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## Postoperative complications in patients with chronic pancreatitis complicated by biliary hypertension

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### Abstract

The population of Ukraine has very high indicators of chronic pancreatitis occurrence. Due to ineffectiveness of conservative treatment and development of different complications, up to 9% of patients with chronic pancreatitis require surgical intervention. This paper focuses on the analysis of surgical treatment of 120 patients with complicated forms of chronic pancreatitis who received operative therapy at the department of general surgery of the Ivano-Frankivsk Regional Clinical Hospital in 2009-2015. The author offers some generalized statistical data on effectiveness of application of these procedures at the abovementioned medical facility. In particular, attention is paid to such methods of treating chronic pancreatitis complicated with biliary hypertension as Frey's procedure, Beger procedure, and Bern modification. The author attempts at studying the reasons for postoperative complications in patients with chronic pancreatitis with biliary hypertension, and elaborating the measures to prevent them. For this purpose, the effectiveness of different surgical procedures used for prevention and elimination of chronic pancreatitis complications is analyzed. The author suggests preventive measures he deems reasonable in such cases.

**Keywords:** chronic pancreatitis, biliary hypertension, postoperative complications, preventive measures.

### 1. Introduction

The frequency of chronic pancreatitis (CP) occurrence in Ukrainian population varies from 0.2% to 0.68%, i.e. from 25 to 50 cases per 100,000 of population, which is a very high rate [1]. Due to ineffectiveness of conservative treatment and development of different complications, 4 to 9% of patients with CP require surgical intervention [2].

Most frequently, chronic pancreatitis is complicated by dysfunction of the biliary system, and development of symptomatic or asymptomatic biliary hypertension (BH), which occurs in 25-40% of cases. A common cause of jaundice in CP is biliary stricture and duodenal stenosis caused by extensive pancreatic fibrosis and inflammation in the pancreatic head. In such cases adhesion between the pancreatic head and duodenum is formed causing dismotility, stricture, and tubular stenosis of biliary ducts with development of the obstructive jaundice [3]. Obstruction of the choledoch is found in 56.3% of patients with CP, jaundice – in 22.2%, and jaundice combined with cholangitis – in 6% of patients [4]. The development of obstructive jaundice in chronic pancreatitis is largely caused by fibrotically changed “pancreatic lingula” constricting the distal part of the common bile duct [5].

At present, the most optimum intervention method in CP with BH is duodenum-preserving pancreatic head resection (Frey's procedure, Beger procedure, and Bern modification). It is reasonable to supplement Frey's procedure with additional excision of the “pancreatic lingula”, and in cases of the distal strictures of hepaticocholedoch – by applying hepaticojejunoanastomosis [5].

Specific complications of operations on pancreas include: postoperative pancreatitis, failure of pancreaticodigestive anastomosis, gastrointestinal and intra-abdominal hemorrhages, pancreatic and biliary fistula, and septic complications [6]. Most dangerous complications are gastrointestinal hemorrhages from the pancreaticojejunostomy area, and failure of the pancreaticojejunoanastomoses, which often go together and cause the mortality rate of up to 60% of all cases [7].

This paper is aimed at studying postoperative complications in patients with CP complicated by BH, and elaborating preventative measures.

### 2. Materials and Methods

In 2009-2015, 120 patients with complicated form of CP underwent surgical treatment at the department of general surgery of the Ivano-Frankivsk Regional Clinical Hospital. In 38(31.6%) patients CP was accompanied by BH. In 14 (11.6%) patients BH was combined

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with chronic duodenal obstruction (CDO), and in 4 (3.3%) patients the combination of BH+CDO and local venous hypertension (VH) of vessels in pancreaticobiliary area was found. The presence of venous hypertension was proven by dilatation of portal vein by more than 1.1 – 1.3 cm during the ultrasonic diagnostics. Additional signs of VH included megalosplenia (2 patients) and gastric varices (1 patient). The analyzed group of patients included 35 (92.1%) men and 3 (7.9%) women aged 21-60.

In addition to laboratory findings, of most importance for diagnostics of changes in pancreas, pancreatic ducts, and the adjacent organs were: ultrasonic examination, endoscopic retrograde cholangiopancreatography (ERCP), and contrast-enhanced computed tomography (CECT).

Intraoperative monitoring of biliary pressure was done in 4 patients to assess the advisability of performing duodenum-preserving operations on the pancreatic head in cases of CP (Frey's procedure, Beger procedure, and its Bern modification) for the purposes of disburdening biliary ducts, finding masked biliary hypertension, and correcting it intraoperatively. In cases of BH (rest pressure in choledoch exceeded 160 mm w. g.), Frey's procedure was supplemented by Roux-en-Y hepaticojejunostomy.

### 3. Results and Discussion

Tubular stenosis of the intrapancreatic part of choledoch caused by fibrous degenerative changes in the pancreatic head was the reason for BH in all 38 patients. In 9 (23.6%) patients it was combined with cysts of pancreatic head. In 27 (71.0%) patients BH had clinical signs (ochrodermia and mucous membrane icterus, and hyperbilirubinemia), in 11 (29.0%) patients BH was asymptomatic and was only diagnosed with the help of ultrasonic diagnostics and CT (tubular stenosis and dilatation of the suprapancreatic choledoch division from 0.7 cm to 1.3-1.5 cm). In 2 (5.2%) patients of this group, BH was accompanied by signs of cholangitis.

In the course of ultrasonic diagnostics, local or diffuse enlargement of the pancreatic head from 3.5 to 5.6 cm were found in all patients, and structural imperfection of the pancreas was found in 24 (63.1%) patients. Dilatation of pancreatic duct of more than 5 mm was found in 12 (31.6%) patients, and lithiasis of Wirsung's duct – in 5 (13.1%) patients.

All patients with CP underwent surgical treatment. They had draining, resection, and combined surgical interventions.

The operations are characterized in Table 1.

**Table 1:** Characteristics of the surgical interventions in patients with chronic pancreatitis complicated by biliary hypertension

Surgery	Number	%
Pancreaticoduodenal resection (Whipple procedure)	5	
Frey's procedure	11	
including with choledochojejunostomy	2	
including with insertion according to V. Kopchak and choledochojejunostomy	2	
Bern modification of Beger procedure	2	
Longitudinal pancreaticojejunostomy	8	
including choledochoenteroanastomosis	3	
including with insertion according to V. Kopchak and choledochoenteroanastomosis	1	
Cystenterostomy	2	
Endoscopic cystoduodenostomy	2	
Application of biliodigestive anastomoses	2	
External drainage of the pancreatic cyst	1	
ERCP with endobiliary stenting	5	
Total	38	100.0

Complications of the early postoperative period are presented in Table 2.

**Table 2:** Early postoperative complications in patients with CP complicated by BH

Complication	Frey's procedure	Beger procedure	Pancreaticoduodenal resection	Biliodigestive anastomoses	Endobiliary stenting	Endoscopic cysto-duodenostomy	External drainage of cysts
mortality	2	0	0	0	0	0	0
failure of anastomosis sutures	1	0	0	0	0	0	0
gastrointestinal hemorrhage	1	0	0	0	1	0	0
early adhesive intestinal obstruction	1						
relaparotomy	2	0	1	0	0	0	0
gastrostasis	0	0	3	0	0	0	0
Total	4	0	4	0	1	0	0

Due to complexity of the general condition or serious concurrent conditions, direct interventions to the pancreas were not applied in 12 (31.5%) patients (2 patients had biliodigestive anastomoses (BDA) applied, 5 patients underwent ERCP and endobiliary stenting, 2 patients – open cysto-enterostomy, 2 patients – endoscopic cystoduodenostomy, 1 patient – external drainage of cyst in the pancreatic head area). The interventions applied in these cases were not pathogenetic, did not eliminate the main substrate of the disease (fibrinous degenerative changes of the pancreatic head), and did not stop the disease from progressing. However, they helped to eliminate BH (temporarily or permanently) and decreased pain syndrome. Patients with BDA underwent only application of the hepatico-jejunoanastomosis (HJA) on Roux-en-Y loop as the most physiologically-friendly procedure. For this reason, application of the cholecystenterostomy and hepatico-entero-anastomoses with entero-entero-anastomosis according to Brown was not used. Postoperative complication (moderate hemorrhage from the papillotomic wound) occurred in one patient, who underwent ERCP and endobiliary stenting. Conservative hemostatic therapy proved to be effective in this case.

Frey's procedure was applied to 11 (28.9%) patients. Main indications for this intervention included enlarged, fibrotically changed pancreatic head, ectasia of Wirsung's duct, lithiasis of Wirsung's duct, and cyst in the pancreatic head accompanied by malfunction of pancreatic juice and bile outflow. Typical Frey's procedure was applied in 7 (63.6%) of 11 patients. During the reconstructive stage of the operation on a patient with postnecrotic intrapancreatic cyst of the pancreatic head, a transplant from the small bowel on vascular pedicle was taken, pancreatico-jejunoanastomosis, and, additionally, an anastomosis between the small bowel transplant and the descending branch of the duodenum in the plane of the major duodenal papilla were applied, and continuity of the digestive tract was restored by application of the end-to-end enteroanastomosis.

If there was no assumption of malignant process in patients with CP complicated by BH and obstructive jaundice, it was deemed reasonable to apply Frey's procedure supplemented by application of biliodigestive anastomoses at the reconstructive stage of the surgery. In cases of sustained BH that was not eliminated endoscopically, the intervention was done in two modifications: Frey's procedure + application of Roux-en-Y choledochojejunostomosis – 2 patients; Frey's procedure + longitudinal pancreatico-jejuno-duodenostomy on an isolated fragment of the small bowel on vascular pedicle according to V. Kopchak, and application of the Roux-en-Y choledochojejunostomosis – 2 patients.

Postoperative complications occurred in 2 (18.1%) patients. Early adhesive small bowel obstruction was found in one patient on the 5<sup>th</sup> day, and eliminated by repeated surgical intervention. The second patient had acute gastric hemorrhage from the acute erosions and ulcers of stomach and duodenum (II B, according to the Forrest endoscopic classification of bleeding), which was eliminated by conservative means. Two (18.1%) of 11 patients died. The death was caused by hemorrhage and failure of anastomosis sutures (1), and cardiac shock (1). In a patient with a hemorrhage from the tissue of pancreatic head into the lumen of PJA, upper semicircumference of PJA was detached and the hemorrhage locus was sutured in the process of relaparotomy. However, the failure of PJA sutures developed later and caused lethal outcome.

Other patients had no complications during the postoperative period, they were discharged from the hospital in satisfactory condition. Patients' stay at the inpatient facility varied from 9 to 21 days, 12.8 days on average. An average period of inpatient treatment after surgery was 10.5 days.

Beger procedure (Bern modification) was applied in 2 patients. This surgery was done in cases of CP with damage of the pancreatic head and slightly changed ducts of the body and tail of pancreas. A number of researchers assess the outcomes of this surgery as acceptable in terms of low (0.8%-0.9%) mortality, small number (up to 23.5%) of postoperative complications and acceptable (3.5-5.3%) number or relaparotomies [8, 9, 10]. These patients had no complications during the postoperative period. Their average stay at the inpatient facility was 15.2 days (12.4 days after the surgery).

Longitudinal pancreatico-jejunosotomy (LPJS) was supplemented by application of the ChJA; in one of the patients LPJS was done on an isolated segment of the small bowel on vascular pedicle according to V. Kopchak with ChJA according to Roux, and in another patient – with external drainage of bile ducts. Average period of inpatient treatment of the patients was 12.4 days, including 10.8 days after the surgery. Average time of surgical intervention was 116 minutes. These patients did not develop postoperative complications. Immediate results of their operative treatment were estimated as good and satisfactory.

Pancreaticoduodenal resection (PDR) according to Whipple was done in 5 (3.2%) patients with CP complicated by BH. The indications for PDR included:

- Presence of enlarged head of pancreas, which simultaneously caused compression of the duodenum, extrahepatic bile ducts, and vessels of the pancreaticoduodenal area (3 patients). PDR allows for simultaneous elimination of these three complications of CP.
- Presence of BH, duodenal obstruction, and impossibility to rule out malignant process on the pancreatic head (one patient). We believe that preoperative fine-needle biopsy and intraoperative express biopsy of the pancreatic head provide little information regarding differential diagnostics of CP and pancreatic cancer;
- Presence of intrapancreatic cysts in the head of the pancreas with determined defect on the aterosuperior pancreaticoduodenal artery, which caused multiple bleedings into the lumen of the cyst and gastrointestinal tract (one patient). In this case it was technically impossible to perform selective angiography.

All 5 patients underwent PDR according to Whipple. The first stage of the operation included distal stomach resection, removal of the duodenum, cholecystectomy with removal of a part of the common bile duct (distal of the confluence of the cystic duct), resection of the 15-20 cm of the initial part of the small bowel, resection of the head, lesser pancreas and pancreatic isthmus. The reconstructive stage of the operation included only embolic terminoterminal pancreaticoenteroanastomosis by double-row interrupted suture and terminolateral hepaticoenteroanastomosis on one loop behind the segmented intestine (according to O. Shalimov and V. Kopchak). At present, we do not practice application of pancreaticoenteroanastomosis even in cases of the ectasia of Wirsung's duct.

Average patients' stay at the inpatient facility was 17.5 days. Average postoperative inpatient treatment lasted for 12.0 days. The duration of surgical intervention varied from 210 min to 240 min, i.e. 225 min on average.

Failure of sutures of the pancreaticoentero- hepaticoentero-, and gastroenteroanastomoses did not occur. Bile escape from the drainages was detected in one patient on the fourth day after the surgery. During the relaparotomy above the hepaticoenteroanastomosis level, a defect of the common bile duct was found (it was qualified as thermal intraoperative trauma resulting from diathermocoagulation – coagulation necrosis), and was sutured. Three patients had gastrostasis during the postoperative period, which influenced the overall duration of their treatment. To eliminate gastrostasis, conservative treatment was used. It included mandatory decompression of the stomach, administration of prokinetics, and gastric secretion inhibitors. On average, signs of gastrostasis were eliminated in all patients by the 9th-10<sup>th</sup> day. A special place among the post-resection complications on the pancreas is occupied by postoperative pancreatitis, which is connected both with operational trauma, and bile backflow (biliary reflux pancreatitis) [11]. In our opinion, any direct intervention into the tissues of the pancreas may cause development of acute pancreatitis of different activity level. To prevent the development of severe pancreatitis, we deem it expedient to use the proton pump inhibitors and H<sub>2</sub> antagonists (for 5 days), and synthetic somatostatin analogues (octra) during 3-4 days after the operation. Postoperative pancreatitis had its clinical signs (flatulence, exudate in the abdominal cavity, edema of the residual pancreas on USG, amylaseemia) in 12 (46.1%) out of 26 patients, who underwent direct pancreatic interventions. However, it was eliminated by conservative therapy within 4-5 days after the operation (on average). We believe that the following is necessary to prevent postoperative complications in patients with CP complicated by BH: 1) full preoperative laboratory and instrumental examination of the state of the pancreas, bile ducts, and adequate correction of homeostasis changes; 2) impact minimization surgery technique on the pancreas using double-row suture and with consideration of angioarchitecture of an organ; 3) formation of a mobile anastomosis loop according to Roux; 4) meticulous hemostasis and thorough through-out suturing and coagulation of all arterial branches of the pancreatic head resection area; 5) prescription of statins (octra) intraoperatively and during the postoperative period; 6) early enteral nutrition.

#### 4. Conclusions

1. Biliary hypertension is diagnosed in 31.6% of patients with complicated forms of chronic pancreatitis that require operative treatment. Thereat, in 71.0% of cases it has clinical signs, and in 29.0% is asymptomatic, and can be diagnosed only using instrumental methods (USG, CT, etc).
2. Main types of surgical intervention for patients with CP complicated by BH are duodenum-preserving resection operations on pancreatic head (Frey's procedure, Beger procedure, and Bern modification), which in some cases have to be supplemented by application of biliodigestive anastomoses.
3. To decrease the number of postoperative complications in patients with CP complicated by BH, it is necessary to apply a comprehensive preoperative preparation, right choice of operative therapy, impact minimization surgery technique, and adequate postoperative therapy.

#### 5. References

1. Gubergrits UXO Kazyulin Academy. *Metabolicheskaya pancreatology*. Donetsk, 2011, 464.
2. Kopchak VM, Hamster IV, Cheverdyuk YES? Zelinsky AI. Surgical treatment of chronic pancreatitis. *Kharkiv hirurgichna school in 2009*; 2.1(33):124-125.
3. Sebastiano di P, Di Mola FF. Pathophysiology of Chronic Damage. *Acute and Chronic Pancreatitis: New concepts and evidence-based approaches*. Ed. by PA Testoni, A Mariani, PG Arcidiacono, Turin, 2013, 63-69.
4. Dobrov DM, Polyakevich AU, Blagitko EM, Thick GBV. Biliary hypertension in patients with chronic pancreatitis. *Annals of Surgical Hepatology*, 2012, 35.
5. Kopchak VM Usenko AIO, Kopchak HF AI Zelinsky. *Surgical anatomy of the pancreas*. Kyiv, 2011, 141.
6. Beger HG, Gansauge F, Schwarz M, Poch B. Pancreatic head resection: the risk for local and systemic complications in 1315 patients-a monoinstitutional experience. *The American Journal of Surgery*. 2007; 941:6-S19.
7. Sparrow AB Shuleyko ACh, Grishin IN, Lurie HV, Orlovsky YOON, Vizhinis Law Institute *et al*. Causes of complications of planned operations in chronic pancreatitis and ways korektsii. *Ukraïnsky hirurgii Journal* 2013; 2(21):27-36.
8. Beger HG, Schlosser W, Friess HM. Duodenum-preserving head resection in chronic pancreatitis changes the natural course of the disease: a single-center 26-year experience. *Ann. Surg.* 1999; 230:512-519.
9. Adam U, Makowiec F, Riediger H. Risk factors for complication after pancreatic head resection. *Am. J Surg.* 2004; 2:187.
10. Petrov R, Schastny AT, Siatkovsky AR. The results of duodenum-preserving pancreatic head resection for chronic pancreatitis. *Pancreatology* 2011; 11:163-164.
11. Schepotin IB Lukashenko AB, Kolesnik EA. Modification of the reconstruction phase in the pancreatoduodenectomy - physiological methods of reconstruction. *Clinical Oncology*. 2011; 1(1):30-34.