

Modified Graham's Patch Repair Versus Graham's Patch Repair for Treatment of Perforated Peptic Ulcer in Terms of Postoperative Morbidity / Mortality

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ABSTRACT

Objective: To compare the surgical procedures; graham's patch repair and modified graham's patch repair for the treatment of perforated peptic ulcer in terms of their post-operative morbidity and mortality.

Study Design: Comparative cross-sectional study.

Place and duration of study: Combined Military Hospital Rawalpindi, from May 2020 to Apr 2021.

Methodology: We conducted the study on 60 subjects divided into groups of two, (Group A and Group B) selected via convenience sampling. Group A underwent Graham's repair and Group B underwent modified Graham's repair. The morbidity and mortality of both the groups was compared statistically with data analysis done using SPSS-23.

Results: The average operating time and hospital stay was 84.93 ± 7.06 minutes and 7.3 ± 1.63 days for group A and 96.9 ± 9.67 minutes and 7.56 ± 2.27 days for group B, respectively. For both groups, there was no significant association to any complications ($p > 0.05$).

Conclusion: Graham's repair and modified Graham's repair are equally effective leaving the decision to the surgeon's preference. We however recommend using Graham's repair in unstable patients.

Keywords: Graham's Omentopexy, Modified Graham's Omentopexy, Omental patch, Peptic Ulcer disease, Peptic perforation.

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INTRODUCTION

A peptic ulcer is a discontinuity in the gastric mucosal surface extending deep into the muscularis mucosa typically $>3\text{mm}$ in size and of visible depth on endoscopy. The cause of peptic ulcer disease (PUD) and its sequelae are mainly two: Helicobacter pylori infection and non-steroidal anti-inflammatory drugs (NSAIDs).¹ It is prevalent in about 10% of the general population with about two-thirds of all cases being asymptomatic.^{1,2} Since most patients of PUD are asymptomatic, silent ulcers later present with complications, most commonly perforation and hemorrhage.^{2,3} In fact peptic perforation, most commonly occurring due to peptic ulcer disease, is a serious complication that requires urgent intervention, mostly surgical.¹⁴

The mainstay treatment of a peptic perforation is a primary open repair with a pedicled omental patch although a laparoscopic approach has now been widely adopted.^{5,6} In 1937, Roscoe Graham developed the most acceptable method of primary open repair, that later went on to be called Graham's repair.⁶ The basic principle of the procedure involves placing packs around the perforation to contain the spillage and

positioning the omental tongue while three to four sutures are placed of a non-absorbable material.⁷

Later on, due to concerns over the strength of the omental seal over the open ulcer bed, the modified Graham's repair was developed. The technique involved placing omental patch after closing perforation with absorbable sutures to provide strength to the omental seal.⁸ The two techniques have been compared in various studies however, no study recommends one over the other for peptic perforations.⁶

The purpose of this research is to assess the post-operative morbidity and mortality of patients with peptic perforation comparing whether Graham's omentopexy is superior to modified Graham's omentopexy in terms of longer hospital stay and post-operative complications as well as intra-operative morbidity.

METHODOLOGY

Our study was a comparative cross-sectional study based in the department of General Surgery, Combined Military Hospital Rawalpindi taking place from May 2020 to April 2021.

Inclusion Criteria: patients presenting in ER, age 30 years and above, diagnosed cases of duodenal ulcer perforation under the International Classification of Diseases (Version-11) (ICD-11).

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Exclusion Criteria: patients with perforation other than of the peptic site, multiple perforations, neoplastic conditions and polytrauma.

Sample size of 60 was used using Purposive Sampling Technique. This sample size of 60 was chosen as it was close to the number of patients presenting in CMH Rawalpindi during the time of my study. Furthermore, only those patients were included which were closely followed and were treated by the authors. Patients whose data was missing were not included.

A total of 60 patients were divided in two groups of thirty. Group A underwent Graham's repair while Group B underwent modified Graham's repair. For both groups the data collected included patient demographics like age and gender, total operative time and postoperative status including total duration of hospital stay, complications and deaths. The study subjects were selected via non-probability convenience sampling. The data was obtained from the patients during their in-hospital stay and follow up at 10 days after discharge.

Ethical clearance for the study was obtained from the Ethics Review Committee of the hospital (Ser No 162/5/2021).

Patients presented with complaints of upper abdominal pain and vomiting in early phase and absolute constipation when presented late. On examination abdomen was tender. NG was passed and patients were catheterized and NPO advised. ² Wide bore IV lines were passed and resuscitation was started. Antibiotics, fluids and pain killers were given. Samples were taken for baselines. Chest X-ray erect was done in all of the cases which showed air under diaphragm diagnostic of perforated duodenal ulcer. Patients were prepared for emergency laparotomy.

An informed written consent was obtained from all study participants prior to undergoing surgery and

The data analysis was done using SPSS-23. Descriptive statistics included appropriate frequencies, percentages, means and their standard deviations describing patient demo-graphics and comparing data distribution between both groups. The chi square test was employed to determine the difference in proportion of both groups. The p -value ≤ 0.05 was considered significant.

Table-I: Characteristics of study participants.

Variable	Variable	Group A n (%)	Group B n (%)
Gender	Male	28 (93.3)	27 (90)
	Female	02 (6.7)	03 (10)

Table-II: Characteristics of study participants.

Variable		Group A n (%)	Group B n (%)
Age (years)	31-40	-	03 (10)
	41-50	07 (23.5)	09 (30)
	51-60	10 (33.3)	09 (30)
	61-70	11 (36.7)	04 (13.3)
	71-80	02 (6.7)	04 (13.3)
	81-90	-	01 (10)

RESULTS

Out of the 60 study participants, 55(91.6%) were males and 5(8.3%) were female. The average age of the study participants was 56.28 ± 10.44 years old with most belonging to the age bracket of 51-60 years old. The breakdown of ages for both groups is given in Table-I and breakdown of gender for both groups is given in Table-II. The average age for group A was 57.6 ± 9.3 years and of group B was 55 ± 11.5 years.

The average operating time taken from first incision to complete abdominal closure was 84.9 ± 7.06 for group A and 96.9 ± 9.67 for group B. For both groups, their immediate and delayed postoperative complications were monitored and are displayed in Table-III. For both groups, there is no significant association to any complications ($p > 0.05$) i.e. p -value of Surgical Site Infection is 0.665, Postoperative Pyrexia p value is

Table-III: Post-operative complications.

Complications		Graham's Patch Repair n (%)	Modified Graham's Patch Repair, n (%)	p -value
Surgical Site Infection	Yes	03 (10)	03 (10)	0.665
	No	27 (90)	27 (90)	
Postoperative Pyrexia	Yes	06 (20)	08 (26.7)	0.381
	No	24 (80)	22 (73.3)	
Leakage	Yes	01 (3.3)	02 (6.7)	0.500
	No	29 (96.7)	28 (93.3)	

all patients were made aware of their rights to withdraw from the study at any point. Confidentiality was maintained at all levels of the study and the researchers were unaware of any of the study participants.

0.381, Leakage value of p is 0.500 and Wound Dehiscence value of p is 0.500. For both groups we do not report any postoperative intra-abdominal abscesses or deaths.

DISCUSSION

Graham's patch repair takes less operative time as compared to modified graham's patch repair making it a better surgical procedure for patients presenting late, with multiple co morbidities as it takes less anesthesia as compared to the other procedure.

Graham's Patch Repair uses a strip of omentum to cover the perforated ulcer while Modified Graham's repair makes use of a strip of omentum to re-enforce the same area theoretically making it a better seal.⁹ The use of a vascularised pedicled omentum seals the perforation while also reducing the risk of cutting through of sutures and via its ability of tissue healing and regeneration accelerates healing and prevents recurrences.^{5,10} Although a laparoscopic procedure exists and arguably produces better results, it is still not the treatment of choice in many tertiary care set ups due to its lack of availability and high operative time.¹¹

The major principles of treating a perforation include deferral of conservative medical treatment as continuing it has shown to allow missing crucial diagnoses like gastric carcinoma,¹² taking multiple samples of the ulcerated segment to assess for a cause and identify potential neoplasms,¹³ closure of the defect via omentopexy, and post-operative control of gastric secretion. The control of gastric secretions was conventionally done via co-operations like highly selective vagotomy however, it has since been replaced by post-operative use of proton pump inhibitors and *H. pylori* eradication therapy.¹⁴

There are many postoperative complications associated with either Graham's or modified Graham's repair. The risk factors for these include high intragastric pressure, cutting through of sutures and auto digestive enzymes of pancreas and bile that lead to leakage.¹⁵ Other risk factors include contamination, increasing age and multiple comorbidities.^{15,16}

In our study, we did not find any statistically significant correlation between the development of a certain complication and the use of Graham's or modified Graham's repair. Findings of the research were in consistence with the studies conducted by Abdallah *et al*, in year 2018 in Egypt and Sankhala *et al*, in year 2017 in India. Findings of these studies suggested no apparent correlation between complications and the use of a specific technique.^{16,17} However, study by Kumar *et al*, in year 2020 in India reported that modified Graham's repair has superiority over Graham's repair due to reduced postoperative morbidity and mortality.¹⁸

We do however report that similar to these studies modified Graham's repair has a prolonged operative time. As in our country patients mostly coming from far areas present late and are unstable. A lot of critical time has already passed when patients come to emergency department. Hence less operative time means less intra operative mortality and morbidity. Lesser the time of General anesthesia lesser the anesthesia related complications and early recovery from GA. None-the-less, similar postoperative hospital stays were seen after both techniques.^{19,20}

LIMITATION OF STUDY

This study had some limitations as well. Due to lack of funding and man power the sample size was small. Only patients coming to CMH Rwp were included instead of taking sample from all the tertiary care hospitals or a community or a multicenter study.

CONCLUSION

Conclusively, based on our results, Graham's repair and modified Graham's repair are equally effective in terms of their mortality and morbidity. Since there is no statistical significance to using one for the other except for total operative time, the decision to use either technique comes down to surgeon's preference. However, the only remarkable difference between the two was that Graham's repair has less operating time. We hence recommend using Graham's repair especially in patients in which less operative time is critical in reducing post op morbidity and mortality.

Conflict of Interest: None.

Authors' Contribution

FK: Discussion and research analysis, MS: Data collection, IAS: Proof reading KM: Proof reading, NH: Data compilation.

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