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Correlation between Clinical Presentation and Operative Feasibility in Patients with Gastric Carcinoma: A Study from a Tertiary-Level Hospital

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Abstract | **Original Research Article**

Introduction: Gastric carcinoma remains a significant cause of morbidity and mortality in developing countries, often diagnosed at an advanced stage. This study aimed to evaluate the correlation between clinical presentation and operative feasibility in patients with gastric carcinoma admitted to a tertiary-level hospital. ***Methods:*** This cross-sectional study was conducted in the Department of Surgery, Bangladesh Medical College Hospital, Dhaka, Bangladesh, from August 2011 to June 2012. In this study, a total of 52 patients with histologically confirmed gastric carcinoma who were admitted to the surgical department of BMCH for operative treatment were included. Demographic data, clinical features, blood group distribution, addiction history, diagnostic findings, and operative outcomes were analyzed. ***Result:*** Most patients (63%) were aged between 40 and 60 years, with a male predominance (71%; male-to-female ratio 2.47:1). Blood group A was the most common (62%). Nearly half of the patients were smokers (54%), and 29% used tobacco in other forms. Common clinical symptoms included pallor/fatigue (69%), epigastric pain or lump (35%), and weight loss (38%). Physical findings showed epigastric tenderness or mass (35%), anemia (46%), and lymphadenopathy (12%). Endoscopic examination revealed mitotic lesions predominantly in the antrum and pylorus (62%). Histopathology showed that 48% of tumors were well-differentiated adenocarcinomas. Among 52 patients, 46 underwent surgery: 24 were operable, 22 underwent palliative procedures, and 6 (12%) were deemed inoperable and unfit for surgery. Advanced disease findings included regional lymph node involvement (65%), fixed posterior abdominal wall growth (42%), and peritoneal seeding (19%). ***Conclusion:*** This study showed that gastric carcinoma continues to present at an advanced stage in Bangladesh, often limiting curative surgical options. Early diagnosis and intervention remain essential to improving operability and patient outcomes.

Keywords: Gastric carcinoma, Operability, Clinical presentation, Correlation, Surgery.

INTRODUCTION

Gastric carcinoma remains a significant global health issue, ranking as the second leading cause of cancer-related deaths worldwide. For patients, a diagnosis of stomach cancer often signifies a devastating prognosis, representing an imminent threat to life. The incidence of gastric cancer varies considerably across geographical regions, with higher rates reported in East Asian countries such as Japan, China, and South Korea, while much lower rates are observed in countries like India, Pakistan, and Thailand. [1]

Historically, gastric cancer has been recognized since ancient times. The earliest recorded evidence appears in Egyptian papyri, even though the term "carcinoma" was not yet in use. The famous Persian physician Avicenna (980–1037) is credited with one of

the first written descriptions of stomach cancer. Later, in 1761, Morgagni provided a more detailed account of malignant gastric lesions, laying the foundation for future clinical understanding. [1]

Globally, a gradual decline in the incidence of gastric carcinoma has been observed, though the patterns and pace of decline vary widely. In Japan, for instance, stomach cancer remains the most frequently diagnosed malignancy in both men and women, accounting for 20–30% of all cancers. Nevertheless, incidence rates in Japan have been steadily decreasing since the 1960s, reflecting broader global trends. Notable variations exist not only across continents but also within regions, such as among South American nations and between racial groups in the United States. [2]

In the U.S., gastric carcinoma cases in the early 20th century predominantly involved the distal stomach (antrum and body). The significant reduction in overall gastric cancer incidence from the 1930s to the mid-1970s was largely due to a decline in these distal cancers. However, since the late 1970s, there has been a notable rise in adenocarcinomas of the proximal stomach and gastroesophageal junction, as documented by the Surveillance, Epidemiology, and End Results (SEER) Program. Similar trends have been reported in Europe, suggesting that cancers of the proximal stomach and gastroesophageal junction may share distinct pathogenic mechanisms compared to distal gastric cancers.[3]

More than 90% of gastric cancers are adenocarcinomas. These are typically classified into two histological subtypes: the intestinal type, characterized by cohesive cells forming glandular structures, and the diffuse type, marked by poorly cohesive cells infiltrating the stomach wall without forming a distinct mass. Intestinal-type adenocarcinomas tend to occur in the distal stomach, are often ulcerative, and usually follow a long precancerous phase. [3] In contrast, diffuse-type carcinomas, which more commonly affect younger individuals and the proximal stomach (especially the cardia), carry a poorer prognosis and are less associated with regional incidence trends. The global decline in gastric cancer incidence is largely attributed to a reduction in intestinal-type cancers, thought to be due to improved dietary habits, particularly the increased intake of fresh foods and decreased reliance on salted food preservation. [3]

Despite advances in diagnosis and treatment, the overall 5-year survival rate for gastric cancer remains low, ranging between 15% and 35%. Numerous clinical trials over recent decades have explored the potential benefits of adjuvant therapies, including chemotherapy and radiotherapy, in improving outcomes. The Southwest Oncology Group (SWOG) study notably supported the use of postoperative chemoradiotherapy as a new standard of care for resected gastric cancer. [4]

Prognosis is also closely linked to tumor stage. The depth of tumor invasion (T stage) and the presence and number of lymph node metastases (N stage) are among the most powerful predictors of recurrence and survival. Additionally, tumor location plays a crucial role, with proximal tumors generally associated with higher recurrence rates and worse outcomes than those in the distal stomach. [5]

Surgical resection remains the cornerstone of curative treatment. The extent of resection significantly influences prognosis: patients achieving an R0 resection (no residual disease) have markedly better survival compared to those with microscopic (R1) or gross (R2) residual disease. This correlation has been consistently observed in large studies from the United States, Germany, and several Asian countries. [5-7]

In the present study, we aimed to evaluate the correlation between clinical presentation and operative feasibility in patients with gastric carcinoma admitted to a tertiary-level hospital.

METHODOLOGY & MATERIALS

This cross-sectional study was conducted in the Department of Surgery, Bangladesh Medical College Hospital, Dhaka, Bangladesh, from August 2011 to June 2012. In this study, a total of 52 patients with histologically confirmed gastric carcinoma who were admitted to the surgical department of BMCH for operative treatment were included.

These were the following criteria for eligibility as study participants:

Inclusion Criteria

- Patients of any sex, aged above 18 years
- Histologically confirmed cases of gastric adenocarcinoma
- Patients fit for clinical and operative assessment
- Patients who gave written informed consent to participate in the study

Exclusion Criteria

- Patients with recurrent gastric carcinoma
- Patients with concurrent malignancies in other organs
- Patients with severe comorbid conditions precluding surgery or endoscopic examination (e.g., advanced cardiac failure, renal failure)

Data Collection Procedure:

Each patient underwent a comprehensive clinical evaluation, which included a detailed history focusing on presenting symptoms such as epigastric pain, vomiting, weight loss, hematemesis, and dysphagia, along with an assessment of personal habits like smoking and tobacco use. A thorough physical examination was performed to detect clinical signs, including pallor, epigastric tenderness, palpable mass, and

lymphadenopathy. Laboratory investigations included complete blood count with hemoglobin estimation, erythrocyte sedimentation rate (ESR), liver function tests (LFT), urinalysis, and white blood cell count to detect leukocytosis. Diagnostic and imaging procedures included upper gastrointestinal endoscopy to determine the location and nature of the lesion. Operative feasibility was evaluated based on tumor resectability, local invasion, regional lymph node involvement, and the overall physical condition of the patient. Based on these assessments, patients were classified into three categories: operable, inoperable but suitable for palliative surgery, and inoperable and unfit for any surgical intervention.

Statistical Analysis:

All data were systematically recorded using a pre-designed data collection form. Qualitative variables were expressed as frequency distributions and percentages. Data analysis was performed using SPSS version 19.0 for Windows (Statistical Package for the Social Sciences). This study received ethical approval from the Institutional Review Committee of Bangladesh Medical College Hospital, Dhaka, Bangladesh.

RESULTS

In the present study, a total of 52 cases of stomach carcinoma were admitted to Bangladesh Medical College Hospital in Dhaka across various surgical units from August 2011 to June 2012.

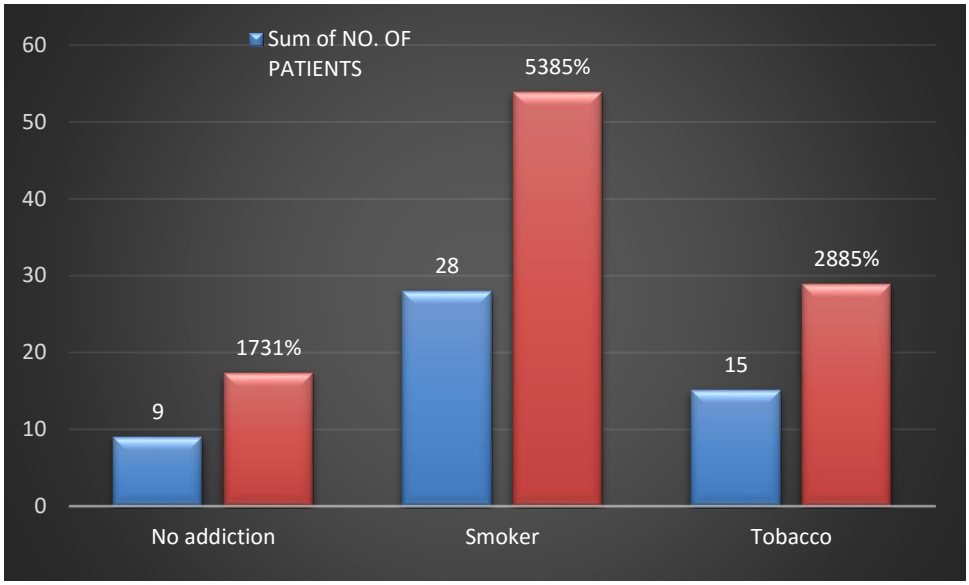

Figure 1: Age distribution of study patients (n=52)

Figure 1 shows that among the 52 cases, 15 cases (29%) of gastric carcinoma were found in the age group below 40 years, and 33 cases (63 %) between the ages of 40-60 years. Beyond 60 years, there were 4 cases (8 %).

Table 1: Distribution of patients according to sex (n=52)

Sex	No. of Patients	Percentage (%)
Male	37	71%
Female	15	29%

Table 1 shows that out of 52 patients, 37 (71%) were male and 15 (29%) were female. The male-female ratio was 2.47:1 in this study.

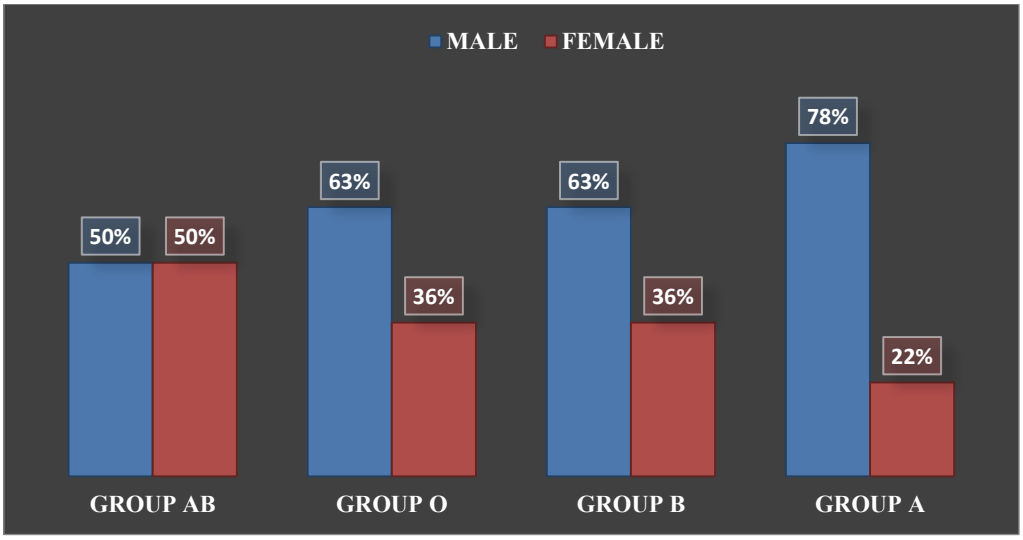

Figure 2: Distribution of patients according to blood group (n=52)

Figure 2 shows that, among the 52 patients, 32 (62%) belonged to blood group A, comprising 25 males (78%) and 7 females (22%). Eight patients (15%) had blood group B, including 5 males (63%) and 3 females (37%). A total of 4 patients (8%) had blood group AB, with an equal distribution of 2 males (50%) and 2 females (50%). Additionally, 8 patients (15%) belonged to blood group O, among whom 5 (63%) were male and 3 (37%) were female.

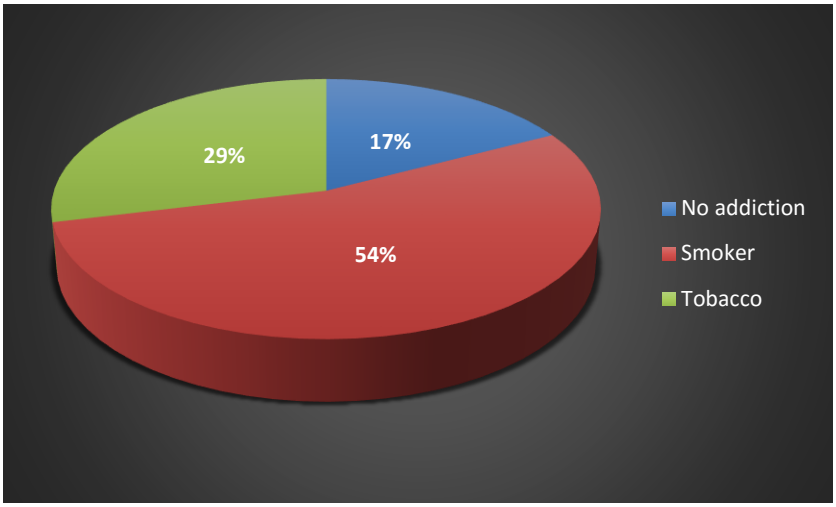

Figure 3: Distribution of patients according to personal habit: (n=52)

Figure 3 presents that among the 52 patients, 28 (54%) were smokers, 15(29%) were tobacco users in other forms, and 9 (17%) patients had no addiction.

Table 2: Distribution of patients according to clinical presentation(n=52)

Symptoms	No. Of Patients	Percentage (%)
Epigastric pain	18	35%
Nausea & Vomiting	17	33%
Epigastric lump	18	35%
Loss of appetite	36	36%
Pallor, Fatigue & Tiredness	28	69%
Hematemesis and melaena	24	46%
Dysphagia	12	23%
Weight loss	20	38%

In table 2, among the 52 patients 18(35%) showed epigastric pain, 17(33%) showed nausea & vomiting, 18(35%) showed epigastric lump, 36(36%) showed loss of appetite, 28(69%) showed pallor, fatigue

and tiredness, 24(46%) showed hematemesis, melaena, 12(23%) showed dysphagia and 20(38%) showed weight loss.

Table 3: Distribution of patients according to physical findings (n=52)

Signs	No. Of Patients	Percentage (%)
Tenderness epigastric region	18	35%
Palpable mass	18	35%
Anaemia	24	46%
Ascites	5	10%
Jaundice	5	10%
Virchow's gland	6	12%
Visible peristalsis	7	13%
Succussion splash	1	2%
Enlarged liver	4	8%
Per rectal examination (rectal shelf)	3	6%

In this table, we found that 18(35%) out of 52 cases had tenderness in the epigastric region, palpable mass in 18(35%) cases, anaemia in 24(46%)cases, ascites in 5(10%) jaundice in 5(10%) cases, virchow's gland in 6(12%) cases, visible peristalsis in 7 (13%) cases, succussion splash in 1 (2%) case, enlarged liver in 4 (8%) and Blummer's shelf in DRE in 3(6%) cases.

Table 4: Distribution of patients according to routine investigations (n=52)

Investigations	No. Of Patients	Percentage (%)
Haemoglobin (>8%Gm/Dl)	6	12%
Elevated ESR (›30Mm/1st Hour)	2	4%
Leucocytosis	2	4%
Abnormality In Urine Analysis (Pus Cell)	2	4%
Abnormal Liver Function Tests	5	10%

In this table, we found that, out of 52 patients hemoglobin percentage were < 8 gm/dL in 6 (12%) cases, elevated ESR(>30 mm in 1st hour) in 2(4%), Leukocytosis in 2(4%), abnormal urinalysis (pus cell) in 2(4%) cases, and abnormal liver function test in 5(10%) cases.

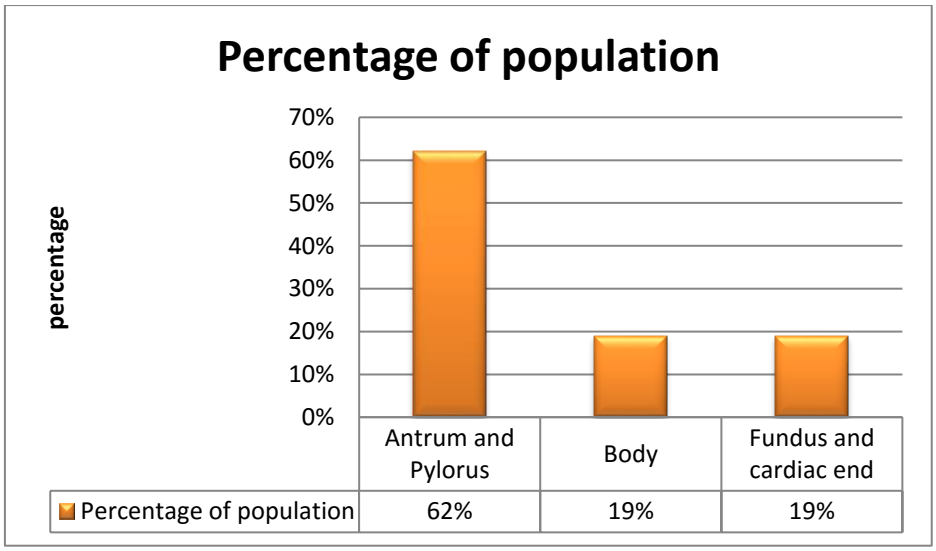

Figure 4: Figure showing the site of growth in endoscopic findings:

Figure 4 shows that, among the 52 patients, upper gastrointestinal endoscopy revealed mitotic lesions in the antrum and pylorus in 32 patients (62%), in the body of the stomach in 10 patients (19%), and in the fundus and cardia in 10 patients (19%).

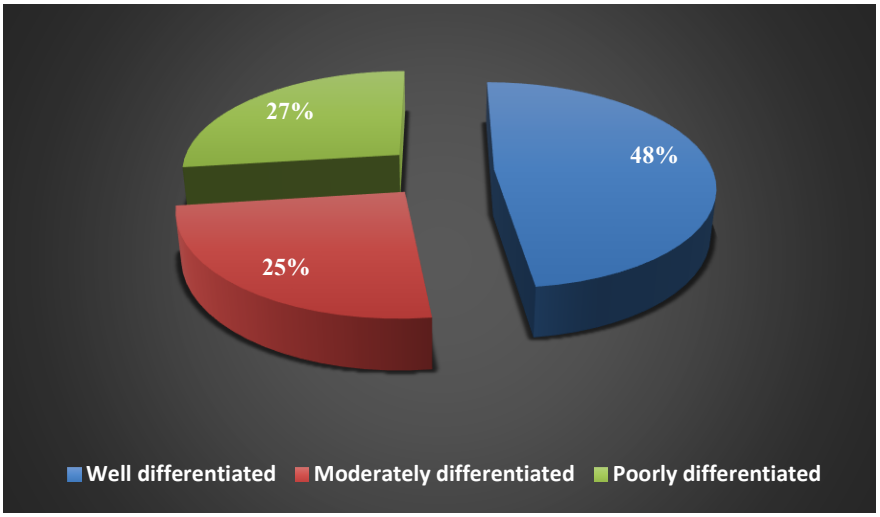

Figure 5: Distribution of patients according to tissue diagnosis (n=52)

Figure 5 shows that among the 52 patients, 25(48%) possess well-differentiated, 13(25%) possess moderately differentiated and 14(27%) possess poorly differentiated adenocarcinoma.

Table 5: Distribution of the study population according to treatment

Treatment	Total	No. of Patients		Percentage (%)	
		Curative /operable	Palliative/ inoperable	Curative /operable	Palliative/ inoperable
Surgery	46(88%)	24	22	52%	48%
Conservative	6(12%)	0	6	0%	100%

Table 5 shows that out of 52 patients, 46 underwent surgery. Among them, 24 patients were operable at the time of presentation, while palliative surgery was performed in 22 inoperable patients. The remaining 6 patients (12%) were inoperable and not fit for palliative surgery.

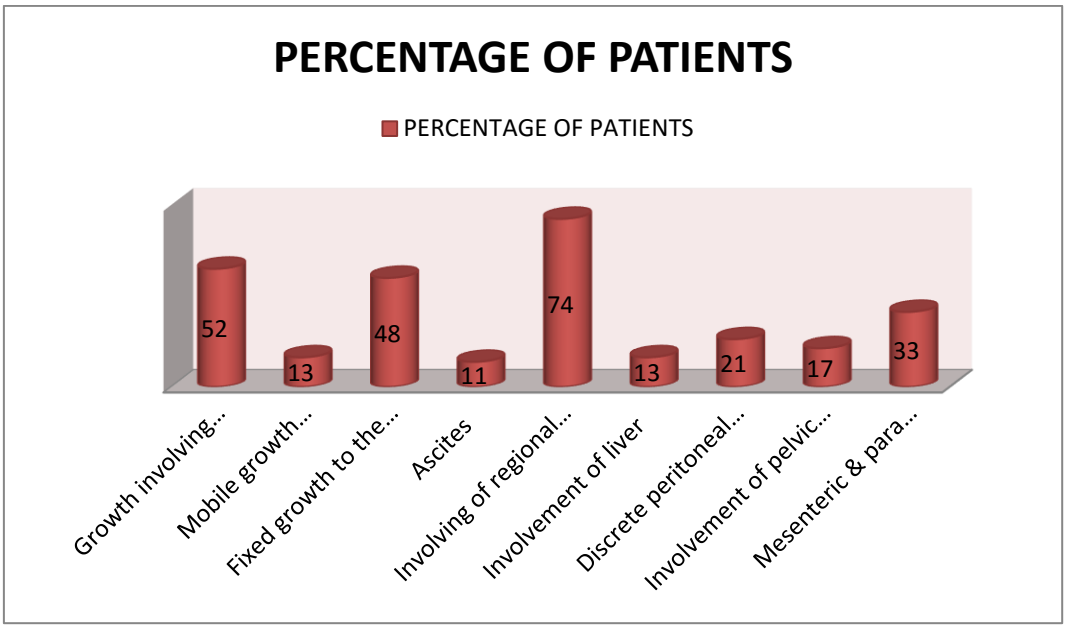

Figure 6: Distribution of patients according to peroperative findings

In Figure 6, we found that among the 52 patients growth involving the mucosa, submucosa and muscular layer in 24(46%), mobile growth involving the serosa in 6(16%) cases, fixed growth to the posterior abdominal wall in 22(42%), ascites in 5(10%), regional lymph node involvement in 34(65%), liver involvement in 6(12%), discrete peritoneal seedling in 10(19%) cases, pelvic peritoneum involvement in 8(15%) and mesenteric & para-aortic lymph node involvement in 15(29%) cases.

DISCUSSION

Gastric cancer remains a significant global health challenge, ranking as the second leading cause of cancer-related deaths worldwide, with an estimated 738,000 deaths, accounting for 9.7% of all cancer deaths. Despite declining incidence rates in many developed countries, its burden remains considerable, especially in regions such as East Asia, South America, and parts of Eastern Europe.

Surgical resection continues to be the cornerstone of curative treatment, with reported five-year survival rates ranging from 58% to 78% for stage I and approximately 34% for stage II disease.[5] However, the prognosis in advanced stages remains dismal, with five-year survival rates rarely exceeding 20%. [8] In the current study, the majority of patients presented at an advanced stage, limiting the scope for curative intervention and highlighting the challenges of early diagnosis.

This study included 52 patients admitted to Bangladesh Medical College Hospital, with most patients being male (71%) and in the 40-60 age group (63%). The male predominance aligns with global trends showing men are affected approximately twice as often as women [6]. Notably, the study observed a higher prevalence of gastric cancer in individuals with blood group A (62%), consistent with previous epidemiological findings suggesting an increased risk among this blood group [9].

A significant proportion of patients came from rural areas, underscoring the disparities in healthcare access and awareness. Many presented late due to economic constraints and limited health literacy. Common presenting symptoms included epigastric pain, vomiting, and weight loss, while classical signs such as anemia and dysphagia were more prominent in advanced disease. This supports the observation that early-stage gastric cancer is often asymptomatic or manifests with non-specific symptoms, leading to delays in diagnosis.

The histopathological analysis revealed that adenocarcinoma was the predominant type, aligning with global data indicating that 90-95% of gastric malignancies are adenocarcinomas. [9] According to Lauren's classification, the intestinal type, which follows a more indolent course, tends to increase with age, while the diffuse type is more common in younger patients and carries a poorer prognosis.[8]

Preoperative staging through imaging and endoscopy was employed to assess operability. Despite this, a large proportion of tumors were found to be unresectable at the time of surgery. In our study, only 24 cases (52%) were deemed operable, while 22 patients (42%) underwent palliative procedures, and in 6 patients (8%), only biopsy was possible due to extensive disease.

Peritoneal dissemination remains a significant concern in advanced gastric cancer, often detected intraoperatively. The mechanism involves tumor cell exfoliation and spreads facilitated by peritoneal fluid dynamics, with common sites including the rectovesical pouch, ovaries (Krukenberg tumor), and the greater omentum, resulting in the so-called "omental cake". [10,11] Imaging modalities like CT, MRI, and PET-CT are used preoperatively, but their sensitivity in detecting low-volume peritoneal disease is limited.

Several etiological factors contribute to gastric carcinogenesis. Environmental influences, dietary habits (e.g., consumption of salted, smoked, and nitrate-rich foods), and infections such as Helicobacter pylori are well-established risk factors. Additionally, prior gastric surgery, chronic gastritis, atrophic gastritis, pernicious anemia, and adenomatous polyps have all been associated with increased risk. [9,12]

Macroscopic classifications, such as Bormann's and histological systems like Lauren's, help guide treatment and prognosis. Early gastric cancer, confined to the mucosa or submucosa, has a significantly better prognosis, but is rarely diagnosed without active screening. [13,14] Most patients in resource-limited settings, including our cohort, present with advanced disease exhibiting alarm symptoms such as anorexia, vomiting, and anemia.

Surgical resection remains the only curative modality, and the type of gastrectomy, total or subtotal, is determined by tumor location. [15] Radical resection with adequate margins and lymphadenectomy offers the best chance for long-term survival. However, as highlighted in our study, the opportunity for curative surgery is often missed due to late presentation. In such cases, palliative procedures aim to relieve symptoms and maintain quality of life.

Despite advances in diagnostic and therapeutic modalities, gastric cancer continues to pose significant challenges. Early detection remains critical. Improving awareness, strengthening primary healthcare, and identifying high-risk individuals could help shift diagnosis toward earlier stages and improve outcomes.

Limitations of the study

This study had several limitations. Firstly, the sample size was relatively small, which may limit the generalizability of the findings. Secondly, the study duration was short. Additionally, in some patients, it was challenging to obtain complete clinical information, particularly regarding the exact time lapse between the onset of symptoms and surgical intervention, which may have impacted the assessment of disease progression and treatment outcomes.

CONCLUSION AND RECOMMENDATIONS

Although the incidence of gastric cancer has been decreasing in many countries, it remains the second most common cause of cancer-related deaths worldwide. The prognosis of gastric cancer is generally poor and depends on several factors, including early diagnosis, patient awareness, and the expertise of the surgeon. Despite advances in diagnostic methods, the disease is often detected only after it has invaded the muscularis propria, as early-stage symptoms are typically vague and nonspecific. The classical triad of anemia, weight loss, and aversion to meat-based foods usually appears only in the advanced stages of the disease. Given the poor prognosis and a five-year survival rate of only around 20%, increasing public awareness and improving healthcare delivery systems are essential. These efforts may help detect gastric cancer at an earlier stage, thereby increasing the chances of curative resection and improving patient outcomes. Further studies using a prospective and longitudinal design with a larger sample size are needed to validate the findings of this study.

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Ethical approval: This study was ethically approved

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