogue scale. On post-operative day 1, mean VAS for OR Group was significantly higher in comparison to LR Group. Later on postoperative day 3, Majority of patients of in LR group had

a highest score of 1-4 while in OR group was score 5-7. Next on postoperative day 5, again mean VAS for LR patients was less in comparison to OR Group. So the significance advantage of minimal invasive was highlighted in all the literature.

In consensus with ours Lunevicius Ret al⁶⁹, Sanabria A.E et al⁹⁸, Siu WT et al⁶⁵, Bertleff M.J et al⁵⁵ and Abdullah et al⁸⁹ also reported similar results regarding post-operative pain. This is explained on minimally invasive nature of laparo scope with little tissue trauma.

Post-operative complications

In the present study we recorded post-operative complications presented by all the patients. It was seen that respiratory complications were found to be lower in LR Group in comparison to OR Group. Other observed complications were abdominal septic complications, wound infections, reoperation and reoperation.

In accordance to our results, Abdullah et al⁴ reported that the rate of pulmonary complications in their study was also lower in the laparoscopy group than in the open group. This can be explained by the higher incidence of co morbidities in the open group, delayed presentation and also due to small number of patients. Again, in another study by Wilhelmsen et al.⁵, similar results were obtained in showing that the rate of pulmonary complications in the laparoscopy group was lower than that in the open group.

Conclusion

As this is the first kind of study in our geographical area in which role of alcohol proved to be an important risk factor. Laparoscopic approach for repair of perforated peptic ulcer may offer significant advantage over open repair approach with lesser post-operative pain, lesser postoperative complications like wound infections, comparable reperforation rates and lesser duration of hospital stay.

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