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# PROGNOSTICUL REZECTIEI PANCREATODUODENALE PE FUNDALUL ICTERULUI MECANIC

## PROGNOSIS OF PANCREATODUODENAL RESECTION PERFORMING ON THE BACKGROUND OF MECHANIC JAUNDICE SYNDROME

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### Rezumat

Tratamentul chirurgical reprezintă terapia de bază în icterele mecanice și are 2 obiective principale: decompresia arborelui biliar (prin suprimarea obstacolului) și reintroducerea bilei în circuitul digestiv.

Aplicarea algoritmului de decompresie biliară propus, luând în considerare riscul prevăzut de intervenție chirurgicală radicală, a făcut posibilă pregătirea pacienților pentru rezecția pancreatoduodenală în termeni optimi prin realizarea unor indicatori satisfăcătoare a stării lor și evitarea progresiei insuficienței hepatice.

### Summary

Surgical treatment is the basic therapy in mechanical jaundice and has 2 main objectives: decompression of the bile shaft (by suppression obstacle) and reintroduction of the ball into the digestive tract.

Applying the proposed biliary decompression algorithm, taking into account the risk predicted by radical surgery, made it possible to prepare patients for pancreatoduodenal resection in optimal terms by achieving satisfactory indicators of their condition and avoiding the progression of liver failure.

### Topicality

Nowadays, pancreatoduodenal resection (PDR) continues to be the only radical surgical intervention in the treatment of focal pathology of the pancreatoduodenal zone, and remains the most difficult, accompanied by a large number of postoperative complications [3, 4, 5]. The PDR performing in conditions of cholemia increases the risk of postoperative complications and is accompanied by high postoperative mortality exceeding 20% [1, 2, 3].

The use of puncture-draining and minimally invasive endoscopic surgical interventions at the stage of preparing of the patient for radical surgical intervention in the volume of PDR allows reducing the level of cholemia in a relatively short time [3, 5]. However, the existing methods of decompression of biliary hypertension are not safe enough and can lead to deterioration in the condition of patients in the first few days, manifested by progression of cholestatic and cytolytic syndrome, toxic hepatic encephalopathy, multiple organ failure [6].

According to some findings, a rapid decrease in pressure in the biliary system leads to a reduction in portal blood flow, causing disorganization and dissociation of hepatic acini, presumably due to the activation of lipid peroxidation and violation of the antioxidant defense of hepatocytes [1, 2, 6]. While delaying the onset of decompression of the bile ducts and increasing the time to complete the radical phase of surgical treatment often worsens the prognosis of survival.

**The aim** of the study was to determine the possibility of predicting an adverse course of the postoperative period in terms of the planned pancreatoduodenal resection because of focal formations of pancreatoduodenal zone on the background of obstructive jaundice.

### Materials and methods

The results of complex surgical treatment of 272 patients with focal pathology of the pancreatic head, accompanied by the phenomena of hyperbilirubinemia, were analyzed. The average age of patients was 47.3 years, 141 men (51.8%), 131 women (48.2%).

Based on the initially asymptomatic course and patients seek for medical help only as the pain or obstructive jaundice syndrome manifests itself, we focused on instrumental research methods in view of the assumption of interest in the pathological process of nearby organs and the main structures, signs of disease neglect.

The diagnostic algorithm at the hospitalization stage included the mandatory performance of ultrasound, CT, MRI, FEGDS, according to indications – ERCP, PET-CT. Mandatory for verification of malignant lesions of the pancreatic head (pancreas) was the determination of the levels of specific tumor markers (CEA, CA 19-9, CA 50).

The main clinical manifestations were obstructive jaundice, Courvoisier syndrome, pain, and minor oncological symptoms.

According to the results of the diagnostic algorithm, pancreatic head cancer was verified in 174 (63.9%) of patients, Vater's papilla cancer in 20 (7.4%), distal choledocheal cancer in 24 (8.8%) and chronic pseudotumoral pancreatitis in 54 (19.9%) of them.

### Research results discussion

Most of patients were admitted in a severe condition, with prolonged jaundice (2-3 weeks or more) and with high bilirubin level (over 200  $\mu\text{mol/L}$ ). Surgical tactics were determined in accordance with the results of the examination. After determining the risk level of the planned radical surgical intervention according to the developed formula (taking into account the pathomorphological parameters of the patient's condition), a decision was made regarding the volume of surgical treatment.

The risk degree (X) of the PDR performance was evaluated by the formula:

$$X = 904.3 + 1.7(\text{Bil}) - 0.2(\text{AlcPh}) - 3.2(\text{GP}) - 7.5(\text{CEA}) + 13.0(\text{CA50}) - 6.8(\text{Alb}) - 24.9(\text{CD}) - 4.6(\text{Dens}) - 83.0(\text{INR}):$$

- X – the risk degree;
- Bil – general bilirubine level before surgery;
- AlcPh – alkaline phosphatase level;
- GP – general protein level;
- CEA – CEA level;
- CA50 – CA50 level;
- Alb – albumin level;
- CD – the common bile duct diameter;
- Dens – density of pancreatic parenchyma in HU;
- INR – coagulation,

and with values of  $X \geq 60$ , radical surgery is defined as highly-risked, and shunting decompression interventions were performed as a first step of radical surgery performing.

Decompression of biliary hypertension was carried out mainly using minimally invasive technologies by performing puncture-draining ultrasound-controlled and laparoscopic interventions in 261 (95.9%) of patients.

Depending on the type of preparation for radical surgery, all patients were divided into two groups: the main group, where an optimized decompression algorithm was used ( $n = 112$ ), and the control group, where preparation for pancreatoduodenal resection was performed according to generally accepted standards ( $n = 160$ ).

In 112 of patients (the main group), preparation for the main surgical intervention was based on the express detoxification according to the developed scheme. The method consisted in performing a traditional transhepatic decompression of the biliary tree with 6F or 9F catheters under ultrasound guidance, followed by the administration of a specially selected pharmaceutical complex to reduce cholemia as soon as possible, extracorporeal detoxification in the form of several plasmapheresis sessions. The efficiency of decompression was evaluated by the volumetric rate of bile secretion by drainage, the value of a 60-100 ml/day was accepted as the optimal target level, and the most acceptable was 300 ml/day. Given the likely development of hepatargy in response to the rapid rate of decompression, the volumetric rate of bile outflow through the catheter was increased daily so that this increase did not exceed 50% of the previous rate determined over the past day.

Daily monitoring of the markers of cytolytic (AlAT, AsAT, GGT) and cholestatic (level of bilirubin and alkaline

phosphatase) syndromes was performed. A satisfactory decrement for these indicators is taken no more than 20-25% per day.

For obvious effectiveness of the optimized express-detoxification method, the results were compared with those in 160 patients (control group) who underwent the usual preoperative preparation. The terms before the onset of the cholemia level decrease, in patients of the main group, were shorter than in patients in the control group (by 41.2%), while the duration of the resolution of cholemia (or, more often, reaching its acceptable level) in patients of the control group was significantly longer (by 68.2%) ( $p < 0.01$ ).

We have performed various types of pancreatodigestive anastomoses (PDA). Whipple terminal-lateral anastomosis was implemented in 38 (13.8%) patients, Shalimov-Kopchak's termino-terminal anastomosis in 40 (14.6%), ductomucosal pancreatojejunoanastomosis (PJE) in 128 (47.0%), routine pancreatogastroanastomosis (PGA) with invagination of the stump of the pancreas in the stump of the stomach – in 35 (12.8%), PGA with immersion of the stump of the pancreas in the sleeve, cut from the greater curvature of the stomach – in 32 (11.8%) of them.

In the process of finding the most optimal pancreatodigestive anastomosis, in particular, with a weakly expressed pancreatic capsule and a "soft" parenchyma, we've began to use the so-called "sleeve" PGA as an alternative to routine PGA (Fig. 1). A feature of this anastomosis is the immersion of the stump of the left pancreatic segment of any length in a "sleeve" cut out of the greater curvature of the stomach with the maximum possible preservation of the short gastric arteries that feed it. The advantage of this technique is the absence of tension in the suture line of PGA due to the mobility of the "sleeve" from the greater curvature of the stomach.

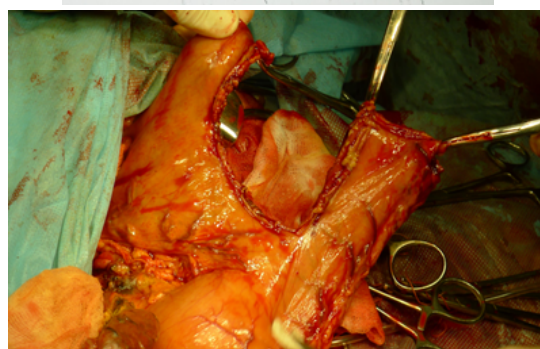
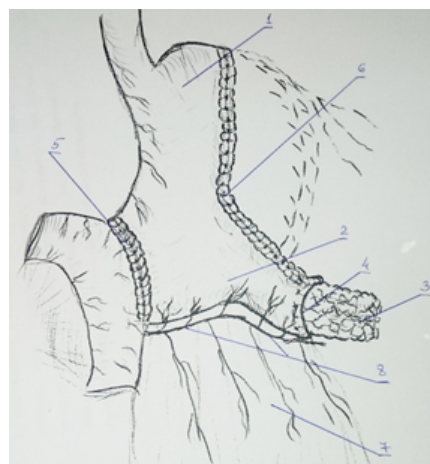


Fig. 1. The view of "sleeve" pancreatogastroanastomosis

According to the Clavien - Dindo classification, the following postoperative complications were noted: II gr. – 54 patients, III gr. – 8, IV gr. – 2. Insufficiency of pancreatodigestive anastomosis developed in 32 (11.7%) of patients.

14 patients died. In single case myocardial infarction was a reason of death, pulmonary artery embolism – 1, and common

hepatic artery – in 1, thrombosis of the superior mesenteric artery (2 of patients). Furthermore, pancreatic stump necrosis with anastomosis failure and sepsis – in 4 cases (1.4%), with arrosive bleeding – in 3 of cases (1.1%), and biliodigestive anastomosis failure with bile peritonitis – in 1 case. Liver failure was detected in 1 patient (Table 1). The mortality rate was 5.1%.

**Table 1**

*Distribution of patients depending on the type of complications*

Complications \ Method	Whipple n= 38 (13.8%)	Shaimov's- Kopchak's n= 40 (14.6%)	Ductomucosal PJS n= 128 (47.0%)	Routine PGA n= 35 (12.8%)	«Sleeve» PGA n= 32 (11.8%)
Complications					
Myocardial infarction	-	1	-	-	-
Pulmonary embolism	1	-	-	-	-
Hepatic artery thrombosis	-	-	1	-	-
SMA thrombosis	1	1	-	-	-
Pancreatic stump necrosis	2	1	-	1	-
Arrosive bleeding	-	2	1	-	-
Biliodigestive anastomosis failure	1	-	-	-	-
Liver failure	1	-	-	-	-

**Conclusion.** The application of the proposed biliary decompression algorithm taking into account the predicted risk of radical surgical intervention made it possible to prepare

patients for pancreatoduodenal resection in optimal terms by achieving satisfactory indicators of their condition and avoid the progression of liver failure.

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