

Comparative Analysis of Laparoscopic Versus Open Peptic Perforation Repair

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Abstract:

Background and Aim: Peptic perforation refers to a duodenal ulcer perforation or a gastric ulcer perforation. Graham's omental patch repair is required to correct peptic perforations. This surgical intervention can be performed either laparoscopically or openly. The study's aims were to investigate various complications of open laparotomy peptic perforation repair and laparoscopic peptic perforation repair, and then to reduce post-operative complications by customising a suitable procedure in a specific person.

Material and Methods: This was a descriptive study. This one-year study was carried out at a tertiary care centre in Gujarat. These patients were split into two groups. Perforated peptic ulcers were fixed laparoscopically in group A (n=30) participants. Perforated peptic ulcers were fixed openly (laparotomy) in group B (n=30) individuals. In terms of intraoperative time, post-operative hospital stay, and post-operative complications such as surgical site wound infection and post-operative pain, the author compared two groups.

Results: Important factors in our study include intraoperative time, post-operative discomfort, surgical site infection, and hospital stay among patients in groups A and B. Group B patients required postoperative analgesics for a longer period of time than group A patients. Group B patients had a higher risk of surgical site infection than group A patients. Group B patients spend longer time in the hospital after surgery.

Conclusion: The shift in disease pattern favours a straightforward repair approach in perforated peptic ulcers. In patients with perforated peptic ulcers, laparoscopic surgery has no additional disadvantages over open repair, but it has the advantage of reducing post-operative time, surgical site infection, and length of hospital stay. Laparoscopic perforated peptic ulcer repair is therefore recommended whenever possible.

Keywords: Helicobacter pylori, Hospital Stay, Laparoscopic, Peptic Perforation.

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Introduction

Despite the significant decrease in the prevalence of peptic ulcer disease (6-15% in the general population) as a result of advances in medical treatment (H2-blockers, proton pump inhibitors, and Helicobacter pylori eradication therapy), perforated peptic ulcer remains a challenging emergency for surgeons, occurring in 5-10% of cases and accounting for approximately 70% of peptic ulcer disease deaths. [1,2]

The fast advancement of laparoscopic surgery has compounded the issue of the best strategy for treating perforated peptic ulcers. [3] Mouret et al. developed the first laparoscopic sutureless fibrin glue fixed omental patch for the treatment of perforated duodenal ulcers. [4] Nathanson et al. performed the first sutured omental patch repair of a ruptured peptic ulcer. [5] Since then, various methods of laparoscopic repair for perforation site closure have been developed, and laparoscopic repair has grown in popularity around the world.

[6] The incidence of perforated peptic ulcers has lately decreased due to the introduction of anti-ulcer medicines and Helicobacter eradication therapy. There are several treatment options for a perforated peptic ulcer, but upper abdominal incision laparotomy is the most common. In most centres, omental patch repair followed by Helicobacter pylori eradication and proton pump inhibitors is the conventional treatment for perforated peptic ulcers. [7-13]

Long incisions, postoperative agony, and slow recovery are all connected with open surgery. In comparison to open surgery, laparoscopic surgery has a smaller buttonhole incision, less pain, little or no surgical site infection, and a shorter hospital stay. With the advancement of laparoscopic surgery, many surgeons began to adopt the laparoscopic procedure for perforation repair, and numerous studies have been published stating the efficacy of laparoscopy for perforated peptic ulcer

repair. However, whether laparoscopic or open repair is superior remains disputed. [14-19] several writers have claimed that laparoscopic repair is inferior to open repair due to a lack of tactile feeling, a lengthy operative duration, and difficult peritoneal lavage. Several researches comparing laparoscopic surgery to open repair have been published in this debate. [20-22] the study's aims were to investigate various complications of open laparotomy peptic perforation repair and laparoscopic peptic perforation repair, and then to reduce post-operative complications by customizing a suitable procedure in a specific person.

Material and Methods

This was a descriptive study. This investigation was carried out at a tertiary care centre in Gujarat. According to the inclusion criteria, a sample was gathered for a period of one year. The surgery encompassed all patients over the age of 18 who presented with a perforated peptic ulcer. The institutional ethical committee provided ethical approval, and all participants provided signed informed consent. Patients with delayed presentation (>48 hours), absolute contraindications for laparoscopy (uncorrectable coagulopathy, severe cardio pulmonary disease), malignant ulcers (detected by postoperative pathology), rare peptic ulcer sites (jejunum, ileum, lower oesophagus), and other complications with perforated peptic ulcer (bleeding or stenosis) were excluded.

These patients were split into two groups.

Perforated peptic ulcers were fixed laparoscopically in group A (n=30) participants.

Perforated peptic ulcers were fixed openly (laparotomy) in group B (n=30) individuals.

Each group's intraoperative time, postoperative discomfort, surgical site infection, and hospital stay were all tracked. The need for injectable analgesics after surgery was used to assess postoperative discomfort.

Statistical analysis

The collected data was assembled and input into a spread sheet programme (Microsoft Excel 2007) before being exported to the data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). The confidence level and level of significance for all tests were set at 95% and 5%, respectively.

Results

In our study, important characteristics include intraoperative time, post-operative discomfort, surgical site infection, and hospital stay in patients in groups A and B. Table 1 shows the number of perforated duodenal ulcers and perforated gastric ulcers in groups A and B. Table 2 shows the gender distribution in groups A and B. Table 3 shows the intraoperative time spent in groups A and B. The difference in intraoperative time between patients in groups A and B. The need for injectable analgesics after surgery was used to assess postoperative discomfort.

Group B patients required postoperative analgesics for a longer period of time than group A patients. Group B patients had a higher risk of surgical site infection than group A patients. Group B patients spend longer time in the hospital after surgery. So, while there is no significant difference in intraoperative duration between groups A and B, there is a substantial decrease in surgical site infection, postoperative discomfort, and hospital stay in group A patients compared to group B patients.

Table 1: Gender wise Distribution of study Population

| Gender | Group A | Group B |
|--------|---------|---------|
| Male | 24 | 25 |
| Female | 6 | 5 |
| Total | 30 | 30 |

Table 2: Perforated duodenal and gastric ulcer in group A and group B

| Variables | Group A | Group B |
|---------------------------|---------|---------|
| Perforated duodenal ulcer | 21 | 20 |
| Perforated gastric ulcer | 9 | 10 |
| Total | 30 | 30 |

Table 3: Intraoperative time in group A and B

| Gender | Group A | Group B |
|--------|---------|---------|
| <60 | 20 | 19 |
| 60-90 | 8 | 8 |
| >90 | 2 | 3 |

Discussion

Since the initial laparoscopic repair of a perforated peptic ulcer by Mouret et al [4], various clinical trials around the world have reported the procedure's feasibility and safety. [23-25] However, there is still considerable debate about the true benefits of laparoscopic surgery of perforated peptic ulcers.

A perforated peptic ulcer is a common occurrence in the emergency department. It needs surgical intervention. It can be done either laparoscopically or openly. But all that is required is a reduction in post-operative morbidity and mortality. According to certain research, the laparoscopic method requires lengthier operative periods than the open approach. Peritoneal lavage is challenging using a laparoscopic technique. It is also necessary to have prior surgical experience. However, several studies demonstrate no substantial difference between the open and laparoscopic approaches. With research published before to 2004, the surgical time with the laparoscopic method was found to be longer. After 2004, studies show that the laparoscopic and open approaches have the same operational time. As a result, the surgical time in the laparoscopic method is gradually decreasing over time. [21]

Laparoscopic competence and technological improvement in equipment have lowered operational time over time. According to several research, laparoscopic repair has a shorter operational time. [26,27] Less anesthetic and CO2 exposure are related with shorter surgical times, which improves post-operative recovery. According to certain research, laparoscopic surgery has advantages over open abdominal surgery for perforated peptic ulcers, including decreased post-operative time and hospital stay. [28,29] Other studies have found that the laparoscopic method has no advantage over open surgery for perforated peptic ulcers, and may potentially have a worse outcome due to the longer operative duration. [30,31] Post-operative discomfort is significantly reduced with laparoscopic treatment of a ruptured peptic ulcer. [32-34] According to Lau's research, the laparoscopic group had a much lower analgesic demand. [35] Some research used the VAS pain scale, which likewise revealed a significantly lower pain score with the laparoscopic method.

In the current study, there is no significant difference in intraoperative time between the laparoscopic and open approaches, but the postoperative analgesic requirement, surgical site infection, and length of hospital stay are significantly lower in the laparoscopic perforated peptic ulcer repair group than in the open surgery group. This was consistent with the findings of several earlier investigations. [36-38] Other studies, on the other hand, have observed practically equal

hospital stays in both groups due to the patients' advanced age and various comorbidities, which necessitated a longer hospital stay to improve their overall condition. [10,26]

Several studies have shown that laparoscopic repair is superior to open surgery for treating perforated peptic ulcers. [39] According to a recent study, laparoscopic patients require open surgery due to technical issues, the size of the perforation, significant peritoneal adhesions, hemodynamic instability, or perforation not identified. [39] Overall morbidity, surgical site infection, and length of hospital stay were significantly lower in laparoscopic repair compared to open repair, but there was no significant difference in post-operative leak, intraperitoneal abscess, postoperative sepsis, paralytic ileus, reoperation rate, or mortality rate. As a result, laparoscopy is the preferred treatment for a perforated peptic ulcer.

The learning curve and small number of included patients are two of the study's drawbacks.

Conclusion

The shift in disease pattern in perforated peptic ulcers favours a straightforward repair method. In patients with perforated peptic ulcers, laparoscopic surgery has no additional disadvantages over open repair, but it has the advantage of reducing post-operative time, surgical site infection, and length of hospital stay. Laparoscopic perforated peptic ulcer repair is therefore recommended whenever possible. Laparoscopy should be added to the general surgeon's toolbox for treating patients with peritonitis.

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