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Research Article

The State of the Organs of the Hepatopancreatobiliary System and the Quality of Life After Cholecystectomy

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Abstract

Objective: To assess the quality of life of patients and the state of the hepatopancreatobiliary system before and after cholecystectomy in the long-term period.

Materials and Methods: The 107 people were examined after emergency and planned cholecystectomy (with symptomatic and asymptomatic course of cholelithiasis).

Results: The majority of patients, regardless of the type of surgery, had symptoms of dyspepsia associated with the development of functional disorders of the gastrointestinal tract (gastroesophageal reflux, duodenogastric reflux, sphincter Oddi dysfunction).

Conclusion: After cholecystectomy, functional disorders of the digestive system predominate in the long-term period due to loss of the physiological function of the gallbladder.

Keywords: Gallbladder Removal; Cholecystectomy; Quality of Life

Introduction

Among all diseases of the digestive system, cholelithiasis ranks third in prevalence. In this regard, there is a large number of cholecystectomies. About 500 thousand cholecystectomies (CE) are performed annually in Russia [1]. It is generally known that after removal of the gallbladder in 5-40% of cases, there are disorders in the organs of the gastrointestinal tract called postcholecystectomy syndrome [2-6]. Diagnosis and treatment of postcholecystectomy syndrome is a challenge for both surgeons and therapists. Currently, there are no uniform standards, recommendations and algorithms for the management of patients with postcholecystectomy disorders [1-3,8-10]. The development of tactics for managing patients after CE are the most important tasks of modern medicine.

Purpose

To assess the quality of life of patients and the state of the organs of the hepatopancreatobiliary system before and after CE in the long-term period.

Material and Methods

We conducted a study on the basis of surgical departments of City Clinical Hospital No. 7 of Kazan.

From 2008 to 2010, we examined 107 patients. Of these, 35 people, there were patients hospitalized for acute cholecystitis in the emergency department and 72 people - hospitalized in the department of planned surgery for cholecystolithiasis (36 people - with asymptomatic and 36 people - with symptomatic course of cholelithiasis). Immediately before planned or urgent surgery, patients filled out quality of life (QOL) questionnaires - general MOS SF-36 and special GIQLI (Gastrointestinal Quality of Life Index) and underwent examination: complete blood count, biochemical blood test (bilirubin, alanine aminotransferase, aspartate transaminase, total cholesterol, α-amylase, glucose), ultrasound of the liver, pancreas, abdominal cavity, esophagogastroduodenoscopy. In 5 days after CE, as well as 1 year after CE, the patients completed the same QOL questionnaires. 5 years after CE, the patients re-filled out the QOL questionnaires and underwent examination: complete blood count, biochemical blood test (bilirubin, ALT, AST, total cholesterol, α-amylase, glucose), ultrasound of the liver, pancreas, abdominal cavity, esophagogastroduodenoscopy with targeted examination of the major duodenal papilla, fractional duodenal intubation. In diagnostically difficult cases, endo-ultrasound and MR cholangiography were performed to detect choledocholithiasis.

The patients were divided into three groups: 1 - those who underwent emergency CE, 2 - who underwent planned CE for the asymptomatic course of cholelithiasis, 3 - underwent planned CE for the symptomatic course of cholelithiasis.

There were no significant differences in age and sex, in the number of comorbidities, in BMI, stress experience, duration of gallstone disease in the groups.

Results

As a result of the 1st stage of the study, patients of group 1 5 years after CE revealed a significant decrease in pain in the right hypochondrium, in the left hypochondrium, in the epigastrium, and the disappearance of vomiting. However, the frequency of heartburn, loose stools, constipation, and bloating increased.

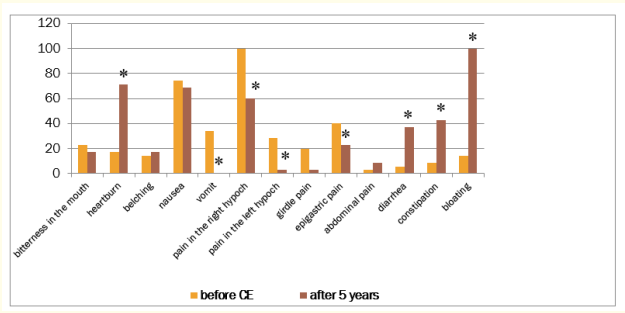

Figure 1: Dynamics of complaints in patients of group 1, p - sign criterion, *- reliable differences, p < 0,05.

Patients of group 2 5 years after CE showed a significant appearance of pain in the right hypochondrium, in the abdomen, an increase in the frequency of heartburn, nausea, loose stools, constipation, and abdominal distention.

Thus, a decrease in the quality of life in the long-term period after CE in most patients is associated with the appearance of symptoms of gastric and intestinal dyspepsia, in some patients - with the appearance of abdominal pain syndrome.

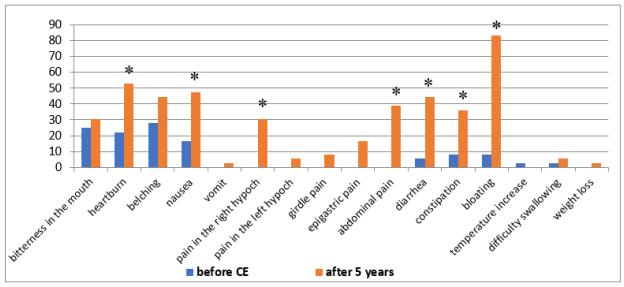

Figure 2: Dynamics of complaints in patients of group 2, p - sign criterion, *- reliable differences, p < 0,05.

Patients of group 3 5 years after CE showed a significant decrease in pain in the right hypochondrium. The frequency of heartburn and abdominal distention has increased.

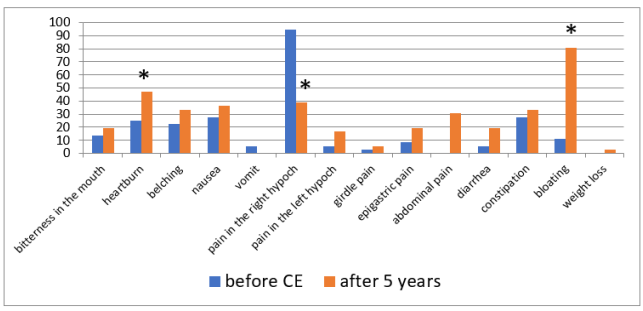

Figure 3: Dynamics of complaints in patients of group 3, p - sign criterion, *- reliable differences, p < 0,05.

Thus, having got rid of the pain syndrome, 5 years after the removal of the gallbladder, most of the patients acquired other complaints in the form of heartburn, gastric and intestinal dyspepsia. Similar complaints appeared in those patients who had no complaints before surgery.

In the majority of patients after CE, multiple stones were removed (91.4%, 63.9%, 66.7% in groups 1, 2, 3, respectively). Solitary stones were found in a smaller number of patients (2.9%, 25% and 22.2%, respectively). Slag gallbladder without stones was detected in 8.6%, 11.1%, 8.3% of patients, respectively.

According to the anamnesis, after 1 month - 1 year (0.5 ± 0.3 years), 3 patients (8.1%) from group 1 received inpatient treatment in the surgery departments of Kazan city hospitals for acute pancreatitis, one patient (2, 7%), 1 year after CE, he received inpatient treatment for stricture of the major duodenal papilla, accompanied by jaundice, cytolysis and cholestasis syndromes. After 2 months - 1 year, two patients (5.6%) from group 2 received inpatient treatment in the departments of surgery of city hospitals in Kazan for acute pancreatitis, 3 patients (8.3%) for stenosis of the major duodenal papilla.

According to the biochemical blood test, 5 years after CE, patients of group 1 showed a decrease in ALT values (44.4 [21.4; 48] in comparison with 24.3 [19.1; 29.5], p < 0, 05). In patients of group 2, on the contrary, ALT, AST parameters significantly increased 5 years after CE compared with preoperative values (15.5 [12.8; 22.0] in comparison with 22.5 [19.9; 30.6], p < 0.01; 26.7 [23.6; 32.9] compared to 30.8 [20.2; 35.6], p < 0.05, respectively). There were patients with increased ALT (0 - 25%, p < 0.01), AST (0 - 19.4%, p < 0.05) in group 2 of patients. In groups 1 and 2, glucose parameters increased (5.3 [4.6; 6.0] versus 6.2 [5.8; 6.7], p < 0.01), the number of patients with increased blood glucose indicators (in group 1, 22.9% - 57.1%, p < 0.01; in group 2, 8.3% - 41.7%, p < 0.01). There were no significant differences in the dynamics of biochemical parameters in patients of group 3.

5 years after CE, according to the data of fibroesophagogastroduodenoscopy, gastroduodenitis was found significantly more often in all groups, confirmed by morphological examination (in group 1, 24.3 - 89.2%, p < 0.01; in group 2, 50 - 75%, p < 0.01; in group 3, 58.3 - 80.6%, p < 0.01), duodenogastric reflux (in group 1, 8.1 - 59.5%, p < 0.01; in group 2, 2.8 - 44.4%, p < 0.01; in group 3, 11.1 - 33.3%, p < 0.05); diverticula of the duodenum in the 1st group of patients (2.7 - 18.9%, p < 0.05).

According to the data of liver ultrasound 5 years after CE, no significant differences were found in any group of patients.

According to the data of ultrasound of the pancreas 5 years after CE, the size of the pancreas body significantly decreased in patients of group 1 (13.1 ± 3.6 versus 12.2 ± 2.0, p < 0.01), the number of hyperechoic pancreas increased in 2 group (47.2 -83.3%, p < 0.01); the frequency of the presence of uneven pancreatic contours increased (in group 2, 13.9 - 33.3%, p < 0.05, p < 0.05), blurred contours (in group 1, 11.4 - 48.6%, p < 0,01; in group 2, 16.7 - 41.7%, p < 0.01), heterogeneity of the pancreas structure (in group 2, 13.9 - 38.9, p < 0.01). Thus, 5 years after CE in patients of groups 1 and 2, signs of progression of chronic pancreatitis (hyperechogenicity of the structure, uneven contours, indistinct boundaries, heterogeneity of the pancreas structure) were revealed. In addition, 2 patients (2.9% from group 1 and 2.8% from group 2) showed signs of acute pancreatitis - "blurring" of the pancreas contours. In patients of group 3, no reliable progression of chronic pancreatitis was revealed according to pancreatic ultrasound.

Fractional duodenal intubation was performed in 100 patients (93.5%) 5 years after CE, the remaining 7 patients (6.5%) was not

performed due to the revealed choledocholithiasis in 4 people. (3.7%), exacerbation of chronic pancreatitis in 2 people. (1.9%), stenosis of the major duodenal papilla in 1 person. (0.9%). According to the data of fractional duodenal intubation, dysfunction of the sphincter of Oddi was revealed in the majority of patients - in 66 people. (61.6%). Of these, 14.9% had hypertonicity, 46.7% had hypotonia of the sphincter of Oddi. Significantly less often, CO hypotonia was diagnosed in patients of group 3 compared with groups 1 and 2 ($p < 0.05$).

Phase	Indicators	Group 1	Group 2	Group 3
I - portion "A"	Volume, ml (norm 30 ± 4 мл)	50,7 ± 25,2	51,1 ± 19,2	46,6 ± 10,8
	Release time, minutes (norm 20 ± 4 minutes)	39,2 ± 7,4	41,8 ± 7,4	42,1 ± 7,9
II - portion closed sphincter of Oddi	Norm 2-6 min	12 (34,2%)	10 (27,8%)	19 (52,8%)
	Less than 2 minutes	19 (54,3%)	19 (52,8%)	12 (33,3%)
	More than 6 minutes	4 (11,4%)	7 (19,4%)	5 (13,9%)
III, IV portions missing				
V - portion "C"	Volume portion "C", ml (norm 34 ± 5 ml)	86,9 ± 28,3	68,2 ± 17,4	82,7 ± 14,0
	Flow time, min (norm 24 ± 2 min)	67,5 ± 11,5	63,2 ± 9,4	61,8 ± 10,8

Table 1: Characteristics of bile secretion according to the data of fractional duodenal intubation in patients 5 years after CE.

Thus, in the majority of patients 5 years after CE, hypotonia of the sphincter of Oddi is present.

In the structure of morbidity in patients of group 1, 5 years after CE, the number of patients with gastroduodenitis (25.7% - 94.3%, $p < 0.01$), duodenogastric reflux (8.6% - 62.9%, $p < 0.01$), duodenal diverticula (2.9% - 20%, $p < 0.05$). Choledocholithiasis was found in 5.7%, exacerbation of chronic pancreatitis in 2.9%, sphincter of Oddi dysfunction in 65.7%.

In patients of group 2, 5 years after CE, a significant increase in chronic pancreatitis without exacerbation, gastroduodenitis, duodenogastric reflux was revealed ($p < 0.01$). Dysfunction of the sphincter of Oddi was found in 72.2%, choledocholithiasis in 5.6%, stenosis of the major duodenal papilla in 2.8%, exacerbation of chronic pancreatitis in 2.8%, duodenal ulcer disease in 5.6%.

In patients of group 3, 5 years after CE, the frequency of duodenogastric reflux significantly increased ($p < 0.05$) and no organic disorders were revealed. Dysfunction of the sphincter of Oddi diagnosed in 47.2% of cases, was significantly less frequent compared with groups 1 and 2 of patients (47.2% versus 65.7%, $p < 0.05$; 47.2% versus 72.2%, $p < 0.01$).

Thus, 5 years after CE, functional disorders of the digestive system in the form of duodenogastric reflux and dysfunction of the sphincter of Oddi prevail in the structure of morbidity 5 years after CE.

According to the study of the quality of life according to MOS SF-36 in patients of group 1 5 years after CE, a significant improvement in indicators on the scales of physical functioning, role physical functioning, pain, role emotional functioning was revealed.

Figure 4: QOL dynamics according to MOS SF-36 data in patients of group 1.

Note: p - Wilcoxon test, × - significant differences between indicators before and 5 days after CE, $p < 0.05$, * - significant differences between indicators before CE and 1 year, before and 5 years after CE, $p < 0.05$.

In the structure of the gastrointestinal tract symptoms according to the GIQLI data, the indices of intestinal dyspepsia decrease in patients of group 1 5 years after CE.

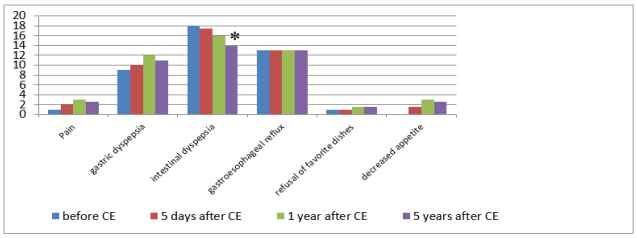

Figure 5: QOL dynamics according to GIQLI data in patients of group 1.

Note: p - Wilcoxon test, * - significant difference between indicators before and 5 years after ChE, $p < 0.05$.

According to the study of QOL according to MOS SF-36, patients of group 2 showed a gradual stepwise decrease in QOL after 5 days, after 1 year, reaching a maximum 5 years after CE of indicators of pain, general health, vitality, social functioning, role emotional functioning, psychological health.

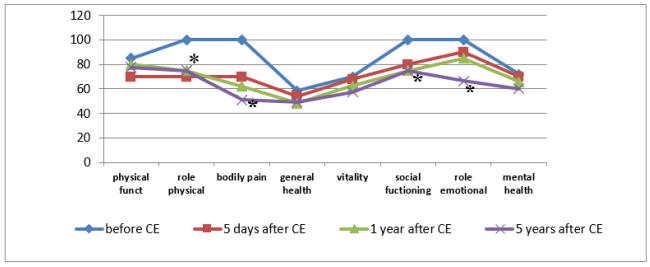

Figure 6: QOL dynamics according to MOS SF-36 data in patients of group 2.

Note: p - Wilcoxon test, * - significant difference between indicators before and 5 years after ChE, $p < 0.05$.

In the structure of the gastrointestinal tract of symptoms, a similar picture is observed - a gradual decrease in QOL, starting from indicators 5 days after CE and reaching the lowest possible values 5 years after CE for all indicators.

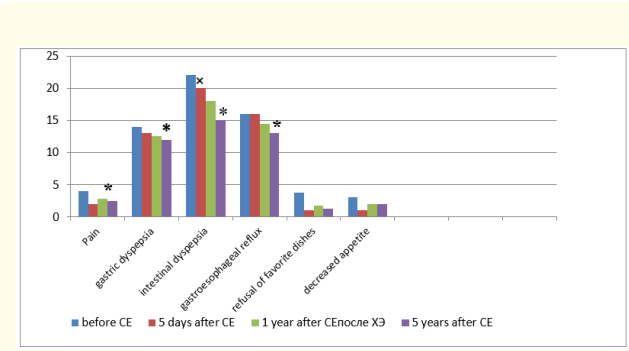

Figure 7: QOL dynamics according to GIQLI data in patients of group 2.

Note: p - Wilcoxon test, * - significant difference between indicators before CE and 5 years after CE, $p < 0.05$; × - significant difference between indicators before CE and 1 year after CE, $p < 0.05$.

According to the QOL data, according to the dynamics of the indicators of the MOS SF-36 questionnaire, in group 3 patients, there was a significant increase in QOL according to the scales of role physical functioning, pain, and social functioning.

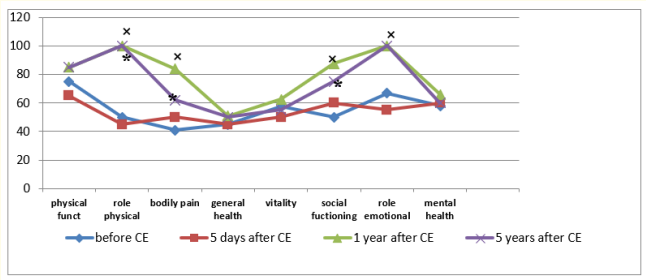

Figure 8: QOL dynamics according to MOS SF-36 data in patients of group 3.

Note: * - significant difference between indicators before and 5 years after CE, $p < 0.05$; × - significant difference between indicators before and 1 year after CE, $p < 0.05$.

According to the dynamics of the gastrointestinal tract symptoms in patients of group 3, there was a significant increase in the

pain scale 5 years after CE as compared to preoperative values. The rest of the QOL indicators did not have significant differences in dynamics.

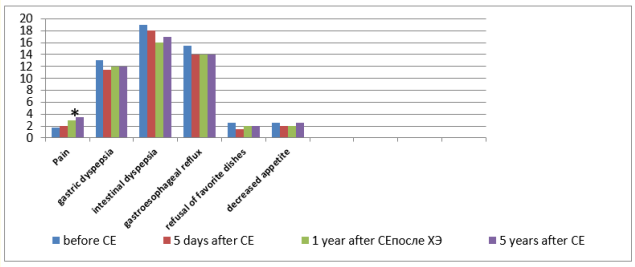

Figure 9: QOL dynamics according to GIQLI data in patients of group 3.

Note: * - significant difference between indicators before and 5 years after CE, $p < 0.05$; × - significant difference between indicators before and 1 year after CE, $p < 0.05$.

As a result of the study, we can conclude that the majority of patients, after removal of the affected organ and loss of its physiological functions, receive functional disorders of the gastrointestinal tract, which reduce the quality of life of patients and are manifested by various symptoms of dyspepsia both from the upper gastrointestinal tract and from the lower ones. in some patients manifested by pain syndrome [1,2,4,7,8,11,12].

Considering the above, we propose the following definition: postcholecystectomy syndrome is a disorder that occurs after cholecystectomy and includes both organic and functional disorders (sphincter of Oddi dysfunction, duodenostasis, chronic biliary insufficiency, bacterial overgrowth syndrome, functional intestinal disorders, impaired exocrine pancreatic function) associated with the loss of the physiological function of the gallbladder [1].

Conclusion

After cholecystectomy, functional disorders of the digestive system predominate in the long-term period due to loss of the physiological function of the gallbladder.

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