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COMPARATIVE ANALYSIS OF TREATMENT RESULTS IN PATIENTS WITH DAMAGE TO DUENUM IN DIFFERENT SURGICAL TACTICS

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ABSTRACT

The analysis of the results of surgical treatment and complications in the early postoperative period in 82 patients with duodenal lesions was carried out. The most frequent and formidable complication in the early postoperative period is the failure of the sutures of the duodenal wound with the development of peritonitis or the formation of an external fistula. The immediate complication leading to a fatal outcome is most often the failure of the sutures of the anastomoses to be applied, retroperitoneal phlegmon, which leads to septic infection and systemic multiple organ failure (SPON).

Key words: Damage to the duodenum, diagnosis, surgical treatment, complications.

INTRODUCTION

The relevance of the research. According to the analysis of home and foreign literature, mechanical damage to the duodenum is an insufficiently studied problem. At the same time, the quality of diagnosis and the results of surgical treatment of patients with duodenal injury still remain at a rather low level, which is explained by the lack of a unified approach to diagnosis and unified surgical tactics for various types of damage to the duodenal wall [1, 3, 9]. The most frequent and severe complication in the early postoperative period is the failure of the sutures of the duodenal wound with the development of peritonitis or the formation of an external fistula [5, 7, 11]. High postoperative mortality occurs mainly due to late hospitalization and diagnosis, ranging from 11.8 to 30.5% with isolated duodenal injuries, and from 46.6 to 80% with combined ones. With the development of retroperitoneal phlegmon, mortality can reach 100% [2, 6, 9].

The direct complication leading to death is most often the failure of the sutures of the applied anastomoses, which result in septic infection and systemic multiple organ insufficiency (MOI) [4, 10, 12]. Also in the literature there are indications of the causes of death: pneumonia, severe toxicosis due to progressive peritonitis and retroperitoneal phlegmon, unrecognized damage to the abdominal organs, sepsis, progressive exhaustion, purulent complications of traumatic pancreatitis, shock, necrosis of the intestinal wall after gunshot woundin, severe concomitant injury [11, 12], multiple organ failure that developed against the background of pancreatitis, disseminated intravascular coagulation syndrome [6, 8, 13]. These problems are the subject of our scientific work.

Purpose of the study. Comparative analysis of treatment results in patients with damage to the duodenum with various surgical tactics.

Material and research methods. The work is based on the analysis of studies carried out in 82 patients with various mechanical injuries of the duodenum who were examined and treated in Samarkand, Surkhandarya, Kashkadarya, Navoi, Jizzakh branch of the Republican Scientific Center for Emergency Medical Care for the period from 2000 to 2020. In most cases, patients of young and middle age were operated on - 63 (76.8%) patients in all, there were 3 times more men than women. There were 64 (78.1%) men and 18 (21.9%) women among the affected patients.

Damage to the duodenum in 5 (6.1%) cases was the result of a fall from a height (catatrauma); the vast majority of duodenal injuries were in 63 (77%) cases due to road accidents; in 4 (4.9%) cases - industrial injuries, and suicide attempts - in 2 (2.4%) observations, iatrogenic damage occurred in 3 (3.6%) observations, beating - in 5 (6.1%) patients. Most of the damage to the duodenum was due to a road accident.

In the conditions of the regions of the Republic of Uzbekistan, it is possible to relatively quickly deliver the victim to a hospital for rendering of qualified specialized medical care. For most cases, this time was 45.3 + 14.5 minutes. However, 17 (20.7%) patients appealed for medical aid more than 6 hours after getting injury. Mostly these are patients with closed abdominal trauma. First of all, the late treatment was associated with patients inadequate assessment of their condition. In the first 6 hours after getting injury, 55 (67%) of 82 victims were admitted to the hospital. In the period from 6 to 24 hours, 17 (20.7%) victims were hospitalized. 24 hours later 10 (12.2%) victims were hospitalized.

Damages to the descending part of the duodenum were revealed in 54 (66%) cases, to the lower horizontal part - in 11 (13.4%) cases, to the upper horizontal part of the duodenum - in 17 (20.7%) cases.

Table 1.

Localization of damage to the duodenum

Localization of damage to the duodenum	*Number of patients*	
	Abs	Abs
Upper -horizontal part	17	20,7%
Descending part	54	65,9%
Lower-horizontal part	11	13,4%
Total	82	100%

An isolated injury appeared in 27 (32.9%) cases. The share of combined and multiple injuries accounted for 55 (67.1%), which were more often revealed in duodenal injuries, that influenced the severity degree of this type of injury. Damage to the duodenum was combined with injury to the pancreas 28 (34.1%), liver - 11 (13.4%), gallbladder - 4 (4.9%), large intestine 4 (4.9%), small intestine - 3 (3.6%) and stomach - 3 (3.6%), portal vein 2 (2.4%). There were no significant differences when comparing the clinical symptoms of patients with isolated and combined closed duodenal injury ($p>0.05$).

The combination of damage to the duodenum with other organs and anatomical areas is presented in Table 2.

Table 2.

Organ damage	*Number of patients*	
	Abs	%
Pancreas	28	34.1%
Liver	11	13.4%
Portal vein	2	2.4%
Gallbladder	4	4.9%
Stomach	3	3.7%
Small intestine	3	3.7%
Colon	4	4.9%
Total	55	67.1%

Depending on the goal and objectives of the study, all the studied patients were divided into two groups.

I (control) group consisted of 34 (41.4%) patients who were treated with the traditional method of treatment, according to the protocol developed in the clinic, designed for placing of a primary suture on the damage to the duodenum with drainage of the abdominal cavity.

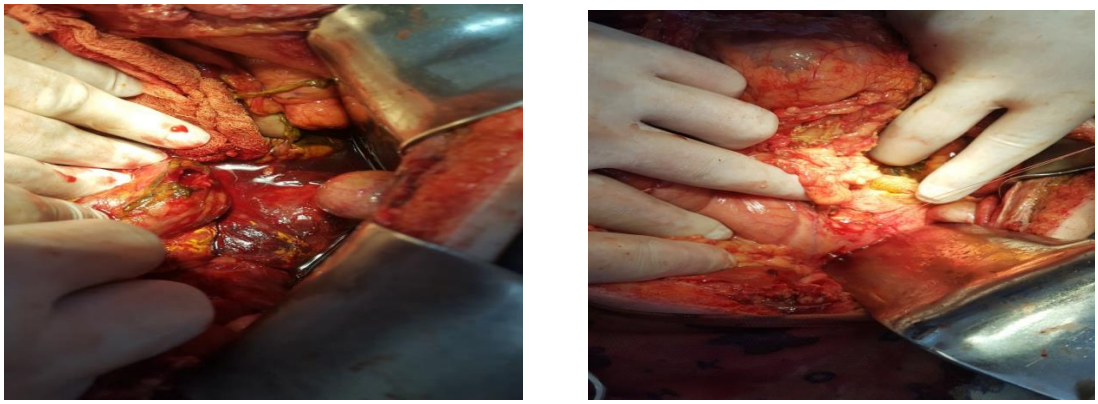

Fig.1. Placing of a primary suture on the damage to the duodenum.

II (main) group consisted of 48 (58.6%) patients, in whom the primary suture of the duodenal wound was supplemented with nasogastroduodenal decompression and passage of a feeding tube, with damage to more than 1/2 of the duodenum circumference, the primary suture was supplemented with a gastric draining operation, diverticulization of the duodenum, antrumectomy, gastrojejunostomy, duodenostomy, drainage of the common bile duct.

Fig.2. Closure of the duodenal wound, diverticulization of the duodenum, duodenostomy.

All patients underwent clinical and biochemical blood tests, X-ray examinations, ECG, ultrasound of the abdominal cavity and retroperitoneal space, and diagnostic laparoscopy, and, if necessary, computed or multispiral computerized tomography. Due to the organizational measures taken and the provision of modern equipment and qualified personnel, it has made it possible to significantly expand diagnostic capabilities and reduce the time for examination of patients admitted for emergency indications with closed injuries and wounds of the abdomen and acute surgical pathology. In the majority of patients with injuries and wounds of the abdomen, the examination was performed directly in the operating room against the background of anti-shock measures.

Research results. As a result of the analysis of surgical treatment of patients with duodenal injuries, the following data were obtained:

In the postoperative period on the 1st and 3rd day in both groups there were signs of intoxication: tachycardia, subfebrile fever, moderate increase in LII. On the 6th and 9th days, all indicators in group II were lower than in group I (table 3). Analysis of the data obtained shows that in group II after surgical treatment of duodenal injuries, symptoms of intoxication and improvement in the well-being of patients occur faster than in group I. Consequently, the ongoing treatment in group II contributes to a favorable course of the postoperative period.

Table 3.

Dynamics of body temperature, heart rate and LII in the postoperative period

Indicator	*1st day*		*3rd day*		*6th day*		*9th day*	
	1 gr	2 gr	1 gr	2 gr	1 gr	2 gr	1 gr	2 gr
body temperature (°C)	38,7± 0,5	37,7± 0,3	37,8± 0,4	37,3± 0,5	37,7± 0,4	36,9± 0,3	37,2± 0,4	36,7± 0,5
heart rate (per min)	118±5	114±4	116±5	108±5	98±4	91±3	88±4	77±3
LII (unit)	2,5±0,2	2,3±0,3	4,5±0,4	4,1±0,3	3,5±0,3	2,1±0,3	3,1±0,2	1,8±0,2

Analysis of the data obtained shows that in group II, after surgical treatment of duodenal injuries, symptoms of intoxication and improvement in the well-being of patients occur faster than in group I. Therefore, the ongoing treatment in group II contributes to the favorable course of the postoperative period.

Taking into account the high percentage of complications and mortality in both the main and control groups, a small number of observations, an assessment of the reliability of an unfavorable outcome was carried out.

In order to carry a dynamic analysis of the condition of patients from the moment of admission to the hospital to discharge, taking into account physiological and clinical data, the following systems of scales Ranson, MIP (Mannheim Peritoneal Index), APACHE II were used. In the group of patients with developed peritoneal phlegmon on the background of duodenal injuries the indices of Ranson and MIP scales were notoriously high and remained high despite treatment. Table 4.

Table 4.

Evaluation of the severity of the condition of patients with duodenal injuries in dynamics in the main and control groups

Group, points	Main Group п=15	Control Group n=21
PIM on the 1st day	19 points	19 points
PIM on the 10 days	11 points	11 points
Ranson on the 1st day	3 points	3 points
Ranson after 48 hours	1 points	4 points
APACHE II 1 day	8 points	9 points
APACHE II 10 th day 3	3 points	5 points

The APACHE II score reflected the positive dynamics of the treatment in the main group. According to the results of the study of clinical and biochemical analyzes, control of the contents of the retroperitoneal space, a dynamic study of the Ranson and MIP criteria, positive dynamics was noted in the main group.

The greatest number of postoperative complications was noted in the group of patients with combined injuries of the liver, pancreas, and intestines. It should be noted that in the postoperative period in 56 (68.3%) patients with closed duodenal injuries, 76 complications were observed (average 1.3 per 1 victim). Rupture of the duodenum due to a closed injury of the abdomen is very often accompanied by post-traumatic pancreatitis, which manifests itself only in the early postoperative period. Against this background, the likelihood of failure of duodenal sutures increases.

Table 5.

Complications of duodenal injury treatment

Type of complication	Control group (n-34)	The main group (n-48)
Pancreatitis	14 (41.2%)	12 (25%)
Pancreatic necrosis	5 (14.7%)	7 (14.6%)
Suture failure	11 (32.3 %)	7 (14.5%)
Retroperitoneal phlegmon	5 (14.7%)	6 (12.5%)
Duodenal fistula	8 (23.5%)	5 (10.4%)
Sepsis	5 (14.7%)	4 (8.3%)
Arrosive bleeding	4 (11.7%)	6 (12.5%)

In group I, after surgical treatment, complications occurred in 24 (70.6%) patients, and in group II - in 16 (33.3%) patients ($p<0.05$). The analysis of complications after surgical treatment shows that in group I more common complications such as pancreatitis in 11 patients (32.3%), pancreatic necrosis in 4 patients (11.7%) than in group II (25% and 12.5% respectively) occured. The incidence of arrosive bleeding in group I was 11.7% (in 4 patients), and in group II

-12.5% (in 6 patients). Also in group I, there were complications such as failure of duodenal sutures (32.3% in 11 patients), retroperitoneal phlegmon (14.7%, in 5 patients), in group II (14.5% and 12.5%, respectively) in group I -duodenal fistula (23.5% in 8 patients), in group II (10.4% in 5 patients), in group I - sepsis (14.7%, in 5 patients), in group II (8.3% in 4 patients respectively).

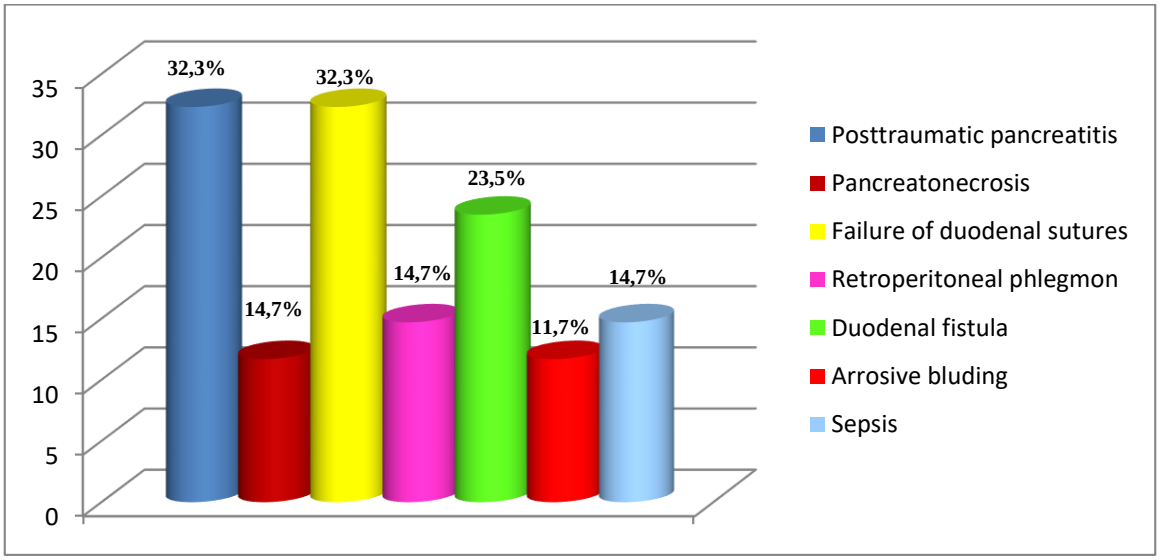

Fig. 3. Complications in the control group after surgical treatment.

As a result of the analysis of the surgical treatment of duodenal wounds, it was found that the likelihood of failure of duodenal sutures increases with the development of complications such as acute pancreatitis and retroperitoneal phlegmon. The most typical were subphrenic, interintestinal and retroperitoneal abscesses, sepsis, retroperitoneal phlegmon, post-traumatic pancreatitis complicated by pancreatic necrosis.

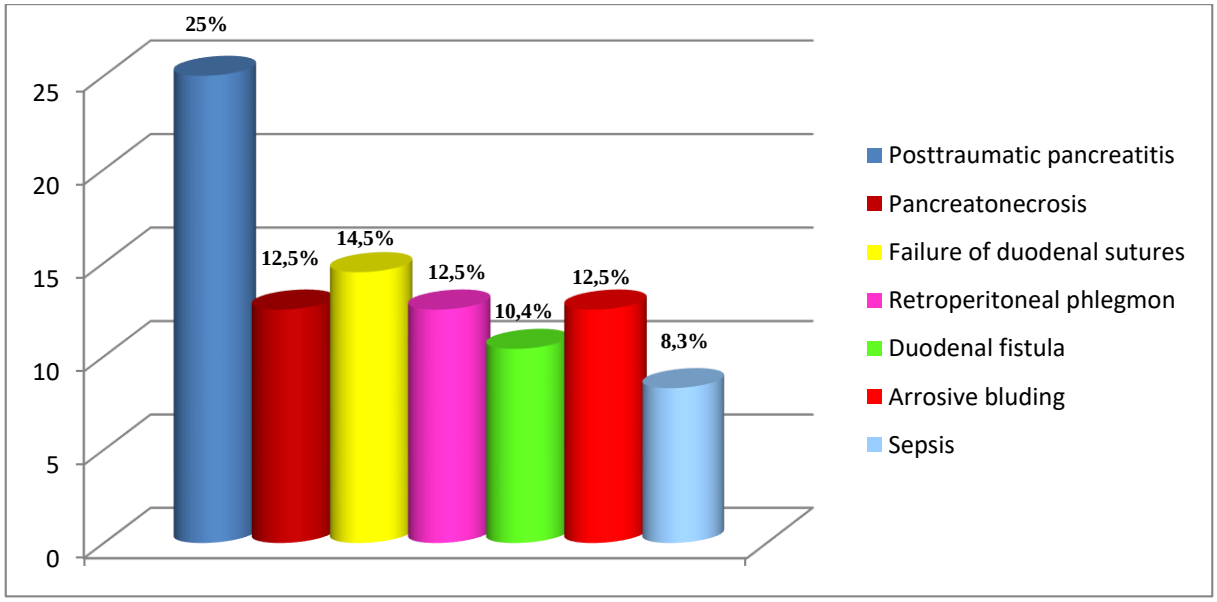

Fig. 4. Complications in the main group after surgical treatment.

The most highly lethal complication was: retroperitoneal phlegmon - 15 (18.3%) cases, of which the largest number was revealed with a closed injury. Lethality depending on the degree of damage is presented in Table 6.

Table 6.

Mortality in duodenal injury depending on the degree of damage

Degree of damage	Number of patients	Mortality	
		abs.h	**%**
Grade I	19	1	5,2
Grade II	36	6	16,6
Degree W	16	4	25
Grade IV	7	3	42,8
Grade V	3	3	100

Mortality among patients with damage to the duodenum of I degree was 1 (5.2%) case, with II degree - 6 (16.6%) cases. The highest mortality was observed among patients with damage to the duodenum of the III degree - 4 (25%) cases. 3 (42.8%) patients died in IV degree of duodenal damage, combined damages to the biliary tract, pancreas, small intestine, transverse colon, and 3 (100%) patients with damage to the duodenum of V degree. With IV and V degrees of damage, the death of patients occurred in the first hours and a week after hospitalization, which was due to the extensiveness of the injury received, a large number of lesions of vital organs.

Lethal outcomes after operations for damage to the duodenum were observed in the following periods: In the first 1-6 days after operations, 7 (8.5%) patients died. The cause of death was associated with the extremely serious condition of the victims before the operation and the progression of multiple organ failure in the postoperative period. Of these, 6 patients were admitted to the hospital in a condition of IV degree traumatic shock and in a condition of endotoxic shock due to retroperitoneal phlegmon. In 10 patients who died from 6 to 10 days after surgery, late purulent-septic complications were noted: arrosive bleeding - in 2 (the source of bleeding was the vessels of the pancreatic head bed - 2); fistulas of the gastrointestinal tract in 2 (duodenal fistula - 2), in 6 victims the cause of death was intoxication caused by retroperitoneal phlegmon and sepsis.

With developed retroperitoneal phlegmon, 5 (55.5%) patients died in the control group, and 4 (66.6%) patients died in the main group.

The treatment performed in the main group made it possible to reduce the risk of an unfavorable outcome, i.e. to reduce mortality to 18.7%. Mortality in the control group, among victims with duodenal injury, was 23.5% (8 patients). In the main group, 9 victims died, while mortality was 18.7% ($p<0.05$).

The average hospital stay of patients with closed duodenal injury was 17.6±11.8 days in the main group and 22.2±13.4 days in the control group ($p>0.05$).

Discussion. Thus, the technique of duodenal injury treatment used in the main group reduces the incidence of complications. Characteristically, the frequency of complications increases with an increase in the degree of damage, and also reaches a maximum value with damage to the descending part of the duodenum.

The proposed treatment and diagnostic program for choosing the method of surgical intervention and management of the postoperative period, depending on the degree of damage to the duodenum with the use of surgical sonation of the retroperitoneal space, will significantly reduce the number of complications, postoperative mortality and improve the results of treatment.

CONCLUSIONS

1. The final decision on the scope of the operation must be taken directly during the operation, taking into account many factors, such as the severity of the patient's condition, the volume and degree of damage to other organs, and the possible need for programmed sanitation.

2. In the early stages after the injury, the imposition of duodenojejunostomy, in our opinion, is the best.

3. In the later stages after the injury, the imposition of duodenostomy on the stretch with disabling the duodenum and with draining operations on the stomach gave good results.

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