

Frequency of Complications of Open Omental Patch Repair for Perforated Duodenal Ulcers

Open Omental Patch Repair for Perforated Duodenal Ulcers

Bezan Baloch¹, Ashiq Hussain², Nazeer Ahmed Sasoli¹, Muhammad Tahir³, Masroor Ahmad⁴ and Shah Wali⁵

ABSTRACT

Objective: This study was conducted to determine the frequency of post-operative complications of omentoplasty in patients with perforated duodenal ulcers.

Study Design: Descriptive Study.

Place and Duration of Study: This study was conducted at the Department of General Surgery, Bolan Medical Complex Hospital Quetta from September 2018 to February 2020.

Materials and Methods: A total number of 261 patients with diagnosis of duodenal peptic ulcers having age 18 to 60 years were included in this study. Closure of perforated duodenal ulcers was done by giving a midline laparotomy incision. Following identification of the perforation area, extensive peritoneal toilet was performed using warm saline. Patch repair was then done in standard fashion. Mass closure of fascia was performed using omental patch with 1/0 suture and interrupted closure to skin incision subsequently with proline sutures. Diagnosis of post-operative complications of omentoplasty e.g. organ space infections, sepsis and death rate were noted in the post-operative period.

Results: Mean age of patients was 40.42±9.61 years. There were 144 (55.17%) male and 117 (44.83%) female patients. Mean duration of symptoms of patients was 9.49±4.38 hours. Organ space infections occurred in 16 (6.13%) patients, sepsis in 10 (3.83%) patients and mortality in 23 (8.81%) patients.

Conclusion: Omental patch repair is simple to perform and yet reliable for closure of much large perforations. Only Patch closure is sufficient for duodenal perforations considering low complications rate. In present study frequency of complications was comparable as mentioned in previous studies.

Key Words: Perforated peptic ulcers, omental patch repair, mortality.

Citation of article: Baloch B, Hussain A, Sasoli NA, Tahir M, Ahmad M, Wali S. Frequency of Complications of Open Omental Patch Repair for Perforated Duodenal Ulcers. *Med Forum* 2020;31(9):21-24.

INTRODUCTION

Structurally the duodenum is C shaped segment part of the the gastrointestinal tract and limited to the pylorus. Duodenal perforation is an occasional but fatal illness.¹ Perforated duodenal ulcer was first described by Muralto in 1688 and reported by Lenepneau.² There after Dean presented the first case in 1894 which successfully surgical closure of a perforated duodenal ulcer.³ Perforated duodenal ulcer disease is associated with a 2% to 10% mortality rate, with septicaemia being the most common cause of death. Preoperative

shock, perforation for greater than 24 hours prior to surgical intervention, and concurrent significant illness have consistently been shown to be predictive of mortality, and the presence of all three risk factors carries a near 100% mortality.⁴ Perforation and fistulas of the gastrointestinal tract may occur after endoscopic/surgical procedures and disease states perforated peptic ulcer.⁵ Iatrogenic gastrointestinal tract perforation rates proportionally increase as more GI endoluminal procedures are performed.⁶ For almost three decades now, the standard of care to treat perforated foregut ulcers has been by simple closure with or without an omental patch (OP) and long-term proton pump inhibitor (PPI) therapy, with antibiotic treatment for *Helicobacter pylori* eradication if present.^{7, 8} The expected high morbidity and mortality from such surgical procedures raises a question about the need for less invasive procedures.⁹ Despite advancements in therapeutic techniques regarding the management of perforated duodenal ulcers, all procedure are still associated with inherent technical and logistic complexity. Clipping of the duodenal ulcers by using an omentum patch has been advocated for sealing larger defects.^{10, 11} Very little data is published regarding the complications of usage of omental patch

¹. Department of Surgery / Microbiology² / paediatric Medicine³ / Plastic Surgery⁴ / ENT⁵, Bolan Medical College Quetta.

Correspondence: Dr. Bezan Baloch, Assistant Professor of Surgery, Bolan Medical College Quetta.

Contact No: 03337906920

Email: bezanbaloch@gmail.com

Received: May, 2020

Accepted: August, 2020

Printed: September, 2020

for closure of duodenal peptic ulcers. Sepsis, organ space infections and death are common devastating complications of omentoplasty. A study found organ space infection rate of 4.6%, sepsis rate of 4.6% and death rate also 4.6%.¹² The wound infections organ space rate of 6.0%, sepsis in 2.0% patients and death rate of 8.0% in patients of perforated duodenal ulcers.¹³ Very little work has been done regarding the complications of omentoplasty in patients of perforated duodenal ulcers and no data has been published from Pakistan regarding the complications of omentoplasty (omental patch) in patients of duodenal ulcers. The results of this study will help us to determine frequency of complications of omentoplasty in patients of duodenal perforations and will help us to recognize what are the most frequent complications in these patients. By knowing most frequent complications we will be able to adopt preventive measures so that we can reduce the frequency of these complications.

MATERIALS AND METHODS

This is Descriptive Study was completed at Department of Surgery, Bolan Medical Complex Hospital, Quetta from September 2018 to February 2020. First of all, approval was taken from the ethical committee of the hospital. After approval, a total number of 261 patients who presented in department of emergency surgical unit of Bolan Medical Complex Hospital Quetta fulfilling the inclusion criteria were included in this study. Besides, non-probability, Consecutive sampling were used for sample collection. Both male and female patients with diagnosis of duodenal peptic ulcers having age 18 to 60 years also included. Patients planned to undergo re-do operations for perforated duodenal ulcers were excluded. Closure of perforated duodenal ulcers was done. Diagnosis of post-operative complications of omentoplasty e.g. organ space infections, sepsis and death rate were made according the criteria given in the operational definitions. Data regarding age, and gender of patients was also calculated.

Data was analyzed using SPSS v17. Frequency and percentage were used to present gender, organ space infections, sepsis and operative mortality. While age, and duration of symptoms was presented as mean + standard deviation. Effect modifiers such as age, gender of patients and duration of symptoms were controlled by stratification. Post-stratification Chi-square test was applied to determine the effect of these effect modifiers on complications of omentoplasty e.g. organ space infections, sepsis and operative mortality. P-value <0.05 was considered as significant effect.

RESULTS

Mean age of patients included in this study was 40.42±9.61 years. Minimum age was 18 years and maximum age was 60 years (Table 1).

Table No. 1: Descriptive Statistics of Age

Age (Years)	
Mean	40.42
S.D.	9.61
Minimum	18
Maximum	60

Mean duration of symptoms of patients was 9.49±4.38 hours. Minimum duration of symptoms was 02 hours and maximum duration of symptoms was 24 hours. There were more males as compared to the females. There were 144 (55.17%) male and 117 (44.83%) female patients. Figure. 1 is demonstrating the organ space infections occurred in 16 (6.13%) patients and remaining 245 (93.87%) patients has no organ space infection.

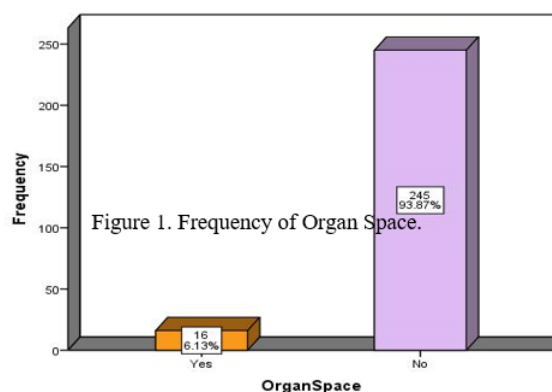


Figure No. 1: Frequency of Organ Space

Table No.2: Stratification of Age to Determine the Association of Age with Organ Space Infections, Sepsis and Mortality

		Age Group		P-value
		18-40 Years	41-60 Years	
Organ Space	Yes	10	06	0.42
	No	120	125	
Sepsis	Yes	03	07	0.33
	No	127	124	
Mortality	Yes	13	10	0.64
	No	117	121	

Regarding frequency of Sepsis, there were 10 (3.83%) patients who were diagnosed with sepsis and remaining 251 (96.17%) patients did not suffered from sepsis. Mortality occurred in 23 (8.81%) patients out of 261 patients. Stratification of age was performed, in patients having age 18-40 years, organ space infections occurred in 10 patients and in patients having age 41-60 years, organ space infections occurred in 06 patients with significant p-value of 0.42. In patients having age 18-40 years, sepsis occurred in just 03 patient and in patients having age 41-60 years, sepsis occurred in 07 patients with insignificant p-value of 0.33. In patients having age 18-40 years, mortality occurred in 13 patients and in patients having age 41-60 years, mortality occurred

in 10 patients with insignificant p-value of 0.64 (Table 2).

Stratification of gender was performed, in male patients, space organ was occurred in 10 patients and in female patients, space organ infections occurred in 06 patients with statistically insignificant p-value of 0.543. In male patients, sepsis occurred in 05 patients and in female patients, sepsis occurred in 05 patients with statistically significant p-value of 0.737. Regarding mortality, mortality occurred in 12 male patients and in 11 female patients with statistically insignificant p-value of 0.762 (Table 3).

Table No.3: Stratification of Gender to Determine the Association of Gender with Organ Space Infections, Sepsis and Mortality

		Gender		P-Value
		Male	Female	
Organ Space	Yes	10	06	0.543
	No	134	111	
Sepsis	Yes	05	05	0.737
	No	139	112	
Mortality	Yes	12	11	0.762
	No	132	106	

Stratification of duration of symptoms was performed, in patients having duration of symptoms 02-09 hours, organ space infections occurred in 12 patients and in patients having duration of symptoms 10-24 hours, space organ infections occurred in 04 patients. This difference was statistically insignificant with p-value of 0.067. In patients having duration of symptoms 02-09 hours, sepsis occurred in just 04 patients and in patients having duration of symptoms 10-24 hours, sepsis occurred in 06 patients. This difference was statistically insignificant p-value of 0.406. In patients having duration of symptoms 02-09 hours, mortality was occurred in 13 patients and in patients having duration of symptoms 10-24 hours, mortality was occurred in 10 patients. This difference was also statistically of 0.714 (Table 4).

Table No. 4: Stratification of Duration of Symptoms to Determine the Association of Duration of Symptoms with Organ Space, Sepsis and Mortality

		Duration of Symptoms		P-Value
		2-9 Hours	10-24 Hours	
Organ Space	Yes	12	04	0.067
	No	126	119	
Sepsis	Yes	04	06	0.406
	No	134	117	
Mortality	Yes	13	10	0.714
	No	125	113	

DISCUSSION

Since the introduction of the management of perforated duodenal ulcers by omental (Graham) patch plication in

1937, the surgical technique has been evolved with the introduction of different modifications and approaches which often used the same principle of closure of the perforation combined with extensive peritoneal lavage.¹⁴ The approach of open repair of perforated duodenal ulcers remained the gold standard treatment. It was simple and effective and provided long-term regression of the disease when combined with eradication of *H. pylori* and recess of nonsteroidal anti-inflammatory medication. In these patients, mortality is frequently associated with underlying sepsis and inflammatory response, which correlates with patient risk factors rather than surgical technique or complications.¹⁵ In present study, we evaluated the complications rate of omental patch repair for management of perforated peptic ulcers. In present study, most common complication was organ space infections occurred in 6.13% patients, followed by sepsis that was diagnosed in 3.83% patients. And mortality occurred in 8.81% patients. A study conducted by lee et al.¹² on outcomes of omental patch repair including 108 patients who underwent open omental patch repair. They reported organ space infections in 4.6% patients, sepsis in 4.6% patients and death also, in 4.6% patients. In another study conducted by Vakayil et al.¹⁶ involving 1846 patients who underwent open omental patch repair for management of perforated peptic ulcers, reported organ space infections in 6.2% patients, sepsis in 11.8% patients and mortality in 5.8% patients. In a study conducted in Pakistan by Unar et al.¹⁷ on postoperative complications of omental patch repair reported intra-abdominal abscess in 6.2% patients, reoperations in 3.6%, renal failure in 4.1%, post-operative leakage in 3.6% patients and mortality in 5.1% patients after surgery. Etonyeaku et al.¹⁸ also reported similar outcomes they reported organ space infections in 8.9% patients, and mortality rate of 13.3%.

Moreover, the factors that can contribute to increased frequency of complications are advanced age, cigarette smoking and delay in surgery after the onset of symptoms.¹⁹ In present study we included only those patients who had duration of symptoms <24 hours to minimize the effect of delay in treatment on surgical complications. We did not find any significant association of age, gender and duration of symptoms on post-procedural complications.

CONCLUSION

Omental patch repair is simple to perform and yet reliable for closure of much large perforations. Only Patch closure is sufficient for duodenal perforations considering low complications rate. In present study frequency of complications was comparable as mentioned in previous studies.

Author's Contribution:

Concept & Design of Study: Bezan Baloch
 Drafting: Ashiq Hussain, Nazeer Ahmed Sasoli
 Data Analysis: Muhammad Tahir, Masroor Ahmad, Shah Wali
 Revisiting Critically: Bezan Baloch, Ashiq Hussain
 Final Approval of version: Bezan Baloch

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Lopez PP, Gogna S, Khorasani-Zadeh A. Anatomy, abdomen and pelvis, duodenum. Stat Pearls Intenet 2019.
- Ansari D, Torén W, Lindberg S, Pyrhönen HS, Andersson R. Diagnosis management of duodenal perforations: a narrative review. *Scan J Gastr* 2019;54: 939-44.
- Afshin Amini; Richard A. Lopez Duodenal Perforation InStat Pearls Internet 2020.
- 4.Donovan AJ, Berne TV, Donovan JA. Perforated duodenal ulcer: an alternative therapeutic plan. *Arch Surg* 1998;133 :1166-71.
- Nirula R. Gastroduodenal perforation. *Surg Clin* 2014;94 :31-4.
- Bielawska B, Day AG, Lieberman DA, Hookey LC. Risk factors for early colonoscopic perforation include non-gastroenterologist endoscopists: a multivariable analysis. *Clin Gast Hep* 2014;12: 85-92.
- Satoh K, Yoshino J, Akamatsu T, Itoh T, Kato M, Kamada T, et al. Evidence based clinical practice guidelines for peptic ulcer disease 2015. *J Gastr* 2016;51:177-94.
- Smith D, Roeser M, Naranjo J, Carr JA. The natural history of perforated foregut ulcers after repair by omental patching or primary closure. *Eur J Trau Emer Surg* 2018; 44:273-277.
- Moran EA, Gostout CJ, McConico AL, Bingener J. Natural orifice transluminal endoscopic surgery used for perforated viscus repair is feasible using lower peritoneal pressures than laparoscopy in a porcine model. *J Am Coll Surg* 2010; 210: 474-9.
- Bonin EA, Bingener J, Rajan E, Knipschild M, Gostout CJ. Omentum patch substitute for facilitating endoscopic repair of GI perforations: an early laparoscopic pilot study with a foam matrix plug (with video). *Gastro Endosc* 2013;77:123-30.
- Budzyński P, Pędzwiatr M, Grzesiak-Kuik A, Natkaniec M, Major P, Matłok M, et al. Changing patterns in the surgical treatment of perforated duodenal ulcer—single centre experience. *Videos Other Minii Tech* 2015;10 :430.
- Lee DJ, Ye M, Sun KH, Shelat VG, Koura A. Laparoscopic versus open omental patch repair for early presentation of perforated peptic ulcer: matched retrospective cohort study. *Surg Res Pract* 2016;2016: 8605039.
- Bertleff MJ, Halm JA, Bemelman WA, van-der-Ham AC, van-der-Harst E, Oei HI, et al. Randomized clinical trial of laparoscopic versus open repair of the perforated peptic ulcer: the LAMA Trial. *World J Surg* 2009;33 :1368-73.
- Abdelwahed A, Mashal A. Comparison study between the outcome of laparoscopic and open repair of perforated duodenal ulcer. *Sci J Al-Azhar Med Facult Girls* 2018;2 :212-6.
- Stavros A. Antoniou, George A. Antoniou, Oliver O. Koch, Rudolph Pointner, and Frank A. Granderath, Meta-analysis of Laparoscopic Versus Open Repair of Perforated Peptic Ulcer. *JSLs* 2013;17: 15–22.
- Vakayil V, Bauman B, Joppru K, Mallick R, Tignanelli C, Connett J, et al. Surgical repair of perforated peptic ulcers: laparoscopic versus open approach. *Surg Endosc* 2019; 33:281-92.
- Unar SK, Danish AA, Bhurt AA, Laghari AA. Outcome of Duodenal Ulcer Perforation After Graham Omental Patch Repair. *APMC* 2019;13: 14-7.
- Etonyeaku AC, Agbakwuru EA, Akinkuolie AA, Omotola CA, Talabi AO, Onyia CU, et al. A review of the management of perforated duodenal ulcers at a tertiary hospital in south western Nigeria. *Afr Health Sci* 2013;13 :907- 13.
- Li LF, Chan RL, Lu L, Shen J, Zhang L, Wu WK, et al. Cigarette smoking and gastrointestinal diseases: the causal relationship and underlying molecular mechanisms. *Int J Mole Med* 2014; 34:372-80.