

A RETROSPECTIVE COMPARATIVE STUDY OF OUTCOMES IN PATIENTS OF PERFORATED PEPTIC ULCER APPLIED WITH CELLAN-JONES REPAIR VERSUS GRAHAM'S PATCH

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ABSTRACT

Perforated Peptic ulcer is a complication of peptic ulcer disease (PUD) and is a surgical emergency with high morbidity and mortality. This study was undertaken to compare the outcome in patients treated with Cellan-Jones repair and Grahams patch for the perforation of peptic ulcer (PPU).

It is a retrospective study done on 50 patients operated for perforated peptic ulcer in the District Hospital at Al Ameen Medical College Hospital Bijapur Karnataka from 2002 to 2005. Patients with acute and chronic peptic ulcer perforation selected for surgery, out of 50 patients 38 patients selected for Cellan-Jones repair and 12 patients selected for Graham's patch. Statistical analysis using Chi-square test was used to study the outcome in patients treated with two different surgical procedures for that particular age, sex, and occupation. Age related morbidity and mortality was also compared in the given study. A total of 50 patients with perforated peptic ulcer 38 patient treated with Cellan-Jones repair and 12 patients applied with Graham's patch. The overall mortality rate is 6% with p-value <0/05; 95% C.I.

This study shows that the patients treated with Cellan-Jones repair and Graham's patch for the perforated peptic ulcer is having almost same result. This indicates that both the surgical methods have better survival outcome.

KEYWORDS: Perforated peptic ulcer, Cellan-Jones repair, Graham's patch.

INTRODUCTION

Peptic ulcer disease results from an imbalance between stomach acid-pepsin and mucosal defense barrier. 10% to 20% of patients with peptic ulcer disease (PUD) will develop complication in the form of bleeding, penetration and obstruction, among them 2% to 14% of ulcers will perforate causing an acute illness (1-2) often presenting with an acute abdomen that carries a high risk for morbidity and mortality (3). NSAIDs, Helicobacter pylori, physiological stress, smoking, corticosteroids and previous history of PUD are risk factors associated with perforated peptic ulcer (PPU) (4-13). Surprisingly treatment has not changed much since, a variety of surgical techniques have been advocated for the management of PPU consisting of primary closure by using interrupted suture, covered with a pedicle (live) omentum on top of repair that is Cellan-Jones repair and plugging the perforation with a free (dead) omental plug that is Graham's patch (14-15) are the techniques commonly used. But these techniques have certain drawbacks particularly in managing large perforation, late hospitalization, old age etc. PPU treatment is associated with significant postoperative morbidity and mortality (16). The present study was done to compare outcomes in patients treated with Cellan-Jones repair and Graham's patch, to study

the prevalence of perforated peptic ulcer based on age, sex, and occupation, and to compare the age-related morbidity and mortality in the given study group.

MATERIAL & METHODS

Study Area: Department of surgery, Government hospital and Al Ameen Medical College Hospital Bijapur, Karnataka.

Study Duration: 2002 to 2005 (3years)

Sample Size: 50

Study Design: Retrospective study, the data was collected from the hospital records in which 38 patients were treated with Cellan-Jones repair (live omentum) and 12 patients were treated with Graham's (dead omentum) patch. Based on pre-existing hospital records for the duration of 3yrs (2002-2005) uneven sample distribution in the study is due to different surgical method applied for the patients of PPU.

Sample Population: Patients admitted for duodenal perforation with presence of pneumoperitonium (plain X-ray abdomen in erect posture showing gas under the diaphragm), abdominal paracentesis showing bile stained turbid fluid, and positive rapid urease test (17).

Inclusion Criteria: Patient with diagnosed acute and chronic peptic ulcer perforation presenting with fever, tenderness, and abdominal rigidity were selected for surgery.

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Exclusion Criteria: Patients suffering from perforation due to trauma, meckel's diverticulum, inflammatory bowel disease or carcinoma of the bowel, ruptured appendix and ingestion of foreign object or caustic substances were excluded from the study.

Ethical Clearance: Entire study was approved by Institutional Ethical Committee which follows the guideline of Indian council of medical research (ICMR) for principles on ethical considerations involving human participants 2017 (18).

Study Interventions: The data was collected from the hospital records to obtain appropriate epidemiological information of 50 patients admitted for duodenal perforation (fulfilling the condition of inclusion and exclusion criteria) with respect to age, sex, occupation, clinical presentation, duration of symptoms, past history of chronic duodenal ulcer, investigations, mode of treatment received, postoperative complications and follow up of the patients. The patients were treated with a closure of perforation with an upper right paramedian incision under general anesthesia in which 38 patients were selected for Cellan-Jones repair (live omentum) and 12 patients were selected for Graham's (dead omentum) patch followed by peritoneal lavage with bilateral flank drains and closure. Average hospital stay for the patients in our study was 10 days, and patients were followed for 6 months to 2 years for any recurrence.

Statistical Analysis: Statistical analysis was done using Chi-square test with SPSS software version 13. A 'p' value <0.05 was considered as statistically significant association.

RESULTS

The variables which were analyzed are:

1. Age
2. Sex
3. Occupation
4. Age-related morbidity and mortality
5. Radiological finding
6. Abdominal paracentesis
7. Rapid urease test for H.pylori infection.

	Type of patch applied out of 50 patients	Mortality	%
LIVER OMENTUM	38	02	5.26
DEAD OMENTUM	12	01	8.33

Table 2: Mortality Rate In Cellan-jones Repair (Live) And Graham's (Dead) Patch

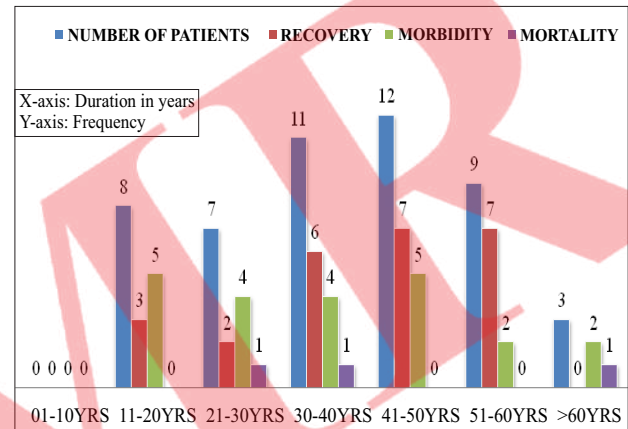


Fig 1: Age Related Recovery, Morbidity & Mortality

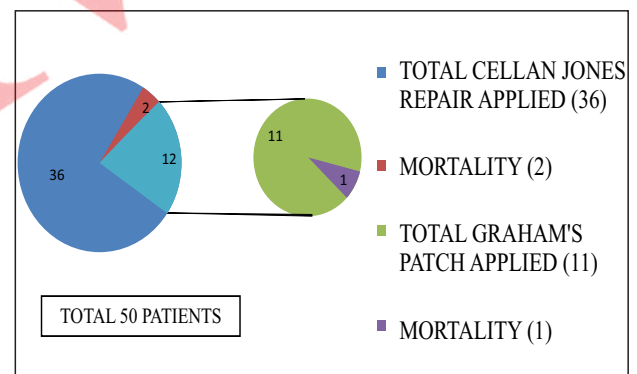


Fig 2: Mortality Rate In Cellan-jones Repair (live) And Graham (dead) Patch

INCIDENCE			OCCUPATION			OTHER INVESTIGATION		
Age(Yrs)	Frequency	%		Frequency	%		Frequency	%
1-10	00	00	Coolie	30	60	Pneumo-peritoneum	48	96
11-20	08	16	Farmer	10	20			
21-30	07	14	Busines	02	04	Paracentesis	40	80
31-40	11	22	Student	04	08			
41-50	12	24	Others	04	08	Urease test	35	70
51-60	09	18						
>60	03	06						
Total	50	100	Total	50	100			

Table 1: Showing Age Occupation And Investigations Eurolled Perforated Peptic Ulcer Patients

The above study shows that the age incidence for PPU increased during the 3rd and 4th decade of life with males (82%) being more commonly affected than females (18%) with a male-female ratio of 4:1. Age-related recovery in the patients were seen in 3rd to 5th decade of life, age-related mortality is maximum in 3rd and 4th decade and in old age group. The data analyzed for the given values shows that p-value is >0.5 under 95% of confidence level which indicates statistically not significant. The other variables were the radiological finding which showed the presence of pneumoperitoneum (gas under the dome of the diaphragm), the presence of bile-stained turbid fluid in the abdominal paracentesis and positive rapid urease breath test which confirmed the presence of PPU.

DISCUSSION

In this retrospective study conducted on 50 patients suffering from PPU, it is seen that the mortality rate in cases treated with application of Cellan-Jones repair (live omentum) and Graham's (dead omentum) patch is statistically not significant. This shows that the patch applied in both the methods is having a similar outcome. A similar study was undertaken by periasamy Subia et al (19) using both omental closure and gastric seromuscular flap for duodenal ulcer perforation which has shown similar survival outcomes. V Srinivas Goud et al (20) in his study conducted on the closure of duodenal perforations with omental plugging versus Graham's patch concluded that omental plugging is better compared to Graham's patch for the closure of duodenal ulcer, but in our study, the results were almost same.

Typically patients with PPU were males with peak age between 40 to 60 years with low socioeconomic status this explains the presence of physiological stress, smoking, and alcohol abuse (21-26) is more common which leads to PUD. Tobacco chewing and bidi smoking is a common habit in rural places (27). Alcohol consumption causes gastric mucosal damage, stimulate acid secretion and increases serum gastrin level (28). The need for surgery for PPU has been reduced by the introduction of H₂- receptor antagonists but still, incidence for PPU is present both in male and female this is because there is an increase in the use of aspirin or Non-Steroidal Anti-inflammatory drugs (NSAID's) or steroid abuse (29). The incidence of PPU is low in female compared to males in our study it may be due to the absence of habits; however, the number of female presenting with PPU may be involved in the abuse of NSAID's and corticosteroids. Studies have shown that PUD is associated with the use of NSAID's and steroids are associated with chronic ulcer perforation (30-33) or

bleeding (34-36). Earlier before the introduction of H₂-receptor antagonist stress and lifestyle factor were believed to be the most important factor contributing to PUD and PPU (37). In, recent years *Helicobacter pylori* (H-pylori) has been discovered for its role in the development of gastric and duodenal ulcer (38). Recovery, morbidity, and mortality after surgery for PPU depends upon old age, the presence of hypotension at the time of admission, delay in the surgery and any coexisting diseases (39-40). In this series of 50 patients of PPU who underwent Cellan-Jones repair and Graham's patch surgery the following observations and conclusions are made.

CONCLUSION

- PPU is more common in the age group of 30 to 40 years.
- The male and female ratio is 4.6: 1 (32 male, 18 female patients)
- Most of the patients belong to low socio-economic status with a rural background such as farmers with a history of smoking, chewing tobacco and alcohol consumption.
- In, this study we found 6 % of overall mortality rate in patients who underwent both Cellan-Jones and Graham's patch repair, which is statistically not significant.
- Hence, this study shows that the outcome in cases applied with Cellan-Jones repair and Graham's patch is almost the same.

Limitations Of The Study

- The sample size with which the study was undertaken might have not found any significant relationship from the data. There is a need for further research to revise the specific methods with a larger sample size to show a significant difference among these procedures.
- The data has relied on pre-existing hospital case record and the data did not specify a delay in the treatment received after hospitalization which will be important for case related morbidity and mortality.

REFERENCES

1. Bertleff MJ, Lange JF. Perforated peptic ulcer disease: a review of history and treatment. Dig Surg. 2010; 27 : 161-169.
2. Lau JY, Sung J, Hill C, Handerson C, Howed CW, Mertz CZ. Systematic review of the epidemiology of complicated peptic ulcer disease: incidence, recurrence, risk factors and mortality. Digestion, 2011; 84(2):102-113.
3. Bas G, Eryilmaz R, Okan I, Sahin M. Risk factors of morbidity and mortality in patients with perforated

- peptic ulcer. *Acta Chir Belg.* 2008; 108(4): 424-427.
4. Zelickson MS, Bronder CM, Johnson BL, Camunas JA, Smith DE, Rawlinson D et al. *Helicobacter pylori* is not the predominant etiology for peptic ulcers requiring operation. *Am Surg.* 2011;77(8): 1054-1060.
5. Chey WD, Wong BC. American college of gastroenterology guideline on the management of *Helicobacter pylori* infection. *Am J Gastroenterol* 2007; 102: 1808-1825.
6. Fuccio L, Minardi ME, Zagari RM, Grilli D, Magrini N, Bazzoli F. Meta-analysis: duration of first-line proton-pump inhibitor based triple therapy for *Helicobacter pylori* eradication. *Ann Intern Med.* 2007; 147: 553-562.
7. García Rodríguez LA, Barreales Tolosa L. Risk of upper gastrointestinal complications among users of traditional NSAIDs and COXIBs in the general population. *Gastroenterology.* 2006;132(2):498-506.
8. Gisbert JP, Pajares JM. *Helicobacter pylori* infection and perforated peptic ulcer prevalence of the infection and role of antimicrobial treatment. *Helicobacter.* 2003; 8(3): 159-167.
9. Lewis JD, Strom BL, Localio AR, Metz DC, Farrar JT, Weinrieb RM et al. Moderate and high affinity serotonin reuptake inhibitors increase the risk of upper gastrointestinal toxicity. *Pharmacoepidemiol Drug Saf.* 2008; 17(4): 328-335.
10. Malfertheiner P, Dent J, Zeijlon L, Sipponen P, Veldhuyzen Van Zanten SJ, Burman CF, et al. Impact of *Helicobacter pylori* eradication on heartburn in patients with gastric or duodenal ulcer disease results from a randomized trial programme. *Aliment Pharmacol Ther.* 2002; 16(8): 1431-1442.
11. Schubert ML, Peura DA. Control of gastric acid secretion in health and disease. *Gastroenterology* 2008; 134: 1842-1860.
12. Sonnenberg A, Müller - Lissner SA, Vogel E, Schmid P, Gonvers JJ, Peter P, et al. Predictors of duodenal ulcer healing and relapse. *Gastroenterology.* 1981; 81: 1061-1067.
13. Vergara M, Catalán M, Gisbert JP, Calvet X. Meta-analysis: role of *Helicobacter pylori* eradication in the prevention of peptic ulcer in NSAID users. *Aliment Pharmacol Ther.* 2005; 21: 1411-1418.
14. Cellan-Jones CJ. A rapid method of treatment in perforated duodenal ulcer. *BMJ.* 1929; 15(1):1076-1077.
15. Graham RR. The treatment of perforated duodenal ulcers. *Surg Gynecol Obstetric.* 1937; 64: 235-238.
16. Imhof M, Epstein S, Ohmann C, Roher HD. Duration of survival after peptic ulcer perforation. *World J Surg.* 2008; 32(3): 408-412.
17. Wang S, Zheng X. Urea breath tests for detection of *Helicobacter pylori*. In: advanced techniques in diagnostic microbiology, 2006; 11-22.
18. Mathur R. National Ethical Guidelines For Biomedical And Health Research Involving Human Participants. Director General. New Delhi: ICMR; 2017.
19. Subbiah P, Gayathri, Gopinath, et al. Closure of duodenal perforation by gastric seromuscular advancement flap. *J. Evolution Med. Dent. Sci.* 2016; 5(73):5355-5358.
20. Goud VS, Babu NV, Kumar PB. Comparative Study of Closure of Duodenal Perforations with Omental Plugging Versus Graham's Patch. *Int J Sci Stud.* 2016; 4(8):138-142.
21. Stabile BE, Passaro E. Duodenal ulcer: a disease in evolution. *Curr Probl Surg.* 1984; 21: 1-79.
22. Nuhu A, Madziga AG, Gali BM. Acute perforated duodenal ulcer in Maiduguri: experience with simple closure and *Helicobacter pylori* eradication. *West Afr J Med.* 2009; 28: 384-387.
23. Parihar S et al. Evaluation of large duodenal ulcer perforation with special reference to omentopexy and omental plugging. *Int Surg J.* 2016 Aug; 3(3):1229-1233.
24. Svanes, C, Soreide JA, Skarstein A, Svanes BT, Svanes K, Soreide O. Smoking and ulcer perforation. *Gut.* 1997; 41:177.
25. Smedley F, Hickish T, Taube M, Yale C, Leach R, Wastell C. Perforated duodenal ulcer and cigarette smoking. *JR Soc Med.* 1988; 81:92.
26. Turkdogan MK, Hekim H, Tuncer I, Aksoy H. The epidemiological and endoscopic aspects of peptic ulcer disease in Van region. *Eastern J Med.* 1999; 4(1):6-9.
27. Mathur PN et al. Retrospective study of perforated peptic ulcer: a surgical emergency. *Int Surg J.* 2017 Jan; 4(1):19-23.
28. Chung KT, Shelat VG. Perforated peptic ulcer-an update. *World J Gastrointest Surg.* 2017; 9(1):1-12.
29. Lagoo S, McMahon RL, Kakihara M, Pappas TN, Eubanks S. The sixth decision regarding perforated duodenal ulcer. *JSLs.* 2002; 6: 359-368.
30. Windsor JA, Hill AG. The management of perforated duodenal ulcer. *N Z Med J.* 1995; 108: 47-48.

31. Kang JY, Elders A, Majeed A, Maxwell JD, Bardhan KD. Recent trends in hospital admissions and mortality rates for peptic ulcer in Scotland 1982-2002. *Aliment Pharmacol Ther.* 2006; 24: 65-79.
32. García Rodríguez LA, Jick H. Risk of upper gastrointestinal bleeding and perforation associated with individual non-steroidal anti-inflammatory drugs. *Lancet.* 1994; 343: 769-772.
33. Hernández-Díaz S, Rodríguez LA. Association between nonsteroidal anti-inflammatory drugs and upper gastrointestinal tract bleeding/perforation: an overview of epidemiologic studies published in the 1990s. *Arch Intern Med.* 2000; 160: 2093-2099.
34. Laine L. Nonsteroidal anti-inflammatory drug gastropathy. *Gastrointest Endosc Clin N Am.* 1996; 6: 489-504.
35. Bombardier C, Laine L, Reicin A, Shapiro D, Burgos-Vargas R, Davis B et al. Comparison of upper gastrointestinal toxicity of rofecoxib and naproxen in patients with rheumatoid arthritis. Vigor Study Group. *N Engl J Med.* 2000; 343: 1520-1528.
36. Mariëtta J.O.E. Bertleff, Johan F. Lange. Perforated Peptic Ulcer Disease: Review of History and Treatment. *Dig Surg.* 2010; 27:161-169.
37. Ahmed N. 23 years of the discovery of *Helicobacter pylori*: is the debate over? *Ann Clin Microbiol Anticrib.* 2005; 4:17.
38. Sivri B. Trends in peptic ulcer pharmacotherapy. *Fundam Clin Pharmacol.* 2004; 18: 23-31.
39. Zittel TT, Jehle EC, Becker HD. Surgical management of peptic ulcer disease today: indication, technique and outcome. *Langenbecks Arch Surg.* 2000; 385: 84-96.
40. Sarosi GA Jr, Jaiswal KR, Nwariaku FE, Asolati M, Fleming JB, Anthony T: Surgical therapy of peptic ulcers in the 21st century: more common than you think. *Am J Surg.* 2005; 190: 775-779.

