

Association of Tumour Profile and Post-Operative Complications of GC Patients

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Abstract

Original Research Article

Introduction: Stomach cancer is the leading cause of cancer related death worldwide hence known as Captain of Men's Death. The survival of patients undergoing surgery for gastric cancer in East Asia was reported to be higher than in Western countries even when patients were matched for post-resection stage. The aim of the study was to evaluate the association of tumour profile and post-operative complications of GC patients. **Methods:** This prospective observational study was conducted at department of Surgical Oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka during July, 2019 to March, 2021. A total of 53 patients were included for the study. Sampling method was purposive non-randomized sampling. Preoperative evaluation included basic laboratory tests such as CBC, RBS, S. creatinine, S. electrolyte, S. albumin, liver function test, ECG, chest x-ray, USG of whole abdomen, contrast CT scan of abdomen and serum CEA. After proper staging evaluation patients were selected for operation. The surgery was carried out as per standard guideline. Statistical analysis was performed by using SPSS (statistical package for social sciences) version 28. Prior to the commencement of this study, the research protocol was approved by the Research Review Committee of Department of Surgical Oncology and the Ethical Committee of National Institute of Cancer Research & Hospital, Dhaka. **Results:** There was no association among postoperative complications of modified D2 gastrectomy with patient's age, gender and smoking status. The highest number of patients 16 (30.19%) suffer from postoperative infection/sepsis. Subsequently, 8 (15.09%) patients had paralytic ileus for > 4 days. High Grade of tumor involved in 21 (39.62%) and Intermediate grade of tumor involved in 32 (60.38%) study subjects. 10 (18.87%), 19 (35.85%), 12 (24.64%) & 12 (24.64%) were pathological stage of IIA, IIB, IIIA, IIIB respectively. There was no association among postoperative complications status after modified d2 gastrectomy with tumor location, pathological stage, grade, LVI/PNI and number of lymph nodes retrieval. **Conclusion:** Surgical resection of a primary tumor provides best chance of cure. Now there are some different opinions regarding conventional and upgraded surgery. Nowadays, modified D2 gastrectomy is gaining popularity across the world day by day.

Keywords: Tumour Profile, Gastric cancer, Oncologic, Post-resection.

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INTRODUCTION

Stomach cancer is the leading cause of cancer related death worldwide hence known as Captain of Men's Death. The survival of patients undergoing surgery for gastric cancer in East Asia was reported to be higher than in Western countries even when patients were matched for post-resection stage [1]. Differences in tumor biology and location, the stage migration phenomenon, as well as the difference in surgical approach (D1 versus D2 resection) were all suggested as possible explanations. This difference in oncologic

outcome has led to the implementation of several prospective randomized trials comparing D1 to D2 gastrectomies. Three of these studies were completed in Western countries. In the MRC trial in the United Kingdom, 400 patients were randomized to D1 and D2 resection. The 5 year survival rates did not differ between the two arms, with 35% for D1 resection and 33% for D2 resection. Disease-free survival did not differ either. The authors concluded that D2 resection offers no survival advantage over D1 resection but did suggest that D2 resection without pancreatic splenectomy may be superior to standard D1 resection.

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1389

The Dutch study randomized 711 patients to D1 and D2 resection. They published their early results as well as their late results, with more than 10 years' follow-up [2]. The findings demonstrated a significant increase in postoperative morbidity and mortality in the D2 group (10% vs. 4% mortality) associated with stations 10 and 11 dissections that necessitated splenectomy and distal pancreatectomy. The third European prospective randomized study was conducted by the Italian Gastric Cancer Study Group. They reported both early and late results and showed no difference in postoperative morbidity and mortality, or in 5years survival between the D1 and D2 approach (66% vs. 64%) [3]. Rapid advances in surgical oncology worldwide have significantly improved the safety of gastrectomy. The 30-day post-gastrectomy mortality rates for patients with gastric cancer in Western countries over the last two decades have ranged from 1.9% to 5.1% [4], with postoperative in- hospital mortality rates of 5.8% to 9.8% [5]. In contrast, the overall operative mortality rates in Japan from 2011 to 2012 were 2.3% after total gastrectomy [6] and 1.07% after distal gastrectomy [7], and the equivalent 30-day mortality rates were 0.9% (43) and 0.45% [7], respectively, which appeared to indicate better outcomes than in Western countries [3]. However, there remains scope for further global improvements in the safety of gastric cancer surgery. According to the theory of epistemology, involving practice, understanding, re-practice, and re-understanding, the preferred extent of gastric resection and lymph node dissection has experienced a pendulum-like phenomenon, from narrowed to extended, and then narrowed again, gradually rationalized from the original bias.

METHODS

This prospective observational study was conducted at department of Surgical Oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka during July, 2019 to March, 2021. A total of 53 patients were included for the study according to following inclusion and exclusion criteria. Study population was patients with gastric cancer who underwent for modified D2 gastrectomy in the department of Surgical Oncology, NICRH, Mohakhali, and Dhaka. Sampling method was purposive non-randomized sampling. Preoperative evaluation included basic laboratory tests such as CBC, RBS, S. creatinine, S. electrolyte, S. albumin, liver function test, ECG, chest x-ray, USG of whole abdomen, contrast CT scan of abdomen and serum CEA. After proper staging evaluation patients were selected for operation. The surgery was carried out as per standard guideline. The

modifications were done are as follows: 1. Modification of extent of lymph node dissection as per procedure, For distal gastrectomy-1,3,4sb,4d,5,6,7,8a,9,11p. 12a irrespective of T stage and for total gastrectomy- 1-7, 8a, 9, 11p, 12a (avoiding 11d & 10 group of lymph node) as recommended by Japanese cancer association 2. Resection of pancreatic tail and spleen was avoided until unless they are directly involved by tumors. Outcome of surgery was measured by assessing postoperative complication for 30 days. Statistical analysis was performed by using SPSS (statistical package for social sciences) version 28. Prior to the commencement of this study, the research protocol was approved by the Research Review Committee of Department of Surgical Oncology and the Ethical Committee of National Institute of Cancer Research & Hospital, Dhaka.

- **Inclusion Criteria**

- All biopsy proven & operable cases of adenocarcinoma of stomach.

- **Exclusion Criteria**

- Patients with stage IV diseases.
- Patients with previous gastric surgery.
- Patients who unfit for surgery.
- Patients unwillingly to take part in the study.

RESULTS

Table I shows that there was no association among postoperative complications of modified D2 gastrectomy with patient's age, gender and smoking status. Table II shows that out of 53 patients the highest number of patients 16 (30.19%) suffer from postoperative infection/sepsis. Subsequently, 8 (15.09%) patients had paralytic ileus for > 4 days. Besides, 8 (15.09%) patients suffered from postoperative pulmonary infection. 2 (3.77%) of each patient had the experience of duodenal blow out and wound dehiscence. Figure I, shows that proximal stomach involved in 15 (28.30%) and Distal stomach involved in 38(71.70%) study subject. Figure II shows that high Grade of tumor involved in 21 (39.62%) and Intermediate grade of tumor involved in 32(60.38%) study subjects. Figure III shows that 10(18.87%), 19(35.85%), 12 (24, 64%) & 12 (24.64%) were pathological stage of IIA, IIB, IIIA, IIIB respectively. Table III shows that there was no association among postoperative complications status after modified d2 gastrectomy with tumor location, pathological stage, grade, LVI/PNI and number of lymph nodes retrieval.

Table I: Association of different demographic parameters and postoperative complication in gastric cancer (n=53)

Parameters	Complications			P value
	no	minor	major	
Age				
<45	9(32.1%)	3(14.3%)	1(25.0)	0.356a
>45	19(67.9)	18(85.7)	3(75)	
Sex				
Male	21(75)	17(81)	3(75)	0.88b
Female	7(25)	4 (19)	1(25)	
Smoking				
Yes	18(64.3)	15(71.4)	3 (75)	0.827c
No	10(35.7)	6(28.6)	1(25)	

a.X²= 2.068 df=2, b.X²=.256 df=2 c.X²=.380 df=2

Table II: Distribution of patients according to postoperative findings (n=53)

Postoperative findings	Frequency (%)
Postoperative wound infection	
Present	16. (30.19%)
Absent	37. (69.81%)
Wound dehiscence	
Present	2 (3.77%)
Absent	51 (96.23%)
Anastomotic leakage	
Present	2 (3.77%)
Absent	51 (96.23%)
Postoperative ileus (in days)	
>4	8 (15.09%)
≤4	45 (84.91%)
Duodenal blow out	
Present	2 (3.77%)
Absent	51 (96.23%)
Pulmonary infection	
Present	8 (15.09%)
Absent	45 (84.91%)

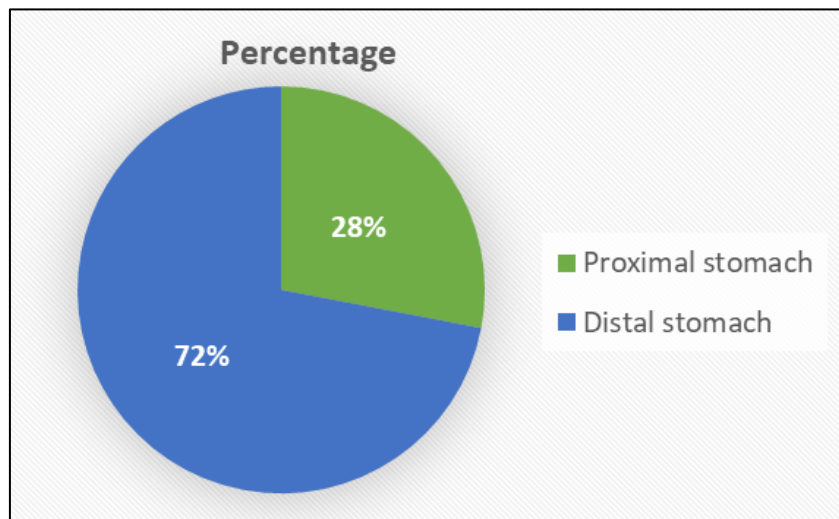


Figure I: Distribution of tumor profile according to anatomical site

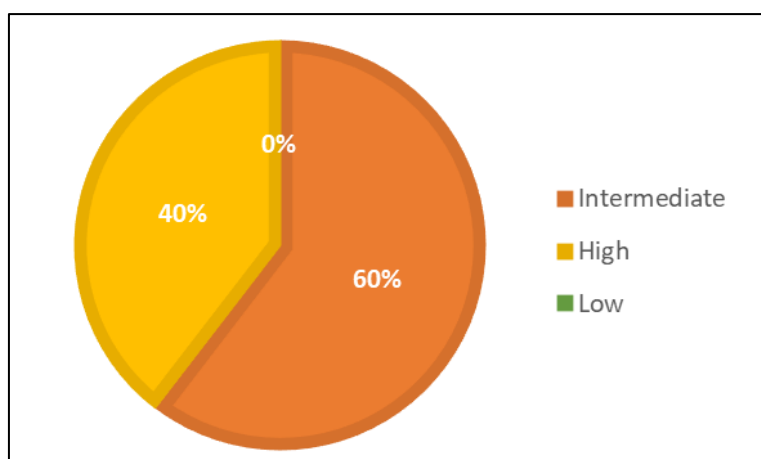


Figure II: Distribution of tumor profile according to Grade of Tumor

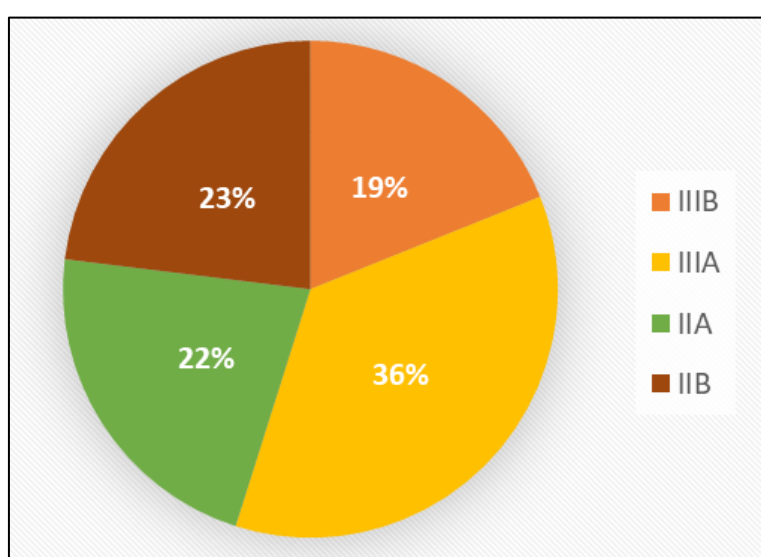


Figure III: Distribution of tumor profile according to pathological stage

Table III: Association of tumor profile and postoperative complication in gastric cancer (n=53)

Parameters	Complications			P value
	no	minor	major	
Anatomical Site				
Distal	21(75)	14(66.7)	3 (75)	0.805 ^a
proximal	7(25)	7.(33.3)	1(25)	
Grade				
High	9(32.1)	10(47.6)	2 (50)	0.498 ^b
Intermediate	19(67.9)	11(52.4)	2 (50)	
Pathological Stage				
II	15(53.6)	11(52.4)	2 (50)	0.99 ^c
III	13(46.4)	10(47.6)	2 (50)	
LVI/PNI Status				
PNI	1(3.6)	1(4.8)	0(0)	0.947 ^d
Total LN retrieved				
<15	8(28.6)	3(14.3)	1(25)	0.494 ^e
>15	20(71.4)	18(85.7)	3 (75)	

DISCUSSION

In this study, it was observed that mean (\pm SD) age was 48.9 \pm 9.36. The most common age group

affected was 45-54(49%) years. The youngest and the oldest were 25 and 80 years respectively. Dr. Sahu *et al.*, [8] observed the mean \pm SD was 49.10 \pm 8.32 which was closely resembled with this study. But according to

the study by Galata *et al.*, [9] the mean age was 65 years which is higher with the comparison to the current study. The proportion of females was considerably low in comparison to males in this study. In this present study it was observed that 41(77.35%) patients were males and 12 (22.64%) patients were females. The male to female ratio was 3:1. Lam *et al.*, [10] found in their study that male to female ratio was 2:1 which is closely resembled with this study. Similar observation regarding male predominant was also observed by Galata *et al.*, [9]. Majority of the patients were found smoker in this study 36(67.92%). Gastric cancer associated with smoking was found in similar with the study of Crumley *et al.*, [11]. But as the sample size is too small to comment on correlation between smoking and gastric cancer was difficult. No association was observed with smoking and postoperative complications. In this current study postoperative complications were categorized as major complications (Anastomotic leak and duodenal blow out) and minor complications (wound infection, wound dehiscence, pulmonary infection and paralytic ileus). The prolonged post-operative ileus is one of the complication after gastric cancer surgery, which is lasted more than 4 days Liang, w. *et al.*, [12]. Post-operative ileus is usually lasted for 3 days following abdominal surgery. But considering our perspective and open surgery it had been arbitrarily raised and it was judged by the patient appreciates passage of flatus and bowel sound all together. In majority of cases the bowel activity returned well in time and 8(15.09%) of cases the post-operative ileus was longer than 4 days. Among those 8 patients, anastomotic leakage the major complication found in only 2(3.77%) of cases. Another major complication was duodenal blow out which had been developed in 2(3.77%) of patients. Rest of the 4 patients of post-operative ileus was found idiopathic. The complication in the form of wound infection was present in 16(30.19%) of cases. This is probably higher in comparison to Nafae *et al.*, [13] presented in his paper 13% wound infection was observed and there was a positive statistical significance with DM. Patients suffered from postoperative pulmonary infection was observed in 8(15.09%) of patients. Statistical analysis was performed to observe the association of pulmonary infection and smoking but no association was found. In this current study only 2(3.77%) patients developed wound dehiscence. Majority of the patients 29(54.71%) of this study did not developed any postoperative complications. the mortality rate of this study was only 1.08%, similar findings were observed in the previous study of Nafae *et al.*, [13] and Sahu *et al.*, [8]. According to the tumor profile of the study population, revealed that the most common site of the tumors were in distal part of the stomach 38(71.70%), this was considered with the previous study of different countries Fujiwara *et al.*, [14] and Lam *et al.*, [10]. In this study no positive statistical association was observed with tumor site and postoperative outcomes but according to Lam *et al.*, [10] most of the postoperative complications were

observed with proximal tumor. The majority of patients of this study had intermediate grade of tumor 32(60.38%). Most of patients were in stage IIB 18(35.84%) which indicates that most of the tumors were in locally advanced stage. Almost similar findings 21% patients with stage IIB were obtained by Fujiwara *et al.*, [14]. In this current study LVI found in 28(52.83%) of patients and PNI found in 6(11.77%) of patients which indicate that tumors were in locally advanced stage. Similar observation was found by Sahu *et al.*, [8] where LVI were found in 60% of patients and PNI present in 22.5% of patients.

CONCLUSION

Gastric cancer is the seventh most common malignancy and the fifth leading cause of cancer death in Bangladesh. However, the different management systems of this disease include surgery, chemotherapy and radiotherapy in some advance cases including bone metastasis. Surgical resection of a primary tumor provides best chance of cure. Now there are some different opinions regarding conventional and upgraded surgery. Nowadays, modified D2 gastrectomy is gaining popularity across the world day by day. This modified D2 gastrectomy is nothing but the surgery of tumor containing part of stomach either distal stomach or total stomach having proximal at least 5 cm and distal at least 2 cm clearance of margin along with the momentum. The findings of this study will determine an appropriate treatment strategy for the individual patient, improve survival prognosis, allows healthcare providers and researchers to exchange their information.

RECOMMENDATIONS

A similar study can be done with large sample size. Similar type of study can be done to observe long term survival.

FUNDING

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CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

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