

## Original Research Article

# Giant peptic ulcer perforation- omentopexy versus omental plugging: a comparative study

Rakesh Kumar<sup>1</sup>, Sneh Kiran<sup>2\*</sup>, H. N. Singh Hariaudh<sup>1</sup>

<sup>1</sup>Department of General Surgery, NMCH, Patna, Bihar, India

<sup>2</sup>Department of Obstetrics and Gynaecology, IGIMS, Patna, Bihar, India

**Received:** 31 December 2019

**Revised:** 12 February 2020

**Accepted:** 13 February 2020

**\*Correspondence:**

Dr. Sneh Kiran,

E-mail: [rakeshirki@gmail.com](mailto:rakeshirki@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Giant peptic ulcer perforation is a life-threatening surgical emergency with high mortality rate. This study compares two different surgical techniques omentopexy and omental plugging for the treatment of giant peptic perforation.

**Methods:** This study was a prospective study comparing the efficacy of omental plugging and omentopexy. The study was done at Emergency Department of General Surgery in Nalanda Medical College and Hospital, Patna over one-year period from October 2017 to September 2018. Patients were randomly allocated to two groups: one for omental plugging (cases) and other for omentopexy (controls).

**Results:** A prospective non-randomized study of 12 patients with giant peptic perforation ( $\geq 2$  cm in diameter) was carried out over a period of 24 months. The highest incidence was seen in males over 50 years of age. Biliary leak rates were 33% in the omentopexy group compared to no leak in the omental plugging group. This rate when calculated on standard error of proportion was significant at 5% level ( $p < 0.05$ ). Mortality rate was higher in omentopexy group compared to omental plugging group.

**Conclusions:** Omental plugging seems to be associated with low rates of biliary leak compared to omentopexy and hence should be the procedure of choice in giant peptic ulcer perforation compared to omentopexy.

**Keywords:** Giant peptic perforation, Omental plugging, Omentopexy

### INTRODUCTION

Perforation is one of the most catastrophic complications of peptic ulcer.<sup>1</sup> Though it is a common surgical emergency, literature is silent on the exact definition, incidence, management and complications of large perforations of peptic ulcers.<sup>2</sup> Giant peptic perforations are defined as perforations of size equal to or greater than 2 cm in diameter. These perforations are considered particularly hazardous because of the extensive duodenal tissue loss, friability of the ulcer margins, surrounding tissue inflammation, poor general condition of the patient and overwhelming sepsis due to bacterial peritonitis.

These factors are said to preclude simple closure using omental patch, often resulting in postoperative leak or gastric outlet obstruction.<sup>2</sup> Omentopexy was first described by Cellan Jones, later modified by Graham in 1937.<sup>3,4</sup> Various methods apart from standard omentopexy have been described for the management of giant perforations and they include partial gastrectomy, jejunal serosal patch, jejunal prediced graft, omental plugging and proximal gastrojejunostomy.<sup>2</sup> Omental Plugging on the other hand is a simple procedure was first described by Karanjia et al in 1993.<sup>5</sup> Apart from omental plugging, all other methods are more elaborate, time consuming and technically difficult to perform.<sup>1</sup>

Omental plugging is associated with lesser morbidity and mortality compared to omentopexy in the management of giant peptic perforations.<sup>6</sup> The present study was done to compare the success rate between omental plugging and standard omentopexy in the emergency management of giant peptic perforations.

**METHODS**

This study was a prospective study comparing the efficacy of omental plugging and omentopexy. The study was done at Emergency Department of General Surgery in Nalanda Medical College & Hospital, Patna over one year period from October 2017 to September 2018 after taking approval from Institutional ethics committee.

**Inclusion criteria**

Patients with peptic ulcer perforations of size >2 cm and patients with age 15 to 80 years were included.

**Exclusion criteria**

Patients with peptic ulcer perforation of size <2 cm, patients with age <15 years and >80 years and malignant gastric ulcer perforation either suspicious or proven by edge biopsy were excluded.

Detailed patient history was taken along with doing complete surgical examination; laboratory investigations; X-ray chest; ultrasound abdomen etc. Fluid resuscitation was done in all cases and after stabilization; patient was taken for exploratory laparotomy. At laparotomy, patients were randomly allocated to two groups; one for omental plugging (cases) and other for omentopexy (controls).

**Omental plugging**

In this process, tip of inserted nasogastric tube is taken out to abdominal cavity through perforation, then free edge of greater omentum was tied to tip of NG tube and anaesthetist/assistant asked to withdraw the NG tube so that 5-6 cm of omentum go inside stomach or duodenum, this will plug the perforation, then edge of perforation is tied to omental plug by 2-0 chromic catgut.

**Omentopexy**

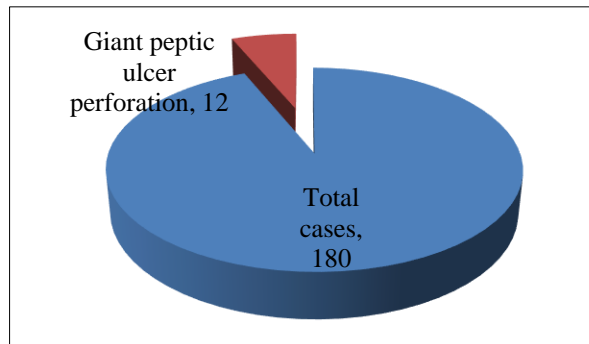
The perforation was sutured in one layer by three interrupted Lambert sutures with 2-0 polyglactin using a patch of omentum pedicle to reinforce the suture line. A thorough peritoneal toileting was then done in all the cases. A tube drain was put inside the peritoneal cavity at the hepato renal pouch through a separate stab incision in the right flank.

The following parameters were compared between two groups- duration of hospital stay, postoperative complications, patient mortality. Sampling were done by

using Microsoft excel sheet and data were analysed by calculating p-value by chi-square test.

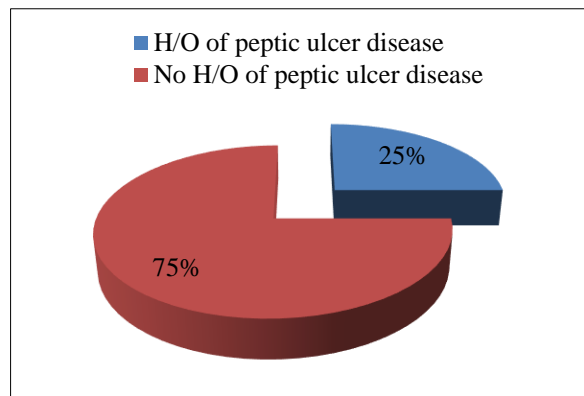
**RESULTS**

Of 180 patients of operated cases of perforative peritonitis, 12 patients with giant peptic ulcer perforation were considered. So, 12 patients were included in the study (3.78%) as per Figure 1.



**Figure 1: Cases of giant peptic perforation.**

All patients underwent laboratory investigations, X-ray abdomen (erect); and were given intravenous antibiotics and fluid support before surgery. Appropriate fluid resuscitation was done in all patients presenting with shock, 3 patients with previous peptic ulcer disease were as per Figure 2, 6 patients underwent omental plugging were taken as cases while 6 underwent omentopexy and were taken as controls. Feeding jejunostomy was done in all cases.



**Figure 2: Patients with previous peptic ulcer disease.**

The incidence of giant perforation was found to be maximum in >50 years age group with more males involved male/female ratio 5:1 (Table 1 and 2).

Total 6 patients underwent omental plugging of which 6 were males and no females. 6 patients underwent omentopexy of which 2 were females and 4 males (Table 2). Past history of peptic ulcer perforation was present in 25% i.e. 3/12 cases (Table 3).

**Table 1: Age wise incidence (n=6).**

Age (in years)	Omentopexy	Omental plugging	%
<30	1	1	16.66
31-50	1	1	16.66
>50	4	4	66.66

**Table 2: Incidence with sex (n=6).**

Sex	Omentopexy	Omental plugging	%
Male	4	6	83.3
Female	2	0	16.6

**Table 3: Patients with previous peptic ulcer disease (n=6).**

H/o of PUD	Omentopexy	Omental plugging	%
Present	2	1	25
Absent	4	5	75

The patients presenting early were about 25%; 33% in about 24-48 hours and 42% after 48 hours of which 8 patients were in shock. Oral feeding was started by 5th to 7th day. In cases of biliary leak, orals were delayed and feeding jejunostomy feeds were started.

The giant duodenal perforation was seen in 75% while giant gastric perforation was seen in about 25% (Table 4).

**Table 4: Type of perforation (n=6).**

Type	Omentopexy	Omental plugging	%
Duodenal ulcer	4	5	75
Gastric ulcer	2	1	25

The occurrence of complications like Respiratory tract infections; Abdominal wound infection; Intraabdominal abscess formation; Intestinal leak; burst abdomen; gastric outlet obstruction at 6 weeks was studied and compared in the two groups (Table 5).

**Table 5: Postoperative complications.**

Post-op complication	Omentopexy	Omental plugging	Total	P value
Respiratory infection	2	1	3	>0.05
Wound infection	1	1	2	>0.05
Intraabdominal abscess	1	0	1	>0.05
Biliary leak	2	0	1	<0.05
Burst abdomen/gastric outlet obstruction	0	0	0	
Mean hospital stay	12.5	11		<0.05

No deaths were found in patients of omental plugging and 2 in patients with omentopexy. Overall mortality rate was 16.6% (Table 6). Patients with delayed presentation had a higher mortality rate so had patients with omentopexy as in these cases the occurrence of biliary fistula was high.

**Table 6: Mortality.**

	Omentopexy	Omental plugging	%
Death	2	0	>0.05

The occurrence of biliary fistula/leak was seen in 2 cases of omentopexy (33%) compared to no cases of biliary leak in cases of omental plugging. This makes omental plugging a superior procedure in cases of perforative peritonitis. The p value calculated was (p<0.05) which was statistically significant.

## DISCUSSION

Peptic ulcer perforation is a common surgical emergency condition. The advent of better proton pump inhibitors have led to decline in the rates of elective perforation

surgery but the emergency perforation rates remain unchanged.<sup>7</sup>

The size of perforation in a peptic ulcer varies from 3 mm to over 3 cm in diameter. Which adversely affects the prognosis. There is correlation between the size of perforation and the mortality as per study by Hennessy et al. Perforations more than 1 cm have mortality rate of around 16-26%.<sup>8</sup> This is comparable to the rates in our study of around 15%.<sup>9</sup>

The highest incidence of giant ulcer perforation was seen in 5th decade of life and maximum cases were noted greater than 50 years of age. These results are comparable to those seen in other studies.

The male to female ratio was found to be 5:1 whereas in other similar studies it ranged from 8.1:1 to 7.5:7.<sup>1,10</sup>

The incidence of biliary fistula post-surgery in omental plugging group was around 0% and 33% in the omentopexy group. The fistula rates are more compared to another similar study by Jani and Saxena who reported rates of 0% and 12% respectively.<sup>1</sup>

The overall mortality rate was 33.33%. The death in the omental plugging group was 0% and that in the omentopexy group was 16.6%. Mortality rates were higher in the omentopexy group and the data is statistically not significant.

The average stay of patients in the omental plugging group was 11 days and in those who underwent Omentopexy it was 12.5 days. The slightly higher hospital stay in the omentopexy group was due to that two patients developed biliary leak of which they were re-operated, increasing the mean hospital stay. This was statistically significant.

The possible explanation is from the principle of physics. In the omental plugging technique, a part of the omentum is taken inside the stomach, even with rise of intra gastric pressure, the omentum is always kept in contact with gastric mucosa. In omentopexy technique; the repair is done from outside and so with rising intra gastric pressure; the patch could be easily disturbed. Hence probably higher leak rates are observed in cases of omentopexy which makes omental plugging a better choice in cases of giant peptic ulcer perforation.<sup>2</sup>

## CONCLUSION

Giant perforations are rare but are associated with significantly higher mortality and morbidity when compared to smaller perforations. Omental plugging for giant perforations, a relatively newer technique, is associated with lesser cases of intestinal fistula formation when compared to the standard method of omentopexy and hence should be the procedure of choice in giant peptic ulcer perforation compared to omentopexy. Our results show that the mortality rate is lower in the omental plugging group, making it a better choice of technique for repair of giant perforations. Omental plugging is simple and easy to learn, and, avoids the performance of a major resection in a patient who is already compromised but this study should be done in large sample size for accurate result.

## ACKNOWLEDGEMENTS

Authors would like to thank Department of General Surgery, NMCH, Patna for the support.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Jani K, Saxena AK, Vagharia R. Omental plugging for large-sized duodenal peptic perforations: a prospective randomized study of 100 patients. *South Med J.* 2006;99(5):467-72.
2. Gupta S, Kaushik R, Sharma R, Attri A. The management of large perforations of duodenal ulcers. *BMC Surg.* 2005;5:15
3. Cellan-Jones CJ. A rapid method of treatment in perforated duodenal ulcer. *BMJ.* 1929;36:1076-7.
4. Graham RR., The treatment of perforated duodenal ulcers. *Surg Gynecol Obstet.* 1937;64:235-8.
5. Karanjia ND, Shanahan DJ, Knight MJ. Omental patching of a large perforated duodenal ulcer: a new method. *Br J Surg.* 1993;80:65.
6. Kong TT, Lomanto D. Atlas of complicated Abdominal Emergencies - Surgical Management of Upper Gastrointestinal Perforations. WSPC. 2014: 39.
7. Rajes V, Chandra SS, Smile SR. Risk factors predicting operative mortality in perforated peptic ulcer disease. *Trop Gastroenterol.* 2003;24:148-50.
8. Hennessy E. Perforated peptic ulcer mortality and morbidity in 603 cases. *Aust NZ J Surg.* 1969;38:243.
9. Buck DL, Vester-Andersen M, Møller MH, Danish Clinical Register of Emergency Surgery. Surgical delay is a critical determinant of survival in perforated peptic ulcer. *Brit J Surg.* 2013;100(8):1045-9.
10. Mukhopadhyay M, Banerjee C, Sarkar S, Roy D, Rahman QM. Comparative study between omentopexy and omental plugging in treatment of giant peptic perforation. *Ind J Surg.* 2011;73(5):341-5.

**Cite this article as:** Kumar R, Kiran S, Hariaadh HNS. Giant peptic ulcer perforation- omentopexy versus omental plugging: a comparative study. *Int Surg J* 2020;7:787-90.