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Short term outcome of surgery for gastric cancer in a tertiary teaching hospital in Addis Ababa, Ethiopia with a review of African literature

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Abstract

Background: There are only a few published works of literature on gastric cancer in Africa. Surgery is the main treatment of gastric cancers that are confined to the stomach and regional lymph nodes. There are limitations in the adequacy of surgery and the availability of neo-adjuvant and adjuvant chemotherapy in Africa. This paper addresses short term one-month outcome of surgery and quality of surgery in terms of lymphadenectomy.

Method: This is a prospective descriptive study of outcomes and quality of surgery of gastric cancer in a tertiary teaching hospital in Addis Ababa, Ethiopia from September 2018 to August 2019 in GI unit of the department of surgery, school of medicine of Addis Ababa University.

Result: 47 patients underwent surgery with a male to female ratio of 1.47:1. Patients' age range from 26 to 80 years, mean of 52.7 +/- 8.4, and a median of 50 years. The commonest age group were 41-50, accounting for 34 % followed by age group of 51-60 (27.6%). Gastric adenocarcinoma accounts for 85.1%. Distal (antrum and pylorus) were involved in 46.8 %. Distal subtotal gastrectomy is the commonest procedure done with curative intent and a bypass gastro-jejunostomy for palliation. Adequate lymph node dissection was achieved in less than a third of patients. There were 9 major morbidity and 6 deaths making post-operative morbidity and mortality rate of 19% and 12.8% respectively.

Conclusion: Although morbidity and mortality of surgery in this study is acceptable, the quality of cancer surgery is not good. We in Africa need to have better training to be able to do a proper and acceptable oncologic surgery for gastric cancer. This can be achieved by creating partnerships with other nations of better expertise and experience in the management of gastric cancer.

Background

Gastric cancer is one of the most common cancers worldwide but considered rare in sub-Saharan Africa despite the high prevalence of *Helicobacter Pylori*^{1,2}. It is cancer with the significant socioeconomic, ethnic, geographical difference in its distribution¹.

Even within Africa there is a significant variation in incidence ranging from 0.3/100000 in Botswana to 20.3/100000 in Mali. In Ethiopia, available works of literature put gastric cancer 9th among all cancers in incidence but it is 4th most common cancer among upper GI cancers in the Sudan³.

More than 90% of malignancies in the stomach are adenocarcinoma, lymphoma, malignant GIST, carcinoids, and others accounting for less than 10%. The intestinal and diffuse types of adenocarcinoma as described by Lauren, differ in epidemiology, etiology, pathogenesis, and biological behavior. Most gastric cancers

occur sporadically, although familial cases are well known to occur in up to 10 %⁴.

Even in advanced countries like the USA, most patients present with symptoms and advanced disease and have incurable disease. Surgically curable early gastric cancers are asymptomatic and infrequently found in outside realm of screening programs⁴.

Weight loss and persistent abdominal pain are the most common symptoms and, palpable abdominal mass is a late but common sign at presentation⁵.

Distal gastric cancers involving the antrum and pylorus are the most prevalent and often present with gastric outlet obstruction⁴. The management of gastric cancer involves either a total gastrectomy or subtotal/near total gastrectomy with reconstructions.

Methods

Ethics approval and consent to participate

Ethical approval was obtained from the research and publication committee of the department of surgery, school of medicine, Addis Ababa University.

Patient selection

All consecutive patients with gastric cancer who were found to have operable disease from pre-operative workup and operated are included in the study.

Patient management

Patients seen by GI surgeon at the surgical referral clinic were first investigated and staged. Those patients with the regional disease (for whom curative surgery is possible) and those who would benefit from a palliative surgery were admitted to ward. The definitive surgery was determined by intraoperative findings.

Statistical analysis

Simple proportions are used to describe finding in demography, type of cancer and outcomes. There was no software used in this study.

Results

Patients' background

A total of 47 (28 males and 19 females) patients underwent surgery. The male to female ratio is 1.47:1. Patients' age range from 26 to 80 years, mean of 52.7 +/-8.4 and a median of 50 years. The commonest age group were 41-50 accounting for 34 % followed by age group of 51-60 (27.6%).

Histopathology and procedure done

Gastric adenocarcinoma accounts for 85.1% (40), and

there were 5 (10.6%) malignant gastrointestinal stromal tumors and 2 (4.3%) carcinoids. Distal (antrum and pylorus) were involved in 46.8 % followed by the body in 27.7%. Only 31 (66%) underwent surgery with curative intent. Majority had all margins free but less than a third of patients operated for adenocarcinoma with curative intent

Table 1: Gender, age distribution of patients operated for gastric cancer, GI unit department of surgery, Addis Ababa, Ethiopia

Category		Number 47 (100%)
Sex	Male	28 (59.6)
	Female	19 (40.4)
Male: Female ratio		1.47
Age group	21-30	2(4.3)
	31-40	5 (10.6)
	41-50	16 (34)
	51-60	13 (27.6)
	61-70	9 (19.1)
	71-80	2 (4.3)
	>80	0 (0)
Median age		50
Mean age		52.7 +/-8.4
Age range		26-80

Table 2: Type of cancer in patients operated for gastric cancer GI unit of department of surgery, Addis Ababa, Ethiopia

Type	Number (%)
Adenocarcinoma	40 (85.1)
GIST	5 (10.6)
Neuroendocrine/carcinoid	2 (4.3)

Table 3: site of cancer in patients operated for gastric cancer GI unit of department of surgery, Addis Ababa, Ethiopia

Site involved	number	%
Proximal (cardia and fundus)	6	12.7
Distal (antrum and pylorus)	22	46.8
Body	13	27.7
Diffuse	6	12.8
Total	47	100

Table 4: Type of surgery in patients operated for gastric cancer GI unit of department of surgery, Addis Ababa, Ethiopia

	Procedure	Number (%)
Surgery with curative intent		31(66)
	Total gastrectomy	8(17)
	Distal gastrectomy	13(27.6)
	Proximal gastrectomy	2(4.3.)
	Near total gastrectomy	3(6.4)
	Wide local excision	3(6.4)
	Ivor-Lewis esophagogastrectomy	1(2.1)
Trans-hiatal esophagogastrectomy	1(2.1)	
Surgery with palliative intent		16(34)
	By-pass GJ	9(19.1)
	Wide local excision	3(6.4)
	Feeding jejunostomy alone	1(2.1)
	Exploration alone	3(6.4)

Table 5: quality of surgery in patients operated for gastric cancer GI unit of department of surgery, Addis Ababa, Ethiopia

Quality of surgery measure		Adenocarcinoma	GIST	Neuroendocrine
LNs harvested	>15	3 of 13 patients	0	0
	10-15	3/13 patients	0	1/2
	< 10	7/13 patients	0	0
Margin	Both free	9/13 patients	5 of 5 patients	1 of 2 patients
	Only one free	4/13 patients	0	1 of 2 patients

Table 6: Morbidity and mortality in patients operated for gastric cancer GI unit of department of surgery, Addis Ababa, Ethiopia

outcome	Number (%)	
Major morbidity	9(19.0)	
Discharged improved	41(87.2)	
Post-operative death	6(12.8)	
Death following	Total gastrectomy	2
	Ivor Lewis esophagogastrectomy	1
	Rest of procedure	3

had adequate lymph node dissection. The commonest surgery performed with curative intent were distal subtotal gastrectomy (in 13 of 47 patients) followed by total gastrectomy (8/47) and a bypass gastro-jejunosomy (9/47) was the commonest palliative procedure.

Postoperative outcome

There were 9 major morbidities and 6 deaths making postoperative morbidity and mortality rate of 19% and 12.8% respectively. Pneumonia and subsequent respiratory failure were observed in five of the nine patients. Some degree of hypo- hypoproteinemia were observed in all patients with complications.

Among those who underwent resection with curative intent (total gastrectomy, distal subtotal gastrectomy, proximal gastrectomy, wide local excision) the pathology report of 20 patients was retrieved.

The Pathology report showed 13 were adenocarcinoma. In terms of lymph node harvest in only 3 of 13 specimens \geq 15 nodes were harvested, in 3 specimens, 10-15 nodes were harvested, in 7 specimens $<$ 5 nodes were harvested. 9 patients both margins are free, the rest one margin is involved.

There were five patients with malignant GIST and both proximal and distal margins are free in all but in one patient who had radial margin involved. No LNs identified in these patients specimen.

There were two patients with neuroendocrine tumors and total gastrectomy was done in one with a huge tumor. 11 LNs were identified in this patient's specimen and proximal margin is involved. The other patient had no LNs identified and all margins are free.

Discussion

Gastric cancer is one of the most common cancers worldwide. Available literature showed that the prevalence and incidence of gastric cancer is lower Africa than the rest of world despite high prevalence of H. Pylori (the 'African enigma')⁶. It is generally reported to be twice more common in males than females but this does not seem to be true in most parts of Africa. According to globocan cancer report the difference in incidence between males and females is less pronounced in Africa as in this study except southern Africa⁷.

The age groups 41-50 and 51-60 account for 61.6% of patients operated in this study and this is in accordance with studies In Africa where it was shown that gastric cancer occurs in younger population than the rest of world. A previous study in this center found the mean age of patients to be 48 (+/- 12) years and another study from Nigeria showed it to be 51+/-6 years^{3,8}.

Gastric adenocarcinoma is universally the most common histopathology accounting for 90 to 95 % of gastric cancers but in this study and some other studies in the Sudan and Morocco showed malignant gastrointestinal stromal tumors, gastric lymphomas and neuroendocrine malignancies seems to contribute significantly^{9,10}.

It is well known that there is a proximal migration gastric cancer in recent decades although it is still distal part of stomach that is affected more as in this study^{1,11}. Distal (antrum and pylorus) involvement were observed in 46.8% and the whole of stomach was diffusely involved in 12.8% in this study. This is similar to a study by Allison N in three Rwandan hospitals where the antrum was the most frequent anatomical site (56.5%). A study on spectrum of gastric cancer in large quaternary hospital Kwazulu Natal SA showed a different picture where the body of stomach was involved in 50%, whereas study on primary GI cancers in Sudan by Khalid Mohammed et al. showed the body and antrum were equally involved^{10,12,13}.

Surgery with curative intent was possible in 66% of our patients and distal subtotal gastrectomy followed by total gastrectomy were the most common procedures done for this purpose. A previous study from these hospital Johnson *et al.* showed curative resection was possible for only 44%

and a study from large quaternary hospital Kwazulu Natal SA, 72.5% did not undergo surgery with curative intent owing to advanced disease^{14,15}.

Total lymph node count and the number of positive nodes are now accepted to be prognostic factor of great importance but there are no published data in Africa that I can find on this issue except one from South Africa^{15,16}. Among the 31 patients operated with a curative intent, a complete histopathology report of 21 patients was available for analysis. In only three of the thirteen patients with gastric adenocarcinoma fifteen or more lymph nodes were retrieved and ten to fifteen lymph nodes were retrieved in the other 3 patients. One margin was positive in four of the thirteen patients. This result is not acceptable. Data loss in terms of histopathology makes our findings incomplete.

The overall major complication and mortality rate of 19 % and 12.8 % respectively is acceptable and comparable with the results in Africa. Gastric cancer at a university teaching hospital in northwestern Tanzania: a retrospective review of 232 cases, postoperative complication and mortality rates were 37.1% and 18.1%, respectively⁸. In a study on management and outcome of gastric cancer in Zaria, Nigeria a postoperative complication rate of 27.7% and a mortality of 16.1% were reported^{13,17}.

Conclusion

Short term outcome in terms of morbidity and mortality - this study is comparable with studies in Africa, but the Quality of surgery i.e., number of LNs retrieved and margin status is unacceptable.

We in Africa need to have a better training to be able to do a proper and acceptable oncologic surgery for gastric cancer. This can be achieved by creating partnerships with other nations of better expertise and experience in management of gastric cancer.

Limitations of the study

The study has a number of limitation, including the small sample size, short follow-up, incomplete histopathology report.

Abbreviations

GI gastrointestinal

SOM School of medicine

CHS College of health sciences

AAU Addis Ababa university

SA South Africa

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Authors' contributions

HWG is GI surgeon and operating surgeon of most of the patients.

BA is the pathologist.

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Availability of data and materials

NO additional data is used other than the ones mentioned.

Ethical approval and consent to participate

Approval obtained from departments research and publication committee.

Consent for publication

Consent to publish were also obtained from research and publication committee of department.

Competing interest

There are no competing interests to disclose.

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