

ORIGINAL ARTICLE

Surgical Audit of Leakage after Open Surgical Repair of Perforated Peptic Ulcer

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ABSTRACT

Objective: to critically analyze the leakage after open surgical repair of peptic ulcer perforation.**Methods:** All patients who fulfilled the inclusion criteria and visited to surgical department SMBBMU, Larkana from September, 2018 to March, 2021 were included in the study. Informed consent was taken after explaining the procedure, risks and benefits of the study. X-ray abdomen erect posture, leukocyte count, and serum amylase were performed. After surgery, site of perforation and type of surgery were recorded. Patients were followed for 30 days in order to assess the leakage.**Results:** Mean $\pm$ SD of age was 42.6 ± 8.5 years. Out of 203 patients included in the study, 145 (71.4%) were male while 58 (28.6%) were female. Leakage was noted in 13 (6.4%) patients.**Conclusion:** It is to be concluded that leakage was less likely prevalent after peptic ulcer perforation repair, but we cannot rule out residual confounders. Practical implication**Keywords:** Leakage, Peptic Ulcer Perforation, Repair, Peritonitis, Laparoscopy, Surgery.

INTRODUCTION

Peritonitis due to perforated peptic ulcer (PPU) is one of the commonest surgical emergencies attended by a general surgeon. Perforation is an acute life-threatening complication of peptic ulcer disease. In most cases it requires urgent surgical management and is associated with a high rate of mortality and morbidity.¹

Nowadays surgery for PPU, after initial resuscitation, consists of laparotomy/laparoscopy with peritoneal lavage and closure of perforation with or without omental patch. Cellan-Jones in 1929 and Graham in 1937 described their techniques of closure of perforation and reported a mortality rate of 17%²⁻³. The addition of definitive acid reducing procedures after repair of PPU although popular in mid and late twentieth century has been made redundant after the introduction of proton pump inhibitors⁴. Despite the passage of time and improvements in care of critically ill patients, PPU still has a substantial mortality⁵. Every year peptic ulcer disease affects 4 million people around the world⁶. It is widely prevalent in Pakistan and is more common among the population of south Asia⁷⁻⁸. Complications are encountered in 10–20% of these patients and 2–14% of the ulcers will perforate⁹. Perforation is the second most common ulcer-related complication. During the early decades of the twentieth century ulcer perforation incidence increased greatly, and there was an epidemic of ulcer perforations situated in the duodenum of middle-aged men¹⁰. Today ulcer perforation incidence is stable or tends to decline, and most patients with ulcer perforations are elderly men and women, with perforations in the prepyloric and pyloric areas as frequent as perforations in the duodenum¹⁰. While older age, comorbidity, and use of NSAIDs or steroids are associated with mortality. Shock upon admission, preoperative metabolic acidosis, tachycardia, acute renal failure, low serum albumin level, high American Society of Anesthesiologists score, and pre-operative delay >24 h were associated with poor prognosis.¹¹ In a study, frequency of leakage was 16%¹². In another study, the frequency of leakage was 5%.¹³ Although several studies have been done worldwide but there was variability in the studies that were published. As there was no local study available on regional as well as national level. Therefore, it was important to investigate the recent status of it in our country, so that treatment of such patients should be anticipated in appropriate clinical line and appropriate diagnosis is made to prevent complications. Furthermore, this study will open windows for newer research protocols and will set the priorities of the patient's treatment.

METHODS

All patients who fulfilled the inclusion criteria and visited to surgical department SMBBMU, Larkana from September, 2018 to March,

2021 were included in this cross-sectional study. Informed consent was taken after explaining the procedure, risks and benefits of the study. X-ray abdomen erect posture, leukocyte count, and serum amylase were performed. After surgery, site of perforation and type of surgery were recorded. Patients were followed for 30 days in order to assess the leakage. 203 patients were included in the study.

RESULTS

In this study 203 patients were included to analyze the leakage after peptic ulcer perforation repair. The frequency distribution of leakage according to age groups is shown in table 1. Mean $\pm$ SD of age was 42.6 ± 8.5 years with C.I (41.42-43.77). Mean $\pm$ SD of weight was 66.5 ± 11.5 with C.I (64.9-68.09) kg. Mean $\pm$ SD of height was 1.61 ± 0.52 with C.I (1.53-1.68) meters. Mean $\pm$ SD of body mass index was 26.1 ± 5.3 with C. I (25.36-26.83) kg/m². Out of 203 patients included in the study, 145 (71.4%) were male while 58 (28.6%) were female. In distribution of site of perforation, 121 (59.6%) patients had duodenal perforations while 82 (40.4%) had gastric ulcer. Type of surgery showed that simple closure with omental patch was noted in 95 (46.8%) patients, gastrectomy in 63 (31.0%) while 45 (22.2%) had done with two-layer closure surgery. Table 2 shows the relationship of different surgical procedures and the leakage. Socioeconomic status showed that 70 (34.5%) patients belonged to lower class, 90 (44.3%) from middle class while 43 (21.2%) were from upper class.

Leakage was found in 13 (6.4%) patients. Stratification of age group, gender, body mass index, site of perforation, type of surgery, and socio-economic status were done with respect to leakage, showing no significant result.

Table 1: Stratification of Age Group with Leakage n=203

Age Group [In Years]	Leakage		P-Value
	Yes	No	
18 – 40	9 (4.4%)	77 (37.9%)	0.042
>40	4 (2.0%)	113 (55.7%)	

Table 2: Stratification for Type of Surgery with Leakage n=203

Type of Surgery	Leakage		P-Value
	Yes	No	
Simple closure with omental patch	5 (2.5%)	90 (44.3%)	0.086
Gastrojejunostomy	2 (1.0%)	61 (30.0%)	
Two layered closure	6 (3.0%)	39 (19.2%)	

Applied Chi-Square test

Post-operative complications included intra-abdominal collection (8.1%), leakage (2.1%) and re-operation (1.2%). Our low leak rates (6.4%) could be explained by early presentation, prompt diagnosis, early resuscitation and appropriate surgery. Our data, mortality was 7.2%.

DISCUSSION

Perforated peptic ulcer (PPU) is a serious complication of PUD and patients with PPU often present with acute abdomen that carries high risk for morbidity and mortality. The lifetime prevalence of perforation in patients with PUD is about 5%. The classic triad of sudden onset of abdominal pain, tachycardia and abdominal rigidity is the hallmark of PPU. Severe pain, systemic inflammatory response from chemical peritonitis and fluid deficit either due to poor intake or vomiting or pyrexia leads to compensatory tachycardia. In patients who delay seeking medical attention, hypotension ensues due to total body water deficit. If uninterrupted; this progresses to mental obtundation and acute kidney injury. This leads to a state where patient becomes physiologically unfit for operative intervention which is absolutely necessary. Hence it is important to establish prompt confirmatory diagnosis. Erect chest radiograph may miss 15% of cases with air under the diaphragm in patients with bowel perforation. Early diagnosis, prompt resuscitation and urgent surgical intervention are essential to improve outcomes. Exploratory laparotomy and omental patch repair remains the gold standard. Laparoscopic surgery should be considered when expertise is available. Gastrectomy is recommended in patients with large or malignant ulcer. Post-operative complications have been reported at around 30%. The most common post-operative complications were post-operative leak (5.9%) and wound dehiscence (4.7%).^{13-14,16}

This study presents the audit of the open surgical repair of the patients who presented with the perforate peptic ulcer. Total 203 patients were enrolled.

The mean age in our study was 42.6±8.5 years. Vats R, et al¹⁵ noted age as 44 years. Lee FY, et al¹⁶ noted as 51.5±18.3 years while Siu WT, et al¹⁷ found age as 53.8 years. Siu WT, et al¹⁷ found to have a mean age of 54 years. In this study, the mean weight was 66.5±11.5 kg, mean height was 1.61±0.52 meters and mean body mass index was 26.1±5.3 kg/m². In current study, out of 203 patients 145 (71.4%) were male while 58 (28.6%) were female. There were 53 (96.36%) males and 02 (3.64%) females found in the study of Vats R, et al¹⁵. Lee FY, et al¹⁶ documented to have 365 (83.71%) males and 71 (16.29%) female patients. Siu WT, et al¹⁷ reported to have 53 (84.1%) males and 10 (15.9%) females.

In recent study, in distribution of site of perforation, 121 (59.6%) patients had duodenal perforations while 82 (40.4%) had gastric ulcer¹⁹. The study of Vats R, et al¹⁵ found the site of perforation as 29 (63.1%) had duodenal perforations while 17 (36.9%) had gastric. In the study of Lee FY, et al¹⁶, duodenal perforation accounted for 344 (78.9%) cases. Siu WT, et al¹⁷ noted to have duodenal perforations in 45 (71.4%) cases. Siu WT, et al¹⁷ reported that duodenal perforation was noted in 137 (79.7%) patients and gastric ulcer in 13 (7.6%). Another study found that 67% of perforations were located in the duodenum and only 17% were gastric ulcers¹⁸. Type of surgery showed that simple closure with omental patch was noted in 95 (46.8%) patients, gastro jejunostomy in 63 (31.0%) while 45 (22.2%) had done with two-layer closure surgery. Socioeconomic status showed that 70 (34.5%) patients belonged to lower class, 90 (44.3%) from middle class while 43 (21.2%) were from upper class.

In present study, leakage was documented in 13 (6.4%) patients. Vats R, et al¹⁵ reported leakage as 09 (16%). Lee FY, et

al¹⁶ reported the incidence of leakage as 7.8% whereas Siu WT, et al¹⁵ noted the same in 10 (15.87%) patients.

In present study, stratification of confounders / effect modifiers with respect to leakage, significant difference was reported in age group (P=0.042), body mass index (P=0.037) whereas insignificant difference was documented in gender (P=0.227), site of perforation (P=0.153), type of surgery (P=0.086) and socioeconomic status (P=0.277).

CONCLUSION

It is to be concluded that leakage was less likely prevalent after peptic ulcer perforation repair, but we cannot rule out residual confounders. The sample population represents a single institutional experience; but the study sample can be generalized as the sample came from various areas of Pakistan.

Disclaimer: This study is based on a Thesis in FCPS course.

Conflict of interest: None

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