*Nat. Volatiles & Essent. Oils, 2021; 8(5): 6799 - 6804*

NVEO
Natural Volatiles & Essential Oils

# The Results of Treatment of Duenal Injuries

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**Summary.** The paper presents the results of diagnostics and features of treatment of traumatic damage to the duodenum for 20 years. The analysis of the results of surgical treatment of 82 patients with closed injuries and wounds of the duodenum was carried out. In the early stages after trauma, the imposition of a duodenojejunostomy is, in our opinion, the best. Separation of duodenum from the digestive system (diverticulation) and operations on the drainage of the stomach, as well as duodenostomy were effective, when the disease was damaged more than half of the duodenum.

**Keywords.** Damage to the duodenum, surgical treatment

**Relevance researches.** Ddiagnosis and treatment of duodenal injury (DPK), especially in the retroperitoneal part, is currently the most difficult and urgent problem of emergency abdominal surgery., the difficulty of the problem is related to the lack of a clear and characteristic clinical picture, and its rarity [1, 3, 17]. To date, the incidence of duodenal injury in the structure of abdominal injuries is about 1.2% -2 and does not exceed 10% in the structure of digestive injuries [2, 4, 9, 11]. The greatest difficulties in making a timely diagnosis are noted with injuries to the retroperitoneal part of the duodenum, which are not diagnosed in 10-30% of victims [5, 7, 8, 13].

Damage to the duodenum (DPK) is one of the most difficult situations for a surgeon, determined primarily by the problem of choosing surgical tactics for treating such patients. Until now, there is no unified surgical tactics in patients with this pathology. With severe injuries of the duodenum, various methods are used.* reconstructive interventions (switching off from of the digestive system, application of gastroetheroanastamosis, pancreatoduodenal resection) [14, 15]. Based on scientific works, the authors point out a large number of complications and high mortality in this category of patients. In the postoperative period, 35-55% of patients develop complications: failure of duodenal sutures, duodenal stump (during cut-off or resection operations), pancreatitis, retroperitoneal phlegmon. As a result, the mortality rate for duodenal injury is 11-30%, and with the development of retroperitoneal phlegmon, it can reach up to 100%[4, 6, 10].

**Purpose of the study.** Analysis of the results of surgical treatment and justification of the optimal amount of surgical care for patients with duodenal injuries.

**Material and methods of research.** The work is based on the results of examination and treatment of more than 82 patients with various mechanical devices damage to the duodenum patients who were examined and treated in Samarkand, Surkhandarya region, Kashkadarya Region, Jizzakh branch of the Republican Scientific Center for Emergency Medical Care for the period from 2000 to 2020

To perform a retrospective analysis results of treatment of patients with traumatic injuries of the duodenum archived data on patients and were identified the following results:

The distribution of patients by age was made in accordance with the classification of age groups adopted by WHO (Kiev, 1963). In most cases, young and middle – aged patients were operated on-63 (72.8%), there were 2 times more men than women. There were 64 (83%) men and 13 (17%) women among the victims.

Injuries to the duodenum in 5 (6.1%) cases were caused by falling from a height (catatrauma).the overwhelming majority of injuries to the duodenum had in 63 (77%) cases - road accidents; in 4 (4.9%) - work injuries, and suicide attempts - in 2 (2,4% ) observations, iatrogenic damage occurred in 3 (3,6% ) observation, beating - in 5 (6,1) patients.

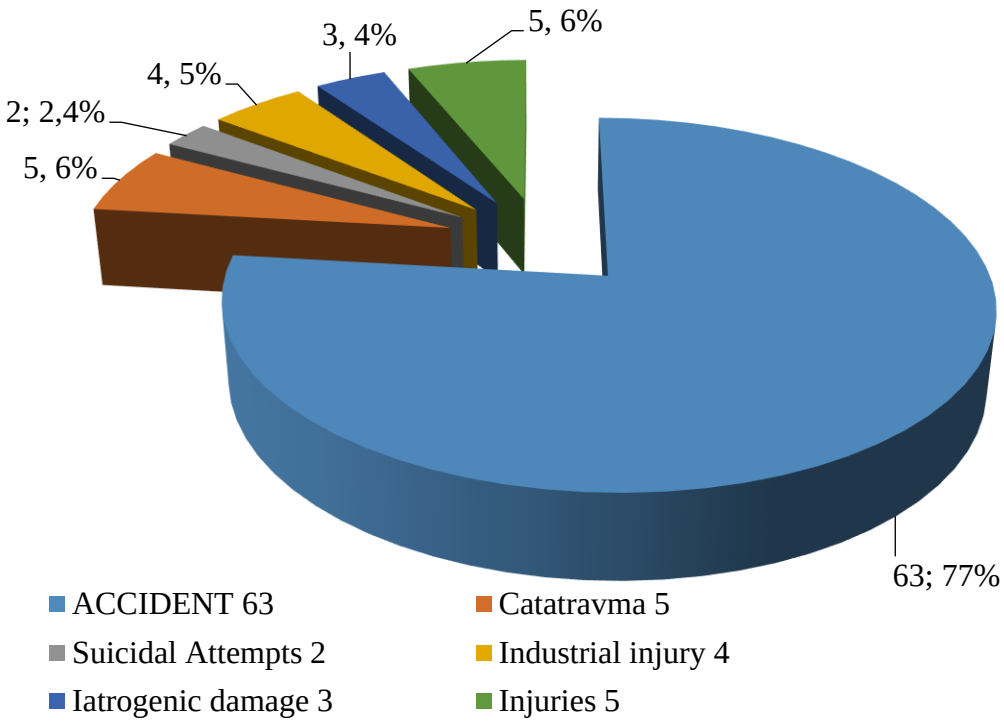
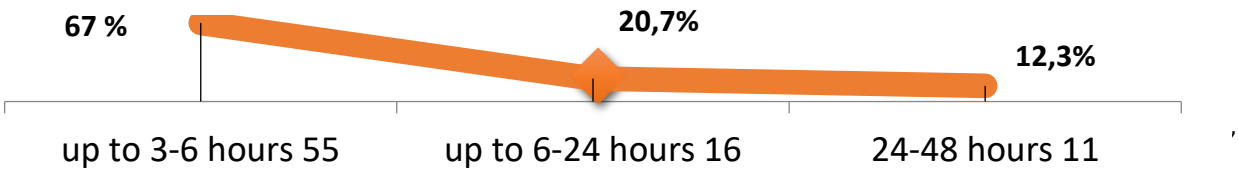



Figure 1. Mmechanism of damage in patients with mechanical damage to the duodenum guts.

In the conditions of the regions of the Republic, it was possible to deliver the victim to a hospital relatively quickly for the provision of qualified specialized medical care. For most cases, this time was 45.3+ 14.5 minutes. However, 17 (20.7%) patients sought medical attention more than 6 hours after the injury. Mostly these are patients with a closed abdominal injury. First of all, the late treatment was associated with an inadequate assessment of patients ' condition. Secondly, it is the presence of the so-called "hidden period". In 12 patients (14.6%) with closed damage to the duodenum after receiving a blunt blow to the abdomen did not have a pronounced pain syndrome. And only after several hours, and in some cases even days, in the absence of the effect of taking analgesics and with increased abdominal or back pain, the appearance of hyperthermia, the victims sought medical help.. In the first 6 hours after the injury, 55 people were admitted to the hospital (67%) of 82 victims. 17 (20.7%)were received in the period from 6 to 24 hours victims. 10 patients (12.2%)were hospitalized after 24 hours victims. The time elapsed from the time of injury to admission of the studied patients to the hospital is shown in Figure 2.



which were more often detected in duodenal injuries, which affected the severity of this type of damage. Injuries to the duodenum were combined with injuries to the pancreas-31 (37.8%), liver-19 (23.2%), gallbladder-6 (7.3%), large intestine-10 (12.2%), small intestine-7 (8.5%) and stomach-5 (6,1% ), portal vein 2 (2.4%). No significant differences were found when comparing the clinical symptoms of patients with isolated and combined closed duodenal injury (p>0.05).

Damage to the descending part of the duodenum was detected in 54 (66% ) cases, the lower-horizontal part - in 11 (13,4% ) cases, the upper-horizontal part of the WPC - in 17 (20,7% ) of observations

Table 1.

Lokalizatsiyand damage to the WPC

| Lokalizatsiyand | Number of patients | |
|---|---|---|
| | Abs | % |
| Upper-horizontal part | 17 | 20,7% |
| Descending order | 52 | 63,4% |
| Lower-horizontal part | 11 | 13,4% |
| Duodenal papilla | 2 | 2,4% |
| Total | 82 | 100% |

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

I The (control) group consisted of 34 (41.4%) patients who used the traditional treatment method, according to the protocol developed in the clinic, designed for applying a primary suture on the duodenal injury with drainage of the abdominal cavity.

II The (main) group consisted of 48 (58.6%) patients who had the primary suture of the duodenal wound was supplemented by nasogastroduodenal decompression and a feeding probe; for injuries of more than 1/2 of the duodenal circumference, the primary suture was supplemented by gastric drainage surgery, duodenal diverticulization, duodenal wound closure, antrumectomy, gastroejunostomy, duodenostomy, drainage of the common bile duct.

Upon admission to the hospital, all patients underwent clinical and biochemical blood tests, X-ray examinations, ECG, ultrasound of the abdominal cavity and retroperitoneal space, diagnostic laparoscopy,and, if necessary, computer or multispiral computed tomography. Thanks to the organizational measures carried out and the provision of modern equipment and qualified personnel it has significantly expanded diagnostic capabilities and reduced the examination time of patients admitted for emergency indications with closed injuries and wounds abdominal pain and acute surgical pathology. In most patients with abdominal injuries and injuries, the examination was performed directly in the operating room against the background of anti-shock measures.

**Research results.** The results of the study did not reveal any pathognomonic symptoms characteristic of duodenal injuries. In more than 10% of cases, patients did not make any complaints at all. In addition, the clinical picture of duodenal injuries in many patients was erased or "masked" by combined injuries to other organs and anatomical areas, lack of consciousness and alcohol intoxication. The main complaints when patients are admitted there was a pain in my stomach. As a rule, it was non-localized. In 17(20.7%) cases, there was pain in the lumbar region.

To determine the most optimal treatment and diagnostic strategy programs and continuity of surgical care. damage classification WPC E. Moore et al (1990) [263]:

**I degree of damage** - the presence of a hematoma that occupies no more than two anatomical parts, or a non-penetrating defect of the D wallPTo.

**N Degree of damage** - presence of a wall defect up to 50% of the circumference intestines with concomitant damage to the pancreas with the presence of retroperitoneal phlegmon.

**III degree of damage** - the presence of an extensive defect in the duodenum wall (over 50% of the circumference) with concomitant pancreatic damage glands and the presence of retroperitoneal phlegmon.

**IV degree of damage** - rupture of more than 75% of the intestinal circumference, damage to the ampulla and distal part of the choledochus.
**V degree of damage** - separation of the Vater papilla, common bile duct or head pancreas from the wall of the duodenum, massive damage to the pancreatic duodenal zone due to crushing of the duodenum and the head of the pancreas.

In the first group, the wounds were limited to the primary suture in 21 (61.7%) patients. The primary suture was supplemented with cholecystostomy in 6 (17.6%) cases. In the second group, the primary duodenal suture was supplemented with cholecystostomy and drainage of the omental bursa. Nasogastroduodenal decompression with active aspiration and installation of an intestinal tube for feeding behind Treitz's ligament were performed in all cases. The formation of a bypass gastroenteroanastomosis with Brown's anastomosis was also carried out in 33 (68.7%) patients with injuries of more than ½ of the duodenal circumference. In 2 (5.8%) cases in group I, 2/3 of the stomach was resected according to Billroth-P modified by Hofmeister-Finsterer with cholecystostomy.
Decompression of the duodenum is an important aspect of the operation in case of damage to the duodenum. In group I, with injuries to the duodenum, nasogastroduodenal decompression was not always performed. In group II, all observations without exception were completed with nasogastroduodenal decompression and insertion of an intestinal tube for feeding over the Treitz ligament.

In case of duodenal hematomas in group I, they limited themselves to the evacuation of the hematoma with subsequent drainage of the retroperitoneal tissue in 5 (14.7%) cases; in group II - evacuation of hematoma followed by drainage of retroperitoneal tissue was supplemented with cholecystostomy - in 14 (29.1%) cases. All hematomas were revised in order to exclude the nature of damage penetrating into the intestinal lumen. Hematomas located in the retroperitoneal part of the duodenum were revised after mobilization according to Kocher. In two patients, revision of the hematoma made it possible to establish a rupture of the intestinal wall. In both groups, the duodenal wall defect was sutured with two-row interrupted sutures. The first row was formed with absorbable suture material on an atraumatic needle (polysorb, vicryl).
The II degree of damage (the presence of a wall defect up to 50% of the intestinal circumference with concomitant damage to the pancreas and developed retroperitoneal phlegmon) with a closed injury was detected in 36 (43.9%) patients. Damage to the duodenum after excision of the wound edges, a primary suture was imposed, supplemented by cholecystostomy, drainage of the omental bursa and retroperitoneal tissue, and nasogastroduodenal decompression and an intestinal tube for feeding for Treitz's ligament, and in 14 (38.8%) cases, the primary suture was supplemented with cholecystostomy.

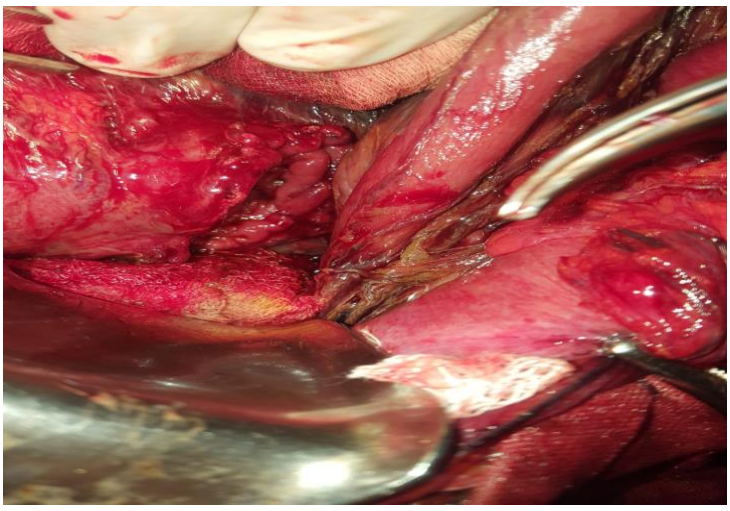


Fig 3. Damage to the lower-horizontal part of the duodenum up to 50% of the circumference.

III degree of damage to the duodenum (the presence of an extensive defect in the wall of the duodenum over 50% of the circumference with concomitant damage to the pancreas and the presence of retroperitoneal phlegmon) was detected in 16 victims.

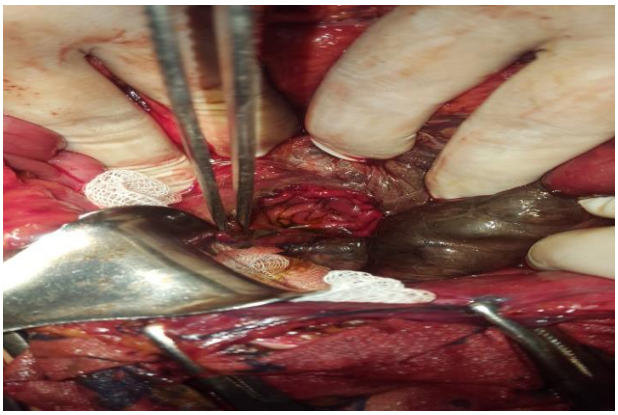


Fig 4. Damage to the lower-horizontal part of the duodenum more than 50% of the circumference and retroperitoneal phlegmon.

In 10 patients of this group, single injuries of the duodenal wall were found within 50% of the circumference, complicated by focal pancreatonecrosis and infected retroperitoneal hematoma. In all cases, the patients were admitted for the first time 12 hours from the moment of injury with the clinic of peritonitis. In all patients, the duodenum was switched off from the passage. In 5 cases, grade III duodenal lesions were combined with pancreatic lesions in the form of capsule rupture and with signs of retroperitoneal phlegmon, with foci of steatonecrosis around the duodenum, hemorrhagic effusion in the omental bursa.

IV degree of damage to the duodenum (rupture of more than 75% of the circumference in the second section, damage to the ampulla or distal part of the common bile duct) was observed in 7 (8.5%) patients. In 3 cases, duodenal diverticulization was performed with unloading jejunostomy (the duodenum wall was sutured with a two-row suture, then the duodenum was turned off, followed by peritonization with a number of interrupted sutures). The operations were completed by the GEA.

In 3 cases, 2/3 of the stomach was resected according to Billroth-P modified by Hofmeister-Finsterer (GF) with cholecystostomy, bypass HEA with Brown's anastomosis - in 1 patient. The duodenal wall defect was sutured with two-row interrupted sutures.

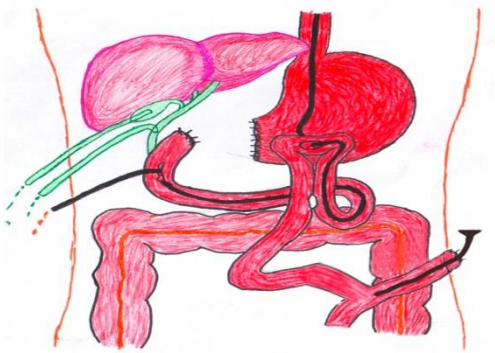


Fig 5. Operation Donavan-Hagen with the imposition of nutritional jejunostomy according to Vitzel.

Was carried out nasogastroduodenal active aspiration, installation of an intestinal probe for nutrition, drainage of retroperitoneal tissue. In all cases, the operation was complemented by duodenostomy and cholecystostomy.

V degree of damage to the duodenum (detachment of the Vater papilla, common bile duct or the head of the pancreas from the wall of the duodenum, massive damage to the pancreatoduodenal zone due to crushing of the duodenum and the head of the pancreas) was diagnosed in 3 victims. In 1 case, pancreatoduodenal resection with unloading jejunostomy was performed. Two patients died during surgery due to profuse bleeding.

Discussion. At the present stage, the treatment of victims with duodenal lesions remains a difficult task that requires further study. The development of new diagnostic techniques and the choice of operations for extensive damage to the

duodenum with adequate drug therapy will help reduce the number of postoperative complications and mortality in this severe category of patients.

Conclusions. Decompression through a tube with constant aspiration of duodenal contents in the postoperative period is an effective measure for the prevention of suture failure and traumatic pancreatitis. In the early stages after trauma, the imposition of a duodenojejunostomy is, in our opinion, the best. In the later periods after the injury, the imposition of duodenostomy along with the disconnection of the duodenum and with drainage operations on the stomach gave good results.

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