MMSL Military Medical Science Letters Since 1925

Mil. Med. Sci. Lett. (Voj. Zdrav. Listy) 2018, 87(2), 61-67
ISSN 0372-7025
DOI: 10.31482/mmsl.2018.013

ORIGINAL ARTICLE

SURGICAL TREATMENT OF GASTRIC ADENOCARCINOMA: TOTAL VS. SUBTOTAL GASTRECTOMY. A SINGLE CENTRE EXPERIENCE

Katerina Vinklerova [1], Radomir Hyspler [2], Jiri Paral [1,3], Petr Lochman [1,3]✉

[1] Faculty of Military Health Sciences, University of Defence in Brno
[2] Institute of Clinical Biochemistry and Diagnostics, University Hospital, Hradec Králové
[3] Department of Surgery, University Hospital, Hradec Králové

Received 14th October 2017.
Revised 19th March 2018.
Published 8th June 2018.

Summary

The purpose of this study is to analyze postoperative morbidity and mortality of patients undergoing various types of gastric resection for adenocarcinoma in a single centre and to evaluate the oncological outcome regarding to completeness of resection.

Ninety-eight patients with gastric adenocarcinoma were involved in the present study. We observed postoperative complications or death and a length of hospital stay, completeness of resection, TNM staging. Differences in overall survival between total (TG) and subtotal gastrectomy (SG) were analyzed using analysis of variance (ANOVA) and Kruskal-Wallis test with $p < 0,05$ value.

There was no statistically significant difference in overall survival between both groups ($p = 0,409$). R0 vs. R1 resection could be evaluated in 72 patients with no difference in survival among them ($p = 0,003$). The median time to recurrence were 12 and 11 months in R0 and R1 resection, respectively. The median time of overall survival were 20 and 15,5 months in R0 and R1 patients, but without statistical significance ($p = 0,406$). The only statistical difference was found in the length of survival between T1 and T3 stage ($p = 0,009$).

If R0 resection could be achieved, there was no difference in overall survival and time to recurrence between TG and SG.

Key words: gastric adenocarcinoma; gastrectomy; overall survival

Introduction

Adenocarcinoma of stomach is one of the most common malignancy. It remains one of the major causes of cancer-related death worldwide (1). In Europe it represents the eleventh most important cause of death and morbidity among cancers (2). The incidence and mortality of gastric cancer in the Czech Republic were 13,82/100 000 and 10,96/100 000 in 2014, respectively (3). Even though the decreasing incidence of this disease the prognosis is still generally poor. In Western countries with higher proportion of tumours in advanced stages the 5-year survival oscillates between 8-26 %, in our country about 12 %. Surgical resection is the only curative method of treatment.

✉ University of Defence. Faculty of Military Health Sciences, Department of Field Surgery, Třebešská 1575, 503 11 Hradec Králové, Czech republic
petr.lochman@unob.cz, lochmpet@seznam.cz
+420 973 253 236

Resection methods include total (TG) and subtotal gastrectomy (SG) (Fig. 1a,b) (4). The oncological advantages of TG are the reduction of likelihood of recurrence due to its radicality (mainly more complete dissection of regional lymph nodes) and a little bit longer overall survival. On the other side surgeons supporting SG emphasize that the only known consequence of TG are increased morbidity and length of hospital stay with no advantage over SG in terms of oncological results (5).

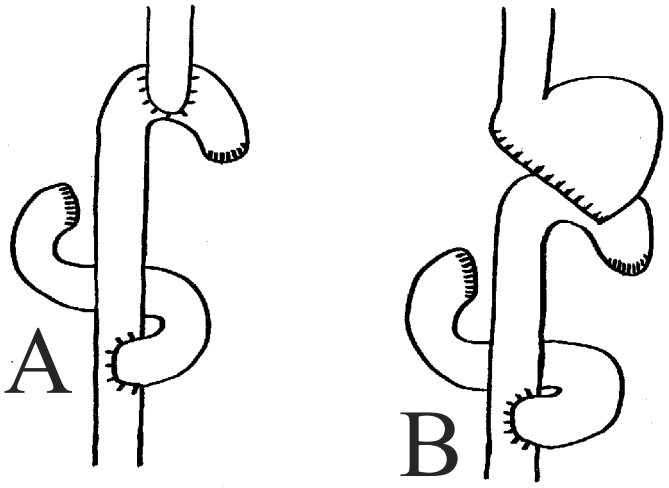

Figure 1a,b. The scheme of total (a) and subtotal (b) gastrectomy in Roux-en-Y modification

Patients and methods

Between January 2007 and December 2011 ninety-eight patients with gastric adenocarcinoma underwent surgical treatment at the Department of Surgery in University Hospital in Hradec Králové, Czech Republic. There were 66 men (67,4 %) and 32 women (32,6 %) with median of age 67 years (37-86 years). An average length of hospital stay were 13 days (8-28 days). For the purpose of this study data from the hospital database were retrospectivelly reviewed and analyzed.

The type of surgery varied according to the location of the tumour and extent of the disease. Seventy-five patients (77 %) underwent some type of resection. SG and TG were done in 45 (46 %) and 30 (31 %) patients, respectively. Palliative bypass (gastroenteroanastomosis) was performed in 8 (8 %) and an exploratory laparotomy in 15 (15 %) patients. Mean operation time was 178 minutes (51-315 min.).

There were two levels of eligibility. Firstly, patients had no history of any previous cancer or gastric resection. Extent of performed surgery included TG, distal or proximal gastrectomy (both marked as SG), palliative gastroenteroanastomosis or exploratory laparotomy. Factors as an anatomic location, size of the tumour, histopathological grade and TNM stage according 6^{th} or 7^{th} edition were also recorded. Specific details about neoadjuvant treatment were not taken into account. The second level of eligibility was possibility to achieve an R0 resection. Regardless the type of resection, SG or TG, an effort to maintain clean resection margin was made. However, if patients had a microscopically positive resection margin (R1) they remained in the evaluable set. The endpoints were an overall survival and time to recurrence related to the extent of gastrectomy, radicality of resection (R0 vs. R1) and TNM stage. All data were analyzed using standard statistical methods – analysis of variance (ANOVA) and Kruskal-Wallis test with p value <0,05.

Results

In the group of gastrectomized patients the 5-year overall survival was 17,3 % (23 patients) and median postoperative survival 20 months. When compared TG vs. SG vs. bypass surgery there was no statistically difference between the groups in the length of survival (p=0,409) (Fig. 2).

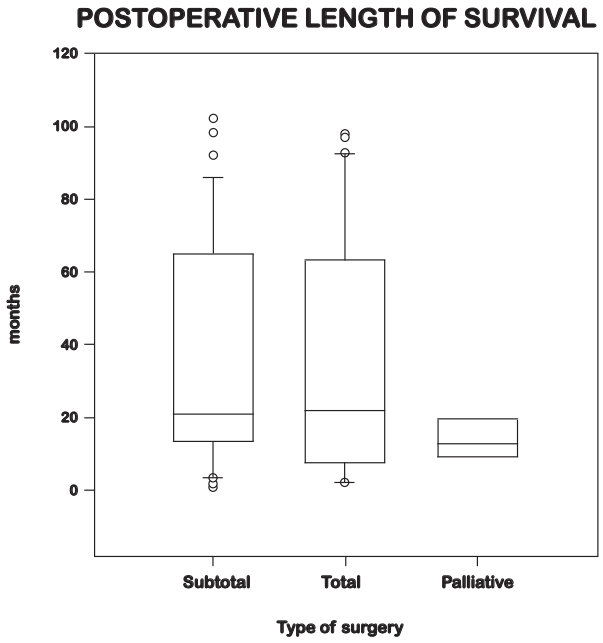

Figure 2. The length of postoperative survival depending on type of surgery

The effect of margin involvement could be evaluated in 72 patients with SG or TG. Among those with R0 resection (57 patients, 79 %) and R1 resection (15 patients, 21 %) we found statistically singificant difference - 20 and 15 months, respectively (p=0,003) (Fig. 3).

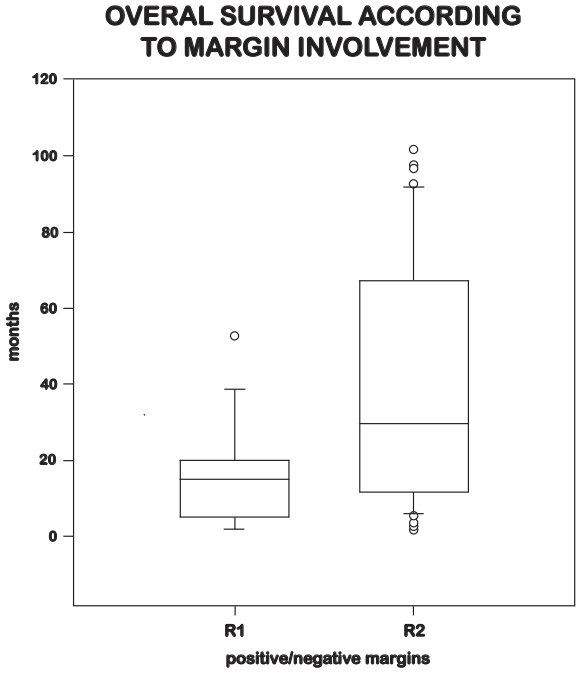

Figure 3. The length of overall survival depending on completeness of resection

According to pTNM system there were tumours classified as T0 in 2 (3 %), T1 in 14 (17 %), T2 in 29 (31 %), T3 in 26 (31 %) and T4 in 12 (14 %) patients. The median survivals were 34,5; 63,5; 23; 12 and 12 months for each stage. The significant difference in survival was observed only in patients with T1 and T3 stage (p=0,009) (Fig. 4).

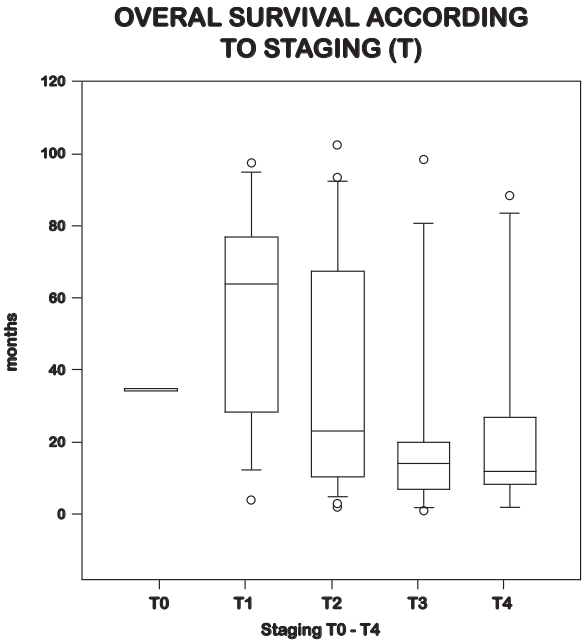

Figure 4. The length of overall survival depending on T stage

The presence of lymph node metastases was histologically confirmed in 1-34 lymph nodes dissected (total number of dissected nodes varied between 2-46). The median survivals in N0, N1, N2 and N3 were 24, 20, 10 and 17,5 months, without statistical significance (p=0,281) (Fig. 5).

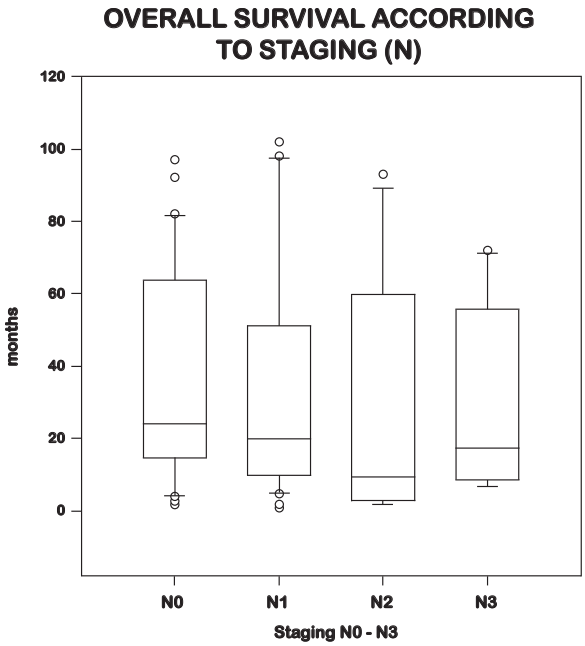

Figure 5. The length of overall survival depending on N stage

In patients with R0 resection the recurrence was observed in 46 % of cases at the time of this report, in patients with R1 it was 53 %, but without statistical significance again (p=0,406) (Tab. 1).

Table 1. Number of patients with recurrences and a length of survival according to completeness of resection

Number of known recurrence in R1/R0 resection		Median time to recurrence in months (range)	Median survival in months
Recurrence in total	34		
Recurrence in R1	8 (of 15)	11 (1 – 43)	15,5
Recurrence in R0	26 (of 57)	12 (1 - 96)	20

Discussion

Gastric cancer is a disease of older population and the incidence rises progressively with age with a peak incidence between 50 and 70 years (6). This is demonstrated by the fact that median age in our sample was 67 years. Male-to-female ratio is approximately 2:1. The average hospital stay after surgery was 13 days, ranging from 8 to 28 days depending on postoperative complications. The time of discharge between 6 – 10 days corresponds to another studies (7).

There was no difference in survival probability in patients assigned to SG or TG. In patients who underwent gastric resection was 5-year survival rate 17,3 %. Long-term survival after potentially curative gastrectomy is generally poor. In American survey, the overall 5-year survival for patients with completely resected gastric adenocarcinoma was 14% (8). TG was performed in 36 % of patients with overall survival rate 22 months after surgery, SG in 54 % of patients with overall survival rate 21 months. Palliative bypass was noted in 10 % of patients with median survival 13 months. It is non-curative method which can lengthens life and relieve from symptoms. Patients undergoing this type of surgery are usually older, have metastasis, great tumour mass and generally bad prognosis. Subtotal gastrectomy is the gold standard treatment for early stage gastric cancer located in distal third of stomach. Total gastrectomy may be required in cases with poorly differentiated histological type, with more invasive growth and with high risk of microscopic invasion of the resection line or in patients with multicentric disease. The results of two European studies have shown that TG has similar long-term survival results as SG. But there are several advantages of performing more conservative surgery. Subtotal gastrectomy entails lower postoperative morbidity and mortality rates and shortens hospital stay as well as improves a quality of life in the long run (9).

From the available literature we can conclude that achievement of curative resection (R0) is more important than the decision about the type of surgery. R0 resection indicates a microscopically margin-negative resection, in which no gross or microscopic tumour remains and is presented with a high survival rate and low recurrence. R1 resection indicates the removal of all macroscopic disease, but microscopic margins are positive (10). We could statistically confirm these thesis in our study. In our sample of patients with microscopically clear margins was reached median survival rate 20 months, on the other hand patients with microscopically involved margins of resection died after 15 months.

In this and other studies was found that the most important prognostic factors related to survival are depth of invasion of the gastric wall and disease stage according to the TNM classification (11). We found statistically significant difference in length of survival between patients with T1 and T3 category (p=0,009). T1 stage was noted in 3 % of cases with median survival rate 63,5 months and T3 category was noted in 35 % of cases with median survival rate 12 months. The tumour grade may also play an important role in survival of patients, but due to missing data about the histopathological grading in many medical records we were unfortunately not able to assess statistically its influence on that in the current study.

Since January of 2010 the seventh edition of UICC TNM classification has been applied to almost all cases of malignant tumours. Some revisions have been made for the classification of lymph nodes (12). Our study is based on data between 2007 and 2011, so TNM revision may influence results of our study by modification in N category. In our group of patients the presence of lymph node metastases was histologically confirmed in 1-34 lymph nodes dissected in lymphadenectomy (total number of dissected lymph nodes ranged 2–46). According to the seventh edition, any cases in whom no metastases are detected in all the lymph nodes with no respect to the number of lymph nodes dissected, even though the number of dissected lymph nodes was no greater than 16,

could be classified as N0 group (the dissection of more than 16 lymph nodes would not be mandatory). Unlike the previous sixth edition of TNM staging system which declared that a pathological examination should be performed to make an accurate assessment of the degree of lymph node metastasis in more than 15 lymph nodes. The mix of these two editions of TNM classification could be the reason why we did not found statistically significant difference in length of survival among N0 - N3 category.

The pattern of recurrence in patients having R0 or R1 resection was local (in anastomosis) as well as distant (malignant ascites, lung metastasis, etc.). Median time in which recurrence occurred was in group R0 12 months, in group R1 11 months. We found out that R0 resection group has better median survival rate with recurrence (20 months) than R1 resection group (15,5 months). Due to Japanese Gastric Cancer Treatment Guidelines 2010 a sufficient resection margin should be ensured when determining the resection line in gastrectomy with curative intent. A proximal margin of at least 3 cm is recommended for T2 or deeper tumours with an expansive growth pattern and 5 cm is recommended for those with infiltrative growth pattern (13). This suggests as well as the potential benefit of adjuvant radiation and/or chemotherapy that probably brings the difference in median survival rate in R0/R1 resection with recurrence.

Conclusion

If R0 resection could be achieved, we found no difference in overall survival and time to recurrence between TG and SG in our group of patient. Therefore TG is not always neccessary and in some cases a functional part of the stomach can be preserved.

Acknowledgement

This work was supported by the long-term organization development plan (DZRO Klinické obory, FVZ UO).

Results of this study were presented at the Student's Scientific and Research Work conference 2017 at Faculty of Military Health Sciences in Hradec Králové.

Declaration of conflict of interest

Authors declare no conflict of interest.

References

1. Parkin DM, Bray FI, Devesa SS. Cancer burden in the year 2000. The global picture. Eur J Cancer. 2001;37(8):S4–66.
2. Available on http://www.who.int/mediacentre/factsheets/fs297/en/ , cited on 15 September 2017
3. Available on http://www.svod.cz/ , cited on 15 September 2017
4. Gorbunov EJ, Wechsler TS, Tomin A. Significant Prognostic Factors in 283 Patients After Surgery For Adenocarcinoma of the Stomach. Scripta Medica. 2005;78(1):3-16.
5. Bozzetti F, Marubini E, Bonfanti G. Total versus Subtotal Gastrectomy: surgical morbidity and mortality rates in a multicentre Italian randomized trial. Annals of Surgery. 1997;226(5):614-615.
6. Crew K, Neugut AI. Epidemiology of Gastric Cancer. World J. Gastroenterol. 2006;12(3):354-362. DOI: 10.3748/wjg.v12.i3.354.
7. Nomura A, Schottenfeld D, Fraumeni JF. Cancer Epidemiology and Prevention. 2nd ed., Oxford University Press. 1996. 707–724.
8. Wanebo HJ, Kennedy BJ, Chmiel J. Cancer of the stomach. A patient care study by the American College of Surgeons. Ann Surg. 1993;218:583–592.
9. Gouzi JL, Huguier M, Fagniez PL, Launois B, Flamant Y, Lacaine F, Paquet JC, Hay JM. Total versus Subtotal Gastrectomy for Adenocarcinoma of the Gastric Antrum. A French prospective controlled study. Ann. Surg. 1989;209:162–166.
10. Hermanek P, Wittekind C. Residual Tumor (R) Classification and Prognosis. Semin. Surg. Oncol. 1994;10:12–20.

11. Abe S, Shiraishi MAI, Nagaoka S, Yoshimura H, Dhar DK, Nakamura T. Serosal Invasion as the Single Prognostic Indicator in Stage IIIA (T3N1M0). Gastric Cancer Surgery. 1991;109:582–588.
12. Kwon SJ. Evaluation of the 7th UICC TNM staging system of gastric cancer. J Gastric Cancer. 2011;11(2):78-85. DOI: 10.5230/jgc.2011.11.2.78.
13. Japanese Gastric Cancer Association. Japanese gastric cancer treatment guidelines 2010 (ver. 3). Gastric Cancer. 2011;14(2):113-123.