

## STOOL TEST PARAMETERS AND PANCREAS STRUCTURAL CONDITION AMONG PATIENTS WITH CHRONIC PANCREATITIS AFTER CHOLECYSTECTOMY

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### Summary

The structural condition of the pancreas among the patients suffering from gallstone pancreatitis, especially those patients having cholecystectomy in the past medical history, was assessed according to the ultrasound data on the basis of Marseille-Cambridge classification. It was found out that the pancreas size becomes a bit smaller after cholecystectomy. However, fibrosis grows considerably. Both chronic inflammation and fibrosis lead to suppression of the acinar and ductal secretory function causing its exocrine and endocrine deficiency. When assessing the stool test, it was found that most patients with chronic pancreatitis have signs of exocrine deficiency, steatorrhea and creatorrhea in particular. These signs were the most prominent among the patients with chronic pancreatitis after open cholecystectomy.

**Keywords:** chronic pancreatitis, open cholecystectomy, laparoscopic cholecystectomy, pancreas exocrine deficiency, stool test

### Резюме

**Параметры копрограммы и структура поджелудочной железы у пациентов с хроническим панкреатитом после холецистэктомии**

Состояние поджелудочной железы у пациентов, страдающих панкреатитом после холецистэктомии в анамнезе, оценивали по данным ультразвукового обследования на основе Марсель-Кембриджской классификации. Было выявлено некоторое уменьшение размеров поджелудочной железы после холецистэктомии. В то же время установлено увеличение степени фиброза. Хроническое воспаление и фиброз приводят к подавлению ацинарной и протоковой секреторных функций, вызывая экзокринную и эндокринную недостаточность поджелудочной железы. При оценке копрограммы было установлено, что у большинства пациентов с хроническим панкреатитом имеются признаки экзокринной недостаточности, в частности, стеаторея и креаторея. Эти признаки были наиболее значимы среди пациентов с хроническим панкреатитом после открытой холецистэктомии.

**Ключевые слова:** хронический панкреатит, открытая холецистэктомия, лапароскопическая холецистэктомия, внешнесекреторная недостаточность поджелудочной железы, копрограмма

### Introduction

The pancreas is one of the main organs responsible for digestion. If the pancreas exocrine function is affected and no enzyme drug therapy follows to compensate for it, the digestive system is the first to find itself under unfavourable impact. Then protein and vitamin deficiency occurs due to changes in fat, carbohydrate and protein metabolism [4]. As a result, there occur some trophological malfunctions: evolving loss of body weight, asthenic reaction, performance decrement, morphofunctional

changes in digestive system organs, immunodeficiency, polyhypovitaminosis, endocrine deficiency syndrome as well as numerous breaches in structure and functions of almost all organs and systems [3]. These phenomena are typical for patients suffering from chronic pancreatitis (ChP) that is often of biliary nature (ChBP) leading to cholelithiasis (ChTh) which, in turn, requires cholecystectomy (ChE).

Considerable attention should be paid to the pathogenesis of the pancreatic exocrine deficiency after ChE. Because of the Sphincter of Oddi dysfunction (SOD) most patients start developing after ChE, as well as due to the breached mechanism of bile and chyme supply to the duodenum as a result of a gall bladder defect, cholagenic secondary pancreatic deficiency appears. The same asynchrony is the reason of increased content of free bile acid leading to secretory diarrhea and further – to enterogenous pancreatic deficiency. If the patient with a long history of ChTh had a ChE, there may develop a secondary biliary cirrhosis and, accordingly, hepatogenic pancreatic deficiency. The ChBP development before or after ChE is the result of both secondary pancreatic deficiency and primary pancreatic deficiency stemming from the pancreatic parenchyma damage [2].

The patients developing ChTh after the ChE experience the lithogenesis whose advance continues in bile ducts (biliary sludge is being stored and the frequency of microliths almost doubles). It leads to the breach of bile run-off, appearance of SOD and cicatricial changes in this area, higher pressure in this area as well as dilation of the common bile duct and the Wirsung's canal. Due to the above described changes, the structural changes of the pancreas and its fibrosis become more significant. In general, all these malfunctions are ChBP-friendly [1].

If there is not enough pancreatic enzyme (PE), some part of food nutrients is left not digested, making the process of absorption and transition into blood via the intestinal barrier impossible. Thus, the primary nutrient pool decreases, if there is ChP with exocrine pancreatic deficiency. This, in turn, leads to the increase of bacterial pool, as there are fewer enzymes in the bowel lumen. Furthermore, the bactericidal role of PE is weaker, while the undigested nutrients become a friendly environment for intestinal flora. However, the bacterial ferments cannot ensure the nutrient hydrolysis to the necessary degree, since it may only occur in case there are enough PEs in a healthy person's intestine. Thus, the bulk of ballast grows and it can be testified by the increased bulk of faeces, appearance of lienteric, steatorrhea and creatorrhea, amyloporrhea [2].

The research objective: to assess the structure of the pancreas using ultrasound data and a stool test of patients suffering from chronic pancreatitis, after cholecystectomy.

### Materials and methods

78 patients with ChP were examined. Group I consisted of 30 patients suffering from ChBP, 21 of them – with cholelithiasis of various stages. Group II included 24 patients who had an open cholecystectomy (OChE) because of the cholelithiasis problem. Group III comprised 24 patients with ChP after laparoscopic cholecystectomy (LChE). 62 patients (74.2%) were female patients and 16 (25.8%) were male ones. The patients' average age was  $55,38 \pm 0,79$ . The groups were equal in sex, age and after-operation period duration, the latter being about  $(4,1 \pm 0,5)$  years among the patients of Group II,  $(4,9 \pm 0,5)$  years in Group III. The ChP duration was  $(9,8 \pm 1,3)$  years.

### Results and discussion

The pancreas structural condition was assessed according to the ultrasound data: 14 patients (46,7%) from Group I had the increase of the head of pancreas, while in Groups II and III this number was 10 patients (41,7%). 7 patients (23,3%) from Group I had the increased tail of the pancreas compared to only 3 patients (12,5%) in Group II and 2 patients (8,3%) in Group III. The increase of the whole pancreas happened among 3 patients (10,0%) from Group I compared to 2 patients (8,3%) from Group II and 2 patients (8,3%) from Group III.

*Pancreas structural condition among the patients suffering from ChBP after ChE*

Ultrasound structural feature of the pancreas	Patient group with ChP		
	I (ChBP) N=30 (100%)	II (OChE) N=24 (100%)	III (LChE) N=24 (100%)
Increase of the head of the pancreas	14 (46,7%)	10 (41,7%)	10 (41,7%)
Increase of the tail of the pancreas	7 (23,3%)	3 (12,5%)	2 (8,3%)
Increase of the whole pancreas	3 (10,0%)	2 (8,3%)	2 (8,3%)
Fibrotic changes in the pancreas	10 (33,3%)	13 (54,8%)	11 (45,8%)

10 patients (33,3%) compared to 13 patients (54,8%) and 11 patients (45,8%) accordingly, experienced some fibrotic changes. The ultrasound pancreas condition was also evaluated in terms of Marseille-Cambridge classification score. The score results were as follows:  $(3,52 \pm 0,14)$  in Group I,  $(6,38 \pm 0,25)$  in Group II and  $(2,71 \pm 0,14)$  in Group III ( $p < 0,05$ ).

The stool test enabled us to distinguish the following features: 26,6% patients from Group I, 54,2% patients from Group II and 27,8% patients from Group III suffered from steatorrhea, while 5 patients (16,7%) compared to 9 patients (37,5%) and 5 patients (20,8%) accordingly had creatorrhea.

### Conclusions

1. The results obtained allow for stating that after OChE the pancreas size decreases a bit while fibrosis increases considerably.

2. When evaluating the score of the pancreas structural changes, it was found out that it is the highest among the patients after the open cholecystectomy and the lowest among those after the laparoscopic cholecystectomy.

3. The results of the stool test showed that most patients had some signs of exocrine deficiency, steatorrhea and creatorrhea in particular that is highly apparent among the patients with ChP after the open cholecystectomy.

### Literature

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