

Profile of Patients with Duodenal Ulcer Admitted for Surgery at a Tertiary Care Centre

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Abstract:

Background: Duodenal ulcers, a common presentation of peptic ulcer disease, are primarily associated with *Helicobacter pylori* infection and NSAID use. Although the prevalence of duodenal ulcers has decreased with advancements in medical management, complications such as perforation and bleeding continue to contribute significantly to morbidity and mortality, particularly in resource-limited settings.

Aim: This study aims to evaluate the demographic, clinical, and surgical profiles of patients undergoing surgery for duodenal ulcers at a tertiary care center, with a focus on outcomes and associated complications.

Methods: A retrospective observational study was conducted at a tertiary care center, analyzing data from 200 patients who underwent surgical management for duodenal ulcers. Data were collected on demographics, clinical presentation, surgical type (elective vs. emergency), complications, and mortality. Statistical analysis was performed using SPSS version 23.0, employing descriptive and inferential statistics to identify trends and associations.

Results: The study included 200 patients, predominantly male (70%), with a mean age of 45.3 years. Elective surgeries accounted for 65% of cases, while 35% required emergency interventions. Postoperative complications were observed in 20% of patients, with infections (37.5%) and bleeding (25%) being the most common. Mortality was recorded at 5%, exclusively in emergency cases. Emergency surgeries were significantly associated with higher complication and mortality rates ($p < 0.05$).

Conclusion: Duodenal ulcers continue to present significant clinical challenges, particularly in cases requiring emergency surgery. Early diagnosis and elective surgical intervention are critical in reducing complications and mortality. Enhanced perioperative care protocols and preventive strategies are essential to improve patient outcomes.

Recommendations: In the surgical treatment of duodenal ulcers, future research should examine the incorporation of minimally invasive procedures and improved recovery regimens. To lessen the burden of emergency procedures and related complications, public awareness campaigns and early intervention techniques are advised.

Keywords: Duodenal ulcer, peptic ulcer disease, perforation, surgical management, postoperative complications.

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Introduction

Duodenal ulcers, a subset of peptic ulcer disease (PUD), remain a significant clinical concern despite advances in medical management. These ulcers, characterized by mucosal defects in the duodenum, are primarily caused by *Helicobacter pylori* infection and the use of nonsteroidal anti-inflammatory drugs (NSAIDs). Additional risk factors such as smoking, alcohol consumption, and stress exacerbate the condition, leading to a spectrum of presentations ranging from mild

symptoms to life-threatening complications [1]. Globally, the prevalence of duodenal ulcers has decreased with the advent of proton pump inhibitors (PPIs) and eradication therapy for *H. pylori*. However, the burden of complications such as perforation and bleeding persist, particularly in low- and middle-income countries [2].

Surgical intervention for duodenal ulcers, once the primary treatment, is now reserved for complications or refractory cases. Despite

advancements in medical therapy, approximately 10-15% of patients with duodenal ulcers experience complications, necessitating surgical management. Perforated duodenal ulcers (PDUs) are the most common indication for surgery, with an incidence of 7-10 cases per 100,000 annually [3]. PDUs are surgical emergencies often presenting with acute abdominal pain and generalized peritonitis. Mortality rates remain high, ranging from 5% to 20%, particularly in resource-limited settings where delayed presentation and inadequate healthcare infrastructure are prevalent [4].

Surgical techniques for duodenal ulcer management have evolved significantly. Simple closure using Graham's patch is widely practiced for perforated ulcers, while definitive surgeries like vagotomy and antrectomy are considered for chronic or recurrent ulcers [5]. Minimally invasive approaches, such as laparoscopic repair, have gained popularity due to reduced postoperative complications and shorter recovery times [6]. However, postoperative morbidity and mortality remain a concern, especially in patients undergoing emergency surgery.

Recent studies emphasize the importance of early diagnosis and timely surgical intervention to improve outcomes in duodenal ulcer patients. A study highlighted that delayed hospital presentation is a significant predictor of morbidity and mortality, stressing the need for increased public awareness and access to healthcare services [7]. Additionally, integrating enhanced recovery after surgery (ERAS) protocols has shown promise in improving patient outcomes and reducing hospital stays [8]. This study aims to evaluate the demographic, clinical, and surgical profiles of patients undergoing surgery for duodenal ulcers at a tertiary care center, with a focus on outcomes and associated complications.

Methodology

Study Design: This study is a hospital-based observational study.

Study Setting: The study was conducted at Jawaharlal Nehru Medical College and Hospital (JLNMC), Bhagalpur, a tertiary care center catering to a large population in Bihar. The hospital provides comprehensive surgical care, including management of duodenal ulcer cases requiring operative intervention.

Participants: A total of 200 patients diagnosed with duodenal ulcers and admitted for surgical treatment during the study period were included in this research. The sample size was chosen to ensure adequate representation and statistical power for the study.

Inclusion Criteria

- Patients diagnosed with duodenal ulcers requiring surgical intervention.
- Individuals aged 18 years and above.
- Patients who provided informed consent for the study.

Exclusion Criteria

- Patients with incomplete medical records.
- Individuals with non-duodenal gastrointestinal ulcers.
- Patients unwilling to participate or withdraw consent.
- Pregnant women and patients with significant comorbidities affecting surgical outcomes.

Bias: To minimize selection bias, all eligible patients meeting the inclusion criteria during the study period were included. Data abstraction was standardized to reduce information bias, and a double-check system was implemented to ensure data accuracy.

Data Collection: Data were collected retrospectively from medical records of patients admitted for duodenal ulcer surgeries. The collected information included demographic details, clinical presentation, diagnostic findings, type of surgery performed, and postoperative outcomes. The data collection process was conducted systematically and confidentially.

Procedure: The records were reviewed systematically to extract relevant data. Cases were categorized based on their demographic characteristics, clinical presentations, and surgical interventions. Surgical procedures were classified into elective and emergency surgeries, and postoperative outcomes were documented for analysis.

Statistical Analysis: The collected data were analyzed using SPSS version 23.0. Descriptive statistics, including frequencies and percentages, were used to summarize categorical variables, while mean and standard deviation were used for continuous variables. Inferential statistics, such as chi-square tests and t-tests, were applied to identify significant associations between variables. A p-value of <0.05 was considered statistically significant.

Results

A total of 200 patients diagnosed with duodenal ulcers and admitted for surgical treatment were included in the study. The mean age of participants was 45.3 years (SD \pm 10.2), with an age range of

18–75 years. The majority were male (140, 70%), while females comprised 60 (30%).

Table 1: Demographics and Baseline Characteristics

Variable	Number	Percentage (%)
Total Participants	200	100
Male	140	70
Female	60	30
Mean Age (years)	45.3	-

This table provides an overview of the participant demographics. The predominance of males (70%) aligns with existing literature that duodenal ulcers are more common in males.

Of the 200 cases, 130 (65%) underwent elective surgeries, while 70 (35%) required emergency interventions due to complications like perforation or bleeding.

Table 2: Surgical Details

Surgical Type	Number	Percentage (%)
Elective Surgery	130	65
Emergency Surgery	70	35

This table illustrates the distribution of surgical types. The higher proportion of elective surgeries suggests effective early diagnosis and management, while emergency cases highlight the critical nature of late presentations.

Postoperative complications were observed in 40 patients (20%). The most common complications were infections (37.5%) and bleeding (25%). Anastomotic leaks and pulmonary embolisms each accounted for 12.5%, while other complications made up the remaining 12.5%.

Table 3: Postoperative Complications

Complication Type	Frequency	Percentage (%)
Infection	15	37.5
Bleeding	10	25.0
Anastomotic Leak	5	12.5
Pulmonary Embolism	5	12.5
Others	5	12.5

This table categorizes postoperative complications. Infections were the most frequent, indicating a need for stringent perioperative sterilization protocols.

The mortality rate was recorded at 5% (10 patients). All deaths occurred in the emergency surgery group, emphasizing the critical nature of late presentations.

Table 4: Mortality Distribution

Mortality Group	Number	Percentage (%)
Elective Surgery	0	0
Emergency Surgery	10	5

This table highlights that mortality occurred exclusively in patients undergoing emergency surgery, reflecting the severity of complications such as perforation and peritonitis.

Discussion

The study analyzed the profile of 200 patients. The majority of the participants were male (70%), with a mean age of 45.3 years, suggesting that duodenal ulcers are more prevalent among middle-aged men. This finding aligns with existing literature that links male gender and certain lifestyle factors, such as smoking and alcohol consumption, to a higher incidence of duodenal ulcers. Elective surgeries accounted for 65% of cases, indicating that many patients benefited from early diagnosis and planned interventions. In contrast, 35% underwent

emergency surgeries, primarily due to complications like perforation or uncontrolled bleeding. This group demonstrated worse outcomes, emphasizing the need for prompt medical attention to prevent complications requiring urgent surgical intervention.

Postoperative complications were observed in 20% of the patients, with infections being the most common, followed by bleeding and anastomotic leaks. These complications were significantly more frequent in emergency surgery cases, highlighting the impact of delayed presentations and the challenges in managing advanced disease. The 5% mortality rate, exclusively among emergency cases, further underscores the severity of late-stage presentations and the need for enhanced perioperative care for such high-risk patients.

A study investigating the prevalence of peptic ulcer disease among patients with abdominal pain at a tertiary care institute in Gujarat found that duodenal ulcers maintained a stable prevalence, while gastric ulcers were more common. Most patients were younger females, with 97% reporting epigastric pain as the primary symptom. Socioeconomic and educational levels among affected individuals were generally low, underscoring the need for targeted public health interventions [9]. A prospective study on surgical complications of peptic ulcer disease in a tertiary care hospital analyzed 180 post-operative patients. It revealed a predominance of males aged 41–50 years and identified employment as a significant factor. Multiple ulcerations were observed in 59.25% of cases. The study emphasized timely surgical intervention to reduce morbidity and complications [10]. An observational study on gastroduodenal perforations reported that middle-aged rural men were the most affected demographic group. Common risk factors included prolonged NSAID use, consumption of spicy food, and *Helicobacter pylori* infection. Histology and rapid urease testing were highlighted as sensitive diagnostic tools. Postoperative management with anti-*H. pylori* therapy was found to be effective in reducing recurrence rates [11]. A retrospective cross-sectional study on duodenal perforations revealed that mortality was influenced by factors such as delayed surgical intervention, preoperative organ failure, and postoperative complications. Of the 55 patients analyzed, a 38% mortality rate was observed. Primary repair and diversion procedures were identified as the preferred surgical interventions, with outcomes heavily dependent on the timing of the surgery [12].

Conclusion

This study highlights that duodenal ulcers predominantly affect males, with a mean age of 45.3 years. Elective surgeries were more common and associated with better outcomes, while emergency surgeries had higher complication and mortality rates. Early diagnosis, timely intervention, and improved perioperative care are

crucial to reducing complications and mortality. Enhanced management strategies for emergency cases are essential to improving overall outcomes.

References

1. Lee YC, et al. *Helicobacter pylori* infection and peptic ulcer disease. *Nat Rev Gastroenterol Hepatol*. 2020;17(10):614-629.
2. Lanas A, Chan FK. Peptic ulcer disease. *Lancet*. 2017;390(10094):613-624.
3. O'Connell F, et al. Trends in surgical treatment of peptic ulcer disease. *Ann Surg*. 2021;274(3):523-530.
4. Chalya PL, et al. Outcome of surgical management of perforated peptic ulcers. *World J Emerg Surg*. 2019; 14:5.
5. Maheshwari S, et al. Laparoscopic versus open repair for perforated duodenal ulcer. *Surg Endosc*. 2020;34(6):2501-2510.
6. Gupta A, et al. Role of laparoscopic surgery in perforated duodenal ulcers. *J Minim Access Surg*. 2021;17(3):272-278.
7. Kim H, et al. Early versus delayed surgical intervention in perforated duodenal ulcers. *Surg Today*. 2021;51(8):1275-1282.
8. Ljungqvist O, et al. Enhanced recovery after surgery: Recent advances. *J Clin Med*. 2019;8(1):170.
9. Charpot RV, Gadhavi J. Prevalence of peptic ulcer disease among the patients with abdominal pain at tertiary care institute of Gujarat. *Am J Sociol*. 2020;3(2):30-32.
10. Kumar N, Saxena NK, Sinha P. Prospective study on surgical complication of peptic ulcer disease in tertiary care hospital. *Int J Health Sci*. 2022;6(8).
11. Bose G, Ray A, Ali SN, Ishore K. Profile of gastroduodenal perforation patients admitted in a rural tertiary care hospital: An observational cross-sectional study. *J West Afr Coll Surg*. 2024; 14:289-294.
12. Bojanapu S, Malani R, Ray S, Mangla V, Mehta N, Nundy S. Duodenal perforation: outcomes after surgical management at a tertiary care centre—a retrospective cross-sectional study. *Surg Res Pract*. 2020;2020.