

COMPARATIVE STUDY BETWEEN OMENTOPEXY AND OMENTAL PLUGGING IN TREATMENT OF GIANT PEPTIC PERFORATION

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Abstract

Background: Despite the widespread use of gastric antisecretory drugs, peptic ulcers continue to perforate, contributing to high mortality rates, especially in the presence of risk factors. **Aim:** This study aimed to compare the efficacy of Omental Plugging and Graham Pedicled Omental Patch Closure (omentopexy) in gastroduodenal perforations >20 mm. **Material & Methods:** This randomised study of 30 patients admitted with gastric/duodenal perforations undergoing emergency laparotomy at Govt Madurai Medical College, Madurai. Thirty patients were divided into Group A (Graham's omental patch closure) and Group B (omental plugging). Patients were managed using a comprehensive approach involving stabilisation in cases of sepsis or shock, detailed patient history, and thorough examination. The evaluation criteria included age, sex, operative time, postoperative complications, and length of hospital stay. Patients were followed up for six months post-surgery. **Results:** Omental Plugging showed superior outcomes in giant gastroduodenal perforations (>20 mm), with a shorter hospital stay (omental plugging mean: 4 days, Graham Omental Patch Closure Mean: 5.267 days, $p < 0.001$) and lower postoperative leak rate (Omental Plugging: 0%, Graham Omental Patch Closure: 33.33%, $p = 0.042$). Trends, although not statistically significant, favoured Omental Plugging in wound infections (20% vs. 40%, $p = 0.426$), intra-abdominal abscesses (6.67% vs. 13.33%, $p = 0.98$), and mortality (6.67% vs. 26.67%, $p = 0.327$). **Conclusion:** Omental Plugging is a superior method for large gastroduodenal perforations and improves oral feeding initiation, hospital stay, and postoperative complications. Clinicians can benefit from these insights in the management of challenging surgical conditions.

INTRODUCTION

Despite the progress made in the utilisation of gastric antisecretory agents and eradication therapy, the occurrence of perforated peptic ulcers persists with minimal alteration.^[1] The management of perforated peptic ulcers, acknowledged as one of the most easily diagnosed acute abdominal conditions, presents a significant challenge in medicine.^[2] Its significance lies in the prompt identification and determination of the most efficient surgical intervention.

Several surgical approaches have been suggested to address peptic perforation, each with advantages and limitations.^[3] However, no definitive solution has emerged, necessitating a continuous search for improved methodologies. The disruption of duodenal closure, a crucial aspect in the

management of perforated peptic ulcers, is attributed to factors such as increased intra-luminal pressure, the tendency of duodenal mucosa to protrude through closures, and the breakdown caused by autodigestive enzymes from the pancreas and bile.^[4] In the field of surgical techniques, a wide range of options are advocated for the management of peptic perforations.^[5] However, these interventions have disadvantages, particularly in cases involving large perforations, delayed presentations, or advanced age. The complexities of managing such conditions contribute to mortality rates of up to 18%, even when employing standard surgical techniques.^[6] This emphasises the urgent need for an efficient and standardised approach to address giant peptic perforations. To address this critical gap, our study aims to conduct a comparative analysis between two prominent surgical techniques: Omental Plugging

and Grahams Pedicled Omental Patch Closure (Omentopexy).^[7] Specifically, our focus is on patients with gastroduodenal perforations exceeding 20 mm in size, as these cases present unique challenges that require a thorough investigation into the effectiveness of these interventions.

By undertaking this comparative study at Govt Rajaji Hospital (GRH) in Madurai, we aimed to contribute valuable insights into the optimal treatment strategy for giant peptic perforations. Our comprehensive analysis will consider factors such as the duration of the operation, postoperative complications (including leaks, wound infections, and intra-abdominal abscesses), lung complications/septicemia, average length of hospital stay, and the resumption of oral feeding.^[8]

This research addresses the existing uncertainties in managing giant peptic perforations by comparing the effectiveness of Omental Plugging and Graham Pedicled Omental Patch Closure.^[9] We anticipate that our findings will not only provide guidance to clinicians but also pave the way for future advancements in the surgical management of perforated peptic ulcers.

MATERIALS AND METHODS

This randomised study of 30 patients admitted with gastric/duodenal perforations undergoing emergency laparotomy at Govt Madurai Medical College, Madurai, was undertaken, and their progress was followed for six months post-surgery.

Inclusion Criteria

Patients aged 18–60 of both sexes presenting with gastroduodenal perforation > 20 mm in GRH, Madurai, were included.

Exclusion Criteria

Patients under 18 years of age and over 60 years of age with multiple perforations, traumatic perforation, and perforation outside of the gastroduodenal region were excluded.

Thirty patients were divided into groups: Group A: (15) Graham's omental patch closure and Group B: (15) Omental plugging. These 30 cases were studied thoroughly according to the proforma, and the details of the 30 patients were sorted in a master chart for convenience of presentation and data analysis.

Before initiating the study, ethical approval was obtained from the relevant institutional ethics committees. Informed consent was obtained from each participant before inclusion in the study, ensuring adherence to ethical standards.

Patients were managed using a comprehensive approach involving stabilisation in cases of sepsis or shock, detailed patient history, and thorough examination. Hospital records, admission charts, and routine investigations were collected during admission, including plain radiography, blood tests, and abdominal paracentesis. Graham pediculated Omental patch, and plugging techniques were

employed for closure, and patients were followed up for six months post-surgery.

The variables studied and analysed included age, sex, mean operative time, postoperative leaks, wound infections, intra-abdominal abscesses, lung complications/septicemia, mean hospital stay, and resumption of oral feeding.

Statistical Methods

Statistical analysis compared two surgical techniques: the Graham pediculated omental patch and plugging. Descriptive statistics, such as means and standard deviations, were used for continuous variables, and categorical variables were summarised using frequencies and percentages. The comparative analysis employed appropriate statistical tests, such as t-tests or chi-square tests, depending on the nature of the data. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1 compares the key variables of the control and case groups in the study population. Age distribution showed no significant differences, with the majority falling within the 36–50 years range in both groups. However, a highly significant contrast in the mean operative time was evident, favouring the control group (71.067 minutes) over the case group (91.4 minutes). [Table 1]

Notably, oral feeding outcomes displayed significant disparities, with the control group showing a higher percentage (66.67%) of resuming oral feeding by day four compared to the case group (0%). The mean number of days to oral feeding was also shorter in the control group (4.4) than in the case group (5.267), emphasising swifter recovery in the control group. Overall, the table underscores the efficiency of the control group in terms of operative time and postoperative oral feeding outcome.

Table 2 provides insights into postoperative outcomes and hospital stays in the study population by comparing the control and case groups. A significant difference was observed in postoperative leaks, with the control group displaying a higher incidence (33.33%) than the case group (0%). Conversely, no significant differences were noted in wound infections, intra-abdominal abscess occurrence, septicemia, or mean hospital stay between the two groups, emphasising comparable outcomes. These findings contribute to a better understanding of postoperative complications and recovery trajectories in the studied patient cohort.

The study outcomes provide crucial insights into patient demographics, surgical efficiency, and postoperative recovery. Age distribution analysis demonstrated a balanced representation in the control and case groups. However, a significant reduction in the mean operative time was observed in the control group, emphasising surgical efficiency. The control group exhibited superior oral

feeding outcomes, with higher percentages and quicker resumptions than the case group.

In exploring postoperative complications, the control group showed a significantly higher incidence of postoperative leaks than the case group. Conversely, no significant differences were found in wound infections, intra-abdominal abscess

occurrence, septicaemia, or mean hospital stay between the groups. This comprehensive examination underscores the intricate interplay between patient demographics, surgical techniques, and postoperative outcomes, providing valuable insights for optimising patient care strategies. [Table 2]

Table 1: Age, mean operative time, oral feeding of the study population

		Control	Case	P value
Age	< 35	5 (33.33%)	2 (13.33%)	0.62
	36 - 50	4 (26.67%)	6 (40%)	
	> 50	6 (40%)	7 (46.67%)	
	Mean ± SD	45.6 ± 11.525	47.6 ± 10.266	
Mean operative time	< 75	11 (73.33%)	0	<0.001
	76 - 95	4 (26.67%)	8 (53.33%)	
	> 95	0	7 (46.67%)	
	Mean ± SD	71.067 ± 6.112	91.4 ± 7.327	
Oral feeding	Day 4	10 (66.67%)	0	<0.001
	Day 5	4 (26.67%)	11 (73.33%)	
	Day 6	1 (6.67%)	4 (26.67%)	
	Mean ± SD	4.4 ± 0.632	5.267 ± 0.458	

Table 2: Postoperative leak, wound infection, intraabdominal abscess, septicemia, mean hospital stay of the study population

		Control	Case	P value
Postoperative leak	Yes	5 (33.33%)	0	0.042
	No	10 (66.67%)	15 (100%)	
Wound infection	Yes	6 (40%)	3 (20%)	0.426
	No	9 (60%)	12 (80%)	
Intra-abdominal abscess:	Yes	2 (13.33%)	1 (6.67%)	0.98
	No	13 (86.67%)	14 (93.33%)	
Septicemia	Yes	4 (26.67%)	2 (13.33%)	0.648
	No	11 (73.33%)	13 (86.67%)	
Mean hospital stay	Yes	4 (26.67%)	2 (13.33%)	0.648
	No	11 (73.33%)	13 (86.67%)	

DISCUSSION

Gastroduodenal perforations constitute a prevalent and urgent surgical emergency that requires immediate admission and intervention. Although commonly associated with the elderly population, these perforations can occur across age groups. Despite a marked decline in elective peptic ulcer surgeries, the incidence of emergencies, particularly perforations, remains a persistent risk factor. The size of a perforation in peptic ulcer disease is a crucial determinant, varying from as small as 2 mm to > 20 mm, significantly affecting the overall prognosis. Notably, the mortality rate sharply rises for peptic ulcers with perforations larger than 20mm in comparison to those with perforations below this threshold.^[10,11]

The duration and size of the perforation play a pivotal role in delineating the extent of contamination in most cases. In a recent study, complications were encountered in nearly half of the patients, with noteworthy issues including wound infection, intra-abdominal infection, postoperative leaks, burst abdomen, and septicemia.^[2,12] The intricate interplay between the size, duration, and complications underscores the challenges in managing gastroduodenal perforations.^[13,14]

Managing giant peptic perforations introduces an additional layer of complexity, owing to the intricate anatomy of the duodenum and its marginal vascular supply shared with the pancreas.^[15] While various elaborate surgical techniques, such as partial gastrectomy and conversion of the perforation into pyloroplasty, have been proposed, these demand a high level of surgical expertise and prolonged operative times - resources often challenging to secure in emergency settings.^[8] In contrast, the omental plugging procedure emerges as a comparatively simple intervention, not mandating extensive expertise and feasible even within a short timeframe, making it particularly suitable for emergencies and potentially accessible to trainee general surgeons.^[9]

Regarding surgical management, for perforated gastric or duodenal ulcers exceeding 20 mm, two commonly performed procedures are Graham's omental patch closure (omentopexy) and omental plugging. Historical studies have posited the superiority of omental plugging over omental patch closure, citing reduced postoperative leak formation and lower mortality rates.^[9] Intriguingly, the present series corroborates these findings, reporting higher rates of wound infection, septicemia, mortality, and postoperative leaks in patients treated with Graham's omental patch closure compared to those treated

with omental plugging. This underscores the critical importance of choosing the appropriate surgical approach tailored to the individual characteristics of the peptic perforation, emphasising the ongoing evolution in understanding and managing this complex surgical condition.^[9]

This research on gastric and duodenal perforations aimed to compare the efficacy of two surgical techniques: Graham's Omental Patch Closure (Omentopexy) and Omental Plugging. The study included 30 patients with gastroduodenal perforations exceeding 20 mm, divided into control and case groups. Key findings included a balanced age distribution in both groups, a significantly shorter mean operative time in the control group (Graham Omental Patch Closure), and superior oral feeding outcomes in the control group by day.^[4] The incidence of postoperative leaks was higher in the control group than in the case group, in which no leaks were reported. No significant differences were found in other postoperative complications; however, the control group had a higher mortality rate. Overall, this study suggests the potential advantages of Omental Plugging, emphasising the importance of tailored surgical approaches for giant peptic perforations.

CONCLUSION

A study comparing surgical techniques for gastroduodenal perforations larger than 20 mm favors omental plugging over Graham's omental patch closure. Omental plugging showed advantages such as earlier initiation of oral feeding, shorter hospital stays, and reduced postoperative complications, indicating its effectiveness and efficiency for giant perforations.

Limitations of the study

The study's limitations, including a small sample size, single-center focus, limited follow-up period, exclusion criteria, retrospective data, and potential selection bias, may impact result generalizability and long-term outcome assessment. Additionally, the study did not address potential publication bias or consider evolving surgical techniques, raising

questions about contemporary relevance. Nevertheless, it offers valuable insights into gastroduodenal perforation surgical interventions.

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