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Influence of Prognostic Factors for Recurrence of Adenocarcinoma of the Stomach

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ABSTRACT

Introduction: Gastric cancer is the second most important neoplasm in the world. Surgical resection is the treatment of choice for gastric cancer, and recognized by the International Union against Cancer (International Union Against Cancer – UICC) TNM classification of the parameters of the tumor and lymph node. Prognostic factors related to characteristics of the tumor by histopathologic findings have an impact on the planning of the operation. According to the results of most studies it is possible to predict survival and recurrence based on histological type and TNM classification of tumors on the one hand and the surgical procedure on the other. **Aim:** The aim of the research was to analyze prognostic factors that influenced the frequency of recurrence in gastric surgery patients. **Patients and methods**: The five year study covered a population of 100 treated patients of adenocarcinoma of the stomach at the Department of Surgery, University Clinical Center Tuzla. The first group were characteristics of tumors in patients with gastric adenocarcinoma. Lymphadenectomy and splenectomy, types of surgery were the second group of prognostic factors. **Results**: Histological type and TNM stage of tumor as prognostic factors had a significant impact on local tumor recurrence. The type of surgery had no statistically significant value for tumor recurrence ($p = 0.7520$). **Conclusion**: Statistical analysis of prognostic factors related to histopathologic characteristics of tumors and the type of surgery gave the results that had an impact on recurrence in gastric surgery patients. The most important prognostic factors were TNM stage of tumor and histological type of tumor that influenced the incidence of recurrence.

Keywords: recurrence, gastric adenocarcinoma, prognostic factors, surgery.

1. INTRODUCTION

Surgical resection of the TNM classification parameters for the tumor and lymph node treatment for gastric cancer, is recognized by the International Union Against Cancer (International Union Against Cancer - UICC). UICC classification in the Japanese study correctly points to survive, but without the risk of recurrence (1). Prognostic factors have an important role in the decisions of the treatment of gastric cancer (2). Finding prognostic factors will be used by developing forecasting systems based on artificial complex network forecasting evaluation survival (3). Many studies have used a variety of factors after surgery. Results indicate that older patients have a worse prognosis (4). Macroscopic lymph nodes were negative, histologically positive have a worse prognosis (5, 6). Japanese clinicopathological study with Borrmann type 4 gastric cancer with peritoneal dissemination have a tendency of recurrence in 77.4% and five-year survival of 23.4%. USA and Japanese classification of equally serious approach to determine all the factors for survival. USA studies have described early and late recurrence within 2 years of surgery (7). By determining the characteris-

tics of tumors, positivity or negativity of the lymph nodes and metastases in the organs, the advantage of certain phases of cancer treatment, surgical method and survival within 1 to 2 years can be assessed (8, 9).

The aim was to identify and analyze the frequency of relapse with stage adenocarcinoma of the stomach in relation to the type of surgery.

2. METHODS

Retrospective - prospective five-year study included 100 patients, randomly selected for analysis of survival. Tumor characteristics and lymph nodes by TNM classification were obtained from the Polyclinic for Laboratory Diagnostics, Institute of Pathology, at the University Clinical Center in Tuzla. Type of gastric resection (R0 to R3) was obtained from the operative findings, the Department of Surgery, University Clinical Center in Tuzla. Postoperative follow-up data on patients were obtained after surgical control, and after 3 months, 6 months, 2 years, 5 years and review of oncology Consilium. Recurrent disease was possible to monitor for the malignancy cases register with Department of Health of Tuzla Canton. The statistical analysis was a univariate assessment of the impact of certain demographic and clinical variables on outcome. As a measure of outcome in our study is the occurrence of relapse, it is an analysis made Log-rank test. The difference is treated significant if $p<0.05$. We made an analysis of the frequency of recurrence. Statistical analysis was done using SPSS statistical package (version 17.0).

3. RESULTS

The average age of patients was 61 years (SD 11.28 +−0.18, 95% CI 58.7620 to 63.2380). The study included 66 male and 34 female patients (ratio of male and female solos was 1,94:1. In the study a higher prevalence of gastric cancer was found in males compared to females, a 2:1 ratio. Further analysis revealed that the most frequent age group for gastric cancer operations was 60 years for males and 70 years for females.

Subgroup		Variable frequency n %	
Tumor size	Up 2 cm	28	28.00
	2-5 cm	45	45.00
	Over 5 cm	27	27.00
Histological type	adenocarcinoma	71	71.00
	signet ring	27	27.00
	others	2	2.00
Tumor localization	cardia	12	12.00
	corpus	36	36.00
	antrum	39	39.00
	pylorus	13	13.00
Bormann classification	polip (1)	11	11.00
	vegetation (2)	22	22.00
	ulcer (3 i 4)	67	67.00

Table 1. Characteristics of tumors in patients with gastric adenocarcinoma.

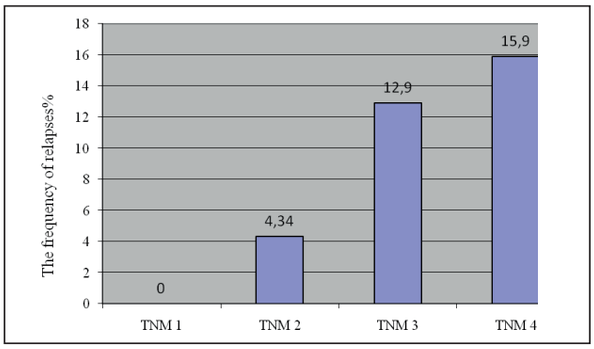

Figure 1. The frequency of relapses by TNM stage of disease.

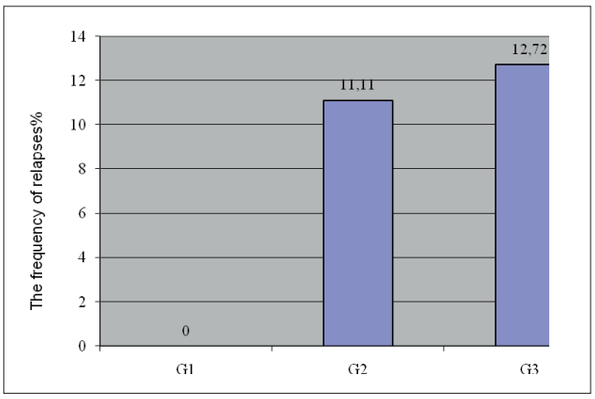

Figure 2. The frequency of relapse by histologic stage of disease

Total gastrectomy was the leading surgical procedure with highest prevalence of 41%, subtotal gastrectomy 40%, 13% Bilroth II patients, palliative surgery had a 2% of patients, and inoperable was 4% of patients. Resection of gastric R1 and R2 were present in 66% of patients, positive for tumor on the proximal margins had 10% of patients, the distal margins of resection of 22% of patients, and 66% of patients had a negative resection margin. Peritoneal dissemination of tumor was not present in 80% of patients, and during surgery in 79% of patients is not made splenectomy. Metastasis to lymph nodes and 6 nodes had 32% of patients and more than 15 lymph nodes in 6% of patients. Since the number of positive lymph nodes were 62% of patients. T4 advanced stage, had 45% of patients and the lowest percentage of 1% of patients had stage T1 or early gastric cancer. Fifty five percent of patients had G3, poorly differentiated tumor, G2 moderately differentiated tumors were 44% of patients and the G1 well differentiated tumors were 5% of patients.

Variable	Subgroup	**Recurrence rate%**	p
TNM stage	T1	0	0.2999
	T2	4.34	
	T3	12.9	
	T4	15.9	
Histological grade	I	0	0.8343
	II	11.11	
	III	12.72	
Type of operation			0.6288

Table 2. The frequency of recurrence depending on the stage of disease and the type of surgery

According to the frequency of recurrences, which are explained in Figure 1 and Figure 2, the highest percent-

Type of operation TNM stage	T1	The frequency of relapses (%), T2 T3	T4	
Radical gastrectomy	-	0	12.50	18.75
Subtotal gastrectomy	0	7.14	12.50	17.40
palliative	-	-	0	0

Table 3. The frequency of relapse with stage cancer in relation to the type of surgery

age of 16% is the fourth stage of the disease, G3 poorly differentiated disease stage according to histological type.

T3 stage disease (12.9%) and T4 stage (15.9%) have a higher relapse rate compared to T1 and T2 stage. According to the histological grade of adenocarcinoma the G3 stage has 12.72% of recurrences in relation to the G2 stage with 11.11% of recurrences. The G1 stage of the tumor had no recurrence. The table shows no statistically significant results of these parameters on recurrence. Table 3 shows that there is no statistically significant (p = 0.7520) frequency of recurrence of the type of surgery in relation to the TNM stage of gastric carcinoma.

4. DISCUSSION

The early 21st century used the less invasive techniques, including endoscopic mucosal resection using the laparoscopic technique. These techniques can be used in patients with early gastric cancer; but their risk was higher than in the open method of operation, the traditional gastrectomy. Several techniques have been described for performing Billroth I anastomosis after gastrectomy using a circular stapler (10, 11). Univariate analysis, prognostic factors for survival of patients treated for adenocarcinoma of the stomach, produced a statistically significant value. The age group for men was 60 years and for women 70 years, while the average age was 61 years, and the representation of men and women was 2: 1. According to other studies in the world, the average age of patients was also 60 years old (12). Location of the tumor in the antrum in 39% of treated patients was the most frequent with a survival to 15 months in relation to the representation of other sites of tumor corpus, pyloric and cardia. In studies by others, significantly important prognostic factor is the location of the tumor in the middle third of the stomach (12). Depth of invasion of gastric wall tumors, according to Borrmann classification, in our study represented a form of ulcer in 67% patients, with the presence of T3 and T4 stage tumors. Nine-months survival is typical for this group of patients. Serous invasion was not as statistically significant a prognostic factor, in our study and in the studies of Yokota and Maehara (12, 13). Maehara conclude that the clinicopathological characteristics of gastric cancer determine the type of recurrence, peritoneal and local recurrences were related to infiltrative growth, in contrast to haematogenous and lymphatic recurrences. And there were no statistical differences in survival time among each type of recurrence and survival was not related to the number of sites of recurrence (13).

In our study, recurrence is closely related to the stage of cancer disease, according to the characteristics of the tumor TNM stage and histological type. Stage T4 tumors had a recurrence frequency of 16%, stage T3 tumors 13%, T2 stage tumors 4.3%, and stage T1 tumors had no recurrence. According to the histological stage of the G3 (poorly differentiated tumor) had a recurrence rate of 12.7%, G2 (moderately differentiated tumor) 11.11% rate of recurrence and stage of G1 (well-differentiated tumor) had no recurrence (14).

The frequency of recurrence of the type of surgery was not statistically significant (p = 0.7520). Subtotal resection in comparison to other surgical techniques provided a higher percentage in the length of survival of the patient. In a study of prognostic factors that had influence in the surgical treatment of gastric cancer and survival in patients the most significant were: tumors larger than 5 cm, tumor localization in the antrum, T3 and T4 stage tumor according to TNM classification and N3 lymph nodes (15).

5. CONCLUSION

Conclusion would be that the TNM stage of tumor and histological type had a statistically significant value for the recurrence of gastric cancer. The type of surgery has no statistically significant value for recurrence of gastric cancer.

- Conflict of interest: The authors declare that there is no conflict of interest about considering or publishing the manuscript.

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