Original Article

Presentation and outcome of Gastric Cancer at a Tertiary Care Center

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Abstract

Introduction: Gastric cancer is the fifth most common cancer globally and the fourth leading cause of cancer-related deaths. Early-stage disease can be managed with endoscopic therapy or surgery, while advanced gastric cancer requires a multimodal treatment approach, including extensive lymphadenectomy. This study aims to evaluate the clinicodemographic profile and treatment outcomes of gastric cancer patients and to establish an effective therapeutic strategy.

Methods: This retrospective descriptive cross-sectional study was conducted in the Department of Surgery at Shree Birendra Hospital. It included patients with gastric malignancies who had complete medical records. Data on patient history, AJCC staging, operative details, and postoperative findings were analyzed. Surgical choices were based on the clinical indication in each case. Clinicopathological characteristics and surgical outcomes were compared across tumor stages. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 24.

Results: The study included 90 patients (62 males, 28 females) aged between 23 and 82 years. The most common clinical presentations were abdominal pain (58%), gastric outlet obstruction (18%), lump (5%), anemia (5%), and peritonitis (4%). Adenocarcinoma was the predominant histological type (87.78%). Curative surgery was performed on 73 patients (81.11%), while 17 patients (18.89%) underwent palliative procedures. Morbidity occurred in 16 patients (17.7%), primarily due to chest complications and sepsis, and mortality was recorded in 5 patients (5.5%).

Conclusion: This study highlights the predominance of locally advanced gastric cancer in males, with distal gastric cancer and well-differentiated adenocarcinoma being the most common. Chest complications and sepsis were the leading causes of morbidity and mortality. No patients received perioperative chemotherapy, underscoring the need for updated treatment protocols to improve outcomes.

Keywords: Chemotherapy; Gastrectomy; Gastric cancer; Lymphadenectomy.

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Introduction

Gastric carcinoma is the fifth most common cancer globally and ranks fourth in global mortality, with a higher prevalence in men. It is also the leading cause of cancer death in several Asian countries.[1] GLOBOCAN 2020 reports higher mortality in low HDI countries with highest incidence and mortality rates in Eastern Asia (mainly in Japan and Mongolia) with increasing trend of incidence among younger population.[2]

Diagnosis is done by endoscopy and endoscopic biopsy for upper Gastrointestinal (GI) tract pathologies such as gastric cancers.[3] As of now, endoscopic therapy or surgery is the only possibly effective treatment for early gastric cancer whereas advanced gastric cancer requires multimodal treatment with extensive lymphadenectomy.[4] With an early diagnosis resulting in a 90% five-year survival rate, gastric cancer typically manifests in an advanced stage with a five-year survival of 10% to 20%.[5] Innovative techniques, including sentinel lymph node biopsy could enhance the quality of life with advancement of stomach-sparing surgeries whose long term consequences are yet to be concluded.[4]

This study aims to evaluate the clinico-demographic profile, presentation and outcomes of Gastric Cancer as well as to analyze and establish a therapeutic strategy at the Department of Surgery of Shree Birendra Hospital, a tertiary care center of Nepal.

Methods

A retrospective descriptive cross-sectional study was conducted at the department of surgery of Shree Birendra Hospital (SBH) from April 2008 to October 2013. Ethical approval was taken from the Institutional Review Committee of Nepalese Army Institute of Health Sciences (245/14).

Patients admitted in the General Surgical Unit of SBH with gastric malignancy having complete medical records were included in our study. Those with incomplete records, who were not admitted or refused surgical treatment were excluded from the study. The patient information was obtained from filled-out audit forms during the patient's stay, the surgical wards, operation theater and pathology department. Analysis of patient's demographics, ethnicity, geographical distribution, presenting symptoms, location, AJCC 7th (TNM) staging,[6] management, survival, perioperative morbidity and mortality were done. Follow up visits to the OPD were noted in the same forms kept in the OPD records.

Gastric malignancies that were confirmed based on histopathology performed via Endoscopic Biopsy or Contrast Enhanced Computerized tomography (CECT) abdomen were included. According to the indication and the technical aspects of the procedure seen in each case, the patient was counseled and the choice of surgery type between D2 Subtotal Gastrectomy, D2 Total Gastrectomy, Gastrojejunostomy(GJ), Antrectomy+Gastrojejunostomy, Wedge excision or Whipple's procedure was made. Lymphatic invasion and metastatic status were evaluated on every patient with histopathological reports and CT findings. Patients with gastric cancer who underwent curative and palliative gastrectomy were included in this study. Clinicopathologic characteristics and results of operations for different stages of tumors were compared and analyzed.

All patients fulfilling the inclusion criteria during the study period were included, which accounted to 90 patients.

The patient's information was obtained from hospital records from the outpatient and inpatient department of Shree Birendra Hospital. Data regarding demography, clinical features, laboratory findings, post-operative status and complications were obtained and recorded in the proforma. Data was collected and stored in Statistical Package for Social Sciences (SPSS) version 24 and the collected data was rechecked and validated before analysis for errors. Analysis was done using the same SPSS tool. This article has been reported as per STROBE guidelines.[7]

Results

A total of 90 patients, 62 males and 28 females were included in the study with age ranging from 23 to 82 years, mean age being 61.07±10.85 years. Most common clinical presentations were abdominal pain (58%), gastric outlet obstruction (18%), lump (5%), anemia (5%) and peritonitis (4%). All patients underwent histopathological examination (**Table 1**).

Table 1. Histopathological Reports

Histopathological Reports	n (%)
Adenocarcinoma	79 (87.78%)
Mucinous adenocarcinoma	5 (5.56%)
Signet ring cell carcinoma	4 (4.44%)
Lymphoma	1 (1.11%)
GIST	1 (1.11%)

Upon histopathological differentiation, 53% were moderately differentiated, 40% were poorly differentiated and 7% were well differentiated. The lymphatic invasion was present in only 33% of patients. Seventy (77.8%) patients had distal carcinoma whereas 20 (22.2%) had proximal.

AJCC (7th edition) staging was done, where 23 patients (25.6%) were of stage IIB followed by 17 patients (18.9%) of stage IIIB and 13 patients (14.4%) of stage IIA (**Table 2**).

Among the patients undergoing surgery, 73(81.11%) patients underwent curative surgery whereas 17(18.89%) had palliative surgeries. The different types of surgery performed are mentioned in **Table 4**.

Table 2. AJCC (7th edition) staging of gastric cancers

Stage	n (%)
IA	2 (2.2%)
IB	7 (7.8%)
IIA	13 (14.4%)
IIB	23 (25.6%)
IIIA	10 (11.1%)
IIIB	17 (18.9%)
IIIC	12 (13.3%)
IV	6 (6.7%)

Table 3. TNM staging of Gastric Cancer

T1	2
T2	16
T3	38
T4a	10
T4b	24
N0	21
N1	32
N2	27
N3	10
M0	84
M1 (liver)	5
M1 (peritoneal)	1

The morbidity was seen in 16 patients (17.7%), among which were chest complications (7), wound complications (6), anastomotic leakage (GJ site) (1), amoebic liver abscess (1) and intraoperative common bile duct injury (1). Mortality was in five patients (5.5%) due to burst abdomen and septicemia (2), pulmonary embolism (1), ARDS (1) and hospital acquired pneumonia(1).

Total number of lymph nodes harvested was 10 to 45 (average being 20). Lymph node positivity was in 69 patients (1-44, average =7). Two peritoneal and one local recurrences were seen.

Discussion

The prevalence of gastric cancer has been increasing in Nepal as per the previous studies with high prevalence among elderly population and most of them lying in the lower 3rd of stomach.[8,9] In contrast, the common gastric cancer sites in western world are at proximal lesser curvature, cardia and the esophago-gastric junction.[10] In our study, the mean age of subjects was 61.07±10.85 years with male predominance (M:F=2:1). Some other studies have shown an increasing incidence of gastric cancer in younger women over the last two decades.[11]

Risk factors more common in our part of the world like *H. pylori* infection, alcohol consumption, tobacco smoking, and improper food preservation contribute to the high prevalence of gastric malignancies.[1] The common presentation of gastric cancer as vague gastrointestinal (GI) symptoms such as dyspepsia, anorexia, anemia and melena which mimic benign conditions such as gastroesophageal reflux or peptic ulcer disease causes presentation of patients in locally advanced states.[12] The non-availability of endoscopy and skilled manpower for early detection in low income countries may also contribute to late presentation of the patients. In this study as well, abdominal pain, gastric outlet obstruction, lump and anemia were the common presentations.

Table 4. Types of Gastric Cancer Surgery

Surgery	n (%)
D2 Subtotal gastrectomy	51 (56.6%)
D2 Total gastrectomy	18 (20%)
palliative Gastrojejunostomy	11 (12.2%)
Antrectomy with gastrojejunostomy (D1 Dissection)	6 (6.6%)
Whipple's procedure	2 (2.2%)
Proximal gastrectomy	1 (1.1%)
Wedge excision	1 (1.1%)

With the shifting trend of the location of the tumor in the stomach more proximally from distal sites worldwide, our study still showed distal stomach as the most common site of cancer.[13] Treatment modalities such as eradication of *H. pylori*, endoscopic therapy, gastrectomy and adjuvant therapy have been identified for early gastric cancers where gastrectomy is preferred over endoscopic resection in developing countries.[14] In cases of operable gastric cancer with a good prognosis, the preferred surgical treatment is gastrectomy with sufficient lymph node dissection.[15] Since most of the patients in our series were diagnosed with distal gastric cancer, the majority of patients had D2 subtotal gastrectomy (56.67%) and palliative therapy were done in unresectable cases (18.87%) with distant metastasis, involvement of hepatic artery and aorta.

A study by Wei Lu et al discussed the advantages of minimally invasive procedures like laparoscopic distal gastrectomy (LADG) with fewer short-term complications as compared to open distal gastrectomy (ODG) for Early Gastric Cancers (EGC).[16] However, quality of life in case of EGC could be further enhanced from function-preserving gastrectomies such as proximal gastrectomy (PG) and pylorus-preserving gastrectomy (PPG).[17]

The level of lymphadenectomy is still debatable with various types of lymph node dissection described in the literature such as D1, D1+, D2 and D3.[15] Studies in Japan have shown preference to aggressive lymph node dissection, whereas current NCCN guidelines suggests, spleen and pancreas preserving D2 lymphadenectomy as the standard of care.[18,19] In our study, a higher number of patients (76.6%) underwent D2 lymphadenectomy along with subtotal or total gastrectomy. But many randomized

trials have advocated regarding the increased morbidity and mortality in D2 lymphadenectomy compared to D1 lymphadenectomy for gastric cancer.[20,21] On average, the number of lymph nodes harvested in our study were 20 (10 to 45). Studies have found that the number of lymph nodes harvested is directly proportional to proper staging and prolonged survival of patients.[22] However, some other studies done in a large population found no influence of survival of stage II gastric cancer patients by retrieving 30 or more lymph nodes making the necessity of harvesting more lymph nodes still debatable.[23]

Perioperative chemotherapy has been the standard of care after MAGIC trial evidenced 13% better survival of the patients receiving perioperative chemotherapy than the upfront surgery group.[24] The 5-year survival in FLOT4 trial was 47% but had high toxicity (27%) and high drop out rate.[25] The CROSS trial where patients received chemoradiation also had a 5-year survival of 45%.[26] The reason for patients not receiving perioperative chemotherapy hasn't been studied yet but could be due to stigma about therapy, cost or lack of awareness among surgeons and physicians. In low-income countries , most patients are diagnosed in an advanced state, have poor performance status and are very reluctant for chemoradiation prior to surgery.

The Japanese Gastric Cancer Association (JGES) guideline for endoscopic submucosal dissection/ Endoscopic mucosal resection and cohort study done in Korea suggest comparable improved long term outcomes in patients with early gastric cancers who underwent endoscopic resection over surgical resection. However, for locally advanced diseases, chemotherapy preceding and following surgical removal has been recommended.[27,28] These guidelines also need further emphasis in our region as a standard method of care.

For patients with advanced cancer, the NCCN guidelines recommend staging laparoscopy to assess peritoneal metastasis using the Peritoneal Cancer Index (PCI) scale, followed by planning for cytoreductive surgery, Hyperthermic Intraperitoneal Chemotherapy (HIPEC), and Pressurized Intraperitoneal Aerosolized Chemotherapy (PIPAC) if the PCI score is less than 10.[29] However, during the study period, these therapies were not available at our center. Moving forward, incorporating these treatment modalities is essential for improving patient outcomes.

WHO reported tubular adenocarcinoma as the most common histologic type of early gastric carcinoma in 2010.[30] Histopathology in our study also showed Adenocarcinoma (87.78%) as the most common finding with overall differentiation mostly being moderately defined (53%) followed by poor differentiation (40%). Patients with the undifferentiated type are more prone to large invasive tumors and a higher incidence of peritoneal dissemination whereas the patients with the differentiated type are more likely to have a liver metastasis.[31]

Studies have identified anastomotic leakage and pulmonary complications as the most common issues following gastrectomy, with other complications like intra-abdominal abscesses and wound infections often necessitating re-interventions, reoperations, and readmissions.[32] In our study, chest complications were the most frequently observed, followed by wound complications and anastomotic leakage, with mortality primarily due to septicemia and respiratory conditions. These findings underscore the importance of proper patient selection, perioperative nutritional and physiotherapy support, and the implementation of strict sepsis protocols to improve outcomes.

This study has several limitations. As a single-center investigation, the findings may not be generalizable to the broader context of gastric cancer in Nepal. The data were collected retrospectively from 16 years ago, which may not accurately reflect the current treatment paradigms. Additionally, the presence of missing data and the limited patient sample hindered our ability to describe the epidemiology within a larger population. Given that our center is a tertiary care facility, most cases were presented at advanced stages, limiting our capacity for long-term follow-up across all stages of the disease. The grading system used was based on the AJCC 7th edition, and none of the patients received perioperative chemotherapy, despite it being the current standard of care. Furthermore, long-term outcome studies assessing five-year survival and disease-free survival using standardized care protocols are necessary in our country but were not included in this study.

Conclusion

In conclusion, this study provides an overview of the demographic profile and early outcomes of gastric cancer patients from a single institute in Nepal. The majority of cases involved locally advanced gastric cancer with a male predominance, and distal gastric cancer was most common. Well-differentiated adenocarcinoma was prevalent, though poorly differentiated types were also significantly present. Chest complications and sepsis were the leading causes of morbidity and mortality, and none of the patients received perioperative chemotherapy during the study period.

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