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Surgical Outcome and Determinant Factors Among Patients with Malignancy Admitted in Tibebe Ghion Specialized Hospital Bahir Dar, Ethiopia

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COLLEGE OF MEDICINE AND HEALTH SCIENCES
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Surgical Outcome and Determinant Factors Among Patients with Malignancy Admitted in Tibebe Ghion Specialized Hospital Bahir Dar, Ethiopia

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TITTLE: SURGICAL OUTCOME AND DETERMINANT FACTORS AMONG PATIENTS WITH MALIGNANCY ADMITTED IN TIBEBE GHION SPECIALIZED HOSPITAL BAHIR DAR, ETHIOPIA

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Bahir Dar, Ethiopia

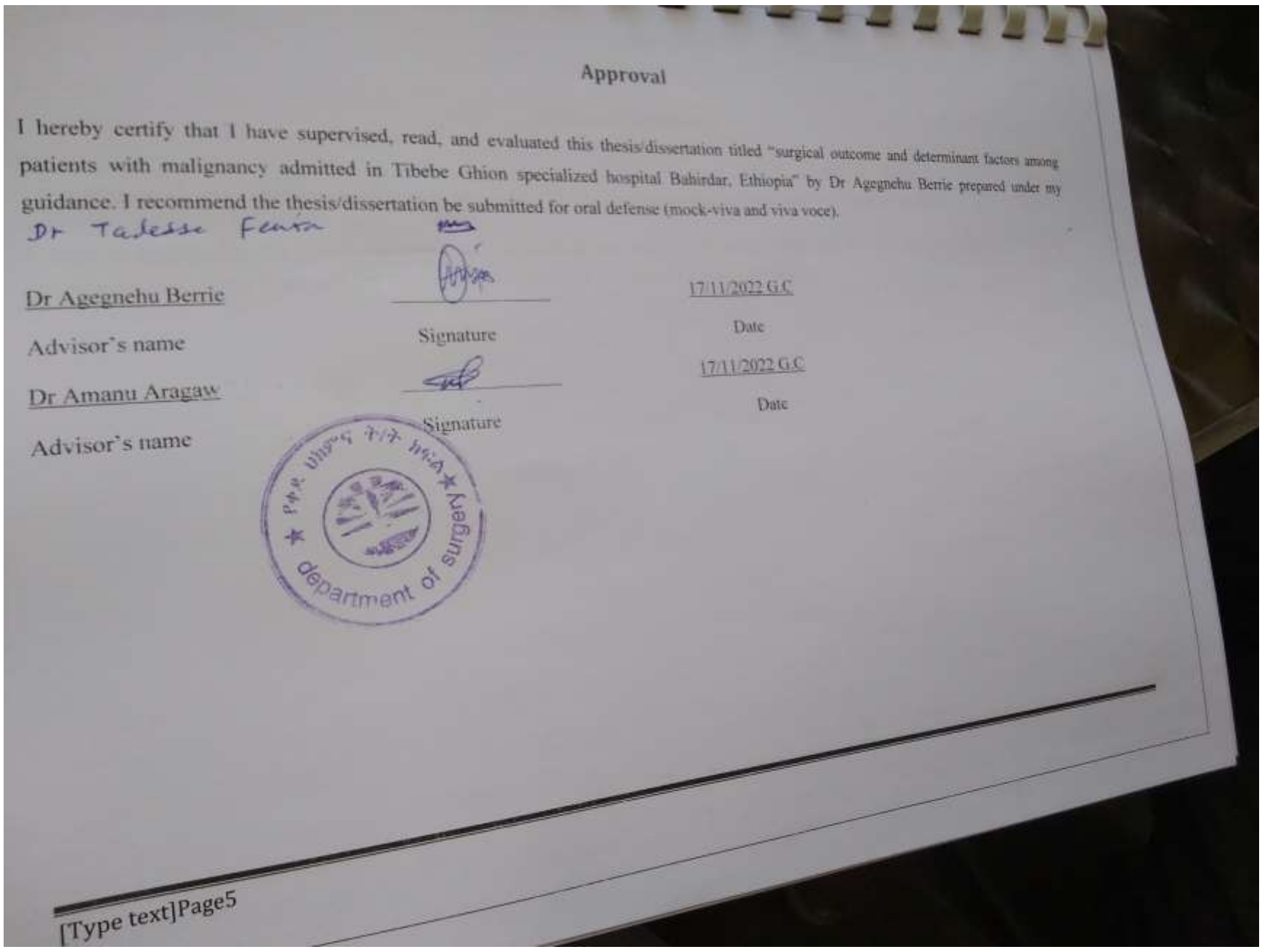
Declaration

This is to certify that the thesis entitled “surgical outcome and determinant factors among patients with malignancy admitted in Tibebe Ghion specialized hospital Bahirdar, Ethiopia”, submitted in partial fulfillment of the requirements for the degree in General Surgery, Department of Surgery, Bahir Dar University, is a record of original work carried out by me and has never been submitted to this or any other institution to get any other degree or certificates. The assistance and help I received during the course of this investigation have been duly acknowledged.

Dr Tadesse Fenta Gela	17/11/2022 G.C	Bahirdar
Name of the candidate	Date	Place

Approval

I hereby certify that I have supervised, read, and evaluated this thesis/dissertation titled "surgical outcome and determinant factors among patients with malignancy admitted in Tibebe Ghion specialized hospital Bahirdar, Ethiopia" by Dr Agegnehu Berrie prepared under my guidance. I recommend the thesis/dissertation be submitted for oral defense (mock-viva and viva voce).



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Abstract

Background: Cancer ranks as a leading cause of death and an important barrier to increasing life expectancy in every country of the world. According to estimates from the World Health Organization (WHO) in 2019, cancer was the first or second leading cause of death before the age of 70 years in 112 of 183 countries and ranked third or fourth in a further 23 countries. The outcome of malignancy after treatment depends on stage, grade, and age, type of malignancy, treatment modality and co morbid illness. Early stage, low grade tumor, had better outcome. Some of the most common cancer types, such as breast cancer, cervical cancer, oral cancer, and colorectal cancer, have high cure rates when detected early and treated according to best practices. Some cancer types, such as testicular seminoma and different types of leukemia and lymphoma in children also have high cure rates if appropriate treatment is provided, even when cancerous cells are present in other areas of the body.

Objective: To assess the outcomes and determinant factors of malignancy after surgery in TibebeGhion Specialized Hospital Bahir Dar, Ethiopia

Methods: A retrospective chart review for patients operated at surgery department. And all the necessary data was collected from operated patients' cards using the pre-developed data collection format. Total number of patients who had cancer operated during 2yrs were 630.from this sample size is calculated using P-value 0.5%.then the sample size were adjusted the final sample size was 239.After data collection the data was entered into Epi data then exported to SPSS 25 version and analyzed through it

Result: death rate in patients with inadequate lymph node dissection was 66.7%, those with co morbid illness were 25.2%,those with palliative procedure was 34.7% ,those with complication was 28.7%,those with positive surgical margin was 43.5% and those with serum albumin <3.5mg/dl 26.7%.

Conclusion: The study showed that patient with co morbid illness, in adequate lymph node dissection, those having complications, operated for palliative purpose had significant death rate.

Lists of Acronyms and Abbreviations

AAH----------Action against Hunger

BMI-----Body Mass Index

CARE--------Cooperative for Assistant & Relief Everywhere

CSS----------Cancer Specific Survival

DFS---------Disease Free Survival.

DSM-------Disease Specific Mortality

HCC----------Hepatocellular Carcinoma

HDI---------Human Development Index

IFRC----------International Federation of Red Cross & Crescent

GLOBOCAN-----Global Cancer Observatory

NGO---------Non Governmental Organization

NMSC----------Non Melanoma Skin Cancer

Oxfam-----Oxford Committee for Famine Relief

OS----Over All Survival

PN-----Partial Nephrectomy

RFS------Recurrence Free Survival

TGSH……TibebeGhion Specialized Hospital

WFP----------World Food Program

WHO ------World Health Organization

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CHAPTER ONE

Introduction

1.1 background of study

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. It can start almost anywhere in the human body, which is made up of trillions of cells. Normally, human cells grow and multiply (through a process called cell division) to form new cells as the body needs them. When cells grow old or become damaged, they die, and new cells take their place. Sometimes this orderly process breaks down, and abnormal or damaged cells grow and multiply when they shouldn't. These cells may form tumors, which are lumps of tissue. Tumors can be cancerous or not cancerous (benign).Cancerous tumors spread into, or invade, nearby tissues and can travel to distant places in the body to form new tumors (a process called metastasis). Cancerous tumors may also be called malignant tumors. Many cancers form lid tumors, but cancers of the blood, such as leukemia's, generally do not[1]

Cancer occurs as the result of the interaction between a person's genetic factors and three categories of external agents

- ✓ physical carcinogens, such as ultraviolet and ionizing radiation
- ✓ chemical carcinogens, such as asbestos, components of tobacco smoke, aflatoxin (a food contaminant), and arsenic (a drinking water contaminant)
- ✓ biological carcinogens, such as infections from certain viruses, bacteria, or parasites[1]

There are more than 100 types of cancer. The most common cancer in 2020 (in terms of new cases of cancer) were: breast (2.26 million cases);lung (2.21 million cases);colon and rectum (1.93 million cases);prostate (1.41 million cases);skin (non-melanoma) (1.20 million cases); and stomach (1.09 million cases)[1]

The most common causes of cancer death in 2020 were: lung (1.80 million deaths);colon and rectum (935 000 deaths);liver (830 000 deaths);stomach (769 000 deaths)[1]

Cancer and its treatment can cause several complications including: pain, fatigue, difficulty of breathing, nausea, diarrhea or constipation, weight lose, chemical change in the body, CNS problem, unusual immune system reaction, metastasis, recurrence, and death[2]

A correct cancer diagnosis is essential for appropriate and effective treatment because every cancer type requires a specific treatment regimen. Treatment usually includes radiotherapy, chemotherapy and/or surgery. Determining the goals of treatment is an important first step. The primary goal is generally to cure cancer or to considerably prolong life. Improving the patient's quality of life is also an important goal. This can be achieved by support for the patient's physical, psychosocial and spiritual well-being and palliative care in terminal stages of cancer. Some of the most common cancer types, such as breast cancer, cervical cancer, oral cancer, and colorectal cancer, have high cure rates when detected early and treated according to best practices. Some cancer types, such as testicular seminoma and different types of leukemia and lymphoma in children also have high cure rates if appropriate treatment is provided, even when cancerous cells are present in other areas of the body [1]

There is also palliative care, which is treatment to relieve rather than cure symptoms and suffering caused by cancer and to improve quality of life of patients and their families. Relief from physical, psychosocial, and spiritual problems through palliative care is possible in more than 90% of patients with advanced stage of cancer. Patient who need palliative care had high mortality rate[1]

Surgery is the main treatment modality for solid tumors. The outcome is determined by the type of cancer, stage of disease, sex and age at diagnosis complete removal of the tumor, grade of the tumor. The patient may end up with cure,death,recurrence.[3]

1.2 Statement of the Problem

Cancer ranks as a leading cause of death and an important barrier to increasing life expectancy in every country of the world. According to estimates from the World Health Organization (WHO) in 2019, cancer is the first or second leading cause of death before the age of 70 years in 112 of 183 countries and ranks third or fourth in a further 23 countries. Its rising prominence as a leading cause of death partly reflects marked declines in mortality rates of stroke and coronary heart disease, relative to cancer, in many countries. Overall, the burden of cancer incidence and mortality is rapidly growing worldwide; this reflects both aging and growth of the population as well as changes in the prevalence and distribution of the main risk factors for cancer, several of which are associated with socioeconomic development. The extent to which the position of cancer as a cause of premature death reflects national levels of social and economic development[4]

There were an estimated 19.3 million new cases (18.1 million excluding Non melanoma skin cancer , except basal cell carcinoma) and10 million cancer deaths (9.9 million excluding NMSC,except basal cell carcinoma) worldwide in 2020.For both sexes combined, one-half of all cases and 58.3% of cancer deaths are estimated to occur in Asia in 2020,where 59.5% of the global population resides. Europe accounts for 22.8% of the total cancer cases and19.6% of the cancer deaths, although it represents 9.7%of the global population, followed by the Americas' 20.9%of incidence and 14.2% of mortality worldwide[4].

In contrast to other regions, the share of cancer deaths in Asia(58.3%) and Africa (7.2%) are higher than the share of incidence (49.3% and 5.7%, respectively) because of the different distribution of cancer types and higher case fatality rates in these regions[4]

Outcome of surgical malignancies are not studied well in Ethiopia. Cancer and more prominently breast cancer, poses a substantial public health threat in Ethiopia. The fight against cancer calls for expansion of population-based registry sites to improve quantifying the cancer burden in Ethiopia and requires both increased investment and application of existing cancer control knowledge across all segments of the Ethiopian population.

For 2015 in Ethiopia, it is estimated that 21,563 and 42,722 incident cancer cases were diagnosed in males and females, respectively. The most common adult cancers were: cancers of the breast and cervix, colorectal cancer, non-Hodgkin lymphoma, leukemia, and cancers of the prostate, thyroid, lung, stomach, and liver. Leukemia was the leading cancer diagnosis in the pediatric age group (age 0 to 14 years). Breast cancer was by far the commonest cancer, constituting 33% of the cancers in women and 23% of all cancers. It was also the commonest cancer in four of the six Ethiopian regions included in the analysis. Colorectal cancer and non-Hodgkin lymphoma were the commonest malignancies in men[5]. The effects of cancer vary from couple to couple. For some couples, facing the challenges of cancer together strengthens their relationship. For others, the stress of cancer may create new problems and worsen existing problems. Relationships can experience changes in roles, responsibilities, physical and emotional needs, and intimacy and sex. Clear, two-way communication helps both people adapt as changes occur. It causes loss of economic resources and opportunities in patients, families, employers, society, and country at large. This lose include financial loss, morbidity, reduced quality of life, premature death[5].

Its effect in individual: Fear of the unknown, fear of pain and suffering, fear of abandonment, loss of identity, loss of body image/self, loss of loved ones, loss of control, loss of hope, economic crisis. The effects of cancer on relationships with friends and family members vary widely, based on the closeness of each relationship. Different families have different communication and coping styles. Considering how family reacts in a crisis and how family members have dealt with other difficult situations. This will help to plan strategy for communicating news and asking for support[5]. Its effect in the family: Loss of the relationship, loss of control, fear of sorrow, economic crisis, and fear of pain and suffering. Here are some suggestions to help you adjust to relationship changes with friends and family: Put one person in charge of giving medical updates, expect relationships to change, take the lead in talking, let people help you, stay involved in social activities, changes in children's behavior, talking to your children about cancer, role reversal, and balancing your needs and your children's needs. There are many obstacles to study about surgical malignancies: Economic factor, political acceptance, applicability of the result, ethical acceptability, documentation problem, poor historian patients, absence of adequate investigative modalities, and absence of cancer registry[5]

Therefore we have to develop ways to improve/solve such problem:

Discussing with government officials about the problem to allocate adequate budget for necessary materials for screening and treatment

Communicate with aiding agencies like NGO,WFP,CARE,Oxfaminternational,IFRC,AAH to aid with necessary materials

Teach people about the problem and take adequate history to increase their awareness

1.3 Significant of study

This study will help to identify pattern and outcome of surgical malignancies in Amhara region at TGSH. It also helps governmental and non-governmental organizations to take intervention measures and set appropriate plans to reduce malignancy related mortality and giving priority for the areas which mostly fatal and prevalent.

The study would serve as a guide to stakeholders in making informed and intelligent decisions with regard to malignancies and the management of determinant factors to avoid death. The findings will also serve for individuals to have awareness about malignancy and to help next researcher to give attention on the remaining issues using the alternative model. It will also used as a base line for further research, to develop cancer registries, & to develop screening protocols in our hospital for different surgical malignancy.

CHAPTER TWO

LITERATURE REVIEW

2.1 OUTCOME OF TREATMENT

Cancer can be treated with surgery and or chemo radiotherapy. The result of treatment may end up with cure, recurrence or complication. Most solid tumors if detected early may be cured[6]

There are different factors determining the outcome. Some of which are: age at diagnosis, sex, grade of the tumor, stage at treatment, completeness of resection margin, types of the tumore,comorbid illness[6]

Age had negative factor of long term outcome including for both cancer specific survival and non cancer specific survival, in patient who underwent curative surgery for solid tumor. Patients age 70 or more had poor short term survival outcome after surgery [7].

Male sex is associated with increased risk and poorer survival for most cancer sites. Identifying and eliminating factors driving the observed sex differences may reduce the global cancer burden[8, 9]

High grade tumor, higher stage at diagnosis, positive surgical marigin,and patients with co morbid illness had poor outcome after surgery[3]

In study done about survival of breast cancer patients treated with surgery from 2010 to 2016 in rural parts of western Ethiopia, 107 histologically confirmed BC patients treated with surgery. The median age at diagnosis was 45 (16–83) years; 57% of the patients presented with cT3/4 tumors, 71% with clinically positive lymph nodes, 21% with HER2-overexpression and 68% with grade 3 tumors. Estrogen and/ or progesterone receptor expressions were present in 66% and triple-negative disease in 25%[10].

In a systematic review of outcome reporting in colorectal cancer surgery which is done by Association of Coloproctology of Great Britain and Ireland, of 5644 abstracts, 194 articles (34 randomized and 160 nonrandomized studies) were included reporting 766 different clinical outcomes, categorized into seven domains. A mean of 14 ± 8 individual outcomes were reported per study. 'Anastomotic leak', 'overall survival' and 'wound infection' were the three most frequently reported outcomes in 72, 60 and 44 (37.1%, 30.9% and 22.7%) studies, respectively, and no single outcome was reported in every publication. Outcome definitions were significantly more often provided in randomized studies than in nonrandomized studies (19.0% vs. 14.9%). One-hundred and twenty-seven (65.5%) papers reported results of all outcomes specified in the methods (randomized studies, n = 21, 61.5%; nonrandomized studies, n = 106, 66.2%)[11]

In study done at Scotland about colorectal cancer outcomes in nonagenarian patients: Forty-nine patients were identified; 24 patients underwent operative management (median age: 91) while 25 received nonoperative management (median age: 92), 15(62.5%) patients had an elective operation, and 8 (37.5%) had an urgent or emergency procedure. None of the patients treated operatively suffered a significant complication or anastomotic leakage. Median hospital stay was 14 days, 5(20.8%) patients required a higher level of care in the community following discharge. Surgical mortality within 30 days was 4.2%[12].

In study done in Kenya about clinical outcomes of colorectal cancer from 2005 to 2010, 233 patients were studied, 50% of the lesions were located in the rectum. There was no relationship between the sub-site location and recurrence and mortality. The mean follow-up period was 15.9 months. Overall recurrence and mortality rates were 37.5% and 29.4% respectively. Most recurrences occurred within one year of surgery. Recurrence was not influenced by age, gender, sub-site, chemotherapy receipt or presence of comorbidity[13].

In study done in Saharan Africa about treatment of colorectal cancer from 2013 to 2017,300 patients were included in the analysis. 71% of patients received a recommended surgical operation. Of those that didn't undergo surgery as recommended, 37% cited cost as the main reason, 30% declined due to personal reasons, and less than 5% absconded or were lost to follow up. Approximately half of patients (50.5%) received a chemotherapy regimen when it was recommended, and 4.1% received radiotherapy when this was advised as optimal treatment[14].

In the study done about colorectal cancer survival rates in Ghana, from 2009 to 2015, 221 patients were diagnosed with CRC. The median survival time was 15 months. The overall survival rate for CRC over the 5 years period was 16.0%. The survival rates at the 1st, 2nd, 3rd, 4th and 5th years were 64%, 40% 95%, 21%, 16% and 16% 95%[15].

In another study done about outcome after radical prostatectomy in young men with or without a family history of prostate cancer from 1994 to 2004, 5880 patients were operated and data from 110 patients (1.9%) were analyzed, of whom 37 had familial cancer (33.6%) and 15 hereditary cancer (13.6%). A total of 85 patients (77.3%) had undergone radical prostatectomy, 39 (45.9%) by open retro pubic surgery and 46 (54.1%) laparoscopically. The surgical margins were positive in 11 patients (12.9%). The mean follow-up after prostatectomy was 39.1 +/- 36.8 months (range 4 to 125). Nine patients (10.6%) experienced biochemical recurrence (PSA level greater than 0.2 ng/mL)[16].

In study done in Japan about prognostic significance of complications after curative surgery for gastric cancer from 2005 to 2008, 1395 patients undergoing curative resection, the median follow-up time was 3.1 years. Two hundred seven patients (14.8 %) had complications. Of 131 patients who died within this period, 87 died of gastric cancer. The 3-year OS in the complication group was 84.1 % compared to 93.1 % in the no-complication group. The cumulative incidence of DSM was also significantly worse in patients with complications. Multivariate analysis identified the same significant increasing risk of complication for both OS and DSM[17].

In study done at Japan about the characteristics and outcomes of small bowel adenocarcinoma/retrospective analysis about the characteristics and clinical courses of 205 SBA patients from 11 institutions/.The primary tumor was in the duodenum and jejunum/ileum in 149 (72.7%) and 56 (27.3%) patients, respectively. Sixty four patients (43.0%) with duodenal adenocarcinoma were asymptomatic and most cases were detected by oesophagogastroduodenoscopy (EGD), which was not specifically performed for the detection or surveillance of duodenal tumors. In contrast, 47 patients (83.9%) with jejunoileal carcinoma were symptomatic. The 3-year survival rate for stage 0/I, II, III, and IV cancers was 93.4%, 73.1%, 50.9%, and 15.1%, respectively[18]

In study about treatment and survival of small-bowel adenocarcinoma in the United States, a total of 2123 patients with small-bowel adenocarcinoma and 248,862 patients with colon cancer were identified. Five-year overall survival rates for patients, with small-bowel adenocarcinoma and colon cancer were 34.9% and 51.5%. A total of 1550 patients with small-bowel adenocarcinoma (73.0%) underwent surgery, compared with 177,017 patients with colon cancer (71.1%). the proportion of patients who received chemotherapy was similar, at 21.3% for small bowel and 20.0% for colon. in contrast to colon cancer, chemotherapy did not improve overall or cancer-specific survival for patients with small bowel adenocarcinoma, regardless of stage. Predictors of poor survival for small-bowel adenocarcinoma on multivariate analysis included advanced age, black race, advanced stage, poor tumor differentiation, high comorbidity index, and distal location. Chemotherapy did not confer additional survival benefit compared with surgery alone.[19]

Study done in Japan about Surgical outcomes of carcinosarcoma of the hepatobilia in 131 cases, the overall 1-, 3-, and 5-year survival rates for patients with carcinosarcoma of the hepatobiliary tract after surgery were 44.0, 29.3, and 27.0 %, respectively. In univariate analyses, age and gender were not significant prognostic factors; however, advanced stage according to the classification of the Union for International Cancer Control in resected specimens was significantly associated with a shorter survival time after surgery. Although carcinosarcoma of the hepatobiliary tract remains a rare disease worldwide, its poor prognosis, even after curative resection, demands further epidemiological and pathological study that could lead to the development of new management strategies[20]

Multicenter Study in Europe about pattern of postoperative mortality after esophageal cancer resection, 2944 consecutive adult patients undergoing esophagectomy for esophageal cancer in 30 centers between 2000 and 2010 were retrospectively collected. The

30-day and in-hospital POM rates were 5.0 and 7.3 %, respectively. Pulmonary complications were the most common, affecting 38.1 % of patients, followed by surgical site infection (15.5 %), cardiovascular complications (11.2 %), and anastomotic leak (10.2 %). Factors that were independently associated with 30-day POM included American Society of Anesthesiologists grade IV, LV center, anastomotic leak, pulmonary, cardiovascular and neurological complications, and R2 resection margin status. Surgical complications preceded POM in approximately 30 % of patients compared to medically-related causes in 68 %. Propensity-matched analysis demonstrated LV centers were significantly associated with increased 30-day POM, and POM secondary to anastomotic leak, and pulmonary- and cardiac-related causes[21]

Study done in Japan about in-hospital mortality after a surgical resection for esophageal cancer, a multivariate analysis revealed that not only undergoing an esophagectomy before 1979, but also patient's age and an incomplete resection were independent factors associated with in-hospital death. The in-hospital mortality rates were 16.1%, 5.8%, 2.5%, and3.1%, while the 30-day mortality rates were 9.2%, 2.2%, 0.8%, and 0.3% during 1964–1979, the 1980s, the 1990s,and the 2000s, respectively. Eight patients had preoperative morbidities among 11 patients who died in the hospital after 1997. The mortality rate was 5.5% in patients with any co morbidities, while it was 1.3% in patients without any co morbidities. The most common direct cause of in-hospital death was previous pulmonary complications; however, cancer progression has recently become the most common cause[22]

Study done about Mortality after Esophagectomy, from 2008 to 2017 from Society of thoracic surgery database of 11,943 esophagectomy patients, 63.9% had a postoperative event and 3.3% died, which did not change over the study period. The postoperative events with the highest impact on operative mortality were respiratory distress syndrome, reintubation, and renal failure. Anastomotic leak requiring reoperation was associated with increased operative mortality (OR 1.48), but medically managed leak was not. Incorporating preoperative characteristics into the operative mortality model had little effect on odds ratio for death for individual postoperative events[23]

In study done about systematic review and meta-analysis of esophageal cancer in Africa: the incidence of EC is higher in males than females, except in North Africa where it is similar for both sexes. The highest age-standardized rate is from Malawi (30.3 and 19.4 cases/year/100000 population for males and females, respectively) followed by Kenya (28.7 cases/year/100000 population for both sexes). The incidence of EC rises sharply after the age of 40 years and reaches a peak at 75 years old. Meta-analysis shows a strong association with tobacco. There was significant heterogeneity between studies on alcohol consumption and on low socioeconomic status as risk factors, but these could also contribute to increasing the incidence of EC. The best treatment outcomes were with esophagectomy with survival rates of 76.6% at 3 years, and chemo-radiotherapy with an overall combined survival time of 267.50 d[24]

In study done about the surgical management and outcome of oesophageal cancer in Addis Abeba. 142 patients with oesophageal cancer seen from 1992-1996 at a surgical unit TAH were studied retrospectively. It represented 13.8% of all malignant tumors that were seen in the department during the study period. Seventy four patients (52%) were explored and thirty four (46%) of them had resection, 27 (80%) had locally invasive tumors). Of the thirty four patients that were explored, thirty had an Ivor-Lewis type of resection, using stomach tube through the right side of the chest, and four had partial gasterooesophagectomy with gastero-oesophagostomy in the left side of the chest. The post operative mortality was 21 (28%). The commonest causes of death were sepsis secondary to anastomotic leak and pneumonia. Follow up was possible for eighteen patients, eleven of them for seven months and the rest for seventeen months, all were doing well. Sixteen patients could not be traced[25]

Study done in Texas about clinical outcome and mortality of differentiated thyroid cancer in children after treatment from 1944 to 1986, 112 patients were identified, 99 patients remained alive and 13 had died. The 99 patients had 25 ± 0.9 years of available follow-up (mean ± SEM) and were 41 ± 0.9 years of age at time of last contact; one fourth had recurrent disease at some point since diagnosis. Among the 13 patients who died, one died of complications from coexisting diabetes mellitus, and the cause of death was not clear in one other case. Two patients died of breast cancer 13 and 15 years after thyroid cancer diagnosis. In three cases, cause of death could be considered etiologically related to initial radiotherapy: one patient developed tracheal necrosis 26 years after diagnosis and died of upper airway complications, whereas another two patients developed sarcomas of the cervical region 22 and 29 years after thyroid cancer diagnosis. Lastly, six patients died of thyroid cancer 26 ± 3.1 years after initial diagnosis (at age 40 ± 2.1 years). Among these cases, one patient had invasive disease and lung metastases at diagnosis and died of progressive lung metastases after 36 years. The other five patients were initially seen with local/regional disease and developed lung and skeletal metastases after a 2- to 20-year disease-free interval[26]

Study done in Taiwan about outcome after treatment for papillary thyroid cancer after treatment, of the 1016 papillary thyroid cancer patients, 394 patients received follow-up for more than 5 years, including 305 women (mean age, 38.4 ± 13.7 years) and 89 men (mean age, 44.0 ± 13.4 years). Of these papillary thyroid carcinoma patients, 227, 76, 68, and 23 patients were categorized in clinical stages I, II, III, and IV, respectively, at the time of diagnosis. 36 (9.1%) patients died. Only 23(5.8%) of them died of papillary thyroid carcinoma. The 1-, 5-,10-, and 20-year survival rates were 0.980, 0.951, 0.901, and0.731. Mortality factors of the papillary thyroid carcinoma patients related to age, gender, tumor size, and postoperative serum thyroglobulin (Tg) levels. Twenty-four patients progressed from clinical stages I, II, and III to stage IV during the follow-up period. Of these 24 patients, 12 died during the follow-up period. In this study, age, gender, 131I accumulated dose, postoperative serumTg levels, and the survival rate were demonstrated to be statistically significant between the patients in early stage and advanced stage groups after treatment[27]

In study done about recurrences of thyroid cancer after radical surgery and complementary treatment, from 1974 to 1999, 1,001 patients were operated on for thyroid cancer, including 778 (78%) for differentiated thyroid cancer and 223 (22%) for other thyroid malignant neoplasms. Radical operations were performed in 716 (92%) patients with differentiated thyroid cancer and in 85 (38%)patients with other thyroid malignant neoplasms. After surgery, all patients underwent various methods of complementary treatment, depending on cancer type and grading (levothyroxine, 131I, radiotherapy and/or chemotherapy). These patients had no evidence of persistent disease after finishing treatment (Tg, CEA, calcitonin, scintigraphy). Observed for recurrences of thyroid cancer

was done, although macroscopic, microscopic, biochemical, and scintigraphic criteria of radicality were present. At 18 months' to 24 years' follow-up, we observed recurrences in 94 (11.7%) of 801 patients treated radically, including in 53 (7.4%) of 716 patients with differentiated thyroid cancer and in 41 (48%) of 85patients with other thyroid malignancies. Among 37 patients with thyroid bed recurrence, 18 (48.6%) underwent radical operations and 19(51.4%) palliative ones. Of 33 patients with regional lymph node recurrence, radical operations were performed in 26 (78.8%) and palliative ones in seven (21.2%). Of 24 patients with distant metastases, four (17%) (With single metastasis) underwent surgery (three radical operations and one palliative one). Other methods of treatment were used in the remaining patients. Occurrence of thyroid cancer recurrences in the thyroid bed and lymph nodes indicates that macroscopic, microscopic, and scintigraphic criteria of radicality are not sufficient. Recurrences after radical surgery are more infrequent in patients with differentiated thyroid cancers than in those with other thyroid malignant neoplasms. In many patients, thyroid bed and lymph node recurrences can be removed radically during surgery[28]

In study done at TAH about patient operated for bladder cancer from 2006 to 2008, 97 patients were operated. 60 patients were male and 37 female (M: F of 1.6:1). Their age ranged from 20 to79 years, with mean age of 49.73±1.5.Duration of symptoms ranged between 1and 48 months (mean 13.9). The most common presenting symptoms were hematuria in 89(91.8%). Cystoscopy and sonographic examination of the bladder were the main modalities of investigation in the diagnosis of bladder tumors in 100% and 96.9% patients respectively. Histopathologically, 87(89.7%) and 10(10.3%) patients had malignant and benign bladder tumors respectively. Of the patients with malignant bladder tumors, 78 (80.4%) had TCC, 5(5.2% SCC, and 3 (3.1%) adenocarcinoma. Common patterns of bladder masses were papillary 77(79.7%), sessile or mixed 10(10.3%), and nodular 6(6.2%).Upon presentation, 66(74.7%) of patients had low grade, whilst 20(23.0%) had high-grade disease, 85.5% of bladder tumors were nonmuscle invasive, while 14.9% were muscle invasive, and 2.4% metastatic. The commonest surgical technique employed for bladder tumor removal was TURBT in 80 (82.5%) patients. Forty-four (45%) of the patients had additional surgery such as repeated TURBT in 16(16.5%), cystectomy+ureterosigmoidostomy in 8(8.2%), radical cystectomy+neobladder in 5(5.2%), ant incontinence procedure in 4(4.1%), partial cystectomy in 4(4.1%) and redo cystectomy+sigmoid bladder in 4(4.1%). In 83(85.6%) patients the postoperative course was uneventful, while 17(17.5%) developed immediate postoperative complications. Twelve developed late complications. There were 6(6.2%) deaths. Post operative hospital stay of 1-70 days (mean 12.1) and a follow up period ranging from 1 to 26 month (mean 3.7 months)[29]

In study done at TAH from 2009 to 2013 about clinical outcome of operated intracranial meningioma, total of 91 patients were enrolled in the study. Tumor size was estimated in 79 /86.8%/ cases. 51/64.6%/tumors were >5cm in diameter. Whereas 28/35.4%/ were ≤5cm.Only 4/5.1%/ patients had tumors <3cm.Tumor size was shown to be related to post operative functional outcome. Surgical mortality rate, which was defined as death within was 14.3%.Among 88 patients with post operativekarnofsky performance status scale score ,43% achieved a post operative score of ≥70[30]

Study done in USA about the effect of surgery on overall survival 1,759 patients with microscopically confirmed pancreatic cancer with stage 1-2B at the time of diagnosis were recorded in the SEER database. 92.6% patients underwent pancreatic cancer-directed surgery. Patients undergoing surgery had a significantly lower mean age at the time of diagnosis (65.8 vs. 69.9 years) and a longer median survival (18 vs. 7 months) compared to those who did not undergo surgery. Surgical resection was a significant predictor of overall survival upon both univariate and multivariate analysis. Younger age at the time of diagnosis, non-white, non-black race, tumor size <40 mm and tumor located in the tail of the pancreas were factors significantly associated with a chance of pancreatic cancer-directed surgery.[31]

Study done in Netherland about Survival after resection for pancreatic cancer, 3082 patients were included, with a median age of 67 years. Median overall survival was 18 months, with a 5-year survival of 15%. The 1-year conditional survival (i.e. probability of surviving the next year) increased from 55 to 74 to 86% at 1, 3, and 5 years after surgery, respectively, while the median overall survival increased from 15 to 40 to 64 months at 1, 3, and 5 years after surgery, respectively. The prediction model demonstrated that the probability of achieving 5-year survival at 1 year after surgery varied from 1 to 58% depending on patient and tumor characteristics[32]

Study done in Japan about Long-term survival after resection of pancreatic cancer from January 2000 to December 2011, 195 patients underwent pancreatic resection. The median survival for all patients was 27.1 months, and the 5-year actuarial survival rate was 34.5%. The median observational period was 595 d. With the univariate analysis, the UICC stage was significantly associated with survival time, and the CA19-9 ≤ 200 U/mL, DUPAN-2 ≤ 180 U/mL, tumor size ≤ 20 mm, R0 resection, absence of lymph node metastasis, absence of extra pancreatic neural invasion, and absence of portal invasion were favorable prognostic factors[33].

Study done about outcomes of Patients with Intrahepatic Cholangiocarcinoma after Surgery,144 patients who underwent hepatectomy for ICC between 1993 and 2014 were divided into groups that received treatment before (n = 65, first period) and after 2006 (n = 79, second period), when new treatment options such as adjuvant chemotherapy and multimodal therapy for recurrence were introduced First-period patients exhibited more advanced tumor characteristics, including larger tumors, higher serum carbohydrate antigen 19–9 levels, and vascular invasion. Median overall survival (OS) durations of the first- and second-period groups were 21.4 and 57.7 months, respectively; corresponding median disease-free survival (DFS) durations were 12.2 and 16.6 months, respectively. Multivariate analysis found an independent association of the treatment time period with OS and DFS. Notably, second-period patients with N1 disease achieved a longer OS and DFS (median OS time: 12.4 and 26.0 months, and median DFS: 4.7 and 10.7 months respectively). Among recurrent patients (first, n = 50 and second, n = 44), second-period patients had a significantly longer survival after recurrence (8.0 vs. 22.3 months).[34]

In study done about performance of prognostic scores and staging systems in predicting long-term survival outcomes after surgery for intrahepatic cholangiocarcinoma , among 1054 ICC patients, median OS was 37.7 months and 1-, 3-, and 5-year survival, were 78.8%, 51.5%, and 39.3%, respectively. Recurrence of disease occurred in 454 (43.0%) patients with a median DFS of 29.6 months. One-, 3- and 5- year DFS were 64.6%, 46.5 % and 44.4%, respectively. The prognostic models associated with the best OS

prediction were the Wang nomogram and the Nathan staging system. No model was proÒcient in predicting DFS. Only the Wang nomogram exceeded a c-index of 0.6 for DFS. The c-index for the AJCC staging system was 0.637 for OS and 0.582 for DFS.[35]

In study done about Outcomes for Patients with Recurrent Intrahepatic Cholangiocarcinoma after Surgery,128 patients with ICC had survival rates of 73 % at 1 year, 52 % at 3 years, and 43 % at 5 years. Recurrent ICC developed in 81 patients (56 men and 25 women) with a median age of 63 years. The median time from initial resection to recurrence was 9 months (range, 0–124 months), and the median survival time after recurrence was 8 months (range, 0–108 months). After recurrence, the overall survival rates were 47 % at 1 year, 23 % at 3 years, and 15 % at 5 years. Multivariate analysis showed disease-free survival time shorter than 1 year and bile duct invasion to be significant prognostic factors. Among the treatment methods, local management such as surgery, transarterial chemoembolization, and radiofrequency ablation were effective in select cases with localized intrahepatic and extra hepatic recurrence.[36]

In study about Presentation, operative data, complications, and survival of gall bladder cancer 410 patients were examined presenting between July 1986 and March 2000, 51 patients were inoperable, 92 were subjected to exploration and biopsy only, 135 to noncurative cholecystectomy, 30 to surgical bypass, and 102 to potentially curative resections consisting of portal lymph node dissection and liver parenchymal resections. Operative mortality was 3.9%. T-stage predicted likelihood of distant metastases and respectability. Median survival for resected patients was 26 months and 5-year survival was 38%, and for patients not resected, 5.4 months and 4%. Effect of Prior Operation*:* 22 patients subjected to potentially curative resection as the first surgical procedure were compared to 80 patients resected after prior exploration elsewhere. Mortality, complication, and long-term survival were the same. By multivariate analysis (Cox regression), resectability and stage were independent predictors of long-term survival, but prior surgical exploration was not.[8]

In study done at Korea about surgical outcome and prognostic factors in patients with gallbladder carcinoma, out of 106 patients, curative resection was achieved in 75 (70.8%). The cumulative 1-, 2- and 5-year survival rates of the gallbladder carcinoma patients were 93.4%, 80.9% and 63.0%, respectively. Radical resections, including extended cholecystectomy, were more beneficial for long term survival of patients. The 5-year survival rate in patients who underwent curative resection (56.9%) was significantly higher than in those who underwent palliative resection. Multivariate analysis revealed that curative resection, preoperative CA19-9, T-stage, N-stage and differentiation of histology were independently significant prognostic factors.[37]

Study done in Denmark from June 1998 to May 2008 about intraabdominal and retroperitoneal soft-tissue sarcomas - outcome after surgical treatment in primary and recurrent tumors, Sixty-five of 73 primary and 22 of 28 first-recurrence IaRS had surgery. Fifty-three (82%) and 11 (50%) patients achieved radical R0 resection. Age and radicality of surgery were independent predictors of death, while recurrence of sarcoma was not. Preoperative mortality was 2.3%. 5-year survival was 70.2% for primary and 51.8% for first-recurrent sarcomas. However, patients with radical surgery had 5-year survival of over 70% in both the primary and recurrent group.[38]

A five and a half years retrospective study between January 2003 and June 2007 and six months prospective follow-up arm between July 2008 and March 2009 in Kenya about recurrence and mortality after surgical treatment of soft tissue sarcomas, Mean age was 32.52+18.17 years. The male/ female sex ratio was 0.97:1. The mean duration of symptoms was 10.87+18.75 months. The extremities had the most number of cases (62%). Fibro sarcoma was the most common histological type (36.0%) and the mean tumor size was 13.0 +7.36 cm. Most (44.7%) patients presented with high grade tumors and 78.0 % of the patients presented with a recurrence. Most of the recurrences (71.7%) occurred within the first year of treatment. Failure to get adjuvant therapy, tumor size>5cm, advanced stage (III and IV) , and positive microscopic margins were adverse prognostic factors for recurrence. Presentation with a recurrent tumor, failure to receive adjuvant therapy, advanced stages (III and IV), positive microscopic margins, and high grade tumors, were predictors for death.[39]

2.2. Factors associated with surgical outcome of malignancy

In the study listed above [10] the estimated 1- and 2-year overall survival probability rates were 78 and 53%, respectively. The 2-year survival for patients with clinically positive lymph nodes was 44% compared to 73% for patients with lymph node-negative disease. The corresponding 2-year survival for patients with cT4 tumors was 25% versus 68% for patients with cT1–2 tumors (cT1–3 vs. cT4. The 2-year survival for patients with hormone receptor-negative disease was 40% compared to 59% for patients with hormone receptor-positive disease through earlier diagnosis of symptomatic disease and adequate treatment, with a fairly equal contribution of each[10].

The study in Scotland about colorectal cancer outcomes in nonagenarian patients [12],patients undergoing an elective operation had a significantly improved survival compared to those undergoing an emergency operation or nonoperative management. On multivariable analyses, non-operative management, and presence of metastases at diagnosis were associated with higher cancer-specific mortality[12]

study done in Kenya about clinical outcome of colorectal cancer[13] Factors significantly associated with mortality included the male gender, presence of co-morbidity, recurrence, curative intent, disease stage and receipt of chemotherapy[13].

Treatment of colorectal cancer in Sub-Saharan Africashows with therapy, the median overall survival for patients diagnosed with stage III and stage IV CRC was 24 and 10.5 months respectively. Overall, It had significantly better median survival for patients that received the recommended treatment (25 vs 7 months)[14].

The study done in Ghana [15] described above showed a significant difference in the survival rate of colorectal cancer according to the different stages. Family history, Chemotherapy, BMI and both chemo/radiotherapy were the significant social and clinical factors influencing the overall survival. Pathological factors such as TNM tumor stage, depth of tumor invasion, lymph node metastasis, and distance metastasis were significantly associated with overall survival[15].

In study done at TikurAnbessa Specialized Hospital about prognosis of colorectal cancer, 422 were studied & patients diagnosed with rectal cancer had 76% increased risk of dying compared to colon cancer patients. Node positive patients were 3.146 times likely to die compared to node-negative and metastatic cancer were 4.221 times likely to die compared to non-metastatic patients. Receiving adjuvant therapy reduced the risk of death by 36.1%.Compared to patients who had an only surgical resection. The median survival time was 39 months and the overall five years survival rate was 33 %[40]

In study about outcome after radical prostatectomy longer PSA-free survival after surgery was significantly associated with high-risk and intermediate-risk patients but not with the surgical procedure or family history of cancer[41]

Study done in Sweden from 2006 to 2019 prognosis after surgery for gastric adenocarcinoma in the Swedish Gastric Cancer Surgery, 2154 patients undergoing gastrectomy gastric adenocarcinoma, 3-year all-cause mortality was 53.3%. Factors influencing 3-year all cause mortality after multivariable adjustment were tumor stage (stage IV vs. stage 0–I), comorbidity (Charlson comorbidity score 2 vs. 0), age (>75 vs. <65 years), and calendar period (2006–2010 vs. 2011–2015). No independent prognostic influence was found for sex (women vs. men), pre-operative chemotherapy (yes vs. no), tumor sublocalization (non-cardia vs. cardia), or education (13 vs. 9 years). The results were similar for 3-year disease-specific mortality[42]

Study about characteristics and outcomes of small bowel adenocarcinoma in Japan [18],And multivariate analysis revealed performance status 3–4, high carcinoembryonic antigen, high lactate dehydrogenase (LDH), low albumin, symptomatic at diagnosis and stage III/IV disease were independent
factors for overall survival (OS). Ten patients (18.5%) with stage IV disease were treated with a combination of resection of primary tumor, local treatment of metastasis, and chemotherapy; this group had a median OS of 36.9 months.[18]

Study done in Japan about Long-term survival after resection of pancreatic cancer[33] and multivariate analysis showed that tumor size ≤ 20 mm and negative surgical margins (R0 resection) were independent favorable prognostic factors. Among the 96 patients, 20 patients survived for 5 years or more, and 76 patients died within 5 years after operation. Comparison of the 20 5-year survivors with the 76 non-survivors showed that lower concentrations of DUPAN-2 (79.5 vs 312.5 U/mL), tumor size ≤ 20 mm (35% vs 8%), R0 resection (95% vs 61%), and absence of lymph node metastases (60% vs 18%) were significantly associated with the 5-year survival[33].

Study done about factors associated with oncologic outcomes after abdominoperineal resection compared with restorative resection for low rectal cancer.Four hundred thirteen (29%) patients underwent abdominoperineal resection and 993 (71%) underwent restorative resection for rectal cancer. Patients with abdominoperineal resection were older , had a higher mean ASA score , worse tumor differentiation , and higher tumor stage. Although overall morbidity was lower in the abdominoperineal resection group the length of stay was greater. After a similar period of follow-up (5.2 ± 3.9 vs 5.3 ± 3.4 y), local recurrence (7% vs 3%) was higher after abdominoperineal resection, but overall survival (56% vs 71%,) and disease-free survival (54% vs 70%) were lower. On multivariate analysis, higher stage, poor tumor differentiation, involved margins, and older age were associated with worse survival, whereas higher stage, poor tumor differentiation, and abdominoperineal resection were associated with greater recurrence. These worse oncologic outcomes persisted even when the groups were stratified based on the location of the cancer in mid or distal rectum and for patients with a clear circumferential margin[43].

A large cross-sectional study from the Scotland Medical Database reported in 2007 that 42% of all patients had at least one comorbidity, while 23% had >2 comorbidities .Patients with increasing numbers of comorbidities were associated with reduced postoperative survival outcomes. Patients with multiple comorbidities were most vulnerable to both cancer- and noncancerous-specific deaths in the first 6 months after cancer surgery.[44]

study done in Taiwan shows significantly greater proportion of patients with comorbidities presented with poorer clinic pathological characteristics compared to those without. After cancer surgery, 26% of patients died after a median follow-up duration of 38.9 months. Overall mortality rates of patients with CCI scores of 0, 1, 2, 3, 4, and 5-8 were 22.9%, 29.5%, 38.2%, 43.2%, 50.2%, and 56.4%, respectively. After adjusting for other clinicopathological factors, patients with increasing CCI scores were associated with significantly reduced overall and noncancer-specific survival rates, while only patients with CCI scores of >2 were associated with higher cancer-specific mortality rates.[45]

CHAPTER THREE

Conceptual Framework

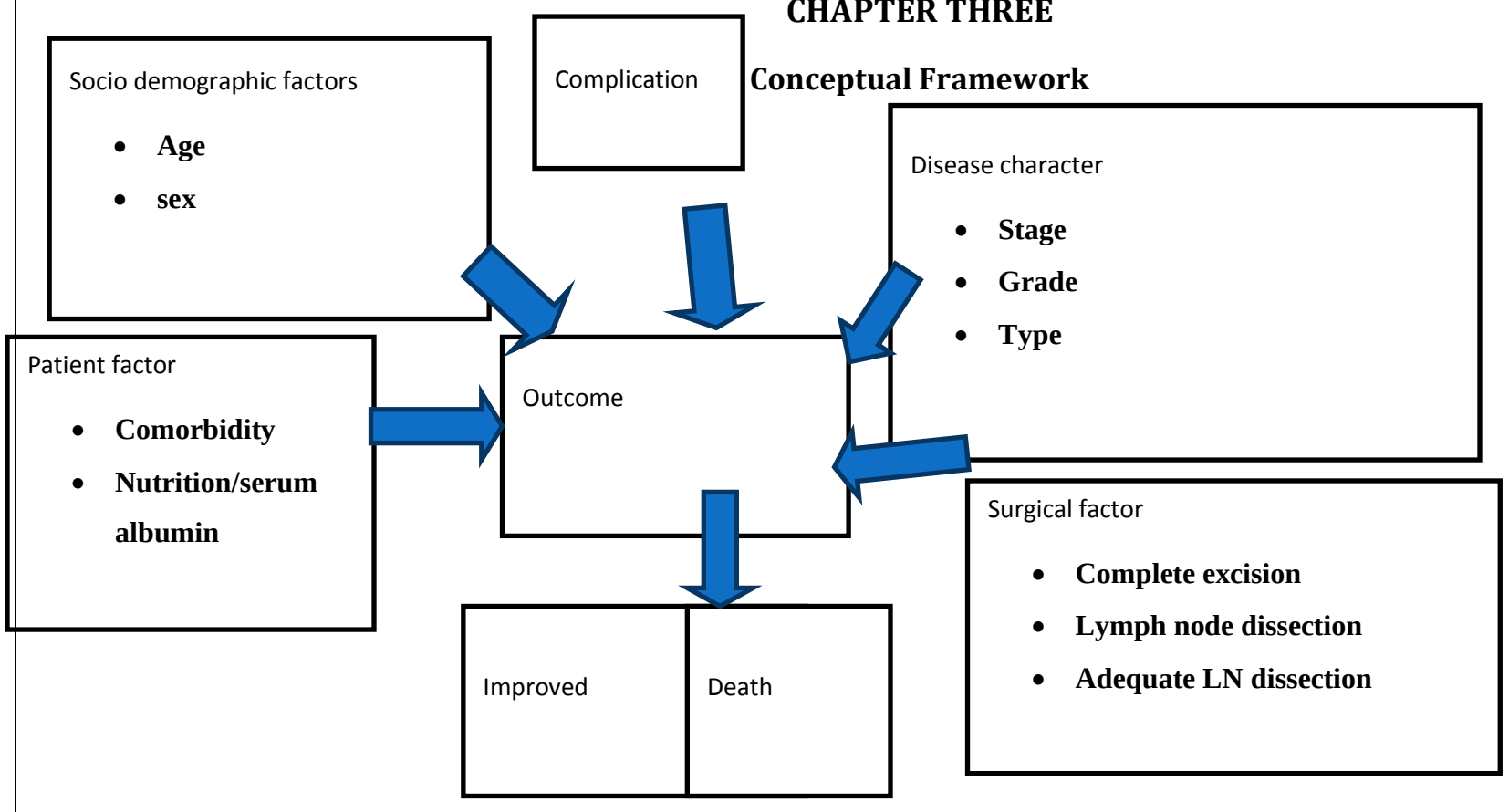

Figure 1 Determinant factors and possible outcome of surgical malignancy after surgery from september1/2019 G.C to August 30/2021 G.C

CHAPTER FOUR

Objectives

4.1 General objective

Surgical outcome and determinant factors among patients with malignancy admitted inTibebeGhion Specialized Hospital bahirdar, Ethiopia

4.2 Specific objective

To evaluate outcomes of malignancies after surgery in TGSH

To identify factors associated with surgical outcome of malignancy

CHAPTER FIVE

Methods and materials

5.1. Study Design

Retrospective cross sectional study design was appliedfrom patientschart for patients operated from September 1/2019 G.C to August 30/2021 G.C

5.2. Study Area and Period

The study was conducted in TibebeGhion specialized hospital starting from October 18/2022October 30/2022G.C. Bahirdar city is located approximately 578 km (360 miles) north-northwest of Addis Ababa, and an elevation of 1,840 meters (6,036 foot) above sea level.

TibebeGhion specialized hospital is located about 10km south from the city center and about 7 km from the new bus station ('AddisuMeneharia') on the way to Adet district and about 23 km from the Blue Nile Falls (locally called 'TisEsat' (Smoke of Fire). It is a tertiary university teaching hospital with 450 bed capacity out of which 105 are occupied by surgical patients. The hospital receives patients who are referred from across the Amhara region and gives outpatient and inpatient services in all major departments. More than 25,000 cases had been operated yet.

5.3. Source Population

All adult patients with malignancy admitted to the surgical ward of TibebeGhion Specialized Hospital fromSeptember 1/2019 to August 30/2021 G.Cwill be the source population.

5.4. Study population

Surgically managed malignant patients who were admitted to the hospital starting from September 1/2019 to August 30/2021 G.C will be the study population.

5.5. Inclusion Criteria

All adult and elderly patients registered with full required information including age, sex,operation note, biopsy result, in the registration book or in the chart were considered to be eligible for the study.

5.6. Exclusion Criteria

Gynecologic and bone tumors were not include in the study.

Operated patients but referred for chemotherapy or not had no follow up.

5.7 Variables

Dependent variable

Improvement

Death

Independent variable

Socio-demographic factors : age, sex

Surgical factor: complete resection, lymph node dissection, margin of resection

Patient factor: comorbidity.

Disease factor: type of cancer, stage, grade of cancer

Nutrition :serum albumin level

5.8. Operational Definitions

- ✓ **Death: when patient died after operation.**
- ✓ **Improved: when the patient is discharged with stable clinical signs and symptoms**
- ✓ **Comorbidity indicates the presence of one or more additional medical disorders co-occurring with a primary disease within the same individual.**
- ✓ **Adequacy of lymph node dissection: when adequate amount of lymph node is retrieved during the operation which matches with AJCC guideline.**

5.9 Sample size

The maximum sample sizes determined as follow: Scince there is no such type of study previously, p=0.5

$n = Z^2p\ (1-p)/w2 = (1.96)2(.5\times.5)/\ (.05)2 = 384.2 \approx 384$ patients

when since we had 630 patients operated for malignancy it is adjusted as follow.

n=n÷1+ (n-1)N

n=384/1+(384-1)/630=384/1.61=239

Based on the above assumptions the estimated sample size becomes 239 patients.

Chart review is made and there total of 630 patients were operated within 2yrs at TGSH.

5.10 Sampling Technique

Systematic random sampling is used and sample size is determined as above.

K value is 630/239 =2.6→3. Then using lottery method where to start was determined during data collection time. During lottery method number two was selected as starting point.

5.11 Data Collection, processing and analysis

Pre-developed data collection format was used to collect data on patient's socio-demographic characteristics, stage of disease, grade of tumor, treatment, death, and any complication. The data was collected from the chart. The collected data was coded and entered into Epi data3.1 version and then transported to SPSS version 25 for analysis. Finally, the data is presented in tables, graphs and figures.

5.12. Data Quality Assurance

The quality of data was measured based on accuracy gathering, relevance, completeness, timeliness, validity. Prior to data collection, the questioner which was already prepared and check list was tested to check the consistency and the ability of the data collector's performance. Pre-test was conducted on some cases and then the questioner and checklist was modified based on the pretest results.

One day training and orientation on how to carry out data collection; how to use the questioner and check list was given for the data collectors.

The final checklist to be used was checked by data collectors & supervisors on daily basis for completeness, accuracy, validity and consistency of data. In addition the recorded data was reviewed daily for readability and data reliability. Finally, identified problems and errors will be corrected daily before the mother is discharged & chart is returned.

4.13. Ethical Considerations

Ethical clearance was obtained from Institutional review board of College of Medicine and Health Sciences, Bahir Dar University then, support letter will be obtained from TGSH.

Names was not be used in collecting the data from the medical files. Confidentiality was maintained by keeping the data collection forms locked in a secure cabinet and the electronic data file was kept securely in a password protected computer. Data obtained in the course of study washandling by the research team.

4.14. Dissemination

The finding of this study will be disseminated through publications, presentations on scientific meetings and conferences. The finding of the study will be forwarded to, Bahirdar University, TGSH, and Amhara National Health Bureaus.

4.15. Limitation of study

This study has some limitations. Absence of cancer registry was one of major obstacle to select samples randomly. Absence of previous study about the topic. Furthermore, being a retrospective study, some information might have been misinterpreted due to incomprehensible documentation. We assume this is at random. We grouped patients in need of a specific therapy according to general guidelines as the basis to analyze the completeness of therapy. We were unable to account for individualized therapy approaches in stage four patients, any non-standard therapy could have falsely been classified as not complete. Personal therapy recommendations by thephysician or individual reasons of the patient not to plan access to such guidelines could not be taken into account due to inconsistent documentation

CHAPTER FIVE

RESULT

5.1 Sociodemographic Characteristics

Total of 239 patients chart were evaluated from which 109(45.6%) were male and the remaining 130(54.4%) were female. There were 23(21.1%) deaths in male which accounted 9.6% of total deaths and 24(18.5%) deaths in female which accounted 10.0% of total deaths.

Those with age range of 18-39 were 75(31.4%) ,with 13(17.3%) deaths which was 5.4% of total deaths.patients with age range of 40-59 years were 91(38.1%) from this there were 16(17.6%) deaths,which accounted 6.7% of total deaths. Those ≥60 years old were 73(30.8%) with 18(24.7%) deaths, which were 7.5% of total deaths.

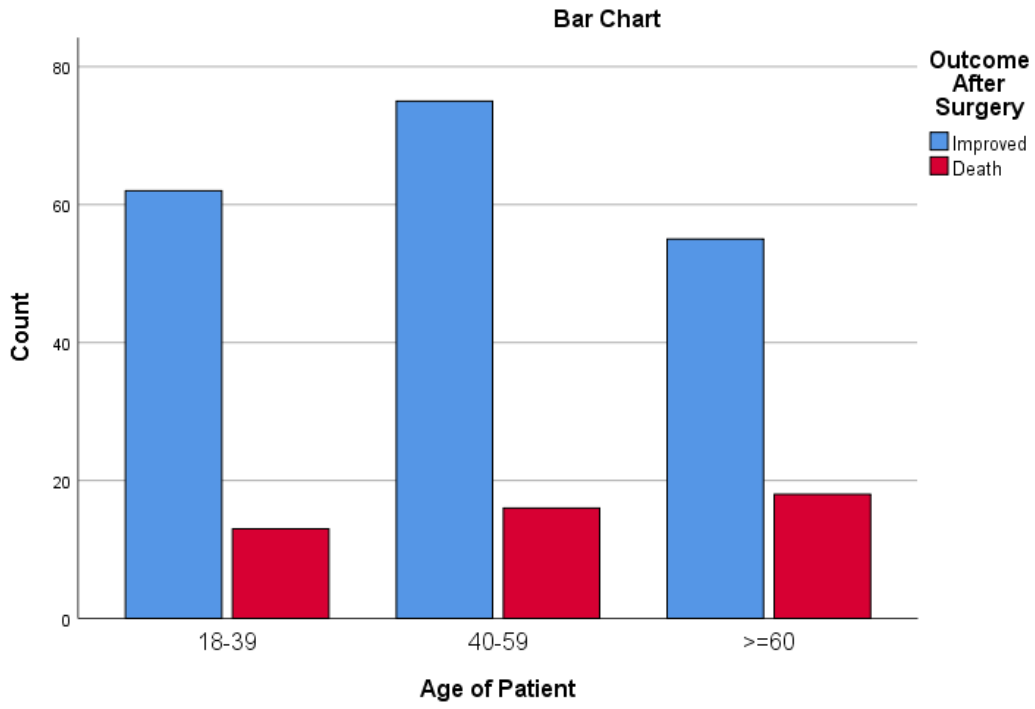

Figure 2. Age of patient and outcome after surgery for different malignancies.

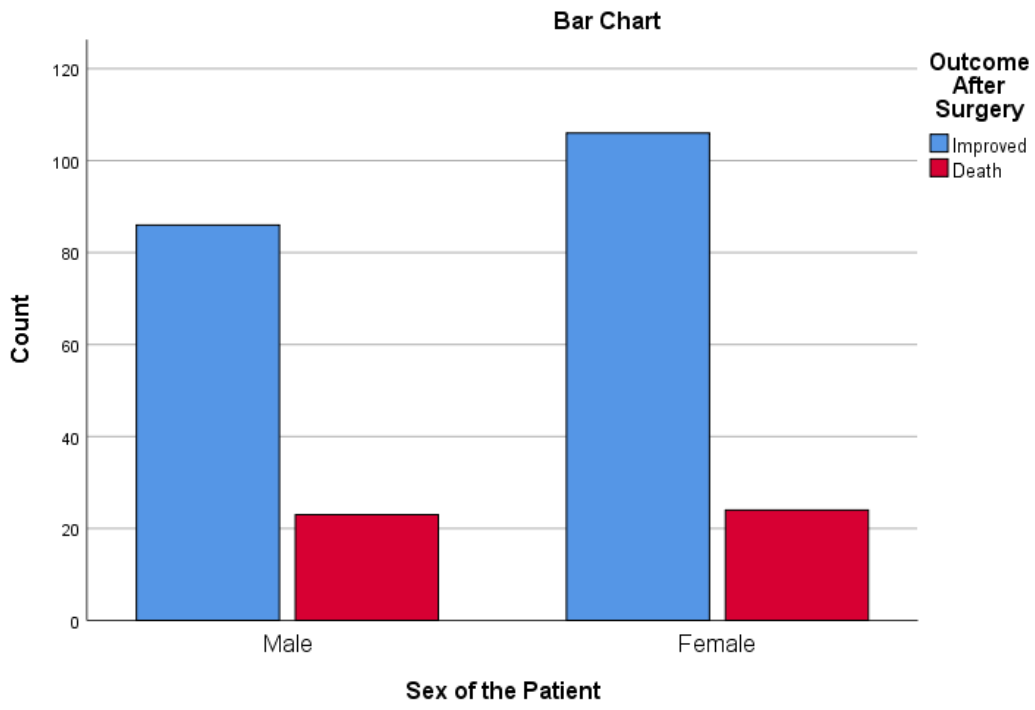

Figure 3**.Sex of the Patient * Outcome after Surgery.**

5.2 Clinical, Laboratory and pathologic result

Out of 239 cases 138(57.7%) were GI patients from which 26(18.8%) death had occurred which accounts 10.9%of total deaths.GUS Cancer accounts 24(10%) cases with 9(37.5%) deaths, which accounts 3.8% of total deaths. There were 38(15.9%) head and neck malignancy with 6(15.8%) deaths, which covers 2.5% from total deaths.

There were 23(9.6%) stage I with 7(30.4%) deaths which covers 2.9 % from total death. Stage II accounts 110(46%) cases with 17(15.5%) death which was 7.1% from total death. Stage III were 79(33.1%) with 17(21.5%) which accounts 7.1% of total death. There were 27(11.3%) stage IV disease with 6(22.2%) death which accounts 2.5% of total death.

89(37.2%) patients had well differeciated histology with 13(14.6%) deaths which accounts 5.4% of total deaths. There were 114(47.7%) patients with moderately differeciated histology, from which there were 22(19.3%) deaths which accounts 9.2% of total deaths. Patients with poorly differeciated histology were 36(15.1%) ,from this there were 12(33.3%) deaths ,which were 5.0% of total deaths.

153(64%) of patients had serum albumin level ≥3.5mg/dl with 24(15.7%) death which accounts 10% of total death. The remaining 86(36%) patients had serum albumin level< 3.5mg/dl with 23(26.7%) death i.e. 9.6% from total deaths

Patients with co morbid illness were 127(53.1%) with 32(25.2%) death which accounts 13.2% of total death. Those patients without co morbid illness were 112(46.9%) with 15(13.4%) death, which accounts 6.3% of total death.

There are 49(38.6%) patients with hematologic comorbidity with 7(14.3%) deaths, which covers 5.5% of total deaths. There were 45(35.4%) patients with immunologic co morbid illness with 11(24.4%) deaths, which accounts 8.7% of total deaths. Cardiovascular co morbid patients were 19(15%) with 5(26.3%) deaths which was 3.9% of total deaths. Respiratory co morbid patients were 14(11%) with 9(64.3%) death which accounts 7.1% of total death.

5.3. TREATMENT OPTION GIVEN TO THE PATIENT

64(26.8%) patients were managed surgical treatment only with 15(23.4%) deaths, which accounts 6.3% of total death. Neoadjuvant chemotherapy followed by surgery then chemotherapy was given for 50(20.9%) patients from whom there were 8(16.0%) deaths which accounts 20.9% of total deaths. Surgery followed by adjuvant chemotherapy were given for the remaining 125(52.3%) patients with 24(19.2%) deaths, which accounts 10.0% from total death

For 204(85.4%) patients curative operation was done, from which there were 35(17.2%) deaths which accounts 14.6% of total death. The remaining 35(14.6%) are operated for palliative purpose and from whom there were 12(34.3%) deaths which was 5.0% of total deaths.

Lymph node dissection were done for 180(75.3%) of patients, from which there were 30(16.7%) deaths which accounts 12.6% of total death. In the remaining 59(24.3%) lymph node dissection were not done, from which there were 17(28.8%) deaths, which accounts 7.1% of total deaths.

There were 162(90.0%) patients with adequate lymph node dissection. From this there were 18(11.1%) deaths which accounted 10.0% of total death. The remaining 18(10.0%) patients had insufficient lymph node dissection, from which there were 12(66.7%) deaths, which accounts 6.7% of total deaths.

There are 193(80.8%) patients with negative surgical margin, from this there were 27(14.0%) death, which accounts 11.3% of total deaths.

The remaining 46(19.2%) patients had positive surgical margin. From this there were 20(43.5%) deaths which were 8.4% of total deaths.

5.4. POST OPERATIVE CONDITION OF PATIENTS

115(48.1%) patients developed some form of complication and there were 33(28.7%) deaths which were 13.8% of total deaths. The remaining 124(51.9%) patients didn’t develop complication from this there were 14(11.3%) deaths which were 5.9% of total deaths.

28(24.3%) patients develop cardiovascular complications. From this there were 9(32.1%) deaths which were 7.8% of total deaths. Hematologic complication occurs in 23(20.0%) of patients. From this there were 7(30.4%) deaths, which account 6.1% of total deaths. Infection of any site had occurred in 31(27.0%) patients, from this there were 5(16.1%) deaths, which accounts 4.3% of total deaths.GUS complication occurs in 17(14.8%) patients with 6(35.3%) deaths, which accounts 5.2% of total deaths.GIS complications occurred in 16(13.9%) patients with 6(37.5%) deaths which accounted 5.2% of total deaths.

5.5. Cause of death

There are total of 47(19.7%) deaths after surgery from 239 patients. Respiratory failure was the most common cause of death, which accounted for 19(40.4%) deaths. 15(31.9%) deaths are due to irreversible shock .13(27.7%) death are due to multiorgan failure.

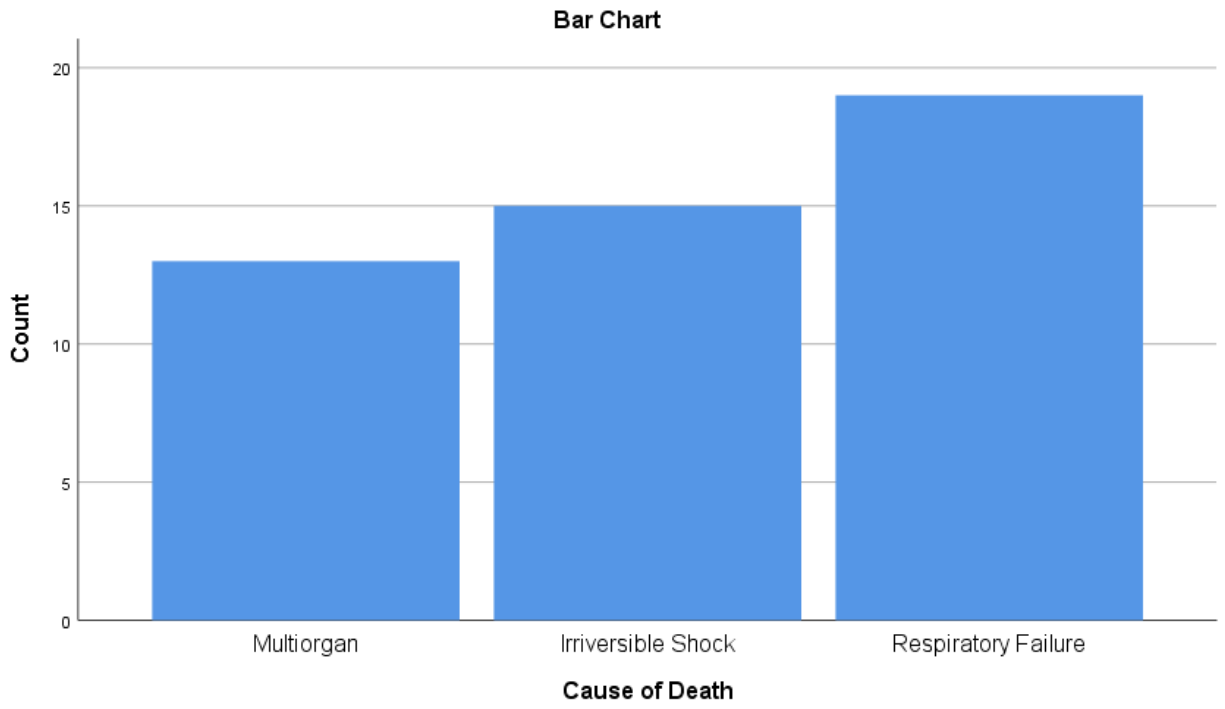

Figure 4. Cause of death for patients died after surgery for malignancies.

5.6. FACTORS ASSOCIATED WITH SURVIVAL/DEATH

The association of independent variables with the dependent variable was investigated using both bivariate and multivariate regression techniques.

On bivariate regression analysis serum albumin<3.5mg/dl,presence of co morbid illness, type of co morbid illness, operation type, absence lymph node dissection, insufficient lymph node dissection, positive surgical margin, high grade histology, presence of complication had significant association with the presence of death.

Multivariate regression analysis showed that the presence of hematologic comorbidity, immunologic co morbidity, and cardiovascular comorbidity had lower risk of death as compared to respiratory comorbidity AOR(95%CI) =0.007(0.000-0.117), 0.033(0.003-0.419), 0.057(0.003-1.025) respectively. Patients operated for curative purpose had less likely to die AOR (95%CI) =0.007(0.000-0.460). Patient with adequate lymph node dissection had lower death rate than patients with adequate dissection AOR (95%CI) =0.019(0.002-0.211).

Patients with no co morbid illness had lower mortality than patients with co morbid illness AOR (95CI) =0.181(0.034-0.971)

Table 1. Frequency ,andbivarate and multivariate regression analysis

Variables	Outcome of Surgical Malignancies.			COR	P-value	AOR	P-Value
		Death	improve				
		47(19.7%)	192(80.3%)				
Age	18-39	13(17.3%)	62(82.7%)	0.641(0.288-1.426)	0.276		
	40-59	16(17.6%)	75(82.4%)	0.652(0.305-1.396)	0.269		
	>=60	18(24.7%)	55(75.3%)	1			
Sex	Male	23(21.1%)	86(78.9%)	1			
	Female	24(18.5%)	106(81.5%)	0.847(0.447-1.604)	0.609		
Diagnosis	GI Cancer	26(18.8%)	112(81.2%)	1			
	GUS Cancer	9(37.5%)	15(62.5%)	2.585(1.020-6.551)	0.045		
	H &N Cancer	6(15.8%)	32(84.2%)	0.808(0.306-2.132)	0.666		
	Breast & soft tissue Cancer	6(15.4%)	33(84.6%)	0.783(0.297-2.064)	0.621		
Stage	I	7(30.4%)	16(69.6%)	1.531(0.430-5.451)	0.511		
	II	17(15.5%)	93(84.5%)	0.640(0.225-1.818)	0.402		
	III	17(21.5%)	62(78.5%)	0.960(0.334-2.754)	0.939		
	IV	6(22.2%)	21(77.8%)	1			
Serum albumin	≥3.5mg/dl	24(15.7%)	129(84.3%)	0.510(0.267-0.973)	0.041		
	<3.5mg/dl	23(26.7%)	63(73.3%)	1			
Co morbid illness	Yes	32(25.2%)	95(74.8%)	1			
	No	15(13.4%)	97(86.6%)	0.459(0.234-0.902)	0.024		
Type of co morbid illness	Hematology	7(14.3%)	42(85.7%)	0.093(0.024-0.359)	0.001	0.007(0.000-0.117)	0.001
	Immunologic	11(24.4%)	34(75.6%)	0.180(0.050-0.651)	0.009	0.033(0.003-0.419)	0.008
	Cardiovascular	5(26.3%)	14(73.7%)	0.198(0.044-0.886)	0.034	0.057(0.003-1.025)	0.052
	Respiratory	9(64.3%)	5(35.7%)	1			
Treatment Modality	Surgery only'	15(23.4%)	49(76.6%)	1			
	Chemotherapy + Surgery + Chemoth	8(16.0%)	42(84.0%)	0.622(0.240-1.612)	0.329		
	Surgery + Chemotherapy	24(19.2%)	101(80.8%)	0.776(0.374-1.610)	0.496		
Operation Type	Curative	35(17.2%)	169(82.8%)	0.397(0.181-0.872)	0.021	0.007(0.000-0.460)	0.02
	Palliative	12(34.3%)	23(65.7%)	1			
Lymph node dissection Done	Yes	30(16.7%)	150(83.3%)	0.494(0.249-0.982)	0.044		
	No	17(28.8%)	42(71.2%)	1			
Adequacy of Lymph node Dissection	Adequate	18(11.1%)	144(88.9%)	0.063(0.021-0.187)	0.000	0.019(0.002-0.211)	0.001
	Insufficient	`12(66.7%)	6(33.3%)	1			

Margin after Resection	**Negative**	**27(14.0%)**	**166(86.0%)**	**0.211(0.104-0.430)**	**0.000**		
	Positive	**20(43.5%)**	**26(56.5%)**	**1**			
Histological Grade of Cancer	**Well differeciated**	**13(14.6%)**	**76(85.4%)**	**0.342(0.138-0.849)**	**0.021**		
	Moderately Differeciated	**22(19.3%)**	**92(80.7%)**	**0.478(0.208-1.102)**	**0.083**		
	Poorly differeciated	**12(33.3%)**	**24(66.7%)**	**1**			
Presence of Complication	**Yes**	**33(28.7%)**	**82(71.3%)**	**1**			
	No	**14(11.3%)**	**110(88.7%)**	**0.316(0.159-0.629)**	**0.001**	**0.181(0.034-0.971)**	**0.046**
Types of complication	**Cardiovascular**	**9(32.1%)**	**19(67.9%)**	**1**			
	Hematologic	**7(30.4%)**	**16(69.6%)**	**0.924(0.281-3.038)**	**0.896**		
	Infection of Any Site	**5(16.1%)**	**26(83.9%)**	**0.406(0.117-1.407)**	**0.155**		

CHAPTER SIX

DISCUSSION

Comorbidity indicates the presence of one or more additional medical disorders co-occurring with a primary disease within the same individual. The prevalence of disease rises with age; therefore, comorbidity becomes increasingly more common over a person's life span. With the aging of the general population and advancements in medical care, the prevalence of chronic diseases has doubled between 1985 and 2005, and the proportion of patients with ≥4 chronic diseases has increased 3-fold [44]

A large cross-sectional study from the Scotland Medical Database reported in 2007 that 42% of all patients had at least one comorbidity, while 23% had >2 comorbidities .Patients with increasing numbers of comorbidities were associated with reduced postoperative survival outcomes. Patients with multiple comorbidities were most vulnerable to both cancer- and noncancerous-specific deaths in the first 6 months after cancer surgery.[44]

Study done in Taiwan shows significantly greater proportion of patients with comorbidities presented with poorer clinic pathological characteristics compared to those without. After cancer surgery, 26% of patients died after a median follow-up duration of 38.9 months. Overall mortality rates of patients with CCI scores of 0, 1, 2, 3, 4, and 5-8 were 22.9%, 29.5%, 38.2%, 43.2%, 50.2%, and 56.4%, respectively. After adjusting for other clinicopathological factors, patients with increasing CCI scores were associated with significantly reduced overall and noncancer-specific survival rates, while only patients with CCI scores of >2 were associated with higher cancer-specific mortality rates.[45]

Our results suggest not only the presence comorbidity increases the risk of death rather the type of comorbidity is statistically associated with morbidity. As described above Hematologic comorbidity, immunologic co morbidity, and cardiovascular comorbidity had lower risk of death as compared to respiratory comorbidity AOR (95%CI) =0.007(0.000-0.117), 0.033(0.003-0.419), 0.057(0.003-1.025) respectively.25% of Patients with co morbid illness had died in our study which is slightly lower than study done in Taiwan[4445].

- Cardiovascular comorbidity→96.6% less likely to die than respiratory complication
- Hematologic cmorbidity→99.0% less likely to die than respiratory co morbidity

Immunologic co morbidity→99.1% less likely to die than respiratory comorbidity

This is also comparable to study done in Scotland[44].

Even though no general study done in Ethiopia, in most studies about post operative outcome of specific cancer, most patients with co morbid illness is high likely to die[25].

Study done in Kenya about curative vs palliative surgery 165 patients were identified on chart review. Survival information was available for 150 patients with a median follow-up of 319 days. 39% underwent curative operations, 25% palliative operations, and 36% no operations. One-year survival was estimated to be 98% for curative surgery, 73% for palliative surgery, and 83% for no surgery [46].

In our study patient operated for palliative purpose had more mortality than patients operated for palliative purpose 34.3% vs 17.2%.During multinomial regression analysis curative surgery is less likely to diecompared to palliative surgery which is 99.3%/AOR (95%CI)0.007(0.000-0.460)/ times less risk of death99.3%/AOR (95%CI)0.007(0.000-0.460)/ times less risk of death.

The median number of Lymph node/nNL was 10 nodes and the mean number of positive nodes was 1.7 nodes. On the N-status attribution plot, the cut-off point where the converging curves turned parallel was at 12 nodes. This cut-off was supported by the significant difference in OS between cases with nLN ≥ 12 (5-year OS 73.0%) and those with nLN< 12 (5-year OS 62.7%), (P-value < 0.01). Multivariate analysis showed that both nLN-12 and LNR were independent factors predicting survival[47].

In our study patients with insufficient lymph node dissection had significantly associated with death. From 18(10.0%) patients with insufficient lymph node dissection, there were 12(66.7%) deaths, which accounts 6.7% of total deaths. In multinomial regression analysis patient with adequate lymph node dissection had 98.1% improvement i.e. AOR (95%CI) =0.019(0.002-0.211) with P-value 0.001.our result is almost comparable to studies done at different areas.

In SEER-Medicare analysis about impact of post operative complication on long term survival after esophagectomy, 940 patients underwent esophagectomy from 2007 to 2014, of which 50 died, resulting in a cohort of 890 patients. 455 patients had no major complications (51.1%), while 285 (32.0%) and 150 (16.9%) patients had one, two, or more major complications, respectively. Overall survival at 90 days was 93.1%. Multivariate analysis of patients followed up for a minimum of 90 days demonstrated that the number of complications was significantly associated with decreased overall survival but no impact on cancer-specific survival[48]

Study done about postoperative complications and long-term survival after complex cancer resection, 905 patients with esophageal cancer, 12,395 patients with lung cancer, and 1966 patients with pancreatic cancer. The serious complication rates were respectively 17.4, 9.5 and 11.8 %. The patients with serious complications had lower 5-year survival rates than those with no complications even if they were rescued and survived 30 days (20 vs 43 % for esophagus, 29 vs 54 % for lung, and 10 vs 21 % for pancreas cancer). Even after patients who died within 180 days after surgery were excluded from the analysis, a decrement in risk-adjusted long-term survival was observed among[49] the patients with serious complications after all three procedures. The association between complications and long-term survival was not explained by differences in receipt of adjuvant chemotherapy

CONCLUSION: Patients who undergo complex cancer resection and experience serious complications have diminished long-term survival, even if they are "rescued" from their complications. This finding persists even when deaths within 6 months after surgery are

excluded from the analysis. Metrics of surgical success should consider terms beyond 30 and even 90 days as well as the long-term consequences of surgical complications[49].

In our study patients with complication had higher death rate than patient without complication.48.1% patients developed some form of complication and there were 33(28.7%) deaths which were 13.8% of total deaths. In multivariate regression analysis patients with complication had death rate i.e. 81.9% death rate than patients without complication with AOR (95CI)=0.181(0.034-0.971) with P-value =0.046.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1. CONCLUSION

The death rate is higher in our hospital. Death is significantly associated with inadequate lymph node dissection, positive surgical margin, palliative surgery, presence of comorbidity. Therefore, this study highlights the need to have good surgical principle and early diagnosis and treatment of cancer and co morbidities. The people also need to be aware about sign and symptoms of malignancy**.**

7.2. RECOMMENDATION

Since the mortality of surgical malignancy depends on stage ,lymph node dissection, surgical margin,comorbid illness we had to adhere to international guideline. All necessary investigation modality should be fulfilled by responsible body to diagnose and treat cancer early.

Peoples should be aware about the signs and symptoms of malignancy.

We have to develop institution based guidelines about cancer.

We have to develop cancer registries.

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Questionnaire

1. MRN----------

2. Age

i. **13-39**
ii. **40-59**
iii. **≥ 60**

3. Sex:

i. **Male**
ii. **FEMALE**

4. Diagnosis

i. **GIS MALIGNANCY**
ii. **GUS Malignancy**
iii. **Head and neck malignancy**
iv. **Breast and soft tissue cancer**

5. Pre operation Stage of disease

i. **stage I**
ii. **stage II**
iii. **stage III**
iv. **stage IV**

6. Serum Albumin level

1 ≥3.5 mg/dl
2<3.5mg/dl.

7. Co morbid illness:

i. **Yes**
ii. **No**

8. Type of co morbid illness

i. **hematologic**
ii. **immunologic**
iii. **cardiovascular**
iv. **respiratory**

9. Type of operation done

i. **Curative**
ii. **Palliative**

10. Grade:

i. **well differeciated**
ii. **moderately differentiated**
iii. **poorly differentiated**

11. Margin:

i. **negative**
ii. **positive**

12.Is lymph node dissection done?

i. **Yes**
ii. **No**

13. If yes and done:

i. **Adequate**
ii. **Insufficient**

14. Treatment modality:

i. **surgery only**
ii. **neo adjuvant chemotherapy + surgery**
iii. **Surgery + chemotherapy**

15. Post treatment outcome:

i. **Improved**
ii. **Death**

16. Post op complication

i. **Yes**
ii. **No**

17. Post operative complication identified:

i. **Cardiovascular**
ii. **Hematologic**
iii. **Infection of any site**
iv. **GUS**
v. **GIS**

18. If death, cause of death

i. **Multiorgan failure**
ii. **Refractory shock**
iii. **Respiratory failure**