DOI: 10.23934/2223-9022-2018-7-2-152-155

THE TACTICS OF SURGICAL TREATMENT FOR GASTRIC BLEEDING TUMORS IN ELDERLY AND SENILE PATIENTS

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ABSTRACT The results of treatment of 112 patients of elderly and senile age patients with non-metastatic gastric cancer, complicated by bleeding were analyzed. Most often bleedings occurred for stomach cancer stage III–IV. The tumor was commonly located in the gastric body. The vast majority of patients had only one complication — bleeding. In the second (control) group, there was no unified diagnostic and treatment algorithm, patients were usually operated urgently upon admission or in case of recurrent bleeding. The differential diagnostic and treatment algorithm was developed for patients of group I (main) taking into account the condition of a patient and the severity of bleeding or repeated bleeding. In the control group, the indications for emergency surgery were continued bleeding and inefficiency of endoscopic hemostasis. In the main group, the risk of recurrent bleeding was considered as well, and in case of high risk emergency surgery was performed after a full preoperative preparation. In addition, the cardial part or 2/3 of the stomach were not resected by reason of the deliberate non-radical tactics. It is worth noting that in the I group argon plasma coagulation, complemented by the hemostatic system EndoClot was used for endoscopic hemostasis. Through the use of the developed algorithm we managed to reliably reduce the frequency of complications from 50 to 28.5% ($p<0.05$), and mortality rate from 28.8 to 3.77% ($p<0.001$).

Keywords: gerontology, elderly and senile age, non-metastatic gastric cancer, gastric bleeding, individual treatment algorithm, argon plasma coagulation, re-occurrence of bleeding, EndoClot system

For citation Sigua B.V., Zemlyanoy V.P., Gubkov I.I., et al. The tactics of surgical treatment for gastric bleeding tumors in elderly and senile patients. *Russian Sklifosovsky Journal of Emergency Medical Care.* 2018; 7(2): 152–155. DOI: 10.23934/2223-9022-2018-7-2-152-155 (In Russian)

Conflict of interest Authors declare lack of the conflicts of interests

Acknowledgments The study had no sponsorship

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INTRODUCTION

Malignant tumors are the leading cause of death in the Russian Federation, second only to cardiovascular disease, as well as poisoning and trauma [1, 2]. Among malignant neoplasms, one of the most common is gastric cancer [3-6]. The results of the research showed that among the elderly and senile people there is the highest risk of gastric cancer development. Thus, more than 8,000 patients with gastric cancer older than 70 years, accounting for more than a third of all patients with this tumor location [7, 8]. It should also be noted that complications develop in these patients more often than in others. In more than two thirds of cases, the generalized stage of the oncological process is diagnosed, and half of patients, especially of elderly and senile age, enter the hospital according to emergency indications [7].

The aim is to improve the results of treatment of elderly and senile patients with gastric bleeding of tumor origin.

MATERIAL AND METHODS

In 1996-2015, 112 patients of elderly and senile age with nonmetastatic gastric cancer, complicated by bleeding were treated at the St. Petersburg Elizavetinskaya Hospital. Upon admission, all patients underwent fibroesophagogastroduodenoscopy. Standard laboratory parameters were determined as well. In assessing the severity of blood loss, doctors relied on laboratory and clinical data.

All patients were divided into two groups. The Group I (main) included 53 patients who were on treatment from 2007 to 2015. In the treatment of Group I patients, a specially developed individual therapeutic and diagnostic algorithm was used, taking into account the patient's condition, the severity of hemorrhage and the risk of bleeding recurrence. The Group II (comparison) included 59 patients treated in the period from 1996 to 2006. There was no single medical diagnostic algorithm in this group, surgical interventions were performed mainly urgently upon admission or in case of bleeding recurrence. We would like to draw attention to the fact that in our work we distinguished two groups of signs of high risk of gastric bleeding recurrence: clinical and endoscopic ones. Clinical signs reflect the nature of bleeding: tempo, volume, velocity, which indirectly indicate the diameter of vessel in arrosion. The clinical signs of high risk of bleeding recurrence are the collaptoid state, severe blood loss, vomiting with slightly changed blood, melena or stool with slightly changed blood, elderly and senile age, and concomitant

pathology in the stage of subcompensation and decompensation. The endoscopic signs of the high risk of bleeding recurrence: macroscopic type of tumor II and III (according to *Bormann*); presence of large clots; presence of multiple clots; location of the tumor along the small curvature and posterior wall of the stomach; profound ulceration; visible arterial vessel; visualization of multiple vessels. The risk of recurrence of bleeding increases with a combination of these signs.

Both in the main and in the comparison group, the majority (86 - 76.8%) of patients were aged 60-79 years. It should be noted that men in the groups somewhat prevailed (72 - 64.3%).

The tumor mainly located in the body of the stomach, which is clearly reflected in Table 1.

Table 1

The location of gastric tumors, complicated by bleeding in elderly and senile patients

Location	Group			
	I (main)		II (comparison)	
	Abs.	%	Abs.	%
Gastric stump	0	0	4	6.8
Fundus	31	58.5	37	62.7
Pylorus	13	24.5	10	16.9
Total lesion	9	17	8	13.6
Total	53	100	59	100

The structure of patients distribution by stages of the tumor process is as follows: I-II stage was noted in 13 patients (22%) in the comparison group and in 9 patients (17%) in the main group; III stage — in 19 patients (23.2%) of the comparison group and in 22 (41.5%) patients of the main one; IV stage — in 27 patients (45.8%) of the comparison group and in 22 (41.5%) patients of the main one. It should be noted that in both groups most often (80%) gastric cancer of the III-IV stage was complicated by bleeding. In more than 80% of cases, bleeding was the only complication of gastric cancer, but other complications were observed: tumor invasion into neighboring organs, stenosis of the stomach, tumor perforation and their combination (Table 2). Complications of nonmetastatic gastric cancer were as follows: bleeding was noted in 49 patients (83%) in the comparison group and in 46 patients (86.8%) in the main group; bleeding and perforation — in 3 patients (5.1%) of the comparison group and in one (1.9%) patient of the main one; bleeding and stenosis — in 6 patients (10.2%) of the comparison group and in 4 (7.5%) patients of the main one; bleeding and germination in neighboring organs was revealed only in 2 (3.8%) cases; a combination of bleeding, stenosis, perforation and invasion in neighboring organs was observed in only one patient (1.7%) of the comparison group.

Table 2

Surgeries for nonmetastatic gastric cancer complicated by bleeding in elderly and senile patients

Operations	Immediate				24-48 hours after admission			
	Group II		Group I		Group II		Group I	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Symptomatic	5	13.2	1	3.6	0	0	1	3.6
Extirpation of gastric stump	1	2.6	0	0	1	2.6	0	0
Resection of cardial part	1	2.6	0	0	0	0	0	0
Resection of gastric 2/3	9	23.7	0	0	0	0	0	0
Subtotal resection	7	18.5	3	10.7	1	2.6	10	35.7
Gastrectomy	11	29	2	7.1	1	2.6	9	32.1
Gastrectomy+pancreatectomy	1	2.6	1	3.6	0	0	1	3.6
Total	35	92.2	7	25	3	7.8	21	75

The severity of bleeding was assessed according to the classification of A.I. Gorbashko (1974). In 33% of patients an average blood loss took place, and 48.2% had severe blood loss. Two patients (3.4%) with hemorrhagic shock were taken to the operating room, bypassing the reception ward.

RESULTS AND DISCUSSION

Out of 112 elderly and senile patients with gastric bleeding of tumor origin, 38 patients (64.4%) of the comparison group and 28 (52.8%) patients of the main group underwent surgery. In 21 patients (35.6%) of the Group II and in 25 patients (47.2%) of the Group I the endoscopic hemostasis with subsequent conservative treatment was successfully performed. These patients were recommended for further treatment in the oncological hospital in a planned manner.

Immediately operated: 35 patients (92.2%) of the comparison group and 7 (25%) patients of the main group. Indications for immediate operation in the comparison group were continued bleeding and inefficiency of endoscopic hemostasis. In the main group, in addition to the continued bleeding and inefficiency of endoscopic hemostasis, the risk of bleeding recurrence was also taken into the account, so in case of high risk, urgent surgery was performed after full preoperative preparation. It is worth noting that in the Group I argon-plasma coagulation, supplemented by the hemostatic system of EndoClot was used for endoscopic hemostasis. Thus, 21 (75%) patients of Group I and only 3 patients (7.8%) of Group II were urgently operated. Types of surgical interventions in both groups are presented in Table 2.

The concept of treating patients, as well as the statistical dependence of the ratio of immediate and urgent surgical interventions are given in Table 3. So, in the Group I (main), urgent surgical interventions were statistically significantly more frequent, and, accordingly, there were less immediate ones (p<0.001). In addition, there were no cardial portion resection and resection of gastric 2/3 in the main group due as these inteventions were not radical.

At the same time, there was a clear correlation between the type of surgical intervention (immediate/urgent) and the frequency of R1 gastrectomy: in immediate operations, the frequency of R1 resections was 40-42.8% in the comparison group and 42.8% in the main group. In urgent operations, the frequency of R1 resections was 9.5% (2) in the main group and 33.3% (1) in the comparison group. In general, the frequency of R1 gastrectomy was 36.8% in the comparison group and 17.8% in the main group (p<0.05) (Table 3).

Table 3

The presence of tumor cells at the resection line: surgeries for nonmetastatic gastric cancer complicated by bleeding in elderly and senile patients

Time of surgery	II group (comparison)			I group (main)		
	Total in group	Presence of tumor cells		Total in group	Presence of tumor cells	
		Abs.	%		Abs.	%
24-48 hours after admission	3	1	33.3	21	2	9.5
Immediately upon admission	25	10	40	7	3	42.8
Immediately after repeated bleeding	7	3	42.8	0	0	0
Total	38	14	36.8	28	5	17.8

In the postoperative period, complications were observed in half of the patients (19-50%) of the comparison group and only in 8 patients (28.5%) of the main group. Postoperative complications: failure of esophagogoanastomosis was noted in 7 patients (18.4%) of the comparison group and in 3 patients (10.7%) of the main group, failure of gastroenteroanastomosis was observed in 5 patients (13.2%) of the comparison group and in 2 (7.1%) patients of the main group, pneumonia developed in 6 patients (15.8%) of the comparison group and in 2 (7.1%) patients of the main one. In the main group there was one case (3.6%) of pancreatic fistula formation. Empyema of the pleura was observed in one patient (2.6%) of the comparison group. It is worth noting that anastomoses failure was observed more often in patients of the comparison group.

Of the 35 patients in the comparison group operated on in an emergency, 16 (42.1%) died, and one patient out of 7 died in the main group (3.6%). The total postoperative lethality in the comparison group was 28.8% (17), and in the main group it was statistically significantly lower, amounting to 5% (2) (p<0.001) (Table 4).

Table 4

Postoperative mortality of nonmetastatic gastric cancer complicated by bleeding in elderly and senile patients

Operations	Immediate				24-48 h			
	II		I		II		I	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Symptomatic	1	2.6	0	0	0	0	0	0
Gastric stump extirpation	1	2.6	0	0	1	2.6	0	0
Resection of gastric 2/3	3	7.9	0	0	0	0	0	0
Subtotal resection	4	10.5	1	3.6	0	0	1	3.6
Gastrectomy	7	18.5	0	0	0	0	0	0
Total	16	42.1	1	3.6	1	2.6	1	3.6

It is worth noting that we did not find the relation between the stage of the cancer process and the level of mortality. In the 2nd group, 6 patients with stage I-II, 9 with III and 5 with the IV stage of the oncological process, died. In the main group, only 2 patients with stage IV disease had a fatal outcome. There was also no correlation between age and mortality: in the second group there were 9 deaths at the age of 60-69 years, 7 cases among patients 70-79 years old and only 2 patients over 80. In the 1st group, both patients with lethal outcome were aged 70-79 years. We also noted an unconvincing correlation between the severity of blood loss and the level of mortality: in the main group, both deaths had a severe degree of blood loss; in the comparison group, the highest number of deaths (11) was also observed among patients with severe bleeding. Among patients with mild and moderate degrees of hemorrhage, there were 9 deaths.

The main causes of death in the comparison group were: intoxication — 2 cases (3.4%), severe hemorrhage — 4 (6.8%), pneumonia — 6 (10.1%) and anastomosis failure — 4 observations (6.8 %). In isolated cases the causes of death were heart failure, empyema of the pleura, pulmonary edema, cerebral edema. In the main group, the cause of death was severe hemorrhage — 2 (3.8%) cases.

CONCLUSION

Adherence to the developed therapeutic algorithm made it possible to statistically significantly reduce the incidence of complications from 50 to 28.5% (p<0.05), and the level of lethality from 28.8 to 3.77% (p<0.001). An obvious advantage of the proposed treatment algorithm is a statistically significant reduction in the frequency of $R1$ resections from 36.8 to 16.8% (p<0.05), which should positively influence the long-term results of treatment in this category of patients.

FINDINGS

1. Gastric bleeding doesn't not always mean that a patient is inoperable due to the advanced stage of the oncological process.

2. With successful combined endoscopic hemostasis, as well as the absence of a risk of bleeding recurrence, patients should be conservatively guided and further recommended treatment at a specialized oncological institution in a planned manner.

3. Determination of the risk of bleeding recurrence after endoscopic hemostasis and urgent surgical intervention after complete preoperative preparation allow to statistically significantly reduce the number of $R1$ resections from 36.8 to 17.8% (p<0.05).

4. We found no statistically significant effect of the patient's age on the outcome of the operation, despite the fact, that according to the literature, it is a prognostically significant factor in the direct result of surgical intervention.

5. Developed individual therapeutic and diagnostic tactics allowed to significantly reduce the incidence of complications from 50 to 28.5% (p<0.05), and the level of postoperative lethality from 28.8 to 3.77% (p<0.001).

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Received on 02.09.2017
Accepted on 08.02.2018