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A retrospective analysis of 26 cases



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Surgical treatment in late-stage gastric cancer. A retrospective analysis of 26 cases

BACKGROUND: Gastric cancer represents the fourth most common form of cancer and the second most common cause of death in the world. It is also one of the most common cancers leading to mortality in Italy. Therefore, this study aimed to determine the survival rate of patients with advanced gastric cancer and its affecting factors in our experience at AOU Federico II.

METHODS: 26 patients with late-stage T4N2M0 and T4N2M1 gastric cancer that were diagnosed and registered during 2008 to 2018 in Federico II Surgical department, were studied. All patients were followed to the end of 2019. Kaplan-Meier method was used to draw survival curves and to determine the effective factors on the survival rate of surveyed patients. Moreover, Log-rank test was used to evaluate whether or not survival curves for different patients, related to residual tumor, are statistically equivalent ($p < 0.05$).

RESULTS: The mean age of the study population was 49 ± 29 , and most of them were males (57,8% (15 patients)). After diagnosis, the survival rates for 1, 2, 3 and 4 years, were 26,9%, 11,5 %, 3,8%, 19,2 %; 11,5% of patients with residual tumors survived 6 months respectively. Overall average survival was of 20.61 sd 17.52 months with a median of 12. No statistical difference was detected in terms of survival among M0 and M1 sub-groups.

CONCLUSION: Based on the findings of the present study, T4 gastric cancer has a poor prognosis. Survival rate was decreased over time after diagnosis. Tumoral stage at the time of diagnosis is the most important factor affecting the survival of surveyed patients. This shows that there is a crucial need to diagnose the gastric cancer in early stages.

KEY WORDS: Advanced gastric cancer, Surgical techniques, Therapy

Introduction

Gastric cancer originates from the lining cells of the stomach.

It represents the fourth most common form of cancer and the second most common cause of death in the world ¹⁻⁴.

More than 70% of gastric cancer cases occur in developing countries, especially in Eastern Asia, which has the highest mortality rates in the world ⁵.

Although the average age of onset is around 60, recent epidemiological studies show an increase in the incidence of gastric cancer in young people ⁶. The male-female ratio is 1.6:1 ⁷.

Among the main risk factors *Helicobacter pylori* (HP) bacterium is the most common; over 60% of cases are related with HP ^{8,9}, while 1% and 3% of cases are due to hereditary genetic syndromes. The symptoms of full-blown pathology can include: weight loss, jaundice, vomiting, dysphagia and blood in the stool ¹⁰.

There are currently no specific screening tests, therefore more than 70% of cases become clinically manifest in advanced stage ¹¹.

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Moreover endoscopic techniques are not enough to diagnose an advanced gastric cancer¹².

Cancer survival is a key measure of the effectiveness of health-care systems¹³⁻¹⁵, but nevertheless gastric cancer has a poor prognosis and a high degree of mortality with a 4-year relative survival less than 30% in our experiences. Therefore, it is necessary to measure the survival rate of cancer to determine the effectiveness of surgery. So, the aim of this study is to evaluate the survival rate related to residual tumors.

Methods

A retrospective study was executed analyzing Federico II University Hospital in Naples cancer registry, as reported in Table I. A total of 26 patients with advanced gastric cancer were registered from 2008 to 2018, and these patients were enrolled in the study and followed until the end of 2019. Table II reports a descriptive analysis related to surgical technique performed.

VARIABLE DEFINITION

The Relationship between advanced gastric cancer patients' survival and factors such as age at the time of diagnosis, complications, location, residual tumors, stage of the cancer, degree of cellular differentiation, were taken into account.

In this study we enrolled 26 patients, 18 males and 8 females, categorized basing on TNM (Tumor Node Metastasis) system. According to TNM patients were divided into two groups, related to residual tumor after surgery. Moreover, basing on cancer cellular differentiation, patients were categorized into three grade; grade I (Low Grade or well differentiated), grade II (Moderately Differentiated), grade III (high Grade or poorly differentiated).

The average age of enrolled population was 68 years.

According to cancer localization, 16 patients had anterior carcinoma with a male/ female ratio of 12: 4; among them, 12 had impassable stenosis and metastases (N+) and 10 severe bleeding, 4 out of 16 patients had distant metastases (M+).

Gastric body cancer occurred in 5 patients, with M:F of 2: 3, all of them presenting haemorrhage and tight stenosis; 1 patient had a M + staged tumor.

The remaining 2 cases concerned gastric stump cancer with a M: F ratio of 1: 1 ratio; in all cases, lymph node involvement and tightened stenosis of the gastro-duodenal esophagus occurred.

The patients were all symptomatic. All patients (both antrum and gastric body cancer) presented severe bleeding, vomiting of blood, weight loss, dysphagia and pain. Cardial localizations, in addition to the above mentioned symptoms, presented regurgitation in 2/3 of patients.

Cardial tumor was treated in 3 patients, with M: F ratio of 1: 2; all patients presented lymph nodes involvement with hemorrhage and tight stenosis.

All patients underwent an urgent oncological clinical staging and urgent hospitalization given the clinical relevance of the manifested symptoms.

It has been difficult to performe a neo-adjuvant treatment because of the advanced stage of cancer¹⁶.

In any case, pre-operative total-body CT was practiced in order to define TNM stage and to program a surgical strategy. Cardiorespiratory evaluation was performed in all patients with cardiac Doppler, spirometry, blood pressure Holter and control a X-Ray chest scan to assess the patient operative risk according to the American Society of Anesthesiologists Physical Score (ASA PS).

12 patients with antral localization, including 2M+, underwent subtotal gastrectomy; 4 patients, of which 2 M+, underwent to gastrectomy with Roux en Y reconstruction.

For gastric body cancer, were performed 1 subtotal gastrectomy, 3 Roux en Y gastric bypasses and 1 Billroth II. Only 1 patient affected by cardial gastric cancer was surgically treated; the other 2 patients were considered not fit to surgery and medically treated with a poor prognosis.

2 Cases of gastric stump cancer underwent to total gastrectomy conversions. As reported in Table III, 8 patients underwent roux en Y surgical technique; survival in months (Table IV), medium survival time (Table V) and quantils styma (Table VI) were analyzed. Figs. 1, 2, 3 report the cumulative survival function related to this surgical technique. Moreover 12 patients underwent subtotal gastrectomy (Table VII). Survival in months (Table VIII), medium survival time (Table IX) and quantil styma (Table X) were studied. Figs. 4, 5, 6 show the cumulative survival function for subtotal gastrectomy.

DATA COLLECTION

Demographic and clinical information were extracted from medical records. Patients were asked to perform an outpatient visit in order to assess the survival rate and complete the questionnaire

Descriptive statistics included frequencies, percentages, ranges, means, median and standard deviations (SD). Survival curves were drawn with the use of the Kaplan-Meier method and the log-rank test was used to evaluate whether or not survival curves for different groups are statistically equivalent. The effect of surveyed factors (with statistical significance in univariate tests) on survival rate was assessed by multiple Cox proportional hazards model with the backward method. The significance level was set at $p < 0.05$ in univariate and multivariate analyses.

TABLE I - Data Collection.

Year	Age	Sex	Localization	TNM	ECOG	Surgical technique	Time	Loss of blood	Complications	Adjuvant	R1	Survival (Months)
2008	61	Woman	Antrum	T4N2M1	4	Subtotal	300 min	100 mL		Yes	Yes	18
2008	73	Man	Antrum	T4N2M0	2	Subtotal	256 min	120 mL		Yes		48
2008	60	Man	Antrum	T4N2M0	3	Roux en Y	248 min	200 mL		Yes		48
2009	68	Woman	Body	T4N2M1	4	Total	350 min	53mL		Yes		48
2009	65	Man	Antrum	T4N2M0	1	Roux en Y	272 min	70 mL		Yes		12
2010	72	Man	Antrum	T4N2M0	3	Subtotal	350 min	120mL		Yes		48
2010	70	Man	Antrum	T4N2M0	2	Subtotal	230 min	220 mL	Duodenal deiscence		Yes	6
2011	59	Woman	Cardias	T4N2M0	3	Radiochemiotherapy	0 min	0 mL		No		0
2011	69	Woman	Antrum	T4N2M1	4	Roux en Y	367 min	130 mL		Yes		4
2011	73	Man	Body	T4N2Mo	2	Roux en Y	278 min	110 mL		Yes		12
2012	55	Man	Antrum	T4N2M0	1	Subtotal	356 min	85 mL		Yes		48
2012	80	Man	Body	T4N2M0	4	Roux en Y	289 min	123 mL		Yes		12
2012	79	Man	Antrum	T4N2M0	4	Subtotal	321 min	220 mL	Hemorrhage		Yes	6
2013	67	Woman	Stump	T4N2M0	2	Total	345 min	250 mL	Fistula E-D	No		6
2013	64	Man	Antrum	T4N2M1	2	Subtotal	320 min	130 mL		Si	Yes	18
2013	61	Man	Cardias	T4N2M0	3	Radiochemiotherapy	0 min	0 mL		No		0
2014	78	Woman	Antrum	T4N2M1	3	Subtotal	400 min	210 mL		Si	Yes	18
2014	73	Man	Stump	T4N2M0	2	Total	340 min	134 mL		Yes		12
2014	71	Man	Antrum	T4N2M0	3	Roux en Y	330 min	210mL	Duodenal deiscence	Yes		12
2015	75	Woman	Body	T4N2M0	3	Roux en Y	300 min	87 mL		Yes		12
2015	83	Man	Antrum	T4N2Mo	2	Subtotal	280 min	230 mL	Hemorrhage		Yes	6
2015	49	Woman	Cardias	T4N2M0	3	Total	300 min	200 mL		Yes		36
2015	56	Woman	Antrum	T4N2M0	1	Subtotal	310 min	210 mL		Yes		48
2016	78	Woman	Body	T4N2M0	2	Roux en Y	250 min	160 mL		Yes		12
2017	65	Man	Antrum	T4N2M0	3	Subtotal	360 min	210 mL		Yes		12
2018	68	Man	Antrum	T4N2M0	3	Subtotal	280 min	160 L		Yes		12

TABLE II - Descriptive statistics (Events)

Surgical technique	Total observed	Events	Censored	Passes of time
Roux en Y	8	8	0	6
Subtotal	12	12	0	11

TABLE III - Descriptive statistic (Roux en Y)

Total observed	Events	Censored
8	8	0

TABLE IV - Kaplan-Meier Table (Roux en Y)

Survival in months	A risk	Events	Censored	Proportion of events	Survival tax	Cumulative survival function	Standard deviation of survival function	Inferior limit (95%)	Superior limit (95%)
9	8	1	0	0,125	0,875	0,875	0,117	0,646	1,000
10	7	1	0	0,143	0,857	0,750	0,153	0,450	1,000
11	6	3	0	0,500	0,500	0,375	0,171	0,040	0,710
12	3	1	0	0,333	0,667	0,250	0,153	0,000	0,550
44	2	1	0	0,500	0,500	0,125	0,117	0,000	0,354
49	1	1	0	1,000	0,000	0,000	0,000	0,000	0,000

TABLE V - Medium survival time (Roux en Y)

Medium survival time	Standard deviation	Inferior Limit (95%)	Superior Limit (95%)
19,625	5,892	8,077	31,173

TABLE VI - Quantils styma (Roux en Y)

Quantil	Estimated value	Inferior Limit (95%)	Superior Limit(95%)
75%	28,000	11,000	49,000
50%	11,000	10,000	44,000
25%	10,500	9,000	11,000

TABLE VII - Descriptive statistics (Subtotal)

Total observed	Events	Censored
12	12	0

TABLE VIII - Kaplan Meyer (Subtotal)

Survival in months	A risk	Events	Censored	Proportion of events	Survival tax	Cumulative survival functions	Standard deviation of survival tax	Inferior limit(95%)	Superior limit (95%)
5	12	1	0	0,083	0,917	0,917	0,080	0,760	1,000
6	11	1	0	0,091	0,909	0,833	0,108	0,622	1,000
8	10	1	0	0,100	0,900	0,750	0,125	0,505	0,995
10	9	1	0	0,111	0,889	0,667	0,136	0,400	0,933
12	8	1	0	0,125	0,875	0,583	0,142	0,304	0,862
15	7	1	0	0,143	0,857	0,500	0,144	0,217	0,783
16	6	2	0	0,333	0,667	0,333	0,136	0,067	0,600
45	4	1	0	0,250	0,750	0,250	0,125	0,005	0,495
48	3	1	0	0,333	0,667	0,167	0,108	0,000	0,378
49	2	1	0	0,500	0,500	0,083	0,080	0,000	0,240
50	1	1	0	1,000	0,000	0,000	0,000	0,000	0,000

TABLE IX - Kaplan Meyer

Medium survival time	Standard deviation	Inferior limit(95%)	Superior limit (95%)
23,333	5,367	12,814	33,853

TABLE X - Quantils styma (Subtotal)

Quantil	Estimated value	Inferior limit (95%)	Superior limit (95%)
75%	46,500	15,000	49,000
50%	15,500	10,000	45,000
25%	9,000	6,000	16,000

TABLE XI - Equality test of cumulative survival functions (GDL = 1)

Statistic	Observed value	Critic value	p-value	alfa
Log-rank	0,518	3,841	0,472	0,050
Wilcoxon	0,252	3,841	0,616	0,050
Tarone-Ware	0,400	3,841	0,527	0,050

TABLE XII - Descriptive statistics (Events)

State	Total observed	Events	Censored	Time of passes
R0	20	20	0	14
R1	6	6	0	5

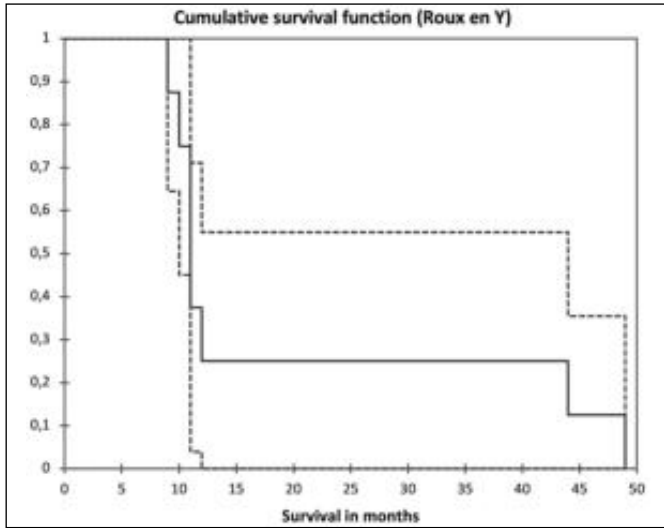


Fig. 1: Cumulative survival function.

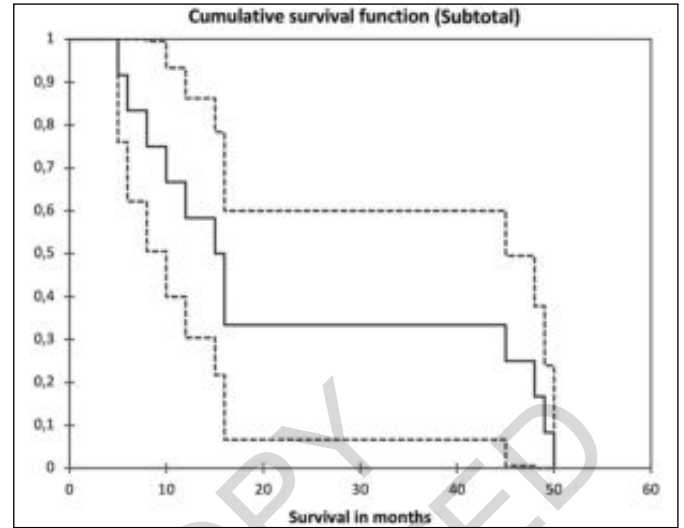


Fig. 4

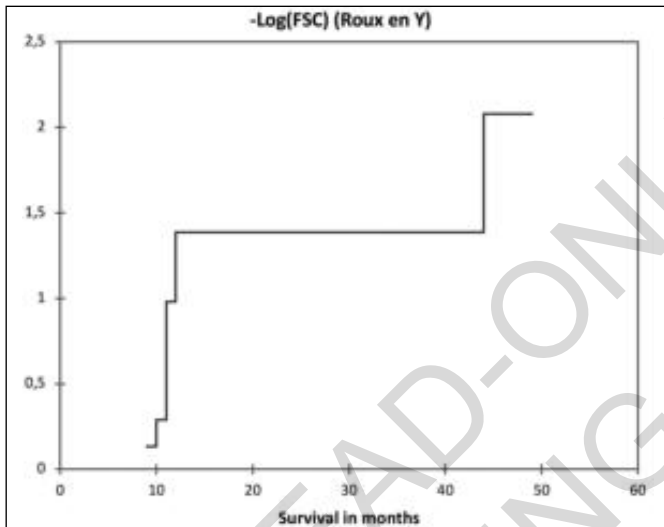


Fig. 2

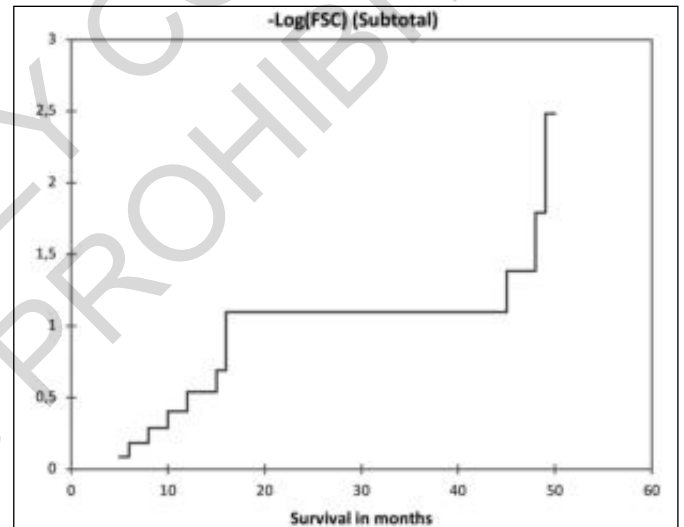


Fig. 5

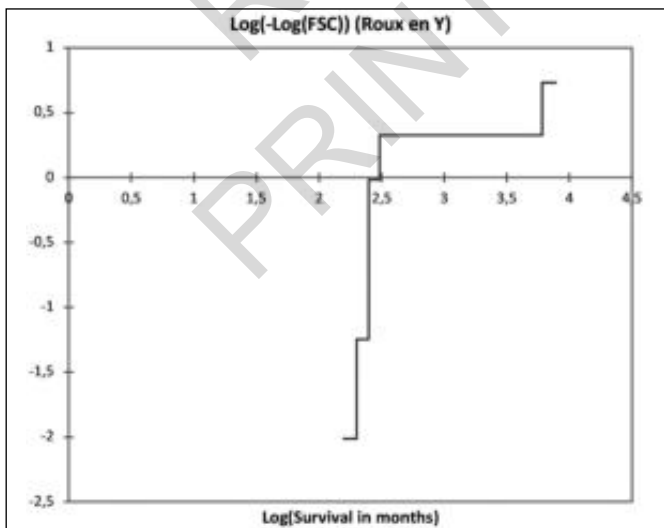


Fig. 3: Log Log cumulative.

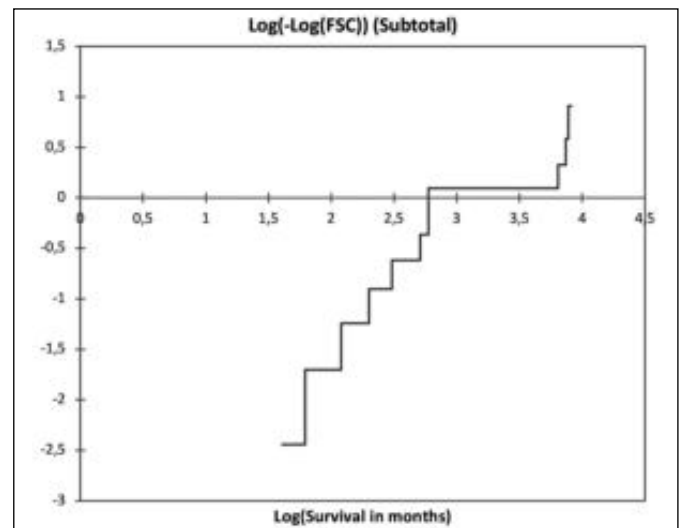


Fig. 6

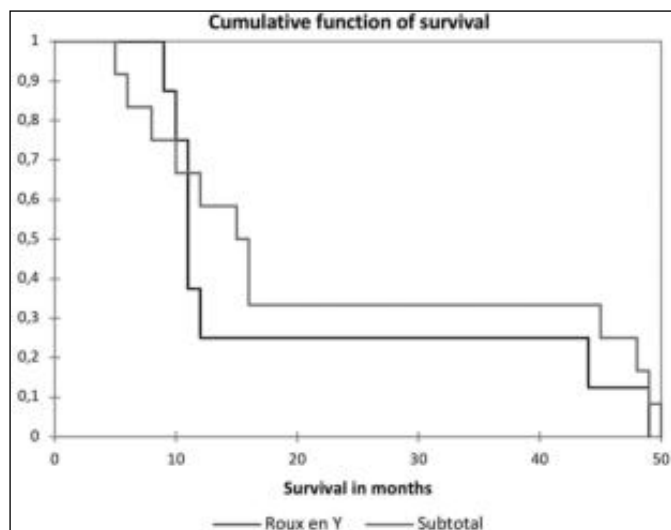


Fig. 7: Cumulative survival function.

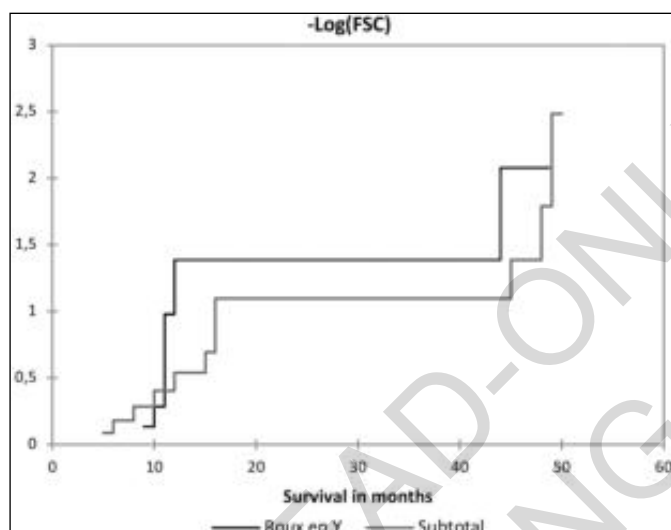


Fig. 8: Log Cumulative survival function.

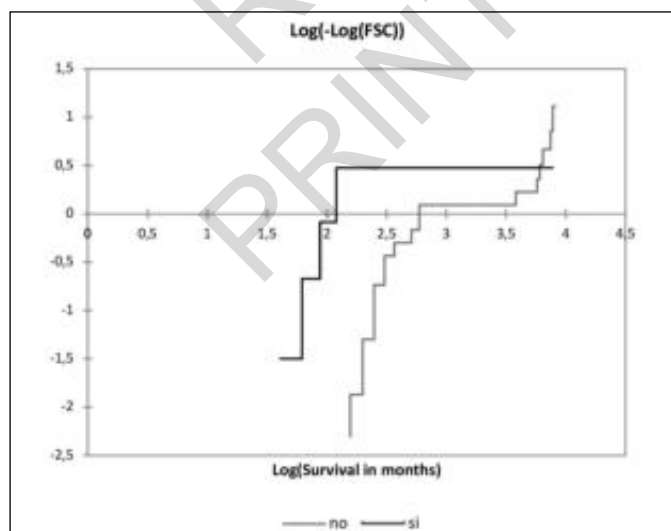


Fig. 9: Log Cumulative survival function.

Results

Totally, 26 patients with advanced gastric cancer were registered from 2008 to 2018. The mean age of patients at the time of diagnosis was 58.9 ± 14.91 years (Range: 49-80), and the majority of them were male (61,5% (16 patients)). The mean age of men (55 ± 25) was higher than women (49 ± 16), but this difference was not statistically significant ($p=0.05$).

At the end of the study, 21 patients (80,7%) were dead. The 10-year survival mean and the median were 19,5 months for men and 12 for woman respectively. Moreover, after the diagnosis the survival rates for 1, 2, 3 and 4 years were 30,7%, 15,3%, 13,8% and 23,5% respectively.

As showed in Table I, the 5-year survival rate and median survival in women are greater than men.

5-year survival rate in older patients group is lower than younger patients group. Other comparisons of the 5-year survival rate among patients with different factors are presented in Table I. Survival probabilities in men are lower than women, but according to log- rank test, this difference was not statistically significant ($p=0.05$).

In gastric antrum tumors, 12 patients underwent laparotomy subtotal gastrectomy with Roux en Y reconstruction. In 6 cases out of 12 total resection was not possible.

Complications included 2 duodenum dehiscences and two post-operative bleeding. The morbidity rate in the immediate post-operative period is 19%, without post-operative mortality. 9 cases out of 12 were submitted to adjuvant chemotherapy.

In the other 4 cases treated with Roux en Y reconstruction, adjuvant therapy was always practiced.

In terms of long-term survival, 3 patients out of 12 who underwent subtotal gastrectomy with residue tumor do not practice adjuvant therapy, due to the advanced stage of disease: being affected by peritoneal carcinosis at the operative stage.

The other 3 patients with tumor residue, including 3 M+, were submitted to adjuvant therapy and survive 18 months.

Four of the R- patients, including one M + patient, survives 36 months, practicing adjuvant chemotherapy treatment. Two patients in the absence of tumor residue, survived 48 months.

The other 4 patients treated with Roux en Y bypass survived 12 months without tumor residue.

As regard to gastric body tumors, one 1 patient out of 5 was treated with total gastrectomy, without residue tumor and underwent adjuvant therapy. The other 4 were submitted to Roux en Y bypass with adjuvant treatment. 1 patient with cardiac tumor was treated with total R0 gastrectomy, and underwent adjuvant therapy and survived 36 months, while 2 were submitted to neoadjuvant radiochemotherapy and survived 12 months, without surgery.

In the remaining two cases of stump cancer the two patients had a total gastrectomy. Among them 1 show an esophageal-jejunal fistula surviving 6 months, the other underwent adjuvant therapy surviving 24 months. Overall average survival was of 20.61 sd 17.52 months with a median of 12. 4 out of 26 patients survived over 48 months.

Survival was compared using Kaplan-meier curves and difference was tested with Log-rank test and statistical significance was considered with values of $p < 0.05$ reported in Table XI. Moreover cumulative survival function were described in Figs. 7, 8.

We tested survival in the following subgroups:

- Survival in under 65 vs over 65 patients;
- Survival in ECOG performance status < 2 vs > 2 patients;
- Survival in male vs female patients;
- Survival in antral cancer (wider subgroup) vs non antral cancer patients;
- Survival in R0 vs R1 patients (Table XII);
- Survival in T4N2M0 vs T4N2M1.

Log rank tests performed to evaluate survival curves showed a not significative statistical difference among all detected subgroups.

Discussion

Reported results show that patients affected by late-stage gastric cancer have a poor prognosis. Recruited cases were affected by a T4N2M0 or T4N2M1 gastric cancer.

Our analysis showed that T4 distance-metastatic gastric cancer has the same probability to lead to death compared to T4 local-metastatic cancer.

No difference in terms of survival was detected among males and females, patients with a good performance status and a poor one, under 65 and over 65 patients, antral and not-antral cancer, R0 and R1 resection.

Our study is affected by small population and it should be useful to open the evaluation among earlier stage gastric cancer.

Based on the findings of this study, stage of cancer is the most important factor affecting the survival of patients with gastric cancer, and if the cancer is diagnosed in later stages, the survival rate will decrease. Therefore, detecting cancer in earlier stages is an important factor for increasing the survival of patients. The results of Moradi et al. study show that the stage of the gastric cancer is the most important predictor of survival¹⁷. This result is also compatible with the findings of other studies¹⁸⁻²⁰.

Gastric cancer has a high degree of mortality in developing countries. Lifetime of patients with gastric cancer is short and depends on some pathological, clinical, and treatment factors. Based on the findings of the current study, five-year survival rate of patients with gastric cancer

was 15,4%. Previous studies have presented different results.

In this regard, a meta analysis on determinants of one, three, and five-year survival rate of patients with gastric cancer was performed, in our institution which show a five-year survival rate of 15,4%. In other studies the five-year survival rate was reported ranging from 5.4% to 30%. Based on the results of a global study, Japan has the highest 5-year survival rate (54-58%) of gastric cancer in the world²¹. Also according to the data from SEER (Surveillance, Epidemiology, and End Results) in the years 2006 to 2012, the 5-year survival rate was 30.4%²². Results of Hiripi study conducted in Germany also show that the five-year survival rate of patients with gastric cancer was 31.8%.

No-one of the analyzed cases reached 5-years survival. However, in Moradi et al. and Yokota et al. studies significant relationships between gender and survival of patients with gastric cancer were observed.

Conclusions

Late stage T4 gastric cancer diagnosis depicts a mortal pathology.

For advanced pathology, chemotherapy treatments are not decisive, but adjuvants, especially in pathologies with infiltrations involving adjacent and vascular structures for which surgical treatment has necessary.

In late-stage gastric cancer surgical treatment is to be considered as a palliative and improvement of these symptoms, although often burdened by cardiorespiratory or post-operative metabolic complications, especially in metastatic patients. In advanced pathologies, in urgency and in highly symptomatic patients, laparotomy surgery is a preferential way to obtain the improvement of survival and the symptomatic picture. The results of the present studies show that the survival rate of gastric cancer depends on state of cancer and most of 50% of cases were diagnosed in advanced stages. Although the advanced stage, it's not always necessary to perform a total gastrectomy²¹.

Therefore screening and early diagnosis can increase the survival rate of patients²²⁻²⁴.

In fact in ECG a percentage of 89% of patients survive after a gastrectomy²⁵.

Riassunto

Il cancro gastrico (CG) è la quarta causa principale di morte per cancro in tutto il mondo, anche se negli ultimi decenni è stato osservato un calo della sua incidenza e del tasso di mortalità.

I casi di tumore avanzato sono difficilmente gestibili in elezione per la presenza di complicanze che impongono spesso un trattamento in urgenza.

Lo studio si propone di esaminare 26 casi di cancro gastrico avanzato, trattati tra il 2008 e il 2018 presso il dipartimento di chirurgia generale "Federico II" e sottoposti a follow up fino alla fine del 2019. Le curve di sopravvivenza sono state costruite usando il metodo di Kaplan-Meier. Inoltre il test di Log-rank è stato utilizzato per valutare se le relative curve di sopravvivenza per pazienti con residuo tumorale e non, fossero statisticamente equivalenti. Si è registrata una sopravvivenza media di circa 20.61 sd 17.52 mesi con una mediana di 12. Non sono state evidenziate differenze significative tra pazienti M0 ed M1, in termini di sopravvivenza. Pertanto, alla luce dei dati raccolti, si evidenzia come la diagnosi precoce di tumore gastrico, rappresenti uno dei principali fattori per migliorare la prognosi e la sopravvivenza dei pazienti.

References

1. Spiegel RL, Miller KD, Jemal A: *Cancer statistics 2019*. Cancer J Clin, 2019; 69(1):7-34.
2. Baeradeh N, Lotfi M, Fallahzadeh H, Kargar S, Salman Roghani H: *Survival rate of patients with stomach cancer and its effective factors in Yazd Province*. JCHR, 2015; 3:278-87.
3. Brenner H, Rothenbacher D, Arndt V: *Epidemiology of stomach cancer*. Methods Mol Biol, 2009; 467-77.
4. Hiripi E, Jansen L, Gondos A, Emrich K, Holleczer B, Katalinic A, et al.: *Survival of stomach and esophagus cancer patients in Germany in the early 21st century*. Acta Oncol, 2012; 51(7):906-14.
5. Tanaka M, Ma E, Tanaka H, Ioka A, Nakahara T, Takahashi H: *Trends of stomach cancer mortality in Eastern Asia in 1950-2004: comparative study of Japan, Hong Kong and Singapore using age, period and cohort analysis*. Int J Cancer, 2012; 130(4):930-36.
6. International Agency for research in Cancer, World Health Organization. GLOBOCAN 2012 v1.1, *cancer incidente and mortalità worldwide*. IARC Cancer Base No. 11.2014. Available from <http://globocan.iarc.fr>. Accessed 1 Jun 2018.
7. Digkila A, Wagner AD: *Advanced Gastric cancer: Current treatment landscape and future perspectives*. World J Gastroenterol, 2016; 22(8): 2403-14.
8. *Are the number of cancer cases increasing or decreasing in the world?* su WHO Online Q&A, WHO, 2008.
9. Fiona S, Martin McKee: *Issues in public health*. 2nd, Maidenhead, Open University Press, 2011; 74, ISBN 978-0-335-24422-5.
10. World Health Organization: *World Cancer Report 2014*. 2014; Chapter 5.4, ISBN.92-832-0429-8.
11. *Gastric Cancer Treatment (PDQ*)*, su NCI, 2014.
12. Kevin C: *Staging laparoscopic for gastric cancer*. Annali italiani di chirurgia 33:27-30, 2001.
13. Coleman M, Forman D, Bryant H, Butler J, Rachet B, Maringe C, et al.: *Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995-2007 (the International Cancer Benchmarking Partnership): An analysis of population-based cancer registry data*. Lancet, 2011; 377(9760):127-38.
14. De Angelis R, Sant M, Coleman MP, Francisci S, Baili P, Pierannunzio D, et al.: *Cancer survival in Europe 1999-2007 by country and age: Results of EUROCARE-5. A population-based study*. Lancet Oncol, 2014; 15(1):23-34.
15. Yurdakul AS, Kocaturk C, Bayiz H, Gursoy S, Bircan A, Ozcan A, et al.: *Patient and physician delay in the diagnosis and treatment of non-small cell lung cancer in Turkey*. Cancer Epidemiol, 2015; 39(2):216-21.
16. Del Rio P, Rocchi M, Dell'Abate P, Pucci F, Mazzetti C, Sianesi M: *Advanced stage gastric cancer and neoadjuvant chemotherapy. Our experience in surgical resectability*. Annali Italiani di Chirurgia, 2013; 365:1-18.
17. Moradi G, Karimi K, Esmailnasab N, Roshani D: *Survival of Patients with Stomach Cancer and its Determinants in Kurdistan*. APJCP, 2016; 17(7):32-43.
18. T, Gayet B, Fékété F: *Total duodenal diversion in the treatment of complicated peptic esophagitis*. Br J Surg, 1988; 75:1108-111.
19. Roshanaei Gh, Baghestani AR, Sadighi S: *Assessment of the survival risk factors in patients with gastric cancer in cancer institute of imam khomeni hospital between 2003-2007*. J Adv Med Biomed Res, 2012; 20(80):40-50.
20. Roshanai G, Kazemnejad A, Seddighi S: *The estimated survival of patients with gastric cancer in the cancer institute hospital tehran imam khomeini and the factors affecting it*. Sci J Hamdan Uni Med Sci, 2010; 17(3).
21. Doglietto GB, Rosa F, Bosola M, Pacelli F: *Lymphadenectomy For gastric cancer: Still a matter of debate?* Annali Italiani di Chirurgia 2012; 205: 2-8.
22. Yokota T, Saito T, Teshima S, Yamada Y, Iwamoto K, Takahashi M, et al.: *Early and late recurrence after gastrectomy for gastric cancer: A multiple logistic regression analysis*. Ups J Med Sci. 2002; 107:17-22.
23. Maroufizadeh S, Hajizadeh E, Baghestani A, et al.: *Determining the postoperative survival in patients with gastric cancer and the associated factors using Cox and Lin-Ying additive hazards models*. J Arak Univ Med Sci, 2012; 15(61):84-92.
24. Ding YB, Chen GY, Xia JG, Yang HY, Yang L, Liu YX: *Correlation of tumor-positive ratio and number of perigastric lymph nodes with prognosis of patients with surgically removed gastric carcinoma*. World J Gastroenterol, 2004; 10(2):182-85.
25. Guido Costamagna, Paola Cesaro: *ECG Detection and endoscopic treatment*. Annali Italiani di Chirurgia. 2012; 188:67-68.