

# Graham's Omentopexy versus Modified Graham's Omentopexy in Perforated Duodenal Ulcers - A Prospective Study

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Received: November 2020

Accepted: December 2020

## ABSTRACT

**Background & Aim:** Duodenal perforation is a serious and most frequent complication of peptic ulcer disease which requires emergency surgical treatment. Our aim was to do a comparative study of Graham's omentopexy versus modified Graham's omentopexy in perforation of duodenum ulcers. **Methods:** A prospective randomized control trial study had included 70 cases of duodenal perforation at MKCG medical college & hospital which were randomized by using random number table into two groups-Graham's omentopexy 35 cases group 'A'. & modified Graham's omentopexy 35 cases group 'B'. The outcome of procedure was measured in terms of complications like wound infection, biliary leakage/fistula, Intra-abdominal abscess, sepsis, reoperation, mortality & hospital stay. **Results:** Out of 70 patients, 63 (90%) were males and 7 (10%) were females with M:F Ratio 9:1. The peak age of patients at presentation was between 30-49 (61.8%). In group A Graham's omentopexy there was wound infections in 11 cases (31.42%), biliary leakage in 2 cases (5.7%), intra-abdominal abscess in 2 cases (5.7%) and 3 patients (8.5%) died, but in Group B Modified Graham's omentopexy, wound infection noted in 9 cases (25.71%) but there was no biliary leakage and intra-abdominal abscess. There were 2 mortalities (5.7%) in group B. The average in-patient hospital stays in Group A Graham's Omentopexy was 11.5 days and in group B modified Graham's omentopexy 10.0 days. **Conclusion:** Patients undergoing modified Graham's omentopexy in perforated duodenal ulcer had lesser post-operative complications & a shorter hospital stays with better outcome than Graham's omentopexy.

**Keywords:** Peptic ulcer, Duodenal perforation, Graham's omentopexy, Modified Graham's omentopexy.

## INTRODUCTION

Perforation is one of the most serious complications which affect 2-10% of Peptic ulcer disease. Duodena I perforation presents with an overall mortality of 10%. Being a life threatening complication of duodenal ulcer perforation, it needs special attention with prompt resuscitation & appropriate surgical management if morbidity & mortality are to be contained.<sup>[1-5]</sup>

Perforation occurs due to erosion of full thickness of duodenum. Perforation is the most common complication of peptic ulcer. Bleeding ulcer & use of Non steroidal anti inflammatory drugs (NSAIDs) have been intricately linked with perforated peptic ulcer disease (PUD).<sup>[6]</sup>

In 1937 the Graham's/ omental patching began when Roscoe Graham of Toronto reported 51 cases of perforated peptic ulcer successfully treated with an omental patch laid over three sutures which are then tied being more than sufficient for closure of the

duodenal perforation (without an attempt for primary closure of the perforation).<sup>[7]</sup> Subsequent modifications came with the principal aim to close the perforation, keeping the omentum sandwiched between two layers of knot to prevent leaking (the major concern with Graham's patch technique).<sup>[8]</sup> The definitive surgical procedures have undergone many changes in the last half century, and the indications and the complications of each option are well known but declining in popularity of them is quite obvious. Now-a-days, primary suturing and omental patch is a frequently selected procedure for perforated peptic ulcer.<sup>[9]</sup>

## MATERIALS AND METHODS

This prospective Randomised control trial study was conducted in department of General surgery at MKCG medical college & university, Berhampur from June 2017- May 2019 which included 70 cases of perforation of first part of duodenum. The patients were randomized into two groups, Group A 35 cases Graham's omentopexy and Group B 35 cases Modified Graham's omentopexy.

### Inclusion criteria:

Perforation of first part of duodenum upto 2 cm

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**Exclusion criteria:**

- 1) Gastric or pyloric perforation,
- 2) Ilea) or jejuna) perforation,
- 3) First part of duodenum more than 2 cm in size,
- 4) Posterior duodenal ulcer,
- 5) Sealed duodenal ulcer perforation,
- 6) Patient in severe sepsis,
- 7) Patients who are not interested in the study.

All patients were admitted with acute abdomen in emergency department, vital checked after proper resuscitation with IV fluids, nasogastric aspiration, urinary catheterization, analgesics & antibiotics proper history taken, thorough clinical examination, radiological investigations (Ultrasonography of abdomen pelvis & X-Ray chest PA view showing both dome of diaphragm to look for air under right diaphragm) that signifies hollow viscus perforation. All operative findings and post-operative complications were recorded. All operations carried out under general/regional anaesthesia. After confirmation of the site of perforation peritoneal lavage was done with 4-5 litres of warm normal saline. Special attention was made to irrigate the sub hepatic pouch, the lesser sac, the paracolic gutters & pelvis. After omentopexy, two drains, one in Morrison's pouch and other in pelvis, were placed & fixed. The midline abdominal wound was closed with mass closure technique.

Patients were randomized into groups while they were on operated table using random number table. Mostly the size of perforation was found between 0.5 cm to 1 cm (65%). The perforation of duodenum more than 2 cm in size was dealt with other surgical procedures i.e. Jejunalserosal patch & antrectomy. In Graham's omentopexy, the 3-4 full thickness suture bites with 2-0 vicryl were placed approximated 0.5 cm away from one margin to other sutures. A vascularized omental patch was laid over the sutures are successively tied from superior to inferior aspect across the omental patch to anchor the omentalgraftin place. In modified Graham's omentopexy, the perforation was closed with vicryl 2-0 through & through sutures-The suture were tied to approximate the wall defect without cutting through the duodenal wall-Then a vascularized segment of omentum brought on the top of the closed perforation and with second set of sutures-Both groups were compared in terms of post-operative complications and surgical outcome-Post operatively, all patients were prescribed for 2 weeks treatment of standard triple drug therapy to eradicate Helicobacter Pylori. All patients were followed up for a period for 12 months on outpatient department.

**RESULTS**

**Sex:** In this study total number of patients were 70 among them 63 males (90%) and 7 were females (10%) shown in [Table 1].

**Age:** The patients age range from 20-65 years with a mean age of 45 years. The age of distribution is shown in [Table 2].

**Size of duodenal perforation:** Duodenal perforation of size <0.5cm seen in 13 (18.57%) patients, 0.6-1cm size seen in 45(64.28%) patients & 1-2 cm size seen in 12(17.14%), showed in [Table 3].

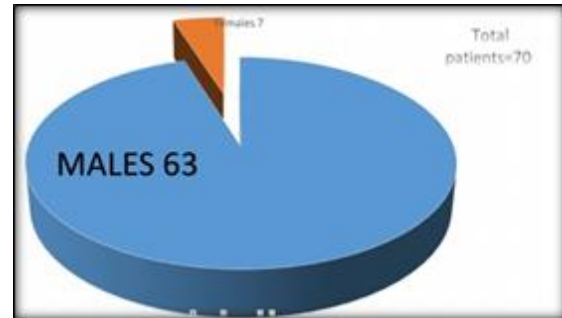


Figure 1: Gender of patients

Table 1: Gender of patients

Sex	No of patients	Percentage %
Males	63	90 %
Females	7	10 %

Table 2: Size of duodenal perforation

Size of duodenal perforation	No. of patients (70)	Percentage %
<0.5 cm	13	18.57%
0.6-0.9cm	45	64.28%
1-2 cm	12	17.14%

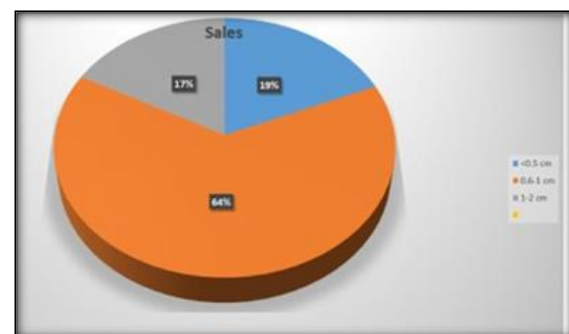


Figure 2: Size of duodenal perforation & no. of patients

Table 3: No. of patients having duodenal perforation

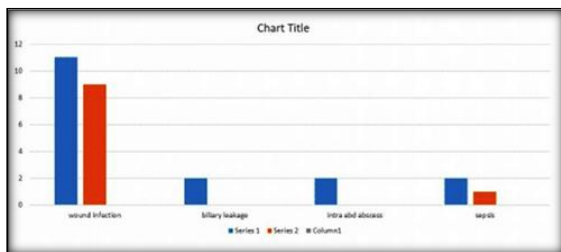
Age (in years)	No. of patients (70) having duodenal perforation	Percentage %
20-29	6	8.6%
30-39	20	28.5%
40-49	23	33.3%
50-59	12	17.14%
>=60	9	10.7%

**Post-operative complications:** The post-operative complications in Group A Graham's omentopexy were wound infections in 11 cases(31.42%), biliary leakage in 2 cases(5.7%), Intra-abdominal abscess in 2 cases(5.7%), sepsis in 2 cases(5.7%), Re-o perat ion in 2 cases(5.7 percent), 3 patients(8.5%) died. In Group B Modified Graham's omentopexy, wound

infections in 09 cases(25-71%), no biliary leakage & Intra-abdominal abscess, sepsis in 1 case(2.8%), none of the cases Re-operated, 2 patients(5.7%) died.

**Table 4: Complication**

Name of complication	Graham's Omentopexy		Modified Graham's omentopexy	
	Grop A N	35 patients 100%	Grop A N	35 patients 100%
Wound infection	11	31.42%	9	25.71%
Biliary leakage/flstula	2	5.7%	0	0
Omtra-Abdominal Abscess	2	5.7%	1	2.8%
Sepsis	2	5.7%	1	2.8%
Re-operation	2	5.7%	0	0
Deaths	3	8.5%	2	5.7%



**Figure 3: Complications**

**Etiology:** In this study out of 70 patients, 40(57.14%) patient had past history of peptic ulcer disease & 30(42.86%) patients presented as duodenal ulcer perforation without history of peptic ulcer disease.

**Mortality:** In this study mortality rate in Group A Graham's omentopexy is 3 patients (8.5%) and in Group B Modified Graham' Omentopexy is 2 patients (5.7%).

**Average Hospital stay:** In this study average hospital stay was 11.5 days in group A Graham's omentopexy and 10.0 days in group B Modified Graham's Omentopexy.

**Recurrence:** In follow-up of 12 months one patient from Group a G raham's Omentopexy was readmitted with recurrence of symptoms and in modified Graham's omentopexy Group B had better outcome without any recurrence.

**Predisposing factors to complications:** The-most important factors predisposing to complications are delay in admission to the hospital, associated diseases and shock on admission.

## DISCUSSION

With the introduction of H-2 blockers & Proton pump inhibitors elective surgery of peptic ulcers has decreased but the incidence of peptic ulcers perforations has decreased but the incidence of

perforation & mortality rates has showed little change.?

In the present study a total of 70 patients were treated for acute perforated duodenal ulcer in our hospital over a period of one year. These were divided in our hospital over a period of one year. These were divided into 2 groups.

Group A and Group B, each consisted of 35 patients, they underwent Graham patch repair and Modified Graham patch repair respectively.

- Sex:** In this study 70 patients of perforated duodenal ulcer were included out of them 63 (90%) were males & 7(10-%) were females (male.-female 9:1) similar to other studies nr Nishikant Gujar et al, male were 86%, females 14% where the male: female ratio ranged f rom6.15 :1 to 9:1.<sup>[9,10]</sup>
- Age:** The peak age of patients at presentation was between 30-49 years (61.8%) with a mean age 45 years which differs significantly from other studies from Africa that had an average of 64.8 +/- 11.4 years and from India highest incidence was between 40-60 years.<sup>[9,10]</sup>
- Etiology:** In this study out of 70 patients, 40(57.14%) patient had past history of peptic ulcer disease & 30(42.86%) patients presented as duodenal ulcer perforation without history of peptic ulcer disease, similar result 47% was reported by Lawal et al & by Nishikant et al, 45% of duodenal ulcer perforation had peptic ulcer disease.<sup>[11,12]</sup>
- Size of perforation:** The size of the duodenal perforation determines the amount of peritoneal contamination. The perforation >1cm has incidence of leakage, morbidity& mortality when compared with small perforation.<sup>13</sup> In this study out of 70 patients, 58 patients (82-85%) had perforation within range 0.1-1 cm in size similar result showed in Nishikant et al 75.5% had perforation within 0.11 cm.<sup>[12]</sup>
- Post-operative complications:** In our study the major post-operative complications in group A Graham's omentopexy was wound infection in 11 cases (31.34%), Biliary leakage in 2 cases(5.7%), intra-abdominal abscess in 2 cases(5.7%), but in group B Modified Graham's Omentopexy wound infection was noted in 9 cases (25.71%) but there was no biliary leakage & intra-abdominal abscess. The similar results of post-operative complications were also shown in other studies by Raj put et al 15 and satapathy et al.<sup>[16]</sup>
- Mortality:** In this study mortality rate in Group A Graham's omentopexy is 3 patients (8.5%) and in Group B Modified Graham' Omentopexy is 2 patients(5.7%). The overall mortality rate was 7.14% associated with late presentation while in other studies by A Nuhu et a1,<sup>[14]</sup> all was 16.4% and satapathy et al,<sup>[16]</sup>In another study by Umran-Muslu et al, the mortality is 3.9%.<sup>[17]</sup> Mortality rate in literature varies with the range of 6.5-20%.
- Average Hospital stay:** In this study average hospital stay was 11.5 days in group A Graham's

Omentopexy and 10.0 days in group B Modified Graham's Omentopexy similar in other series the average hospital stay was 9+-1.2 days-16 The hospital stay varies with the size of perforation, duration of illness & the condition of patient on arrival.<sup>[19]</sup>

8. **Anti H. pylori role:** Several literatures support the role of therapy for H. pylori in post-operative period.<sup>[20]</sup>H. pylori eradication speeds up healing & decrease the relapse rate of ulcer disease as reported as Sebastian et al.<sup>[21]</sup>Therefore post-operatively all patients were prescribed for a 2 weeks course of standard triple drugs anti H. pylori therapy.
9. **Recurrence:** In follow-up of 12 months one patient from Group A Graham's Omentopexy was readmitted with recurrence of symptoms and in modified Graham's Omentopexy Group B had better outcome without any recurrence.
10. **Predisposing factors to complications:** The most important factors predisposing to complications are delay in admission to the hospital, associated diseases and shock on admission. Mortality & morbidity can be reduced by early admission, prompt resuscitation, and treatment of associated disease, early surgical intervention and prophylaxis of complications.

## CONCLUSION

The present study showed that patients undergoing modified Graham's omentopexy in perforated duodenal ulcer had lesser post-operative complications and a shorter in patient's hospital stay with better outcome than Graham's omentopexy.

## REFERENCES

1. Testini M, Portincasa P, Piccinni G. et al. Significant factors associated with fatal outcome in emergency open surgery for perforated peptic ulcer. *World J Gastroenterol.* 2003;9:2338-40.
2. 5011 AH. Peptic ulcer and its complications. In: Slesinger & Fordtran's Gastrointestinal and Liver disease: Pathophysiology, Diagnosis, Management. 611, ed. Edited by: Feldman M, Scharsschmidt BF, Slesinger MH, Philadelphia PA:W.B.Saunders; 1998:620-78.
3. Rajesh v, Sarathchandra S, Smile SR. Risk factors predicting operative mortality in perforated peptic ulcer disease. *Trop Gastroenterol.* 2003;24:148-50.
4. Hermansson M, Von Holstein CS, Zilling T. surgical approach and prognostic factors after peptic ulcer perforation. *Eur J Surg.* 1999;165:566-72.
5. Elnagib E, Mahadi SE, Mohamed E, et al. Perforated peptic ulcer in Khartoum. *Khartoum Medical Journal.* 2008;1(1):62-4
6. Gabriel SE, Jaakkimaine L, Bombardier C. Risk for serious gastrointestinal complication related to use of non steroidal anti-inflammatory drugs- a meta-analysis. *Ann Intern Med.* 2006;145:787.
7. Christensen A, Bousfield R, Christensen J. Incidence of perforated and bleeding peptic ulcers before and after the induction of H2- Receptor antagonists. *Ann Surg.* 1998; 207: 4-6.
8. Jamieson GG. Current status of indications for surgery in peptic ulcer disease. *World J Surg.* 2000; 24: 256-8-

9. Plummer JM, McFarlane M E, N ewn ha m. Su rgica l management of perforated duodenal ulcer; the changing scene *West Indian Med J.* 2004;53:378-81.
10. Nishikant, jilani, Mudhol S. Contractor, Ravikumar Choudhari and Sushila G a ra g. I m med i ate Results of omentopexy in Perforated Duodenal Ulcer.-A study of 186 cases *Al Ameen J Med Sci.* 2012;5(1):29-38
11. Ohene — Yeboah M, Togbe B. Perforated gastric and duodenal ulcers in an urban African population. *WEST Afr J Med* 2006; 25: 20S-11.
12. Lawal O, Fadiran OA, Oluwale SF Campbell B. Clinical pattern of perforated prepyloric and duodenal ulcer at Ilesha, Nigeria. *Trop Doct.* 1998; 28: 152-5.
13. Subedi SK, Afaq A, Adhikary S, Niraula SR, Agrawal CS. Factors influencing mortality perforated duodenal ulcer following emergency surgical repair. *J Nepal M Assoc.* 2007; 46:31-5.
14. Anuhu, Madziga, B Gali. Acute perforated duodenal ulcer In Maiduguri. *The Internet Journal of surgery.* 2008.
15. Rajput IA, Iqbal M, Manzar S. Comparison of omentopexy techniques for duodenal perforation. *Pak J Surg.* 2000; 16: 1-4.
16. Mani Charan Satapathy, Dharitri Dash, Charan Panda Modified Graham's omentopexy in acute perforation of first part of duodenum; A tertiary level experience in South India *Surgical Journal*, September — December, 2013.
17. Umran Muslu, Ali Kagan Gokakin, Ayesgul Demir, Orhan Ureyen, Ozcan Altinel, Eyup Sabri Tezcan, Mustafa Atabey, Gunduz Akgol, Hudai Genc. Mortality and Morbidity. Risk factors in surgery of peptic ulcer perforation. *Cumhuriyet Med J.* 2012; 34: 189-193.
18. Pai D, Sharma A, Kanungo R, Jagdish S, Gupta A. Role of abdominal drains in perforated duodenal ulcer patients: A prospective controlled study. *Aus. N Z J Surg.* 1999; 69: 210-3.
19. Aeveen S, Jagdish S, Kadambari D. Perforated peptic ulcer in South India: An institutional perspective *World J Surg.* 2009;33: 1600-4.
20. Ng EK, Chung SC, Sng JJ, Lan YH, Lee DW, Lau JY. High prevalence of Helicobacter pylori in duodenal ulcer perforations not caused by non-steroidal anti-inflammatory drugs. *Br J Surg.* 1996; 83: 1779-81.
21. Sebastian M, Chand ran VP, Elashaal YI, Sim AJ. Helicobacter pylori infection in perforated peptic ulcer disease. *Br J Surg.* 1995; 82: 360-2.

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**How to cite this article:** Sethy MK, Narendra SR, Rao MVK, Panigrahi S. Graham's Omentopexy Versus Modified Graham's Omentopexy in Perforated Duodenal Ulcers - A Prospective Study. *Ann. Int. Med. Den. Res.* 2021; 7(1):SG06-SG09.

**Source of Support:** Nil, **Conflict of Interest:** None declared