Outcome of gastric gastrointestinal stromal tumors at National Cancer Institute, Cairo University

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Background
The purpose of this research was to inspect the tumor landscapes, surgical particulars, and survival distribution of patients of gastric gastrointestinal stromal tumors (GIST) that were surgically removed at the National Cancer Institute, Cairo University.

Materials and methods
Patients who submitted an application to our clinic and were ultimately diagnosed with gastric GIST were included in this retrospective analysis. Patients' ages and sexes were recorded, as well as their original tumor sites, histological features, staging, treatments received, treatment methods, and survival rates.

Results
There were a total of 23 patients, with a female to male ratio of 1 : 3, who had a diagnosis of gastric GIST. They averaged 56 years of age. Tumor sizes, on average was 11.2 cm. In 18 (78.3%) cases, the tumor was located at the distal end, whereas in 5 (21.7%) cases it was located at the proximal end. 19 patients underwent first surgery, whereas only 5 got neoadjuvant treatment focused on the primary tumor. 17 (73.9%) individuals (73.9%) had sleeve gastrectomy, making it the most prevalent operation. 7 days was the typical duration of stay in the hospital. Two patients showed postoperative gastric leakage; the first was treated conservatively, while the second was treated surgically and resulted in a total gastrectomy. With regard to risk categorization, 10 (43.5%) patients had tumors with a high level of risk, 9 (39.1%) had tumors with an intermediate risk, whereas just 4 (17.4%) had tumors with a low risk (Table 3). 16 (69.6%) patients received supplemental targeted treatment. The median duration of patient follow-up was 42.6 months, and all patients were tracked. The cumulative overall survival at 5 years was 82.1%, while the cumulative disease-free survival was 65.4%.

Conclusion
For individuals who need their gastric GIST removed, extensive local resection that preserves the stomach yields excellent functional and oncological results.

Keywords:
functional outcome, gastric gastrointestinal stromal tumor, surgical outcome, survival outcome

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Introduction

Gastrointestinal stromal tumors (GISTS) make up 1% of all gastrointestinal cancers [1], they arise from mesenchymal tissue, by most of cases (60–70%) happening in the stomach. Most cases of GIST (~70%) manifest in the digestive tract [2], The small intestine accounts for around 20%, while the large intestine and the rectum both provide 5% [3], Even fewer (5%) can be located in the esophagus [4]. Just only single Cases of omental and mesenteric origin have been stated [5]. Both the location and size of the tumor have an impact on how it manifests clinically [6]. The treatment of GIST has been greatly improved by genetic research, which has led to the development of targeted therapies [7].

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Surgical resection is the only proven method of treating gastric GISTs [8]. The goal of surgery is to achieve a resection of R0, which means there are no symptoms of microscopic residual disease and the margins are negative. With a healthy pseudocapsule [9]. The surgical method adopted and the amount of stomach removed may be affected by the size, position, and closeness to surrounding intraabdominal viscera [10]. Although current recommendations suggest that lymphadenectomy is not always necessary, they do not specify when it is called for. If a clean resection margin is needed, an bloc resection of surrounding organs may be necessary [11]. During the last decade, imatinib has been utilized in the neoadjuvant context to decrease initial tumor size and increase the likelihood of a clean resection margin [12].

The purpose of this research was to estimate effects of individuals with gastric GISTs that need surgery at the National Cancer Institute.

Materials and methods

This was a retrospective cohort study of all cases diagnosed with gastric GIST (23 individuals) who underwent surgery at the National Cancer Institute's surgical department from January 2016 to December 2020.

Preoperative workup

All surgical candidates had a preoperative workup for anesthetic fitness consisting of a hepatic and renal functional test, complete blood count, thyroid function test, coagulation profile, serum electrolytes, electrocardiography, and computed tomography (CT) chest. Patients were staged preoperatively based on the findings of upper Gastrointestinal tract (GIT) endoscopy. Imaging by use of computed tomography and sometimes endosonographic. The preoperative biopsy was not routinely done.

Statistical analysis

The SPSS (Statistical Package version 28) was utilized to analyse the data. The mean±standard deviation or median (range) will be utilized to define quantitative data. Frequency and percentage were utilized to summarize qualitative data. From the date of diagnosis until death or the last follow-up date, the overall survival will be determined. Disease-free survivals were calculated from surgery time till the time of documented recurrence, metastasis, death, or last follow-up. The Kaplan-Meier technique was utilized to conduct the survival analysis. The log-rank test was utilized to compare two survival curves. A P value less than or equal to 0.05 will be considered significant.

Results

Twenty three individuals were diagnosed with gastric GIST and underwent surgery between January 2016 and December 2020. The median age was 56 years, with a range of 29–83 years. There was a slight female predominance with 56.53% (13/23) females versus 43.47% (10/23) male. The weight loss was the most common and widespread sign that prompted cases to seek medical care (52.7%) (Table 1).

Prior to the operation, the average patient's hemoglobin level was 10.8 gm/dl and serum albumin was 3.6 gm/dl. The median size of a tumor was 11.2 cm. With regard to the tumor's location, it was distal in 18 (78.3%) individuals whereas proximal in 5 (21.7%) individuals. The majority of cases were subjected to upfront surgery (19 individuals) and only 5 cases received neoadjuvant imatinib. Sleeve gastrectomy was the most common procedure, it was done for 17(73.9%) individuals (Table 2). Lymphadenectomy was done only for 5 (21.7%) individuals. Complete negative resection margin was performed in 91.3% (21/23) of patients. The average hospitalization length was7 days. Only 2 cases developed postoperative gastric leakage, the first case was managed conservatively while the other case was managed repeated endoscopic stenting and ended with total gastrectomy. Regarding the risk classification, 10 (43.5%) individuals had high risk tumor and 9 (39.1%) individuals had intermediate risk while only 4 (17.4%) individuals had low risk tumor (Table 3). Sixteen (69.6%) individuals received adjuvant imatinib. All patients were followed-up and the median follow-up period was 42.6 months. The Cumulative overall survival at 5 years was 82.1% while the Cumulative disease-free survival was 65.4% (Figs 1 and 2).

Table 1 Displaying demographics and symptoms of cases

Variables	Values
Age	56 (29–83)
Sex (%)	
Female	13 (56.5%)
Male	10 (43.5%)
Smoker (%)	11 (47.8%)
Symptoms (%)	
Weight loss	12 (52.7%)
Abdominal pain	6 (26%)
Obstruction of Gastric Outlet	5 (21.7%)

Table 2 The preoperative and intraoperative data

Variable	Value
Laboratory readings	Median (range)
Hemoglobin level (gm/dl)	10.8 (8.9–13.2)
Total white blood cells count	7300 (3400–13200)
Serum Albumin(gm/dl)	3.6 (1.9–4.3)
Serum creatinine(mg/dl)	0.8 (0.7–1.4)
Intraoperative factors	
Tumor diameter (cm)	4 (1–10)
Tumor site (%)	
Proximal	5 (21.7%)
Distal	18 (78.3%)
Type of Surgery (%)	
Sleeve resection	17 (73.9%)
Proximal gastrectomy	2 (8.7%)
Total gastrectomy	2 (8.7%)
Distal gastrectomy	2 (8.7%)
Method of reconstruction (%)	
Primary closure	17 (73.9%)
Billroth II reconstruction	4 (17.4%)
Roux-en-Y	2 (8.7%)

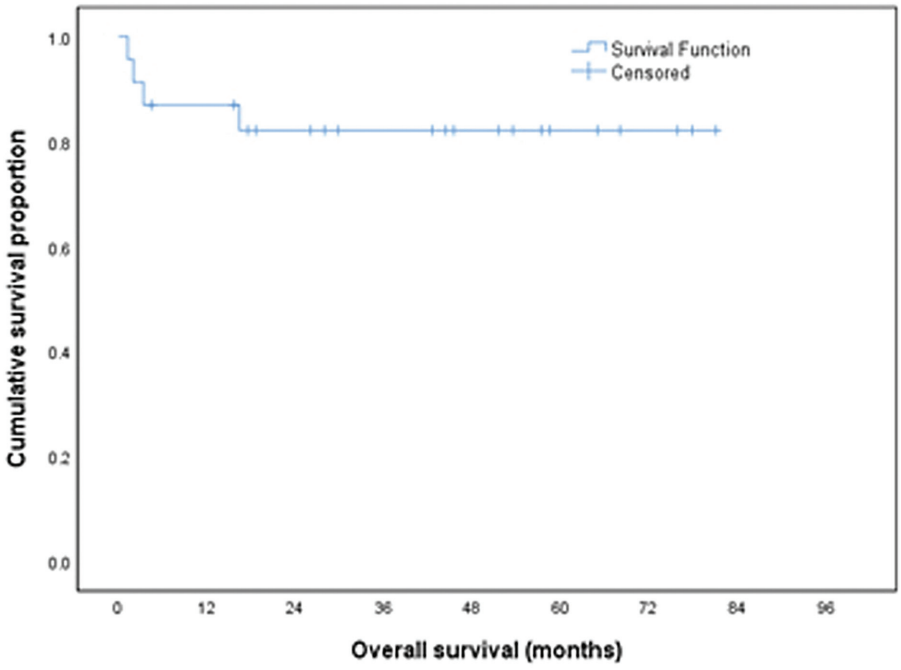
Table 3 The tumor characteristics

Variable	Value
Tumor size (cm)	
<5	6 (26.1%)
5-10	9 (39.1%)
>10	8 (34.8%)
MI	
<5/50	11 (47.8%)
>5/50	9 (39.1%)
>10/502	3 (13%)
Risk	
High	10 (43.5%)
Intermediate	9 (39.1%)
Low	4 (17.4%)

Discussion

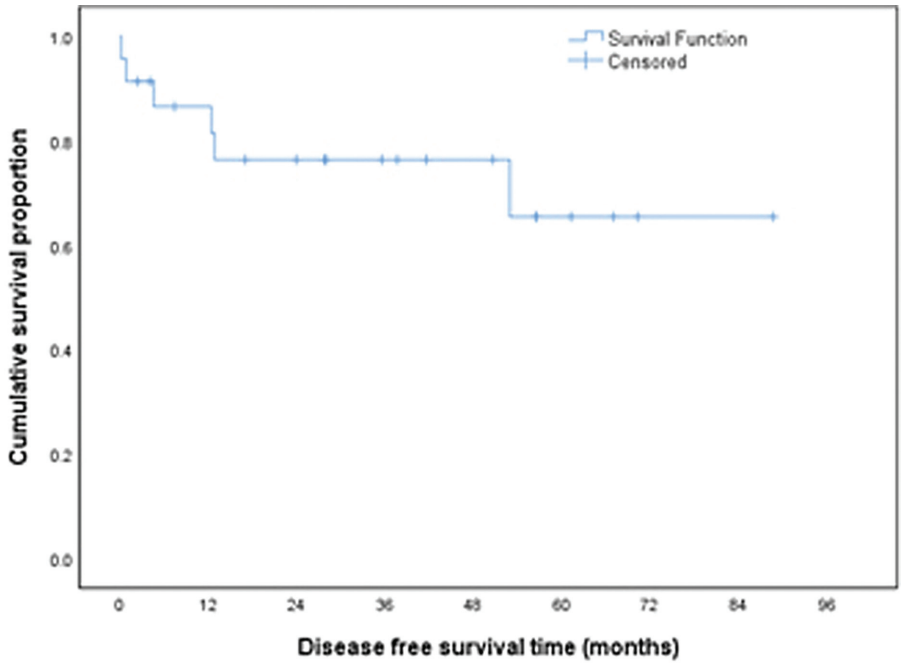
In this research, At the National Cancer Institute at Cairo University, a total of 23 patients who had been diagnosed with gastric GIST were included in a retrospective study on the outcomes of gastric GIST following surgery. The findings of this study indicate that the clinical outcomes of patients are not adversely affected when a broad local resection is performed on the condition that a R0 resection can be achieved. The primary factor in determining whether or not a local excision was conducted seems to be the tumor's location. When tumors were found at the intersection of the cardia and the gastroesophageal tube, they had to be surgically removed in order to keep the digestive system working. The size of the tumor was an additional factor in deciding whether or not to do resection for tumors in the lesser curve and antrum. In order to accomplish a R0 resection and offer an acceptable functional result, larger tumors found in these areas needed a formal anatomical resection as opposed to a local excision. The majority of tumors (78.3%) were amenable to wide local excision which is similar to other studies which reported that (65%) of gastric GIST were subjected to local excision with good outcome [13].

Figure 1



The overall survival of the whole group.

Figure 2



The disease free survival of the whole group.

The systematic lymphadenectomy for gastric GIST is not as necessary as gastric adenocarcinoma because gastric GIST rarely metastasize to lymph nodes [14]. In this study lymphadenectomy wasnot routinely done.

The research carried out by Rutkowski and colleagues reveals the relevance of neoadjuvant imatinib in the decrease of the total number of individuals who are diagnosed with major forms of gastrointestinal cancer [12]. In this research, the majority of patients (82.6%) were subjected to upfront surgery and only (17.4%) patients received neoadjuvant imatinib followed by surgery and which is different compared with other studies which reported that 92% of gastric GIST received neo adjuvant imatinib followed by R0 resection [13]. This disparity may be explained by the quantity of patients overall. in this research was small and the majority of patients even those with large tumors were amenable to local excision without large morbidity. On the other hand (69.6%) patients received adjuvant imatinib because only (17.4%) patients were low risk according to Fletcher's classification [15].

The overall survival of the whole group at 5 years in this study was 82.1% which is good but lower than results of Madhavan and colleagues which reported that the 5-year survival of R0 resection patients was 100% [13].

In summary, wide local resection, preserving the stomach, provides excellent functional and oncological results for patients requiring evacuation of a gastric GIST.

The limitations of the study

As GIST is a rare disease, only a small number of patients were included in this retrospective study. In addition, there was a lack of surgical details in the patient's files, a defect in proper genetic studies due to financial issues, and the unavailability of second line targeted therapy, which means that this study is only comparable with a limited number of other studies. These limitations may have an effect on the findings of the study.

Conclusion

The location and extent of the tumor seemed to possess the greatest influence on whether or not local excision was undertaken with favorable functional and oncological outcomes. A wide local resection does not compromise patient outcomes if a R0 resection can be performed with an acceptable functional outcome.

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Ethical approval: Institutional Review Board (IRB) approval was obtained (IRB approval number: 00004025).

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Conflicts of interest
No conflicting interests have been declared by the authors.

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