

## Curative gastric resection for the elderly patients suffering from gastric cancer

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**SUMMARY: Curative gastric resection for the elderly patients suffering from gastric cancer.**

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*The improvement of the socio-economic conditions and the progress of medicine have extended the life span of the world's population and as a result, the number of patients with malignant neoplasms has increased. Gastric cancer is the third most common cancer (after lung and prostate) and the second leading cause of death caused by cancer (after lung bronchogenic cell carcinoma) in males; while it's the fifth*

*cancer by frequency and the fourth cause of cancer death in females. It presents a peculiar geographical distribution with a lower incidence in Western Europe and North America, and higher incidence in the Far East, South America and Eastern Europe. Its incidence in Italy is 122 cases per 100000 inhabitants in males and 83 cases per 100000 inhabitants in females (in Italy). It occurs more frequently in old age, is quite rare in individuals under the age of 45. The aim of this work is to analyze the clinical and pathological characteristics of gastric carcinoma and the feasibility of curative surgery in patients over 75, identifying the factors affecting mortality, morbidity, survival and quality of life after surgery. These data have been compared with those of younger patients to assess the correct type of surgery.*

KEY WORDS: Gastric cancer - Curative surgery - Elderly patients - Younger patients.

### Introduction

The improvement of the socio-economic conditions and the progress of medicine have extended the life span of the world's population and as a result, the number of patients with malignant neoplasms has increased (1, 2). Gastric cancer is the third most common cancer (after lung and prostate) and the second leading cause of death caused by cancer (after lung bronchogenic cell carcinoma) in males; while it's the fifth cancer by frequency and the fourth cause of cancer death (3) in females. It presents a peculiar geographical distribution with a lower incidence in Western Europe and North America, and higher incidence in the Far East, South America and Eastern Europe (4). Its incidence in Italy is 122 cases per 100000 inhabitants in males and 83 cases per 100000

inhabitants in females (in Italy) (5). It occurs more frequently in old age, is quite rare in individuals under the age of 45. The aim of this work is to analyze the clinical and pathological characteristics of gastric carcinoma and the feasibility of curative surgery in patients over 75, identifying the factors affecting mortality, morbidity, survival and quality of life after surgery. These data have been compared with those of younger patients to assess the correct type of surgery.

### Patients and methods

Were included 111 patients admitted at the Department of Surgery "P. Valdoni" at "Sapienza" University of Rome (from January 2007 to December 2012) with diagnosis of gastric carcinoma at acceptance. Out of these 111 patients, 43 (71.63%) were over 75 years old (Group A) and 68 under 75 years (Group B), and all of them underwent gastrectomy R0 (potentially curative). We have analyzed, in particular, the clinical features of individual patients reported in their medical history, comorbid features of tumor such as the venue, the diameter, and the histological type (6, 7), the patholo-

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gical staging of the tumor, the surgical procedure performed and any eventual complications.

The surgery was considered potentially curative in absence of tumor residual (R0), liver and peritoneal metastases or lymph node involvement.

Executing a total or subtotal gastrectomy in these patients depended on tumor location and the assessment of adequate resection margin equal to or greater than 7 cm (8). Gastrojejunal or esophagus anastomosis was created with Y- loop according to Roux.

Regarding the postoperative prognosis and survival, all our patients underwent clinical and instrumental follow-up of the average duration of approximately 38.3 months.

The quality of life of patients was evaluated after 6 and 12 months through 2 questionnaires: Karnofski scale to analyze the patient's autonomy in performing daily life activities after surgery, and the Visick rating system that evaluates how surgical outcome affects the daily life of the patient.

## Results

### a) Clinical characteristics of patients

The median age was significantly different ( $P = 0.000$ ) between the 2 groups: Group A 77.2 years (range 75-90 years) and Group B 61.6 years (range 41-74 years); While no major differences were detected in sex distribution between patients included in our study ( $P = 0.567$ ).

About a fifth of elderly patients had hypoalbuminemia and a higher incidence of comorbidities in their medical history, in particular primary arterial hypertension ( $P = 0.007$ ) or previous stroke ( $P = 0.028$ ). It is worth noticing that 32% of patients over 75 presented more than one comorbidity, and this difference, compared to younger patients, became statistically significant when we considered the subgroup of the elderly patients who referred 3 concomitant diseases ( $P = 0.013$ ) (Table 1).

### b) Characteristics of the tumor and surgery

The study revealed a significant difference regarding the average size of the tumor at the time of diagnosis, which was larger in patients over 75 (range  $2 \pm 5.3$  cm) as compared to younger patients (range  $0.4 \pm 2.9$  cm) ( $P = 0.039$ ).

No significant difference was found between the 2 groups about other features of malignancy like the location of the tumor that was most often found in the antrum ( $P = 0.044$ ); The histological type (Lauren's classification) was predominantly of intestinal type ( $P = 0.390$ ); and the frequency of lymph node metastases at diagnosis ( $P = 0.538$ ) (Table 2).

Concerning the surgical treatment performed, in the group B the 67.44% (29 out of 43) was subjected to subtotal gastrectomy, for tumor located in the antrum (26/29) or in the stomach body (3/29), while the remaining (14/43) have undergone total gastrectomy because the cancer was located at cardias and fundus level (11/14) or in the stomach body (2/14) or was multifo-

TABLE 1 - CLINICAL FEATURES OF THE PATIENTS.

PARAMETER	GROUP A (n=43)	GROUP B (n=68)	P value
Average age (years)	77,2	61,6	0,000
Sex (man/woman)	0,7/1	1,3/1	0,567
Comorbidity			
Coronary artery disease	5 (11.62%)	8 (11.74%)	0,699
Arterial hypertension	9 (20.93%)	8 (11,74%)	0.007
Previous stroke	5 (11.62%)	3 (4.41%)	0.028
BPCO	6 (13.95%)	7 (10.29%)	0.242
DM	3 (6.9%)	5 (7.35%)	0.622
Chronic Hepatopathy	3 (6.9%)	4 (5.88%)	0.602
Anemia (Hb<10 g/dL)	9 (20.93%)	10 (14.7%)	0.068
Hypoalbuminemia (<3,5g/dL)	12 (27.9%)	10 (14.7%)	0.003
Associated diseases (number)			
0	8 (18.6%)	46 (67.64%)	0.779
1	12 (27.9%)	11 (16.17%)	0.535
2	10 (23.25%)	9 (13.23%)	0.855
3	13 (30.23%)	2 (2.94%)	0.468

TABLE 2 - ANATOMICAL-PATHOLOGICAL CHARACTERISTICS OF NEOPLASM.

PARAMETER	GROUP A (n=43)	GROUP B (n=68)	P value
Average tumor size (cm)	6.1	5	0.039
<b>Tumor venue</b>			
Cardias	6 (13.95%)	4 (5.8%)	0.432
Fundus	9 (20.93%)	15 (22.05%)	0.841
Body	12 (27.9%)	18 (26.47%)	0.087
Antrum	16 (37.2%)	31 (45.58%)	0.044
<b>Type of invasion</b>			
Early	4 (9.3%)	12 (17.64%)	0.341
Late	39 (90.7%)	56 (82.36%)	0.222
<b>Histological type</b>			
Intestinal	31 (72.09%)	42 (61.76%)	0.390
Diffuse	12 (27.9%)	26 (38.23%)	0.120
<b>Metastatic lymph nodes</b>			
Positive	25 (58.13%)	36 (52.94%)	0.538
Negative	18 (41.86%)	32 (47.05%)	0.401
<b>TNM stage</b>			
I	19 (44.18%)	26 (38.23%)	0.779
II	15 (34.88%)	18 (26.47%)	0.525
III	9 (20.93%)	22 (32.35%)	0.855
IV	0 (0%)	2 (2.94%)	0.449

cal (1/14). In the group A the 47.05% was subjected to subtotal gastrectomy (32/68) because the tumor was located at antrum (23/32) or body-wide (9/32), while the 52.95% (36/68) had undergone total gastrectomy when the tumor was located in the cardias or fundus of the stomach (23/36), body-wide (11/36) or multifocal (2/36). In addition, 12 patients under 75 with diffuse histological type tumors were treated with total gastrectomy as it is considered a more aggressive histological variant.

Overall, surgical resection was accompanied in 88.28% of cases (98 patients) with D2 lymphadenectomy, while the remaining percentage of cases with D1 lymphadenectomy.

The postoperative average hospital stay was 23 days for patients over 75 and 21 days for younger patients. (P = 0.931) Naturally, both groups of patients who underwent total gastrectomy had a longer hospital stay than the patients who underwent subtotal gastrectomy, and this is more evident in patients over 75 (Table 3).

TABLE 3 - SURGERY AND POSTOPERATIVE STAY.

PARAMETER	GROUP A (n=43)	GROUP B (n=68)	P value
<b>Gastric resection</b>			
Subtotal	29 (67.44%)	32 (47.05%)	0.331
Total	14 (32.56%)	36 (52.94%)	0.211
<b>Lymphadenectomy</b>			
D1	6 (13.95%)	7 (10.29%)	0.231
D2	37 (86.04%)	61 (89.71%)	0.322
<b>Combined resection</b>			
Distal esophagectomy	2 (4.65%)	4 (5.88%)	-
Splenectomy	1 (2.32%)	2 (2.94%)	-
Postoperative hospital stay (average, days)	23	21	0.931
Subtotal gastrectomy	19	19	0.822
Total gastrectomy	27	22	0.566

TABLE 4 - POST-OPERATIVE COMPLICATIONS (MORBIDITY).

COMPLICATIONS	GROUP A (n=43)	GROUP B (n=68)
<b>1 - SURGICAL</b>		
Anastomotic Dehiscence	6 (13.95%)	5 (7.35%)
Stenosis of anastomosis	2 (4.65%)	2 (2.94%)
Duodenal Dehiscence	-	1 (1.47%)
Wound infection	-	2 (2.94%)
Bleeding	1 (2.32%)	5 (7.35%)
<b>2 - MEDICAL</b>		
Pulmonary embolism	-	-
Acute pulmonary edema	-	1 (1.47%)
Pneumonia	1 (2.32%)	2 (2.94%)
Pleural effusion	1 (2.32%)	1 (1.47%)
Hepatic insufficiency	-	-
Ascites	-	2 (2.94%)
Stroke	-	-
Ulcers	1 (2.32%)	-
<b>TOTALE</b>	<b>12 (27.9%)</b>	<b>21 (30.88%)</b>

TABLE 5 - POST-OPERATIVE COMPLICATIONS (MORTALITY).

COMPLICATIONS	GROUP A (n=43)	GROUP B (n=68)
<b>1 - SURGICAL</b>		
Anastomotic Dehiscence	-	-
Stenosis of anastomosis	-	-
Duodenal dehiscence	2 (2.32%)	1 (1.47%)
Wound infection	-	1 (1.47%)
Bleeding	-	1 (1.47%)
<b>2 - MEDICAL</b>		
Pulmonary embolism	1 (2.32%)	-
Acute pneumonia	1 (2.32%)	-
Pulmonary edema	-	-
Pleural effusion	-	-
Hepatic insufficiency	-	1 (1.47%)
Ascites	-	-
Stroke	1 (2.32%)	-
Ulcers	-	-
<b>TOTALE</b>	<b>5 (11.62%)</b>	<b>4 (5.88%)</b>

TABLE 6 - QUALITY OF LIFE OF PATIENTS UNDERGOING GASTRECTOMY ON KARNOFSKI SCALE.

PATIENTS	OVER 75 YEARS (n=43)	UNDER 75 YEARS (n=68)	P value
Karnofski index ( $\pm$ SD)	66.8 $\pm$ 25	76,1 $\pm$ 19	0.217

TABLE 7 - QUALITY OF LIFE OF PATIENTS EVALUATED WITH GASTRECTOMY DEGREES OF VISICK.

PARAMETER	SUBTOTAL GASTRECTOMY	TOTAL GASTRECTOMY	P value
Age >75 years (n=19)			
Visick grade (I-II/III-IV)	12/2	1/4	0.017
Age <75 years (n=67)			
Visick grade (I-II/III-IV)	30/6	20/11	0.086

### c) Complications and survival

There were no significant differences in surgical complications between the two groups of patients. Particularly among those over 75 there was a surgical complication rate equal to 20.92% (9 patients) and a 2.32% mortality (2 patients), whereas in patients under 75 a surgical complication rate was 22.05% (15 patients) and a mortality of 4.41% (3 patients). However the rate of medical complications was significantly greater in patients over 75 ( $p = 0.044$ ) (Tables 4, 5).

The overall survival after 5 years was 45,2% in the group A patients and 60.3% in the patients in Group B. Both groups showed a similar survival rate after 5 years and the only prognostic factor influencing this figure was the stage of the tumor.

Regarding the postoperative quality of life, although patients over 75 required more assistance, when we administered Karnofski scale questionnaire to the patients, there were no statistically significant differences in terms of impact on quality of life between the 2 groups of patients ( $P = 0.217$ ) (Table 6).

After follow-up at 6 and 12 months the surgical outcome evaluated by Visick scale was significantly better over 75 patients undergoing subtotal gastrectomy, compared with patients of the same group undergoing total gastrectomy ( $P = 0.017$ ). In the group of younger patients there was no significant difference between the 2 surgical procedures ( $P = 0.086$ ) (Table 7).

## Discussion

Overall, the elderly patients have physiological and/or pathological conditions related to age (reduced functional reserve bodies, presence of concomitant comorbidities, mental imbalances) which make surgeons often reluctant to perform surgery due to the high rate of complications and mortality rates associated with them (9, 10).

However, several recent studies have demonstrated how advances in surgical and anesthetic techniques have reduced the incidence of complications, thus improving the short-term surgical results in the elderly (10, 11).

The purpose of our work was to analyze the clinical and pathological characteristics of gastric carcinoma and the feasibility of curative surgery in patients over 75, identifying those factors that affect mortality, morbidity, survival and quality of life after surgery. These data were compared with those of younger patients to assess the correct type of surgery.

The choice of surgical procedure to be performed in the elderly must ensure both the oncological disease control and achieving a good surgical outcome in terms of survival and quality of life after surgery, especially for a portion of patients who, because of age, has a shorter life expectancy.

In addition to the diameter of the tumor that was found to be higher in elderly patients, our study has shown that the clinical and pathological characteristics of gastric carcinoma as the histological type, the location of the tumor and the degree of aggressiveness of the tumor are not age-related, as previously reported by other authors (12).

Regarding post-operative complications, there was no significant difference in the overall rate of complications among patients over 75 and younger patients. However, the incidence of postoperative complications and mortality rates related to them is significantly increased in the elderly. This impact is increased by the presence of pre-existing comorbidities, such as cardiopulmonary disease, and not to the age of the patients (13).

It is evident from our study and analyzed by other authors (14), the rate of complications is very low after gastrectomy, it is higher in younger patients than older patients, and there are several theories to explain this. The first explanation may be given by a more careful preoperative evaluation of the elderly patients, performed to

estimate the functional reserve of organs and their performance status, including nutritional status that seems to greatly influence the surgical outcome of patients, and in particular of the elderly (15). Another explanation is given by limited lymph node dissections often performed in these patients (16).

As regards the overall survival there is no difference between the two groups analyzed in our study. This result is consistent with what was reported by other authors and suggests that the age alone does not constitute a binding factor for surgical treatment in patients over 75 (12, 17). Also similar survival rates between the two groups suggest that survival is related to tumor stage and not to the patient age.

Currently, surgical resection of neoplasm-associated lymphadenectomy is the only effective treatment for stomach cancer. Executing a total or subtotal gastrectomy in these patients was correlated to the location of the tumor and evaluate appropriate resection margin equal to or greater than 7 cm (8). Even the presence of a diffuse histological type, according to Lauren, some authors consider classification of gastric carcinoma as a risk factor for the recurrence of the disease and for this reason it is treated with a total gastrectomy regardless of its location (18, 19). In our study 12 young patients with diffuse histologic type have undergone total gastrectomy, although the tumor was located in the lower third of the stomach. In these cases in the elderly the choice of total gastrectomy can be taken into account, bearing in mind, however, that the postoperative quality of life is poor at times, especially in patients with decreased functional reserve that tend to develop serious disorders of nutritional nature (15).

Since elderly patients have a reduced life expectancy, the postoperative quality of life should be taken into account in the choice of surgical treatment that should be performed (20-26). Subtotal gastrectomy should be the procedure of choice in patients over 75, as it provides a better quality of life after surgery.

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