

Patterns of Gastric cancer in Tikur Anbessa Specialized University Hospital Radiotherapy Unit from 2012 to 2017



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Hospital radiotherapy unit from 2012 to 2017

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Abbreviation and Acronyms

AAU	Addis Ababa University
AJCC	American joint committee on cancer
Co 60	cobalt 60
DNA	Deoxyribonucleic acid
EBRT	External beam radiotherapy
EGC	Early gastric cancer
EMR	Endoscopic mucosal resection
EUS	Endoscopic ultrasound
GEJ	Gastroesophageal junction tumor
Gray	Unit of radiation
HDR	High dose rate radiotherapy
H. Pylori	HELOCBACTER PYLORI
IORT	Intraoperative radiotherapy
RO	resection with negative microscopic disease
SPSS	Statistical Package for the Social Sciences

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Abstract

Background: Gastric cancer is one of the most common alimentary tract cancers. Due to environmental and dietary factors, its incidence is on the rise, especially in the developing world. There is a lack of published studies on gastric cancer in Ethiopia.

Objective: To evaluate pattern of gastric cancer among patients coming to Tikur Anbessa Specialized Hospital, Radiotherapy Center from 2012-2017 G.C.

Methodology: The record of all patients taken from the departments inpatient and outpatient log book who were registered in the department from January 2012- December 2017 was taken as the source population and those patients who were labeled as gastric cancer was taken as the study population. The information was collected by the principal investigator. Data were compiled and analyzed using IBM SPSS version 22 software and presented using tables and figures.

Results- A total of 42 patients who fulfilled the inclusion criteria were enrolled in the study. The male to female ratio was 2:1. Patient ages ranged from 24 to 75 years. The majority (42%) of the patients aged 45-60. Abdominal pain was the most common initial clinical presentation accounting for (45.2%) of the cases. The majority (83.3%) had stage 4 disease at the time of the initial presentation. ECOG performance status 2 was recorded in (59.5%) of the patients. Known risk factors like alcohol and cigarette smoking were recorded in 14.3% and 2.4 % respectively. Antrum was the most common tumor site involved in 35.7% of the patients. The majority of the patients were evaluated with upper GI endoscopy (95.2%). Of the surgical procedures done on the study population palliative bypass gastrojejunostomy was the most frequent procedure (50%). Palliative combination chemotherapy was given to (69%) of the patients. Pain medications were given to (50%) of the patients.

Conclusion/recommendation: The study has shown gastric cancer affects a diverse group of patients in terms of age, sex, place of living, marital status, and religion. The majority of the patients had an advanced stage of disease after presenting with a protracted duration of symptoms were palliative combination chemotherapy was the only treatment option. We recommend proper pathological and clinical documentation.

1. Introduction

1.1 Background

Gastric cancer is one of the most common cancers and remains a major public health problem as the fourth most common cancer and the second leading cause of cancer death worldwide. (1) According to a global estimation, approximately 985,600 new cases of gastric cancer are being diagnosed each year and a minimum of 738,000 patients die from the disease. (1, 2) Nearly two-thirds of gastric cancers occur in developing countries. (3) There is a wide variation in the incidence of gastric cancer in different geographical regions. While the incidence of gastric cancers is high in China, Japan, and Korea, the incidence is comparatively low in most of Europe, North America, and Africa. (3) Within the African continent, there are also great variations. (2,4)

In a population based cancer registry in Ethiopia, Gastric cancer accounts for 3.9% of all cancer cases in males. (5) In Nigeria, the rate in the southwestern areas has been put at 4.1%, and double this rate in the northern part of the country. (6, 7) In East Africa, a high incidence of gastric cancer has been reported in areas around Mount Kilimanjaro. (9) Differences in dietary and genetic factors and variation in the infectivity rate of *Helicobacter pylori* have been reported to be responsible for this variation. (7, 9)

The incidence of gastric cancer by tumor location has also been reported to vary widely based on geographic location, race, and socioeconomic status. (10) Distal gastric cancer predominates in developing countries, among blacks, and lower socioeconomic groups, whereas proximal tumors are more common in developed countries, among whites, and higher socio-economic classes. (11)

Diverging trends in the incidence of gastric cancer by tumor location suggest that they may represent two diseases with different etiologies.

The main risk factors for distal gastric cancer include H. pylori infection and dietary factors; whereas, gastroesophageal reflux disease and obesity play important roles in the development of proximal stomach cancer. (11, 12)

Gastric cancer is a multifactorial disease involving both genetic and environmental factors. (12) Several factors are implicated in the development of gastric cancer, including diet, H. pylori infection, previous gastric surgery, pernicious anemia, adenomatous polyps, chronic atrophic gastritis, prior radiation exposure, and genetic factors. (12, 13)

Gastric cancer is difficult to diagnose early because there is usually a time lag between the onset of growth and the appearance of symptoms. (14)

Early symptoms of gastric cancer are non-specific and vague; as a result, most patients with early gastric cancer present with symptoms indistinguishable from benign peptic ulcer disease and, subsequently, these patients are diagnosed with late-stage gastric cancer or one of its complications. (7, 15) In low-income countries like Ethiopia, patients with dyspeptic symptoms are managed solely based on clinical examination because radiological and upper gastrointestinal endoscopic facilities are not available in many centers. (7, 8, 13-15)

These patients present later with advanced gastric cancer, which may be unresectable, or relapse after complete resection.

In Japan, up to 60% of gastric cancers are diagnosed as early cancers. (15) In developing countries, however, early disease is much less frequently detected due to poor endoscopic facilities and a lack of mass screening programs. (16) Screening for this group of patients improves the detection rate of early gastric cancer and, therefore, its prognosis. Endoscopy for surveillance of premalignant lesions has been explored with this objective in mind (15, 17). A high index of suspicion by clinicians, health education for early presentation, and availability of endoscopic facilities may help to facilitate early diagnosis and improve outcomes.

The management of gastric cancer presents a great challenge in resource-limited countries as found in Africa. Late presentation of the disease, lack of adequate screening programs, lack of endoscopic facilities, lack of adjuvant therapy, and high morbidity and mortality are among the hallmarks of the disease in these countries. (16)

The treatment of gastric cancer depends on several factors, including the size, location, and extent of the tumor, the stage of the disease, the patient's age, and overall health. (18)

Current treatment options for gastric cancer include surgery, chemotherapy, radiotherapy, targeted therapy, and palliative care. Surgery is currently the only treatment option for gastric cancer with curative potential. (18, 19)

However, the outcome of treatment of gastric cancer has been poor because the majority of these patients present late to the hospital with an advanced stage and only palliative care is possible. (19) This is partly due to the paucity of local data regarding this condition and lack of community awareness on the importance of early reporting to the hospital for early diagnosis and treatment.

In a retrospective study done in Tikur Anbessa specialized hospital, 90 % of the patients had stage III & IV disease (55)

The staging of the patient can be used to determine the prognosis of the patient. Whereas stage I disease has about a 60 to 80% five-year

Survival, this can be as low as a less than 5% five-year survival rate in stage IV. (13)

In a retrospective study done in black lion specialized university hospital surgical department, 56.8% patients with Gastric cancer were Males, nearly a quarter, 23.2% were below the age of 45 years. Weight loss, epigastric pain and vomiting were the most common presenting complaint and anemia and abdominal mass were the two most common findings on the examination. The antrum and pylorus were the most common sites. Only 40% underwent either palliative or curative surgery. (44)

This study aimed to describe the experience in the radiotherapy center on the demographic, clinical, and pattern of care in gastric cancer.

1.2 Statement of the problem

- Gastric cancer is a common and aggressive malignancy whose early detection and management is challenging. As a result of a wide variety of non-Specific clinical presentation and pathological subtypes, most patients present with advanced stage of disease. Lack of reliable diagnostic, treatment facilitates and a long waiting list for treatment is a major drawback especially in the developing countries.

1.3 Significance of the study

- Our study emphasize on pattern of gastric cancer in terms of patient demography, clinical sign and symptoms and treatment options that were offered. It highlights the wide variety of presentation and pathology. In addition it might lay the foundation for further studies that will help in formatting national and institutional guidelines.

2. Literature review

Gastric cancer is estimated to afflict 21,320 people in the United States in 2012 and result in 10,540 deaths. (20) During the past 70 years, there has been a significant decline in the incidence of gastric cancer in both sexes in Western countries. The causes of this decline are unknown. (21, 22) Risk factors implicated in gastric cancer development include consumption of smoked, pickled, and salted foods; low intake of fruits and vegetables; low socioeconomic status; smoking; decreased use of refrigeration; and dried meat/fish consumption. (21, 24) the presence of *Helicobacter pylori* is associated with a three to six times greater risk of gastric cancer than if the infection is absent. The increased association of *H. pylori* appears to be confined to those with distal gastric cancer and intestinal-type malignancy. (25)

In a study done in Bale highlands of south Ethiopia, for patients who present with upper gastrointestinal symptoms 10.8% had carcinoma. Of these 12 (3%) were stomach and 31(7.8%) were esophageal. Among adenocarcinomas, 7 were located in the distal esophagus, 6 in the cardia, one in the fundus and 5 in the pylorus. (52)

In a retrospective study assessing the pattern of cancer based on a hospital based registry in Tikur Anbessa specialized hospital oncology center, GI malignancy account for 12% of the cases. (54)

Historically, gastric adenocarcinomas have been diagnosed as intestinal or diffuse types. Intestinal types are more prevalent in high-incidence areas and responsible for much of the observed global ethnic variation of the disease. (26) The most common presenting symptoms of stomach cancer are loss of appetite, early satiety, abdominal discomfort, unintentional weight loss, anemia-related weakness, nausea and vomiting, and tarry stools. The duration of symptoms is <3 months in almost 40% of patients and >1 year in 20%. The physical examination can reveal advanced disease, for which the presentation may include an abdominal mass (epigastric or liver mass as well as a periumbilical node [i.e., Sister Mary Joseph node]), palpable left supraclavicular nodes (i.e., Virchow's node), or a rectal shelf (representing peritoneal seeding [i.e., Blumer's shelf]). (21)

Diagnosis is usually confirmed by upper gastrointestinal endoscopy as well as imaging studies in some instances. Double-contrast x-ray studies may reveal small lesions limited to the inner layers of the gastric wall. Endoscopy with direct visualization, cytology, and biopsy yields the diagnosis in .90% of exophytic lesions; however, infiltrative (linitis plastica), small (<3 cm), or cardia lesions may be more difficult to diagnose endoscopically. Endoscopic ultrasonography is the most accurate method of determining the depth of tumor invasion (intramural vs. extramural extension) before resection but is less accurate in detecting regional nodal metastases. (27, 28)

Adenocarcinomas account for 90% to 95% of all gastric malignancies. Lymphomas, including both favorable and unfavorable histologies, are the second most common malignancies. Rarely, leiomyosarcomas (2%), carcinoid tumors (1%), adenoacanthomas (1%), and squamous cell carcinomas (1%) occur. (21)

In a retrospective study done in black lion specialized teaching hospital

Surgical department adenocarcinomas accounts for (69.5%), Gastrointestinal stromal tumor (20%), squamous cell carcinoma (2.1%) and gastric lymphoma (8.4%). (44)

In a review article from sub-Saharan Africa by Daouda, pre-operative imaging including abdominal ultrasound and CT scan and in some cases laparotomy showed most patients had evidence of metastatic disease mainly in the liver and peritoneum. (50)

The site of origin of gastric cancers within the stomach has changed in the United States over recent decades, and proximal lesions are being diagnosed and treated more frequently. Although the highest frequency is still in the antrum/distal stomach (approximately 40%), the lowest frequency is now in the body rather than the proximal portion of the stomach (approximately 25%), with intermediate frequency in the proximal stomach and GE junction (approximately 35%). Several investigators have reported an increased frequency of proximal lesions due to obesity. (29, 30)

Gastric cancers sometimes are categorized according to Borrmann's five types. Type I tumors are polypoid or fungating; type II are ulcerating lesions surrounded by elevated borders; type III

have ulceration with the invasion of the gastric wall; type IV are diffusely infiltrating (linitis plastica), and type V is unclassifiable. (31)

Surgery is the only curative treatment option. It is recommended that gastric cancer surgery be performed by experienced surgeons in high-volume centers, entailing the removal of the perigastric lymph nodes (D1) as well as those along the main vessels of the celiac trunk (D2), to examine 15 lymph nodes. (32) The extent of lymph node dissection is controversial. At resection, it is recommended at least 15 lymph nodes be retrieved to reduce stage migration. In a D0 dissection, there is generally incomplete removal of the lymph nodes along the greater and lesser curvature. D1 dissection refers to the removal of nodes along the lesser curvature (nodal stations 1, 3, and 5) and greater curvature (nodal stations 2, 4, and 6) (Besides, more extensive lymph node dissection, including removal of nodes along the left gastric artery (nodal station 7), common hepatic artery (nodal station 8), celiac trunk (nodal station 9), and splenic artery (nodal stations 10 and 11) are referred to as a D2 dissection. In series with rigorous pathologic evaluation of these nodes the likelihood of discovering lymph node metastasis increases markedly in both D1 and D2 procedures. (33)

In a retrospective review of 229 patients in three hospitals in Rwanda, 51% underwent operations; of these 74% received gastrojejunostomy or were inoperable and 29% underwent curative surgery. (53)

The results of the U.S. Gastrointestinal Intergroup Gastric Adjuvant Trial has changed the standard of care in the use of both chemotherapy and radiation therapy in the postoperative setting for patients with disease extension through the gastric wall and/or with nodes positive for tumor. Postoperative irradiation plus concurrent and maintenance 5-FU–based chemotherapy is recommended for patients with stage IB-IV and M0 gastric cancer. (34)

Cases of gastric cancer diagnosed in our clinical practice are usually in advanced stage and significant proportion occurs in younger patients. A study is required for the better understanding of this situation and its management in a low resource set up.

3. Objectives

3.1. General objective

To retrospectively assess gastric cancer in the radiotherapy unit.

3.2 Specific objectives

- To assess the demographic pattern of gastric cancer patients in study period
- To assess the common initial clinical presentation and patient work up
- To assess the type of treatment offered to the patients
- To assess the use of pain medications

4. Methodology

4.1. Study area

The study was conducted in Tikur Anbessa Specialized Hospital Radiotherapy center. Established 25 years back with the help of the International Atomic Energy Agency (IAEA), the Center currently has two Cobalt-60 Teletherapy units one out of order for the past few years and one HDR Brachytherapy unit dedicated for gynecologic malignancies. Five full-time consultant oncologists, three medical physicists, and five radiotherapists are currently working in the center. The center has started training in clinical oncology in 2013 and currently, 40 residents are enrolled. Activities include inpatient admission for chemotherapy and outpatient clinics for new patient evaluation and follow-ups. With a recently opened cancer center nearby the department has now 35 beds for chemotherapy admissions. (51)

4.2. Study design and period

A retrospective cross-sectional study design on the pattern of Gastric Cancer in the oncology department was conducted from May to August 2018 G.C.

4.3. Study variables

Age, Sex, place of living, history of alcohol, and use of tobacco, HIV infection Performance Status, Grade, Stage, Gross appearance, duration of symptoms and modes of therapy including surgery, chemotherapy, Radiotherapy, and use of pain medication

4.4. Population

4.4.1. Source population

All cancer patients seen in the oncology department from 2012-2017.

4.4.2 Study population

All cases of gastric cancer cases registered in the inpatient and outpatient log book from 2012 to 2017 in the department.

4.5.1 Inclusion criteria

Patients with pathologically proven Gastric Cancer in the study period.

4.5.2 Exclusion criteria

Inadequate labeling

Inadequate data lacking more than two variables regarding in age, sex, address, marital status, occupation, place of living, religion and clinical history

Patients with non-carcinomatous gastric tumors

4.6 Sample and sampling method

All eligible patients were included.

4.7 Data collection:

Data were collected by the principal investigator using a pretested and structured checklist from the patient medical record chart.

The data collection process was supervised by the advisor.

4.7.1 Data quality control and analysis

The collected data were checked for completeness and accuracy daily. The collected data were checked for completeness, coded, and analyzed using SPSS windows version 22.

Results are presented in tables, figures, and statements.

4.8 Ethical considerations

Ethical approval was obtained from the department of oncology. Confidentiality, accountability, and neutrality on patients' data were kept throughout the study and afterward.

4.9 Dissemination of results

The study finding will be submitted to the department of oncology and AAU CHS. Publication of the result on scientific journals will be considered through peer review and presentation on different meetings/conferences.

CHAPTER FIVE: RESULTS

5. Study population

5.1 Socio-demographic data, clinical presentation, stage, risk factors, and co-morbid medical conditions

A total of 103 cases were recorded as gastric tumors in our radiotherapy center during the study period. Of these, 61 patients with inadequate information, incorrect labeling and non-carcinomatous gastric tumors were excluded from the study. Thus, 42 patients were enrolled in the study representing 40% of the cases. There were 28 (66.7%) males and 14 (33.3%) females giving a male to female ratio of 2:1 (Table 1). The ages ranged from 24 to 75 years. The modal age group was (45 to 60 years) accounting for 42.9 % of cases (Table 2). 37 (88.1%) of the patients were married at the time of the study. Most of the patients, 14 (33.3%) were farmers in occupation and 21(50%) came from the rural part of the country (Table 3). In terms of religion 23(54.8%) of the patients are Christian orthodox and 17 (40.5%) were Muslim. The majority of 18 (42.9%) of the patients came from the Oromia region (Table 4).

The duration of symptoms ranged from 2 to 24 months. The majority of patients presented 18 (42.9%) between 3-6 months compliant (Table 6). The majority of the patients 19 (45.2%) presented with abdominal pain followed by abdominal obstruction and dysphagia (14.3%). Upper GI bleeding as an initial presentation was recorded in 4.8% of the patents (Table 5). ECOG performance status of II was recorded in 25 (59.5%) of the patients. According to AJCC staging of Gastric Cancer the majority of patients, 35 (83.3%) was stage 4. Only one (2.4%) patient was stage 3 gastric cancers. The other 6 (14.3%) were non-metastatic gastric cancers who are difficult to stage due to inadequate post-operative biopsy reports (Table 7).

Alcohol consumption and smoking were reported in 1 (2.4%) and 6 (14.3%) patients, respectively. six (14.2%) patients had associated co-morbid medical illnesses, such as hypertension in two patients, diabetic Mellitus in one patient, and HIV infection in three patients (7.1%). H.pylori infection confirmed by stool antigen test was recorded in 1 (2.4%) of the patients (Table 8)

Table 1: Sex Distribution of patients with gastric cancer in the radiotherapy unit from 2012- 2017

Sex	Frequency	Percent
Male	28	66.7
Female	14	33.3
Total	42	100

Table 2: Age Distribution of patients with gastric cancer in the radiotherapy unit from 2012-2017

Age	Frequency	Percent
19- 30	4	9.5
31-45	11	26.2
45-60	18	42.9
61-100	9	21.4
Total	42	100.0

Table 3: Occupation of patients with gastric cancer in the radiotherapy unit from 2012-2017

Occupation	Frequency	Percent
Housewife	7	16.7
Public servant	9	21.4
Private work	1	2.4
Businessman/woman	3	7.1
Farmer	14	33.3
Retired	1	2.4
Other	7	16.7
Total	42	100

Table 4: Address of patients with gastric cancer in the radiotherapy unit from 2012-2017

Address	Frequency	Percent
Oromia	18	42.9
Addis Ababa	16	38.1
Amhara	4	9.5
SNNP	4	9.5
Tigray	0	0
Afar	0	0
Somalia	0	0
Benishangul Gumz	0	0
Gambella	0	0
Dire Dawa	0	0
Total	42	100.0

Table 5: Clinical presentation of gastric cancer in the radiotherapy unit from 2012-2017

Clinical presentation	Frequency	Percent
Asymptomatic	4	5.2
Abdominal pain	19	45.2
Abdominal swelling	5	11
Abdominal bleeding	2	4.8
Dysphagia	7	14.3
Weight loss	4	5.2
Total	42	100

Table 6: Duration of illness of gastric cancer in the radiotherapy unit from 2012-2017

Duration	Frequency	Percent
0-3 month	5	11.9
3-6 month	18	42.9
6-9 month	1	2.4
9-12 month	4	9.5
More than a year	14	33.3
Total	42	100.0

Table 7: Clinical-stage of gastric cancer patients in the radiotherapy unit from 2012-2017

Stage	Frequency	Percent
I	0	0
II	0	0
III	1	2.4
IV	35	83.3
Unknown	6	14.3
TOTAL	42	100

Table 8: Marital status, religion , risk factors and medical comorbidities of patients with gastric cancer in the radiotherapy unit from 2012-2017

Marital status	Married	37 (88.1%)
	Not married	5 (11.9%)
Religion	Orthodox Christian	23 (54.8%)
	Muslim	17 (40.5%)
	Protestant	2 (4.7%)
	Catholic	0
	Other	0
Use of Alcohol	Yes	1 (2.4%)
	No	41 (97.6%)
Use of cigarette	Yes	6(14.3%)
	No	36(85.7%)
Medical co morbidity	Yes	6 (14.3%)
	No	36(85.7%)

5.2 Pathological pattern

The anatomical site, Gross appearance, Histopathological type/grade and metastasis

The antrum was the most frequent anatomical site involved in 15 (35.7%) of cases (Table 9). The most common macroscopic appearance according to Borrmann classification system was type I (Fungating tumor) seen in 38.1% of cases (Table 10). Most of the tumors 34 (81.0%) had unknown grade status on the pathological report. Poorly differentiated adenocarcinoma was documented in 7 (16.7%) patients (Table 11). According to Lauren's classification of gastric adenocarcinoma, 2(4.8%) were intestinal, 2 (4.8%) were diffuse, and 38 (90.4%) were not classified into a specific group.

Lymph node metastasis at the time of diagnosis was recorded in 4 (9.5 %) of cases. Lymph node involvement was not evaluated in 90.5% of the cases. Distant metastasis occurred mainly to the liver (Table 12).

Table 9: Location of primary Tumor on gastric cancer in the radiotherapy unit from 2012-2017

Location	Frequency	Percent
Gastro Esophageal	9	21.4
Cardia	4	9.7
Fundus	2	4.7
Body	6	14.2
Antrum	15	35.7
Unknown	6	14.3
Total	42	100

Table 10: Gross appearance of tumors in patients with gastric cancer in the radiotherapy unit from 2012-2017

Gross appearance	Frequency	Percent
Type 1	16	38.1
Type 2	0	0
Type 3	8	19.0
Type 4	3	7.1
Type 5	1	2.4
Unknown	14	33.3
Total	42	100.0

Table 11: Tumor Grade of patients with gastric cancer in the radiotherapy unit from 2012-2017

Grade	Frequency	Percent
Well differentiated	0	0
Moderately differentiated	1	2.4
Poorly differentiated	7	16.7
Unknown	34	81.0
Total	42	100.0

Table 12: Laurens classification and lymph node evaluation of patients with gastric cancer in the radiotherapy unit from 2012-2017

Laurens classification	Intestinal type	2 (4.8%)
	Diffuse type	2 (4.8%)
	Unknown	38 (90.4%)
Lymph node evaluation done	Yes	4 (9.5%)
	No	38(90.5%)

5.3 Pattern of Diagnosis and Clinical care

5.3.1 Diagnosis

The diagnosis of gastric cancer was confirmed pathologically by upper GI endoscopic biopsies in 40 (95.2%) of Patients and the remaining 2 (4.8%) patients were diagnosed during laparotomy for a presumed diagnosis of ovarian cancer in one case and imaging of Abdominal CT Scan and FNA of metastatic site in the other case (Table 13). Metastatic workup including CXR, Abdominal U/S and Abdominal CT scan was recorded in 25(59.5%) of the patients (Table 14).

Table 13: Initial modality of diagnosis of patients with gastric cancer in the radiotherapy unit from 2012-2017

Diagnostic Modality	Frequency	Percent
Barium study	0	0
Upper GI Endoscopy	40	95.2%
CT SCAN	0	0
MRI	0	0
Laparotomy	2	4.8%
Endoscopic ultrasound	0	0
Total	42	100

Table 14: Metastatic workup of patients with gastric cancer in the radiotherapy unit from 2012-2017

Metastatic work up	Frequency	Percent
Chest X ray and abdominal ultrasound	16	38
Chest x ray, Abdominal Ct scan and Abdominal Utrasound	25	59.5
Chest CT scan and Abdominal CT scan	1	2.5
Total	42	100

5.3.2 Clinical care of patients with gastric cancer in the radiotherapy unit from 2012-2017

Out of 42 patients, 21 (50%) patients underwent surgical procedures for gastric cancer and the remaining 21 (50%) patients came with biopsy results. Of the type of surgical procedures performed, bypass gastro-jejunostomy was the most frequently performed surgical procedure, accounting for 26.2 % of cases. In addition to gastric resection, Krukenberg's tumors excision was performed in 2 (4.8%) of the patient (Table 15).

Table 15: Types of surgery done in patients with gastric cancer in the radiotherapy unit from 2012-2017

Surgery	Frequency	Percent
Subtotal-gastrectomy	9	21.4
Metasstecomy	2	4.8
By pass surgery	11	26.2
Not done	20	47.6
Total	42	100.0

Of the 9 (21.4%) who underwent radical intent surgery 7 (16.7%) had D1 lymphadenectomy and none of the patients had D2, D3, D4 dissections (Table 16).

Table 16: Lymph Node Dissection done in patients with gastric cancer in the radiotherapy unit from 2012-2017

	Frequency	Percent
D1	7	16.7
D2	0	0
D3	0	0
D4	0	0
Not done	35	83.3
Total	42	100.0

Of the nine patients who underwent radical surgery only three (33.3%) of the patients had pathological surgical margin evaluation. Two had negative margins (22.2%) and one (11.1%) had a positive margin (Table 17).

Table 17: Surgical margin evaluation of patients with gastric cancer in the radiotherapy unit from 2012-2017

Surgical margin status evaluated	Frequency	Percent
Yes	3	33.3
No	6	66.7
Total	9	100

The use of chemotherapy was documented in 36 (85.7%) patients. Of these, 1 (2.4%) were given chemotherapy as a neoadjuvant therapy, 29 (69%) in palliative treatment whereas, in the remaining 6 (14.3%), patients, chemotherapy was used as adjuvant therapy (table 18).

Table 18: Reason for chemotherapy treatment in patients with gastric cancer in the radiotherapy unit from 2012-2017

Purpose of chemotherapy	Frequency	Percent
Neo adjuvant	1	2.4
Adjuvant	6	14.3
Palliative	29	69
Total	36	100

Analgesics were prescribed in 21 (50%) of the patients (Table 19).

Table 19: Use of Analgesics in patients with gastric cancer in the radiotherapy unit from 2012-2017

Analgesics	Frequency	Percent
Yes	21	50.0
No	21	50.0
Total	42	100.0

Radiotherapy and Targeted therapy were never used in patients in this study period (Table 20).

Table 20: Use of radiotherapy and targeted therapy in patients with gastric cancer in the radiotherapy unit from 2012-2017

Radiotherapy and targeted therapy	Frequency	Percent
Yes	0	0
No	42	100
Total	42	100

CHAPTER SIX: DISCUSSION

It has been shown that gastric cancer is not uncommon malignancy in the radiotherapy center. The male to female ratio is 2:1 which is comparative to the study done in Mali. (35) Like other African studies, the majority of the patients were in a relatively younger age group between 45-60. (36)

It has been shown that 50% of the patients in our study came from the rural part of the country where the socio economic status is low.

Prospective studies have demonstrated a significant dose-dependent relationship between smoking and gastric cancer risk. (38, 39) There is little to support for an association between smoking and gastric cancer in our study.

In our study, the majority of patients presented late with an advanced stage IV which is in keeping with other studies in developing countries. (40, 41, 55)

This study showed a wide spectrum in the location, gross appearance and microscopic features on gastric cancer. The commonest location was gastric antrum, which was similar to a study done in Tikur Anbessa hospital surgical department (44). Grossly, according to the Borrmann classification system, the fungating type was the most common tumor in this study. However, our findings did not match with those of Schindler et al who found infiltrative lesion (linitis plastica) to be the most common type. (43)

Laurens classification of gastric tumors is of a significant prognostic value. Compared with the diffuse types, the intestinal type is known to be associated with a better prognosis. (45) In our study 90.4% of the patients don't have an assigned Lauren classification. Inadequate pathology reporting in terms of gross appearance, grade, subtype, lymph node status, and surgical margins was observed.

The development of endoscopic techniques has improved the proportion of gastric cancers detected at an early stage, particularly in Japan, which has the highest incidence of the disease

and the most developed programs for screening. (45) In our study, 95.2% of the patients had an upper Gi endoscopy as the initial diagnostic workup. In addition abdominal CT SCAN was evaluated in 25(59.5%) of the patients.

Treatment modalities of gastric cancer include surgery combined with chemotherapy and radiotherapy given either as neo- or adjuvant therapy. (46) Surgery is and, most probably, will remain the cornerstone of curative management of resectable gastric cancer; however, this benefit is limited to patients who present with early and, perhaps, localized disease. (47) In this study, only 21.4% of patients had gastric resection with curative intent and 26.2% of patients underwent palliative bypass surgery alone due to the advanced nature of the disease.

While surgical resection remains the cornerstone of gastric cancer treatment, the optimum extent of nodal resection remains controversial, with randomized studies failing to show that the D2 procedure improves survival when compared with D1 dissection. (48) In the present study, D1 lymphadenectomy was carried out on fit patients (16.7%) with locally advanced disease.

In addition multimodal treatment involving chemotherapy or radiotherapy, in addition to surgery, is thought to be a promising strategy for improving loco-regional control of gastric cancer. (49) The majority of gastric cancer patients in this study had stage 4 disease at presentation and was, therefore, not candidates for adjuvant therapy. In our study, the use of chemotherapy and radiotherapy was reported in 85.7% and 0% of cases, respectively. Of this 69% of the chemotherapy was given for palliative purposes.

Pain medications were given to only half of patients despite the majority of the patients has locally advanced and metastatic disease.

Limitations of the study

- ✓ There was a challenge on data recording and individual variation on filling patient profiles on the charts.
- ✓ The cases registered on logbooks and patient charts were discordant for many patients.
- ✓ This is a retrospective study which is less powerful than a prospective study

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The study has shown gastric cancer affects a diverse group of patients in terms of age, sex, place of living, marital status, and religion. The majority of the patients had an advanced stage of disease after presenting with a protracted duration of symptoms were palliative combination chemotherapy was the only treatment option.

7.2 Recommendations

The principal investigator recommends for further studies and close follows up of gastric cancer patients to see change in the pattern of demography, clinical presentation and treatments.

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9. Annex I Data extraction tool

9.1 Demography

9.1.1 Age

- a. 0- 18 year
- b. 19- 30 year
- c. 31- 45 year
- d. 46- 60 year
- e. > 60 year

9.1.2 Sex

- A. male
- B Female

9.1.3 Marital status-

- A. Married
- B. Not married
- C. Divorced
- D. widow

9.1.4 Religion-

- A Christian
- B. Muslim
- C. Protestant
- D. catholic
- E. other

9.1.5 Occupation

- A house wife
- b. public servant
- c. private employee
- d. business man/woman
- e. farmer
- f. retired
- g. other

8.1.6 Address (region)

- A. Addis Ababa
- B. Oromia
- C. Amhara
- D. Tigray
- E. SNNPR
- F. GAMNELLA
- G. AFRAR
- H. BENISHANGUL
- I. DIRE DAWA
- J. HARARI

8.1.7 Place of living

- a. Urban
- b. Rural

9.2 Risk factor

9.2.1. Smoking history-

- a. yes
- b. No

9.2.2Alcohol

- a. yes
- b. No

9.2.3Family history of gastric cancer

- a. yes
- b. no

9.2.4. History of H. pylori infection confirmed by stool h pylori antigen test

- a. yes
- b. no

9.3 Comorbid medical condition

9.3.1. Diabetes mellitus

- A. yes
- B. No

9.3.2. Chronic hypertension

A. Yes

B. No

9.3.3 HIV infection

A. Yes

B. No

9.4 Location

a. Gastroesophageal junction

b. Cardia

c. Fundus

d. Body

e. Antrum

f. unknown/ not mentioned

9.5 Gross appearance

a. Type I (Polypoid/fungating)

b. Type II (Superficial spreading) tumor

c. Type III (Ulcerating) tumor

d. Type IV (Diffusely infiltrating/linitis plastica) tumor

e. Type V (unclassified tumor)

F. unknown/ NOT mentioned

9.6 Pathological types

a. Intestinal

b. Diffuse

C. Unknown

9.7 Grades

a. Well-differentiated

b. Moderately differentiated

c. Poorly differentiated

d. Undifferentiated

e. unknown/ not mentioned

9.8 Clinical stages

a. 1

b. 2

c. 3

d. 4

e. Unknown/difficult to asses

9.9 Surgical margins if operated

a. Negative

b. Positive

c. Unknown/ not mentioned

9.10 Numbers of lymph nodes submitted for pathological examination

a. Adequate (16 lymph nodes)

b. Inadequate

9.11 Initial clinical presentation

a. Asymptomatic (incidental diagnosis)

b. abdominal pain

c. abdominal bloating

d. abdominal swelling/distention

e. abdominal bleeding

f. abdominal obstruction

g. dysphagia

h. viscous perforation

i. weight loss

j. change of stool color

k. symptoms of anemia like fatigue, light headiness, and SOB

l. other

9.12 Duration of symptoms

a. 0 month – to 3 month

b. 3 month – 6 month

c. 6 month – 9 month

- d. 9 month- 12 month
- e. more than a year

9.13 ECOG PERFORMANCE STATUS

- a. 0
- b. 1
- c. 2
- d. 3
- e. 4

9.14 Initial diagnostic investigation for the primary tumor

- a. Barium study
- b. Endoscopy
- c. CT scan
- d. MRI
- F. Laparotomy
- G. Endoscopic ultrasound

9.15 Metastatic scan

- A. Chest x-ray
- b. Abdominal ultrasound
- c. Chest CT
- D. Abdominal CT
- E. PET scan
- F. Abdominal MRI

9.16 Tissue diagnosis acquired from

- A. Primary tumor site

B. Metastatic site

9.17 Modalities used to take pathologic specimen

A. FNA

B. biopsy

C. Body fluid analysis

D. Post-operative tissue specimen

9.18 Treatment

9.18.1 Surgery

- a. Biopsy only
- b. Radical
- c. Palliative
- d. Not done

9.18.2 If surgery is done what is the type of surgery

- a. Total gastrectomy
- b. Subtotal gastrectomy
- c. Wedge resection
- d. Metastectomy
- e. Bypass Surgery

9.18.3 If surgery is done the type of lymph node dissection

- a. D1
- b. D2
- c. D3
- d. D4
- e. UNKNOWN OR NOT DONE

9.18.4 Is Chemotherapy Given?

- A. Yes
- B. NO
- C.

9.18.5 If the answer is yes, what was the intent of chemotherapy

- a. Adjuvant chemotherapy alone
- b. Adjuvant Concurrent chemoradiotherapy
- c. Neoadjuvant chemotherapy alone
- d. Neoadjuvant concurrent chemoradiotherapy
- e. Perioperative chemotherapy
- f. Palliative chemotherapy
- g. Not given

9.19.6 Duration between surgery and chemotherapy

- a. 0- 3 month
- b. 3- 6 month
- c. 6- 9 month
- d. 9- 12 month
- e. > 1 year

9.19.7 Is radiotherapy given

- a. Yes
- b. No

9.18.8 If the answer is yes then, the intent was

- a. Intraoperatively
- b. Postoperative in the adjuvant concurrent setting
- C. Preoperatively
- D. Palliative purpose

9.18.9 Targeted therapy use

- A. Yes
- B. No

9.18.10. Use of analgesics

- a. yes
- b. no

ANNEX II ASSURANCE OF INVESTIGATOR

I,.....the undersigned Clinical Oncology Resident agree to accept responsibility for the scientific, ethical and technical conduct of the research project and provision of required progress reports as per terms and conditions of the research and publications office of the Addis Ababa University.

Name of the Investigator: Dr. Yonas Dandena (4th Year Clinical Oncology Resident)

Signature_____ Date ____/____/_____

APPROVAL OF THE PRIMARY ADVISOR

Advisor Name: Dr. Wondimagegneu Tigeneh (MD, MPH, Consultant Oncologist)

Signature_____ Date ____/____/_____