

## Laparoscopic repair in perforated peptic ulcer

Abdul Razaque Qazi , Ahsan Ali Leghari, Pir Sahib Shah

### Abstract

**Objectives:** To evaluate the efficacy and outcome of laparoscopic approach in perforated peptic ulcer (PPU) in our setup.

**Design:** Prospective and observational study.

**Setting and duration:** Department of Surgery PMCH & Faiz Medicare, Nawabshah from July 2007 to June 2010.

**Methodology:** A total of 25 patients with diagnosis of PPU were recruited in this study. Patients with extensive peritonitis, upper abdominal incision, shock or presenting 24 hours after the onset of perforation were excluded out. Patients were followed for complications.

**Results:** Duration of procedure was 75 minutes, patients were on parenteral analgesics for 2 days, hospital stay was 5.5 days. 4 patients required conversion to open procedure, postoperative complication were recorded in 6 patients.

**Conclusion:** Laparoscopic closure of PPU is safe procedure and has advantages of absence of midline incision, low Postoperative pain and short hospital stay .To achieve desirable results, it is essential that Laparoscopic procedure should be done by expert surgeon or under his supervision and Careful selection of patients is crucial in curtailing conversion and complication rate.

**Keywords:** Peptic Ulcer Disease, Perforated Peptic Ulcer, Laparoscopic Closure

### Introduction:

The need for surgical intervention in peptic ulcer disease (PUD) has greatly decreased, with the advent of proton pump inhibitors.<sup>1,2</sup> However the incidence of Perforated peptic ulcer (PPU) changed little.<sup>3</sup> PPU mainly occurs due to disruption in balance between acid secretion and mucosal defenses that resist acid digestion .Majority of the patients with PUD are infected with H pylori. However NSAIDS, steroids use, cigarettes smoking, alcoholism and defective immune mechanisms are also implicated in pathophysiology of PUD. Because of the recognition of role of Helicobacter pylori in PUD and its eradication by effective drug therapy, complicated peptic ulcer has become a rarity. Therefore, most, PPU's seen in recent are acute type associated with non steroidal anti inflammatory drugs and stressful conditions.<sup>4, 5,6,7,8,9,10</sup>

As many as 10 % of patients with peptic ulcers get complication of perforation of the Stomach and duodenum culminating in peritonitis. Delay in diagnosis may result in the Life threatening complication including death. It has been seen that often these patients have comorbid factors which may influence the ultimate outcome of the disease. Boey et al reported in his series the factor associated with high morbidity and mortality rates included serious concurrent medical illnesses, preoperative hemodynamic instability and perforation more than 48 hours in duration at the time patient presented.<sup>11</sup>

The traditional treatment of PPU is urgent surgical repair with or with definitive procedure depending on the condition of the patient. Considering the changing pattern of PPU performing a surgical acid reducing procedure is rarely indicated.<sup>12</sup>

Peoples Medical College,  
Nawabshah  
AR Qazi  
AA Leghari  
PS Shah

### Correspondence:

Abdul Razaque Qazi,  
Associate Professor,  
Surgical Unit-III,  
Peoples Medical College,  
Nawabshah.  
Cell: 0300216581

In open procedure after thorough peritoneal lavage, perforation is closed with or without reinforcement of omental patch. Few surgeons during emergency peptic ulcer surgery have adequate experience with selective vagotomy, therefore it is recommended that suture or omental flap is followed by medical treatment including elimination of H pylori if present otherwise maintain on proton pump inhibitor.<sup>13</sup> Laparoscopic treatment of PPU was first reported by Mouret et al in 1989<sup>14</sup> followed soon after by Nathanson et al.<sup>15</sup> The recognized advantages of laparoscopy are decreased postoperative pain, early mobilization, early return to work and lower complication rate, make this treatment modality attractive to many surgeons all over the world. Nonetheless there are relative contraindications which include elderly patients, cardiac pathology, chronic respiratory insufficiency, obesity, cirrhosis and severe coagulopathies.

There are variety of techniques to close the perforation laparoscopically such as intra and extracorporeal knots, holding omental path with fibrin glue or sealing with gelatin etc. The aim of this study was to evaluate the efficacy and safety of laparoscopic closure of PPU and also identify those patients who are not suitable for this treatment modality.

**Materials and Methods:**

Total 25 patients were recruited for this prospective study. This study was conducted from July 2007 to June 2010 and all patients were attempted for laparoscopic closure of PPU in Surgical Unit 3, PMCH and private hospital. The diagnosis was based on sudden onset of severe, sharp abdominal pain present in epigastrium or generalized pain accompanied by nausea and vomiting. On examination obvious distress, tachycardia, tachypnoea along with abdominal signs of tenderness guarding and rigidity. Patients were also asked about past history of PUD, intake of NSAIDS, alcohol and smoking. Routine investigations such as Blood CP, serum amylase, blood urea, chest x-ray in erect posture and US were also performed to reach the diagnosis. Exclusion criteria for this procedure were extensive peritonitis, upper abdominal incision, patients

presented 24 hours after perforation and shock. Parameters observed were operative time, intraoperative and postoperative complication, pain management, hospital stay and rate of conversion to open surgery. Once the diagnosis of PPU was established patient resuscitated aggressively before the operation. Laparoscopy performed via 4 ports one port in the umbilicus for camera, 2 working ports at right and left upper abdomen and one port in the epigastrium to retract the quadrate lobe of the liver. 2-0 vicryl used for closure of perforation and omental patch anchored over the perforation with vicryl stitches to seal the perforation completely, thorough abdominal lavage performed with saline.

**Results:**

In 25 consecutive patient's laparoscopic closure of perforated peptic ulcer (PPU) attempted. There were 20 (80%) patients males and 5 (20%) females (Figure-1). The mean age was 42.2 (22-75) years (Figure-2). The mean operative time was 75 (55 to 110) minutes. Patients have started oral intake from third day. The mean postoperative hospital stay was 5-8 days. In 5 (16%)

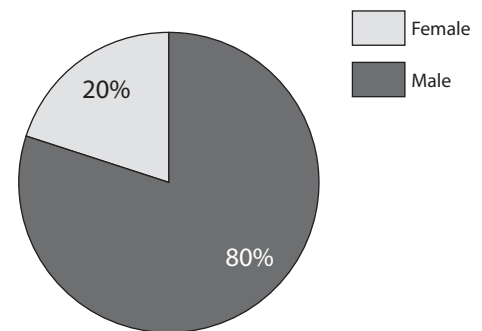


Figure 1: Sex Distribution (n= 25)

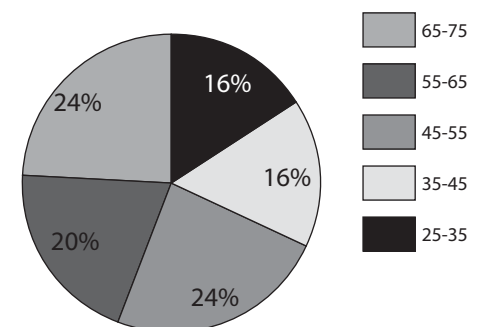


Figure 2: Age Distribution (n= 25)

patients conversion to open procedure was necessitated due to following reasons, i.e large size of ulcer, suspected malignancy in gastric ulcer and presence of local abscess (Table-1). The postoperative complications were chest infection recurrence of perforation, infection of umbilical port and subphrenic abscess (Table-2).

### Discussion:

Advances in medical treatment of PUD have dramatically reduced the number of elective Procedure performed for this disease. Nonetheless the rate of complications appears to be unchanged. PPU is a notorious complication of PUD frequently leads to peritonitis. Initial treatment to be directed toward correction of hypovolaemia and any electrolyte imbalance. Oliguria and poor peripheral perfusion are contraindication to immediate operative treatment and their correction should take precedence even over radiological studies.<sup>16</sup> There is no doubt that some patients with perforated ulcer can be managed non operatively with successful out come. The problem with this approach, which is reserved for poor risk elderly patients, is a high incidence of a residual abscess formation, particularly in subphrenic region which will subsequently require drainage.<sup>17</sup> The issue that has been raised often is whether the patient with perforated peptic ulcer must be operated on by an open procedure or laparoscopic technique should be employed. Simple closure with omental patch is not a demanding procedure for a surgeon who is able to perform intracorporeal knots. The choice between combining definitive treatment and simple closure of the perforation is still a matter of controversy. This choice depend upon certain factors, including the age and fitness of the patient and the status of peritoneal cavity.<sup>18</sup> Laparoscopy has significant advantage that it allows more accurate visualization of peritoneal cavity and can evacuate collection of fluid

which may be distant from perforation. Other establish advantages are less postoperative pain which is supported by significant reduction in post operative analgesic requirement, avoidance of excessive gut manipulation reflects in short period of ileus, early oral intake of food. Early mobilization, short hospital stay an early resumption of work make this technique an attractive alternative to laparotomy. However this approach is not as popular as laparoscopic cholecystectomy due to disadvantages of significantly prolong duration of operation and high rate of suture leak requiring repeated operation. During the 2 years study period we only manage to select 25 patients due to strict criteria in which we excluded patients with any risk factors, patients presented 24 hours after perforation and due to lack of facility of laparoscopy in emergency only few patients underwent procedure at elective list, however majority of patients were operated at private hospital. In our study duration of operation was average 75 (65 to 110) minutes, which is consistent with studies conducted by Schirus e al<sup>19</sup> and different from Mastuda<sup>20</sup>. One of disadvantages of this technique is significantly longer time than open procedure, however with increasing expertise the operative time of laparoscopy become shorter. In our series parenteral analgesics were given for first 2 days. Average hospital stay was 6.5 (5 to 8) days, which was also observed by Arnaude al<sup>21</sup>. 4 (5.7 %) patients necessitated conversion to open, the most common reasons were large size (more than 1 cm), gastric cancer and presence of abscess. The postoperative complications were chest infections, subphrenic abscess and re-operation due to suture leak. Abscess was drained under ultrasound and leak required repeated procedure. Siu et al<sup>22</sup> found that laparoscopic repair PPU was a safe and reliable procedure, associated with a shorter operating time, less postoperative pain,

Table 1: Reasons for Conversion (n=25)

Reasons	Number of Patients (%)
Large size of Perforation (>1cm)	02(33%)
Local Abscess	02(33%)
Gastric Cancer	01(16%)

Table 2: Post Operative Complication (n=25)

Complication	Number of Patients (%)
Recurrent Perforation	02(08%)
Chest Infection	02(08%)
Port Infection	01(04%)
Subphrenic Abscess	01(04%)

reduced chest complications, a shorter postoperative hospital stay and return to normal daily activities than the normal conventional surgery.

### Conclusion:

Our study has shown that laparoscopic PPU closure is not a difficult technique can supplant the open procedure due to its advantages of fewer requirements of analgesics, short hospital stay and early return to work with cosmetically acceptable scar.

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