



## Original article

ACTA FAC MED NAISS 2007; 24 (3): 125-134

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## TREATMENT PROCEDURES IN ACUTE GASTRIC AND DUODENIC BLEEDING ULCERS

### SUMMARY

Profuse bleeding of upper parts of gastrointestinal tract is an emergency medical condition, requiring intensive re-animation and treatment by gastroenterologist and surgeon. The most frequent causes of such haemorrhage are esophagus varices and acute bleeding, gastric and duodenal ulcers.

Until ten years ago, surgical treatment of acute gastric and duodenic bleeding ulcers (AGBDU) had been a method of choice. Today, urgent surgical treatment is a choice only if an endoscopic therapeutic intervention is impossible, or in case of persistent or recurrent bleeding.

The aim of our research was to determine the optimum treatment of AGBDU, as well as its frequency, types of applied surgical procedures, postoperative complications and the mortality rate. The research comprises a prospective-retrospective study of patients treated at the Nis Surgical Clinic in the period 1994-2005.

The subjects were divided in two groups: A (patients treated from 2000-2005) and B (patients treated from 1994-1999). The division was based on the introduction and application of new approaches in diagnosis and urgent endoscopic procedures, improvement of reanimation techniques and a more active approach to the surgical treatment of AGBDU, with respect to the principles of gastroduodenal surgery.

There is no significant discrepancy in the number of subjects (group A-218, group B-233) and the types of performed surgical procedures. Significantly, in group A there were remarkably less postoperative complications (39.44% vs. 73.81%) ( $p=0.000001$ ), with a lower mortality rate (17.43% vs. 31.75%) ( $p=0.00253$ ).

Patients suffering from AGBDU are at high risk. They require urgent diagnostics and application of urgent endoscopic intervention procedures. The results prove that, in time, the treatment of this serious condition has considerably improved, but that the percentage of morbo-mortality is still above those presented elsewhere in the world. Proper choice of endoscopic techniques, pre- and postoperative techniques, appropriate surgical moment and approach, along with an application of worldwide-recognized standards of AGBDU treatment allow for obtaining better results in the treatment of this disease.

**Keywords:** duodenal ulcer, gastric ulcer, haemorrhage, bleeding

## INTRODUCTION

Peptic ulcer is a local, benign, non-specific digestive tract ulceration. It is characterized by chronic inflammation of muscularis mucosa, which may be caused by a mechanic and/or chemical irritation and bacteriologic agent. Pathophysiologically, it derives from an impairment of the balance of protective and aggressive factors – mucosal protective barrier.

On average, an evolution of ulcerous condition takes 15-25 years, whereas complications are manifested in 20-25% of the subjects (bleeding, perforation, penetration, stenosis). Acute gastroduodenal bleeding ulcer (AGBDU) represents a serious and frequent complications of ulcerous conditions and requires urgent diagnosis and treatment.

During the past four decades, the diagnosis and treatment of this complication has developed from passive and diagnostic esophagogastroduodenoscopy (EGDS) to active urgent endoscopic intervention and angiography. This type of treatment leads to cessation of bleeding in approximately 80% of subjects.

Surgical treatment is applied in cases of ineffective endoscopic techniques, as well as when bleeding is prolonged or recurrent. Each recurrent or prolonged bleeding increases the mortality risk, which is around 10%.

## AIMS

The aim of this paper was to determine the number of AGBDU subjects, analyze the types of their treatment, the level of surgical treatment success, types of post-operative complications and mortality rate, based on the results of the prospective-retrospective study of the patients' records.

## MATERIAL AND METHODS

The research comprises a prospective-retrospective study of patients treated at the Nis Surgical Clinic in the period 1994-2005. The subjects were divided in two groups: group A (January 1, 2000 - January 6, 2005) and group B (January 1, 1994- December 31, 1999).

In group A, urgent EGDS was applied as a diagnostic and endoscopic intervention procedure in each patient with signs of bleeding from the upper parts of gastrointestinal tract. The urgent EGDS intervention decreased the number of persistent, recurrent bleeding ulcers, as well as the number of patients which had to be subjected to the surgical treatment of haemorrhagic lesion, in accordance

with the new approach in gastroduodenal surgery. The patients were in a difficult general condition, so that an application of urgent endoscopy and reanimation procedures were helpful in reaching a haemodynamic and electrolytic stability (in approximately 60% of the subjects), thus allowing for an adequate preparation for a surgical intervention.

In group B, urgent EGDS did not represent a routine procedure, urgent endoscopy was often unsuccessful, with more frequent occurrence of persistent and recurrent bleeding, whereas the treatment included urgent surgical interventions („must operations“). These patients were in a very serious general condition, with an impaired haemodynamic status, hematocrite values under 0.20, impaired hepatorenal function, marked hypoproteinemia and hypo-albuminemia, in an electrolytic and acidobasic disbalance. A hypovolemic shock was developed in approximately 25% of subjects.

In both groups, an indication for surgical intervention was established by a surgeon. Surgical treatment was applied in prolonged, recurrent bleeding and where urgent EGDS was not feasible. The patient's difficult condition was frequently a restrictive factor, so that surgical procedures, in most patients (approximately 85%) were aimed at bleeding site sanitation.

The research results have been systematized and presented in the tables below (Excel 2000, Word 2000). Program package SPSS, version 10.0 i Statcalc EpiInfo version 5a was used for the purpose of statistical analysis. The following statistical tests were used:  $\chi^2$ -test, Mantel-Haenszel's test with Yates correction and Fisher's test.

## RESULTS

In group A, a total of 248 patients were hospitalized for upper gastrointestinal tract bleeding, 218 of them (87.9%) due to AGBDU: 125 males (57.33%), mean age 51.5 years (23-80 years.) and 93 females (42.66%), mean age 65 years (41-89 years). In this period, the subjects with acute bleeding duodenal ulcer (ABDU) were three times more frequent.

In group B, 323 patients were hospitalized for upper gastrointestinal tract bleeding: 248 (76.78%) for AGBDU - 158 males (63.7%), mean age 55.5 years (26-85 years.) and 90 females (36.29%), mean age 68 years (48-88 years). In this period, the subjects with acute bleeding duodenal ulcer (ABDU) were 1.5 times more frequent, ( $p=0,00026$ ) (Table 1).

Table 1. Number ADGBU Patients

	Gastric ulcer	Duodenum ulcer	Total
Group A	56 (25.68%)	162 (74.31%)	218
Group B	99 (39.79%)	134 (54.03%)	248
P	0.00026*		

ADGBU therapy included conservative treatment (CT) and surgical treatment: blood vessel ligation with suture (LS), blood vessel ligation with suture and proximal selective vagotomy (LSPSV), ulcer excision with suture (ES), partial gastrectomy: Billroth I (BI) or Billroth II (BII). (Tables 2a, b and c).

Table 2a: Types of AGBU Treatment

	Group A	Group B	P
CT	15 (26.78%)	36 (36.36%)	0.298
LS	20 (35.71%)	31 (31.31%)	0.702
LSPSV	2 (3.57%)	5 (5.05%)	0.981
ES	3 (5.35%)	6 (6.06%)	0.859
BI	0	8 (8.08%)	0.051
BII	16 (28.57%)	13 (13.13%)	0.031*
Total	56	99	0.0000018*

Table 2b: Types of ADBU Treatment

	Group A	Group B	P
CT	89 (54.93%)	68 (50.74%)	0.547
LS	25 (15.43%)	15 (11.19%)	0.373
LSPSV	3 (1.85%)	11 (8.2%)	0.022*
ES	2 (1.23%)	2 (1.49%)	0.753
BII	43 (26.54%)	38 (28.35%)	0.828
Total	162	134	0.027*

Table 2c: Total Number of Treatment Procedures

	Group A	Group B	P
CT	104 (47.7%)	104 (44.63%)	0.576
LS	45 (20.64%)	46 (19.74%)	0.904
LSPSV	5 (2.29%)	16 (6.86%)	0.038*
ES	5 (2.29%)	8 (3.43%)	0.659
BI	0	8 (3.43%)	0.008*
BII	59 (27.06%)	51 (21.88%)	0.242
Total	218	233	0.351

The number of ADBU patients was different in the investigated groups: 99 subjects in group B and 56 in group A. In group B, CT was more frequently applied in approximately 10% of the subjects. The greatest difference in the types of surgical methods was noticed in cases where LSPSV was applied. The treatment applied in B group subjects was twice more frequent than in group A. The same goes for gastrectomy ADBU treatment by BI, which was performed in 85 group B subjects, whereas none of the group A patients was subjected to it. BII was statistically significantly more frequently applied in group A ( $p=0.031$ ). Also, there was a significant difference in the number of patients between groups A and B – there were more patients in group B (99), than in group A (56) ( $p=0.0000018$ ) (Table 2a).

In both groups, the number of patients with ADBU was approximately the same as the number of patients with applied CT. The type of surgical treatment was not considerably changed in either group, except for the application of LSPSV, which was more frequently applied in group B, in about 7% of the subjects ( $p=0.022$ ). In terms of ADBU, there was a significant difference in the A and B group subjects – group A (162 patients) vs. group B (134 patients) ( $p=0.027$ ) (Table 2b).

Total therapeutic procedures applied in AGDBU treatment of the examined groups were significantly more different in LSPSV application (in group B – 6.8% of patients, in group A 2.2%) ( $p=0.038$ ) and in gastrectomy and BII (group B - 34.4%, group A – no application) ( $p=0.008$ ) (Table 2c).

The complications which appeared after the treatment of patients were divided into those which could be treated conservatively: (operational wound infection (OWI), postoperative febrile states caused by the presence of abdominal collections (FS)) and

complications which required a repeated surgical intervention: dehiscence of laparotomy (Deh. lap.), suture dehiscence (Deh.sut.), postoperative abdominal dirt collection (DC). Duodenal fistules (DF), identified in the subjects were not treated at our clinic (Tables 3a, 3b; 3c and 4).

The AGDU complications were treated conservatively, and in total, they were twice more frequent in group B (p =0.00348). In these patients, OWI was three times more frequent after LS and ES and two times more frequent in BII gastrectomy. OWI appeared more frequently only in case of LSPSV. FS were three times more frequent in group B subjects after LS, while no FS were identified in this group after BIII gastrectomy, unlike group A subjects (6.2%).

Generally speaking, the frequency of complications in ADBU did not significantly differ between the examined groups (p=0.522). OWI

appeared more frequently in group B after LS and ES, whereas in group A it was more frequent in LSPSV and BII gastrectomy. FS were more frequent in group B, whatever surgical procedure was applied. The research results indicated that the total frequency of conservatively treated complications following AGDBU treatment was 2.5 times higher in group B than in group A (p=0.00559) (Table 3a).

The complications which required reintervention after AGDU treatment were in total by 10% more frequent in group B than in group A. In group B, Deh.lap. appeared more often after LSPSV and ES; Deh. sut. after LS and LSPSV; Deh. GEA in BII gastrectomy; DC in performed LSPSV and BII gastrectomy, and DF appeared in BII gastrectomy. In group A subjects, only Deh.lap was more frequent after LS and BII gastrectomy and Deh. sut. after ES.

The total frequency of complications in ADBU treatment was by 20% higher than in group B.

Table 3a. Conservatively treated complications

		A			B		
		No.	OWI	FS	No.	OWI	FS
U	A LS	20	5(25%)	2(10%)	31	21(67.7%)	11(3.4%)
	G LSPSV	3	1(33.3%)	0	5	1(20%)	0
	B ES	3	0	1(33.3%)	6	2(33.3%)	2(33.3%)
	U BI	-	-	-	8	3(37.5%)	3(37.5%)
	BII	16	2(12.5%)	1(6.2%)	13	3(23%)	0
		Total complications 12 (21.42%)			46 (46,46%)		
P		0.00348*					
U	A LS	25	8(32%)	2(8%)	15	6(40%)	2(13.3%)
	D LSPSV	3	2(66.6%)	0	11	2(18.1%)	5(45.4%)
	B ES	3	2(66.6%)	0	2	2(100%)	1(50%)
	U BII	43	9(20.9%)	5(11.6%)	38	4(10.5%)	6(15.7%)
			Total complication 28(17.28%)			28(20.89%)	
P		0,522					
		Total complications 40(18.34%)			74(31.75%)		
P		0.00559*					

Table 3b. Complications which required surgical reintervention – Group A

		No.	Deh.lap.	Deh. Sut.	Deh.GEA	DC	DF
A G B U	LS	20	4(20%)	2(10%)	0	2(10%)	0
	LSPSV	3	0	0	0	0	0
	ES	3	0	1(33.3%)	0	1(33.3%)	0
	BII	16	4(25%)	0	2(12,5%)	3(18,7%)	4(25%)
	Total complications		23(41.07%)				
A D B U	LS	25	4(16%)	3(12%)	0	2(8%)	0
	LSPSV	3	1(33.3%)	0	0	0	0
	ES	3	0	0	0	0	0
	BII	43	3(6.9%)	0	3(6.9%)	1(2.3%)	6(13.9%)
	Total complications		23(14.19%)				
Total complications		46(21.1%)					

Table 3c. Complications which required surgical reintervention – Group B

		No.	Deh.lap.	Deh. Sut.	Deh.GEA	DC	DF
A G B U	LS	31	6(19.3%)	6(19.3%)	0	3(9,%)	0
	LSPSV	5	1(20%)	1(20%)	0	1(20%)	0
	ES	6	2(33.3%)	0	0	2(33.3%)	0
	BI	8	4(50%)	0	0	3(37.5%)	5(62.5%)
	BII	13	3(23%)	0	4(30.7%)	4(30.7%)	6(46.1%)
Total complications		51(51.51%)					
A D B U	LS	15	4(26.6%)	8(53.3%)	0	4(26.6%)	0
	LSPSV	11	2(18.1%)	2(18.1%)	0	2(18.1%)	0
	ES	2	2(100%)	0	0	1(50%)	0
	BI	0					
	BII	38	6(15.7%)	0	5(13.1%)	3(7.8%)	8(21%)
Total complications		47(35.07%)					
Total complications		98(42.06%)					



Table 4. Total number of complications

Number of subjects	Complications		Total
	Conservative Treatment	Surgical treatment	
Group A	40(18.34%)	46(21.1%)	86(39.44%)
Group B	74(31.75%)	98(42.06%)	172(73.81%)
P	0.00559*	0.00003*	0.000001*

In these subject, the only less frequent complication was Deh.lap. which appeared after LSPSV with a low percentage. Other types of complication in group B were more frequent than in group A, regardless of the type of surgical procedure applied. The research results indicated that the total frequency of reinterventions after surgical treatment of AGDBU was twice higher in group B than in group A ( $p=0.000028^*$ ) (Tables 3b and 3c).

The number of patients in both groups was similar, but the results indicated that group B had twice as many complications both in the conservatively treated group ( $p=0.00559$ ) and surgically treated group ( $p=0.00003$ ). Thus, the total frequency of complications in this subject group was much higher ( $p=0.000001$ ) (Table 4).

Inspite of the recent significant progress made in both conservative and surgical treatment of AGDBU, the mortality rate of these subjects was still very high. The lethality was higher in group A only after ES, whereas in group B the lethality rate was higher in all other interventions. The lethality rate of AGBU was significantly higher in group B (39 patients), than in group A (27 patients) ( $p=0.01558$ ). The total lethality rate in group B was almost twice higher than that in group A ( $p=0.00253^*$ ) (Table 5).

Table 5. Subject mortality rate

	AGBU		ADBU		Total	
	A	B	A	B	A	B
CT	4	13	8	16	12(11.54%)	29 (27.88%)
LS	2	14	9	8	11(24.44%)	22 (47.82%)
LSPSV	0	2	0	3	0	5 (31.,25%)
ES	2	1	2	0	4(80%)	1(12.5%)
BI	-	1	-	0	-	1(12.5%)
BII	3	4	8	12	11(18,64%)	16(31.37%)
Total	11	35	27	39	38 (17.43%)	74(31.75%)
P	0.06		0.01558*		0.00253*	

## DISCUSSION

Upper gastrointestinal tract bleeding is defined as hemorrhage proximal to lig. of Treitz. The etiology of such bleeding is diverse. In 90% of cases the causes are: Mallory-Weiss syndrome, bleeding esophageal varices as the consequence of portal hypertension, gastritis and peptic ulcer disease (Figures 1,2,3,4).

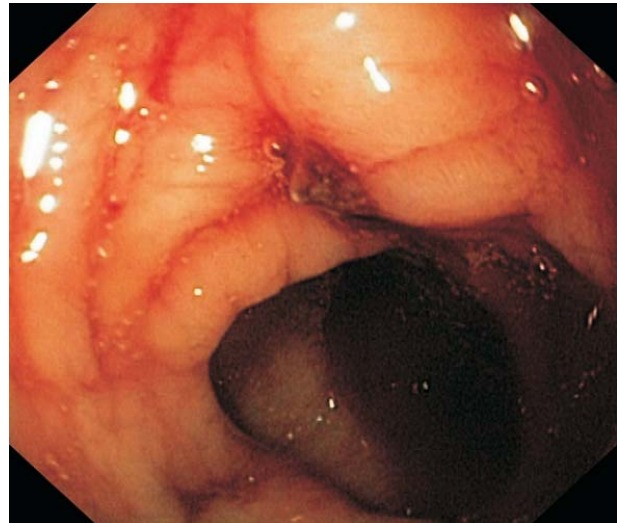


Figure 1. Bleeding gastric ulcer

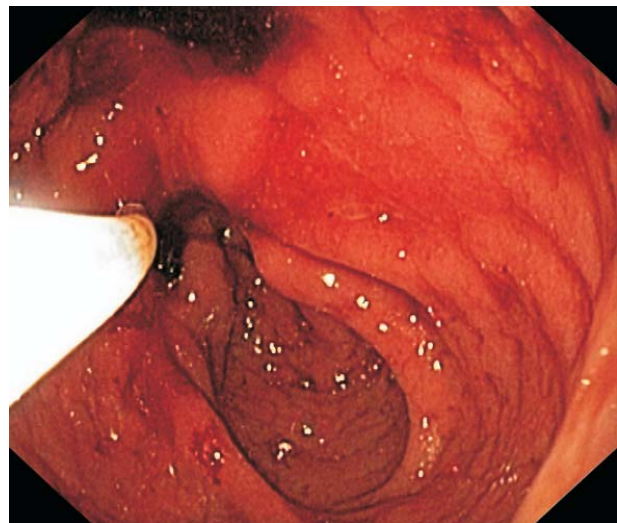


Figure 2. Injection hemostasis of bleeding gastric ulcer

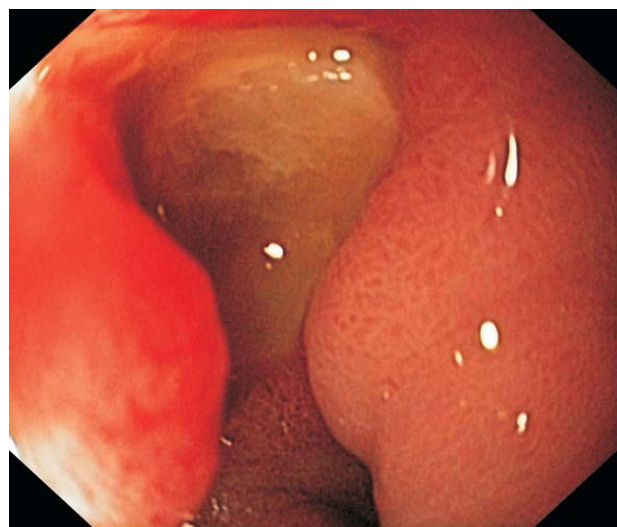


Figure 3. Duodenal ulcer with stigmata of bleeding



Figure 4. Bleeding duodenal ulcer

Upper gastrointestinal bleeding can be the first symptom of gastroduodenal or some other (pancreas, breast) organ malignancy (1,2).

More than one-third of these patients (13-47%) are older than 60 years of age. In 80-85% of the patients, bleeding stops spontaneously, whereas the mortality rate is around 10%, although this rate is higher in elderly patients (33-65%) (3).

Risk factors for increased mortality rate include: inappropriate nutrition, excessive alcohol intake, liver diseases, inadequate ulcer treatment, recurrent or persistent bleeding, patient's poor general condition, excessive medication use, particularly non-steroid anti-inflammatory medicaments, age factor, etc.

Early recognition of AGDBU directly influences morbidity and mortality of patients. Monitoring of the patient's general condition, laboratory analyses, urgent EGDS and intensive reanimation measures are some of the basic diagnostic and treatment initiation factors.

Until 1980s, EGDS was used solely as a diagnostic procedure. In 1980, the US National Institute of Health Consensus adopted the approach by which in AGDBU one of the following four endoscopic procedures should be applied:

- injection epinephrin haemostasis;
- heat coagulation;
- bipolar electro coagulation and/or
- laser coagulation (3)

Lately, argon plasmic coagulation and haemoclips haemostasis have been applied with success.

In patients suffering from ischemic coronary diseases and proven high prevalence of *H. pylori*, elective EGDS should be done before elective coronary by-pass-graft operations (4), whereas

endoscopic argon plasmic coagulation is used as prevention of recurrent bleeding (5).

Today, urgent EGDS yields very good results. Recurrent bleeding occurs in approximately 2% of the AGDBU patients, while they are more frequent in varix bleeding – in approximately 8% (6). A need for surgical treatment after a well-performed urgent EGDS is minimized to about 20% (6). Multipolar electrocoagulation, if applied within 24 hours from the moment of bleeding, leads to haemostasis in 90% of the cases, decreases a need for transfusion or surgery, decreases the length of hospitalization, treatment costs are lower, but it does not decrease the mortality rate. Adrenalin contributes to initial haemostasis in 98%, whereas a combination of adrenalin injection and heat coagulation helps haemostasis in 99% of bleeding cases. No particular difference has been observed with regard to blood transfusion, recurrent bleeding and length of hospitalization. The need for surgical treatment of ulcer is twice greater in patients in which initial haemostasis was reached by adrenalin injection only, than in those who were treated by combined procedure (7).

In the 1990s, the research was aimed at determining the success of combined medication-endoscopic treatment. The frequency of recurrent and prolonged bleeding, surgical treatment risk and patient mortality rate were examined. The research showed that intra-arterial Vasopresin infusion enhances haemostasis in not more than 70% of bleeding ulcers, whereas an embolization of blood vessel can control bleeding in as many as 88% of the patients (8). The therapeutic effects of Cimetidine and Tranexanemic acid (anti-fibrinolytic agent) on AGDBU were investigated, as well. Such type of treatment reduces the risk of prolonged, recurrent bleeding to a certain extent, with a considerably decreased mortality rate. The frequency of surgical treatment is the same, despite of the decreased risk of recurrent bleeding.

Following endoscopic AGDBU treatment, Omeprazol infusions have proved to have a significant risk-reducing effect on recurrent bleeding (9). Somatostatin (Octreotide) reduces the risk of continuous bleeding and, consequently, a need for surgical ulcer treatment. These can be administered as adjuvant therapy, prior to endoscopic procedures or in case of an uneventful endoscopic haemostasis. The research has shown that Somatostatin (Octreotide) is much more effective than  $H_2$  antagonists (10).

Nowadays, a particular attention is paid to endoscopic procedures, while surgical treatment is applied only in strictly indicated cases. Diagnostic and therapeutic procedures must be applied



simultaneously. After a clinical examination of the patient and laboratory analyses, intensive reanimation measures are necessary, in combination with fluid recovery, blood transfusion and constant monitoring of the patient's condition. Urgent EGDS within the initial 12 hours is used for determining the site of bleeding, and haemostasis is initiated by: administering adrenalin injection in the 1:10.000 physiological solution, heat coagulation, multipolar coagulation or mechanical clipping. Unsuccessful endoscopic initial haemostasis is an indication for a repeated heat coagulation. In some cases, such procedure is not possible, due to the bleeding characteristics, which means that it should be postponed 12-24 hours. Some authors' opinion is that initial haemostasis with recurrent bleeding represents an indication for surgical treatment (11, 12).

Surgical AGBU treatment starts with an adequate anaesthetic and surgical preparation. It is advisable to avoid surgeries between midnight and 7 a.m. whenever possible. The mortality rate after an urgent surgical intervention is in correlation with pre-operative APACHE 11 score. It is best to do gastric ulcer excision whenever possible, or to perform partial gastrectomy, depending on ulcer size and locality. There is no official surgical attitude towards the best treatment procedure – rather, various surgical experiences can be considered. In case of suspected malignity, partial resection is a method of choice, whereas older patients or patients in difficult general condition should be subjected to the shortest possible, sparing surgery – local excision or bleeding site suture (13).

Surgical treatment of ADBU can vary, but there is only one way to prevent recurrent bleeding. Recurrent bleeding is less likely in the patients who were subjected to gastric resection with ulcer removal, either by Billroth I or Billroth II gastrointestinal tract reconstruction, than in patients who have undergone a sparing, conserving surgery. However, the level of bile secretion is much higher after gastrectomy than after sparing operations, so that this does not affect the total mortality rate.

Some research suggests that in duodenal ulcers with lower-scale bleeding, a ligation of gastroduodenum and dextrous gastroepiploic artery has the same effects in bleeding prevention as stomach resection (14). Historically speaking, vagotomy takes a significant place as ADBU treatment method but, today, in the era of powerful anti-secretolitics, it is less and less applied (12).

AGDBU represents an urgent state with a dramatic clinical picture. Our patients are frequently in a very difficult general condition, with hypovolemic-haemorrhagic shock signs. Such patients require an urgent reanimation and electrolytic

balance correction, along with necessary diagnostic procedures. Treatment success is quite dependant on quick diagnosing and a choice of adequate therapeutic and surgical strategy.

Initial endoscopic haemostasis by adrenalin or hemoclips has decreased a need for surgical treatment as the first act, but it is related to a large number of cases of recurrent or prolonged bleeding, which, in the case of our patients, were indications for surgical treatment. In some cases, pre-operative treatment is very short, which increases the risk of morbidity and mortality. The decision about the type of surgical intervention had to be brought intraoperatively and urgently.

This study has shown that there is no significant difference between the number of patients with AGDBU in the two examined groups. The average age was approximately the same in both groups. In group A, there were 218 subjects – 162 with ADBU and 56 with AGBU. In group B, out of 233 hospitalized patients, 134 suffered from ADBU and 99 from AGBU. Statistically significantly, the number of patients with ADBU was by 1.5 times higher than those with AGBU ( $p=0.00026$ ).

In both groups, ADGBU treatment was primarily conservative, with frequent prolonged or recurrent bleeding. In group A, 52.3% of patients were subjected to surgical treatment, whereas in group B, 55.36% of patients were subjected to it.

Surgical procedures were the same: ulcer suture with blood vessel ligation, PSV ligation, ulcer excision and partial gastrectomy by BI or BII method. There was no significant difference in the surgical procedures applied in both groups, except that in group A no BI gastrectomies were performed ( $p=0.008$ ), with three times less blood vessel ligatures with PSV ( $p=0.038$ ).

The frequency of complications following surgical interventions is significantly different between the groups. In group A, in AGBU, the incidence of complications which did not require surgery is twice lower than in group B (21% vs. 46%) ( $p=0.00348$ ), while the number of complications in ADBU treatment is approximately the same in both groups (17% vs. 20%). Nevertheless, the total rate of these complications in group A is significantly lower than in group B (18% vs. 31%) ( $p=0.00559$ ).

The complications which were surgically treated, following the AGBU operations, appeared in 41% and 51% of the cases in groups A and B, respectively. The frequency of such complications, following the ADBU operations, was 14% and 35% in groups A and B, respectively. The total frequency of complications was 21% in group A, vs. 42% in group B ( $p=0.000028$ ).



In both groups, laparotomic dehiscence was solved by resuturing of the laparotomic wound.

In group A, suture dehiscence without PSV was treated by stomach resection, while in group B, the suture was performed in 4 (66.66%) AGDU subjects and 2 (25%) ADBU subjects.

In group A, there was no suture dehiscence after blood vessel ligation and PSV, whereas in group B such cases were solved by resuturing gastric ulcers and with BII-type stomach resection in duodenal ulcers.

Resections performed for the purpose of treating complications have not been included in the results of AGDBU treatment.

GEA dehiscences in group A, which occurred in 5 subjects, were resutured in 2 patients with AGBU, while in 3 ADBU patients, demounting anastomosis was performed with a repeated GEA. In group B, 4 AGBU patients had GEA dehiscence: 3 patients (75%) required resuture and 1 patient (25%) required a repeated anastomosis creation. In cases with duodenal ulcers, 5 patients had GEA dehiscence, 2 of which (40%) were resutured and 3 (60%) had a new GEA performed.

In group A, post-operative abscesses, in most cases small and subfrenic, were treated conservatively in 7 (87.5%) subjects, with only one patient requiring surgical evacuation. Of 23 subjects with complications in group B, 19 (82.6%) subjects were drained, and only 4 (17.39%) subjects were conservatively treated.

In groups A and B, in 10 and 19 patients, respectively, a duodenal fistule which could not be treated occurred. There are no data available on their morbidity and mortality.

According to the available data, in group A, 39% out of 218 subjects had complications, while in group B, 74% of the 233 patients had complications after the surgical treatment, which indicates that the frequency of complications was significantly higher in group B ( $p=0.000001$ ).

The average time of hospitalization of the group A conservatively treated subjects was 8 days (6-13 days), while the average hospitalization of the patients treated by ligation with suture was 11 days (9-16 days), ligation with suture and PSV 6.33 days (6-8 days), ulcer excision with suture 8 days (6-10 days) and BII stomach resection 14 days (11-35 days). In group B, in some cases, the hospitalization period was twice as long. Average hospitalization length in conservatively treated patients was 11 days (8-14 days), those treated by ligation with suture 14 days (10-18 days), ligation with suture and PSV 7 days (5-9 days), ulcer excision with suture 14 days (10-18 days), BI stomach resection 16.6 (11-22 days)

and BII 20.5 days (13-28 days).

A comparison of data reveals that the mortality rate in the subjects decreases, both in the case of conservative treatment with substitutive treatment (group A-11.54%, group B-27.88%) and surgical treatment (group A-22.6%, group B-34.88%). Total lethality rate in group A is nearly twice lower than in group B ( $p=0.00253$ ).

Although the total lethality incidence in group A is twice lower than in group B (17.43% vs. 31.75%), the mortality of our patients is above the world's average, which cannot be justified by the age of the patients, inadequate re-animation techniques or some other reasons.

## CONCLUSION

AGDBU represents a serious surgical problem and comprises a considerable part of urgent surgical interventions, accompanied by a number of local and systemic disorders which lead to a rapid deterioration of general patient's condition (and require a rapid and accurate diagnosis).

Urgent diagnostics and, above all, urgent endoscopy (within the first 12 hours of bleeding) is essential for appropriate treatment of such patients. Urgent endoscopy stops bleeding in 98% of the patients, which allows for elective surgical treatment. In prolonged and recurrent bleeding, endoscopic effort should be repeated in the first 12-24 hours. Surgical treatment of AGDBU is associated with high risks and should be a method of choice only in cases of unsuccessful endoscopic attempts.

A surgeon is urged to decide about the surgical treatment with respect to the general patient's condition and ulcer locality, while considering the principles of gastroduodenal surgery. Surgical treatment should not be postponed in favour of conservative treatment which temporarily stops the bleeding, but is neither preventive from prolonged or recurrent bleeding, nor curative. The success of surgical treatment, shorter morbidity or decreased mortality largely depends on the patient's general condition, as well as on the opportunities and appropriacy of the chosen surgical intervention.

High postoperative morbidity and mortality, though significantly decreased in recent years, are indicative enough of the seriousness of this disease. Prevention of complications, appropriate surgical techniques, intensive reanimation procedures, constant education and application of new knowledge offer prospects for achieving better results.

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## PROCEDURE LEČENJA AKUTNIH ŽELUDAČNIH I DUODENALNIH ULCERA KOJI KRVARE

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### SAŽETAK

Profuzna krvarenja gornjih partija gastrointestinalnog trakta predstavljaju hitna medicinska stanja koja zahtevaju intenzivnu reanimaciju i lečenje od strane gastroenterologa i hirurga. Najčešći uzroci ovih krvarenja su variksi ezofagusa i krvareći ulkus želuca i duodenuma.

Lečenje akutnih krvarećih ulkusa želuca i duodenuma (AKUGD), do pre desetak godina, bila su isključivo hirurška. Danas se za hitno operativno lečenje odlučuje u slučajevima nemogućnosti izvođenja interventne endoskopske terapije perzistirajućih ili rekurentnih krvarenja.

Cilj našeg ispitivanja bio je utvrditi način lečenja AKUGD, učestalost i vrstu primenjenih hirurških procedura, postoperativnih komplikacija i mortalitet bolesnika. Ispitivanje predstavlja prospektivno-retrospektivnu studiju bolesnika lečenih od 1995. do 2005. godine na Hirurškoj klinici u Nišu.

Bolesnici su podeljeni u dve grupe: A (2000-2005) i B (1995-1999). Podela je izvršena na osnovu boljeg izvođenja dijagnostičkih i interventnih endoskopskih procedura, poboljšanja reanimacionih postupaka i bržeg odlučivanja za operativno lečenje AKUGD, uz poštovanje principa gastroduodenalne hirurgije.

Podaci studije pokazali su da ne postoji značajna razlika u broju bolesnika (grupa A-218, grupa B-233) i vrsti preduzetih hirurških procedura, ali da je u grupi A došlo do značajnog smanjenja postoperativnih komplikacija (39.44% prema 73.81%) i mortaliteta bolesnika (17.43% prema 31.75%).

**Ključne reči:** ulkus duodenuma, ulkus želuca, hemoragija, krvarenje