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PALLIATIVE DECOMPRRESSION IN MALIGNANT OBSTRUCTIVE JAUNDICE: FOCUS ON THE LIVER FUNCTION

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Abstract

Background and Study Aim: to investigate the impact of endoscopic and laparoscopic palliative decompression of the common bile duct on the liver function of patients with obstructive jaundice caused by tumor growth.

Materials and Methods. 48 patients were involved in the study with diagnosed incurable tumors and severe mechanical jaundice in the period from 2011 to 2017 years. Palliative decompression of the common bile duct was performed for all of them: endoscopic methods in 30 patients and laparoscopic hepaticojejunostomy – in 18 patients. Every subgroup was randomized by age, sex, duration of jaundice, and major biochemical parameters determined before surgery. Patients were monitored following next 6 months after decompression. Before surgery, 1, 7 and 14 days, as well as 3 and 6 months after decompression liver function markers were checked: prothrombin time, INR index, serum total protein and albumin with routine methods.

Results. Laparoscopic decompression of the common bile duct by hepaticojejunostomy leads to faster recovery of liver function (manifested by a steady decrease in prothrombin time, INR index and an increase in serum total protein and albumin in next 3-6 months) compared to endoscopic methods.

After endoscopic decompression in this period, the prothrombin time and INR index are significantly higher, the content of total protein and albumin in the serum is lower in

comparison to laparoscopic decompression. The indicators of hepatodepressive syndrome significantly deteriorate, 3-6 months after the procedure of endoscopic decompression, which is associated with the development of complications in 30.0% of patients.

Conclusions. Laparoscopic decompression of the common bile duct by forming a hepaticojejunoanastomosis is accompanied by faster restoring of liver function markers compared to endoscopic methods in patients with inoperable periampullary tumors.

Key words: laparoscopic hepaticojejunostomy; mechanical jaundice; periampullary tumor; hepatodepressive syndrome.

Introduction

There is an increase in the incidence of malignant neoplasms of the gastrointestinal tract, recently. Among them, from 1 to 15% of cases are tumors of the biliopancreatoduodenal area [1, 2].

Up to 25,000 new cases of periampullary tumors are detected annually in the United States [3]. The average incidence of cancer in this location is 6.6 people per 100 thousand populations in Japan [4]. The incidence of these tumors increases after the age of 55, reaching a maximum up to 70 years [5].

The main clinical manifestation of periampullary tumors is a blockade of bile outflow with the development of mechanical jaundice [6]. In 75-95% of cases, mechanical jaundice may be the first sign of the disease and indicate its incurability [6, 7], as it is detected in the later stages of the disease, when radical interventions are unlikely.

The main direction of treatment for such patients is palliative decompression of the common bile duct. Minimally invasive endoscopic methods have been used to decompress the bile ducts, including transpapillary stenting, suprapapillary choledochoduodenostomy, and endoscopic papillectomy [8, 9].

Endobiliary stenting is a priority method, as a palliative one, but within 3-6 months 20–28% cases have complications and require reintervention, which can be fatal because of disease progresses.

Laparoscopic hepaticojejunostomy is an effective alternative to endoscopic palliative methods of decompression of the common bile duct. [10]. The use of laparoscopic method allows you to visualize in detail the operating area throughout the procedure. This ensures better performance of all manipulations, reducing blood loss.

Drainage of the common bile duct eliminates cholestasis – the main cause of liver failure. However, the comparative effect of endoscopic and laparoscopic palliative

decompression on the manifestations of hepatic insufficiency, in particular, the liver function markers has not been studied quite deep. This makes impossible to do objectively based approach concerning the choice of palliative decompression.

The aim of the study: to determine the dynamics of hepatodepressive syndrome in patients with mechanical jaundice of tumor genesis after endoscopic and laparoscopic palliative decompression of the common bile duct.

Materials and methods. There were 48 patients with periampullary tumors under the supervision in the Shalimov`s National Institute of Surgery and Transplantation of National Academy of Medical Sciences of Ukraine in period from 2011 to 2017. Among them there were 32 men (66.7%) and 16 women (33.3%). The average age was (63.7±1.5) years. There were found incurable tumors with acute mechanical jaundice (MJ) after complex examination, which included biochemical analysis of blood and coagulogram; determination level of tumor markers in the blood; ultrasound diagnosis of abdominal organs and retroperitoneal space; fibrogastroduodenoscopy; computer tomography. The average duration of MJ was (22.1±1.3) days. All patients underwent palliative decompression of the common bile duct: 30 patients - using endoscopic methods; 18 patients with laparoscopic hepaticojejunostomy. Each subgroup was randomized by age, sex, duration of jaundice, and major biochemical parameters determined before surgery.

Patients were supervised for 6 months after decompression. Before surgery, 1, 7 and 14 days, as well as 3 and 6 months in patients were determined markers of hepatodepressive syndrome: prothrombin time, total serum protein and albumin level by routine methods.

Inclusion and exclusion criteria. Inclusion criteria. All patients were diagnosed with malignant obstructive jaundice by ultrasound and computed tomography (CT) imaging; all patients met biliary obstruction criteria; all patients signed the consent form.

Exclusion criteria. Patients had bile duct stones and benign obstructive jaundice; patients showed weak compliance; patients did not have complete clinical information.

Statistical analysis. Non-parametric descriptive statistics have been presented to show the analysed variables The obtained digital data were statistically analysed. Differences between comparison groups were estimated using the nonparametric Mann – Whitney test. All test values which meet the condition of $p<0.05$ are considered statistically significant. SPSS 22.0 was used for statistical analysis.

Results and Discussion. In the first phase of our study, investigating the effectiveness of endoscopic and laparoscopic palliative decompression of the common bile duct, we

determined the level of total and conjugated bilirubin in serum, which are one of the main indicators of liver function in the clinic.

The value of the studied indicators after hospitalization in groups of patients with palliative endoscopic and laparoscopic decompression (Tables 1, 2) was almost the same (p> 0.05), which indicates the representativeness of the selected comparison groups for the severity of cholestasis.

Table 1 - The content of total bilirubin in serum (μmoL · l^{-1}) after endoscopic and laparoscopic palliative decompression of the common bile duct in patients with mechanical jaundice of tumor genesis, Me (QL; QA).

Group of patients	At the day of hospitalization	Term of examination after operation				
		Day 1	Day 7	Day 14	3 months	6 months
Endoscopic decompression (n=30)	339,0 (233,0; 404,0)	311,0 (211,5; 376,0)	85,0* (55,0; 106,7)	36,5* (23,4; 42,8)	96,0* (49,5; 106,0)	158,5* (89,8; 212,8)
p_1		–	1d	1d,7д	1d,14д	1d,7д,14д,3м
Laparoscopic decompression (n=18)	330,0 (245,5; 380,3)	304,0 (219,5; 354,3)	78,0* (66,8; 91,2)	31,5* (27,0; 36,8)	20,9* (18,1; 24,6)	22,5* (19,5; 26,5)
p_2		–	1d	1d,7д	1d,7д	1d,7д
p	>0,05	>0,05	>0,05	>0,05	<0,05	<0,05

Notes. Here and in other tables:

1. p - the probability of differences between groups of patients who had endoscopic and laparoscopic palliative decompression.
2. * - differences in the preoperative period are statistically significant (p <0.05).
3. p1 - the probability of differences in comparisson with previous terms of observation in endoscopic decompression.
4. p2 - the probability of differences in comparisson to previous terms of observation in laparoscopic decompression.
5. 1d, 7d, 14d, 3m - differences according 1, 7 and 14 days, as well as 3 months after surgery are statistically significant (p <0,05).

The serum content of total bilirubin in patients with endoscopic decompression gradually decreased (Table 1) and from day 7 became significantly lower compared to baseline (by 74.9%, p<0.05) in the postoperative period. Subsequently, the index continued to decrease and after 14 days reaching its minimum and was lower than during hospitalization by 89.2% (p <0.05) and by 57.0% in comparisson to the previous observation period (p<0.05). However, after 3 months, the content of total bilirubin in the blood serum began to increase and was 2.63 times higher (p<0.05). After 6 months, the indicator continued to

increase and exceeded the level of 3 months of observation by 65.1% ($p<0.05$). During this period, the figure reached 46.6% of the level recorded during hospitalization.

After laparoscopic decompression, the rate also became lower in comparisson to the level immeidately after hospitalization. After 7 days, the differences were significant (by 76.4%, $p <0.05$) in comparisson to baseline. After 14 days, the indicator was 9.5% from the baseline ($p <0.05$) and remained on the same level for up to 6 months of observation ($p>0.05$).

Comparison of both groups of patients who had different types of palliative interventions showed (see Table 1) that up to 14 days postoperatively, the content of total bilirubin in the serum was almost no different ($p>0.05$). However, after 3 and 6 months of monitoring terms in the group of patients who had laparoscopic decompression, the rate became significantly lower than in the group of patients with endoscopic decompression (respectively 4.59 and 7.04 times, $p<0.05$).

The content of conjugated bilirubin in the serum in different types of palliative decompression of the biliary tract also decreased (Table 2). After endoscopic decompression, after 7 days the indicator became lower than the level established at the time of hospitalization (by 65.8%, $p <0.05$) and remained statistically significantly lower during the entire observation period (after 14 days - by 85.8%, $p <0.05$, after 3 months - by 71.0%, $p <0.05$, after 6 months - by 47.3%, $p<0.05$).

Table 2 - The content of conjugated bilirubin in serum (μmol · l^{-1}) after endoscopic and laparoscopic palliative decompression of the common bile duct in patients with mechanical jaundice of tumor genesis, Me (QL; QA).

Group of patients	At the day of hospitalization	Term of examination after operation				
		Day 1	Day 7	Day 14	3 months	6 months
Endoscopic decompression (n=30)	211,9 (156,1; 249,3)	180,4 (122,7; 211,4)	72,5* (44,8; 85,7)	30,0* (18,5; 35,4)	61,5* (36,6 77,8)	111,6* (64,2; 147,9)
p_1		–	1d	1d,7д	1d,14д	1d,7д,14д,3м
Laparoscopic decompression (n=18)	197,2 (160,0; 222,2)	174,4 (131,7; 206,3)	74,2* (56,0; 87,7)	25,1* (18,9; 29,6)	14,3* (10,4; 17,1)	8,1* (6,3; 9,7)
p_2		–	1d	1d,7д	1d,7д	1d,7д,14д,3м
p	>0,05	>0,05	>0,05	>0,05	<0,05	<0,05

After laparoscopic decompression, the content in the serum conjugated bilirubin, from the 7th day after hospitalization was statistically significantly lower too, than at baseline (62.4%, $p <0.05$). Subsequently, the rate continued to decline and after 14 days was lower

than the level of hospitalization by 87.3% ($p < 0.05$), after 3 months - by 92.7% ($p < 0.05$). After 6 months, the rate was only 4.1% of the level right after hospitalization ($p<0.05$).

Comparison of experimental groups showed (see table. 2) that up to 14 days after surgery, significant differences between groups of comparisson with the content in the serum of conjugated bilirubin was not observed ($p>0,05$), but after 3 and 6 months the value of studied indicator in patients with palliative laparoscopic decompression was lower than after endoscopic (76.7% and 92.7%, respectively, $p<0.05$).

Analysis of the dynamics of conjugated bilirubin after various palliative interventions showed that by the 14th day of the postoperative period, the rate of both groups decreased and became statistically significantly lower in comparisson to previous observation periods ($p<0.05$). However, in the future, patients who had endoscopic decompression, a significant increase in the content of conjugated bilirubin in the serum was noted. After 3 months, the figure was 2.05 times higher than after 14 days ($p<0.05$), after 6 months - 81.5% higher than in the previous observation period ($p<0.05$). At the same time, after the use of laparoscopic decompression methods, the content of conjugated bilirubin in the blood serum continued to decrease. Thus, after 3 months the indicator became 40.4% lower than after 14 days ($p<0.05$), after 6 months - by 43.4% lower than after 3 months ($p<0.05$).

The results indicate that the dynamics of the content of total and conjugated bilirubin in serum, the efficiency of decompression of the biliary tract with the help of laparoscopic and endoscopic technology up to 14 days after surgery is almost the same. The values of these indicators are significantly reduced in comparisson to the preoperative condition, but between the groups in which different methods of decompression were used, there are almost no differences. However, 3 and 6 months after surgery, the serum content of total and conjugated bilirubin is characterized by a statistically significant increase, while after laparoscopic interventions, on the contrary, a decrease, indicating a significant advantage of laparoscopic method over endoscopic.

Blood clotting parameters, serum albumin and total protein give us important information about the functional state of the liver, in particular its synthetic function.

Comparison of groups of patients who had palliative endoscopic and laparoscopic decompression of the common bile duct, according to the indicators of hepatodepressive syndrome before surgery (Tables 3-5) showed that in this period by the value of prothrombin time, total protein and serum albumin content no differences were observed ($p> 0.05$). The results gave us reason to believe that the degree of liver parenchyma destruction in the comparison groups was almost the same.

Analysis of the value of prothrombin time showed (Table 3) that after endoscopic decompression the rate decreased and, starting from 7 days after the intervention, became statistically significantly lower than right after hospitalization (12.0%, p <0.05). After 14 days the indicator was lower than the level right after hospitalization by 14.0% (p <0.05), after 3 months - by 12.0% (p <0.05), after 6 months - by 10.0% p <0.05).

Table 3 - Prothrombin time (c) after endoscopic and laparoscopic palliative decompression of the common bile duct in patients with mechanical jaundice of tumor genesis, Me (QL; QA)

Group of patients	At the day of hospitalization	Term of inspection after operation				
		Day 1	Day 7	Day 14	3 months	6 months
Endoscopic decompression (n=30)	25,0 (23,0; 26,0)	26,0 (24,0; 26,8)	22,0* (20,3; 24,0)	21,5* (20,0; 23,8)	22,0* (19,3; 24,0)	22,5* (20,3; 25,0)
p_1		–	1d	1d	1d	1d,14д
Laparoscopic decompression (n=18)	24,0 (22,3; 26,0)	24,5 (24,0; 26,0)	21,0* (20,0; 22,0)	19,0* (18,0; 19,8)	17,0* (16,0; 18,0)	18,0* (16,3; 18,8)
p_2		–	1d	1d	1d,7д,14д	1d,7д,3м
p	>0,05	>0,05	<0,05	<0,05	<0,05	<0,05

After laparoscopic decompression, the prothrombin time also became significantly shorter than at the day of hospitalization, after 7 days - by 12.5% (p<0.05). In the future, the indicator continued to remain lower than the initial level: after 14 days - by 20.8% (p<0.05), after 3 months - by 29.2% (p<0.05), after 6 months - by 25.0% (p<0.05).

Comparison of prothrombin time between groups in which performed palliative endoscopic and laparoscopic decompression of the common bile duct showed that after 7 days the study value in the group of patients with laparoscopic decompression was statistically significantly lower than with endoscopic (p <0.0). This pattern persisted for up to 6 months of observation.

Analysis of the dynamics of prothrombin time showed that its value decreased by 14 days after endoscopic decompression, which was statistically significant in comparisson to 1 day of observation (p<0.05).

Subsequently, the value of prothrombin time gradually increased and 6 months after the intervention became statistically significantly higher than in 14 days (p<0.05) but did not reach the control level (p>0.05). After laparoscopic intervention, the value of prothrombin time was reduced to 3 months of observation. During this period, the figure was statistically

significantly lower than after 1, 7 and 14 days ($p<0.05$). After 6 months, the rate increased, which was statistically significant in comparisson to 3 months ($p<0.05$) but remains significantly lower than 1 and 7 days after surgery ($p<0.05$).

Determining the INR index is important in understanding the liver function. This is a standard for determining the state of the blood coagulation system, which does not depend on the method of determining prothrombin time and the sensitivity of reagents used in laboratories.

Studies have shown (Table 4) that right after hospitalization in groups of patients with mechanical jaundice of tumor genesis, the value of the INR index was almost the same ($p>0.05$). After palliative interventions in the group of patients who had endoscopic decompression of the common bile duct, the rate decreased and after 14 days became statistically significantly lower than right after hospitalization (10.8%, $p<0.05$) and in comparisson with 1 day. In the future, the rate increased and after 3 and 6 months did not differ from the level of hospitalization ($p>0.05$). In addition, after 6 months the figure became statistically significantly higher, than after 14 days (by 6.8%, $p<0.05$).

Table 4 - The value of the INR index (dm) after endoscopic and laparoscopic palliative decompression of the common bile duct in patients with mechanical jaundice of tumor genesis, Me (QL; QA).

Group of patients	At the day of hospitalization	Term of examination after operation				
		Day 1	Day 7	Day 14	3 months	6 months
Endoscopic decompression (n=30)	1,48 (1,36; 1,54)	1,47 (1,42; 1,54)	1,37 (1,30; 1,48)	1,32* (1,23; 1,47)	1,39 (1,31; 1,50)	1,41 (1,36; 1,48)
p_1		–	–	1d	–	14д
Laparoscopic decompression (n=18)	1,50 (1,39; 1,63)	1,48 (1,37; 1,60)	1,37* (1,32; 1,42)	1,31* (1,29; 1,33)	1,25* (1,23; 1,28)	1,24* (1,20; 1,27)
P_2		–	1d	1d,7д	1d,7д,14д	1d,7д,14д
p	>0,05	>0,05	>0,05	>0,05	<0,05	<0,05

After endoscopic palliative decompression, the value of the INR index also decreased, but the rate became statistically significantly lower in comparisson to the level of hospitalization within 7 days after decompression (8.7%, $p<0.05$). In the future, the rate decreased steadily and after 14 days became lower than the level of hospitalization by 12.7% 9$p<0.05$), after 3 months - by 16.7% ($p<0.05$), after 6 months - by 17,3% ($p<0.05$). It should be noted that from 7 days to 3 months after the intervention, the value of the INR index in

each subsequent monitoring terms period was statistically significantly lower than in the previous one ($p<0.05$). did not differ significantly from the level of 3 months of observation ($p>0.05$).

It was found that in 1st, 3rd and 14th days after palliative decompression of the common bile duct, there is no significant differences between the groups under endoscopic or laparoscopic interventions ($p>0.05$). However, after 3 and 6 months, the rate in the group of patients who had laparoscopic palliative decompression was significantly lower in comparisson to the group with endoscopic decompression (respectively 10.1 and 12.0%, $p<0.05$).

Analysis of the content of total protein in the serum showed (Table 5) that after endoscopic decompression, the rate increased to 14 days after the intervention and was statistically significantly higher than right after hospitalization ($p<0,05$). However, after 3 and 6 months he returned to the level established right after hospitalization ($p>0.05$). After laparoscopic decompression, the content of total protein in the serum also increased. During all terms, the rate was statistically significantly higher than the level right after hospitalization ($p <0.05$).

Table 5 - The content of total protein in serum ($g \cdot l^{-1}$) after endoscopic and laparoscopic palliative decompression of the common bile duct in patients with mechanical jaundice of tumor genesis, M e (QL; QA).

Group of patients	At the day of hospitalization	Term of examination after operation				
		Day 1	Day 7	Day 14	3 months	6 months
Endoscopic decompression (n=30)	60,7 (55,9; 63,2)	60,5 (58,2; 63,2)	63,4* (59,2; 68,3)	64,2* (60,6; 69,7)	61,9 (58,8; 64,3)	59,1 (56,7; 60,6)
p_1		p_1	–	1d	1d	14д
Laparoscopic decompression (n=18)	60,3 (55,9; 64,6)	59,0 (55,7; 62,8)	65,2* (63,4; 68,5)	66,6* (65,4; 68,9)	68,2* (66,7; 70,4)	67,0* (65,5; 68,2)
P_2		P_2	–	1d	1d	1d,7д,14д
p	60,7 (55,9; 63,2)	60,5 (58,2; 63,2)	63,4* (59,2; 68,3)	64,2* (60,6; 69,7)	61,9 (58,8; 64,3)	59,1 (56,7; 60,6)

Comparison of the experimental groups showed that, starting from 14th day and after 3 and 6 months after surgery, the content of total protein in the serum after laparoscopic decompression was significantly higher than after endoscopic decompression ($p <0.05$). Analysis of the dynamics of these markers of liver function in groups of patients who used

different methods of palliative decompression of the common bile duct showed that after endoscopic decompression the indicator after 7 days became significantly higher caompared after day 1 ($p<0.05$), and remained at the same level up to 14 days of observation ($p>0.05$). After 3 months, the rate decreased and after 6 months became significantly lower than after 7, 14 days and 3 months of observation ($p<0.05$).

In the group of patients who had laparoscopic decompression total protein and serum albumin concentration gradually increased up to 3 months of observation, reached its maximum value and was statistically significantly higher than the previous observation period ($p <0.05$). Total protein in the serum decreased after 6 months, but it was still significantly higher compared to the 1 day after surgery.

Serum albumin level (Table 6) after endoscopic decompression during next 7 days after the intervention did not differ from the level right after hospitalization ($p>0.05$). However, after 14 days the rate increased significantly and became statistically significantly higher than right after hospitalization ($p <0.05$). It was higher after 3 months ($p<0.05$) in comparisson to the day of hospitalization, after 6 months, the content of serum albumin decreased, and did not differ from the level right after hospitalization ($p<0.05$).

Table 6 - The content of albumin in serum ($g \cdot l^{-1}$) after endoscopic and laparoscopic palliative decompression of the common bile duct in patients with mechanical jaundice of tumor genesis, Me (QL; QA).

Group of patients	At the day of hospitalization	Term of examination after operation				
		Day 1	Day 7	Day 14	3 months	6 months
Endoscopic decompression (n=30)	33,1 (30,8; 34,7)	32,8 (31,1; 34,7)	34,2 (32,2; 36,4)	37,2* (35,9; 39,6)	36,2* (33,4; 37,6)	33,6 (32,2; 35,4)
p_1		p_1	–	–	1д,7д	1д,7д
Laparoscopic decompression (n=18)	34,2 (31,7; 36,6)	31,9 (30,1; 34,0)	36,4* (35,3; 38,0)	38,0* (36,9; 39,4)	39,9* (38,9; 41,1)	38,0* (37,1; 38,4)
P_2		p_2	–	1д	1д,7д	1д,7д,14д
p	>0,05	>0,05	<0,05	>0,05	<0,05	<0,05

After laparoscopic decompression, the content of albumin in the serum 7 days after surgery became statistically significantly higher than right after hospitalization ($p <0.05$) and continued to significantly exceed this level in other monitoring terms ($p <0.05$).

Comparison of study groups showed that 7 days, as well as 3 and 6 months after laparoscopic decompression, serum albumin content was statistically significantly higher than after endoscopic decompression ($p < 0.05$).

Analysis of the dynamics of albumin content in serum showed that after endoscopic decompression, it increased to 14 days of observation and in this period was significantly higher than in previous periods of observation ($p<0.05$). In the following periods, the rate decreased and was statistically significantly lower after 6 months than after 14 days and 3 months after the intervention ($p<0.05$).

After laparoscopic decompression, the content of albumin in the serum after 7 days of observation increased significantly in comparisson with 1 day ($p < 0.05$). After 14 days, the indicator continued to grow and reached a maximum, significantly exceeding 1 and 7 days of observation ($p < 0.05$). The indicator was at the same level after 3 and 6 months of observation ($p > 0.05$).

Thus, the use of palliative endoscopic and laparoscopic decompression for up to 14 days leads to a statistically significant decrease in prothrombin time, INR index and increase in serum total protein and albumin in comparisson to the level that was right after hospitalization. Subsequently, after endoscopic intervention, the value of prothrombin time and the value of the INR index begin to increase, and the content of total protein and albumin in the serum decreases, which becomes significant in comparisson to previous monitoring terms. After laparoscopic intervention, the indicators continue to be better and after 3-6 months are statistically significantly different from those obtained during endoscopic interventions.

The results suggest that laparoscopic decompression creates higher physiological conditions for bile outflow than endoscopic decompression. Choledochjejunoanastomosis is lower affected by the oncological process, which provides a constant outflow of bile for 6 months and reduces the manifestations of liver failure. At the same time, after endoscopic decompression 3-6 months after the intervention in 9 patients (30.0 ± 8.4) % there were complications - reflux cholangitis, cholangiogenic abscesses and recurrent episodes of jaundice, which apparently were the main cause of aggravation indicators of hepatodepressive synodrome.

Thus, the laparoscopic method of decompression of the common bile duct in unresectable periampullary tumors, with technically competent performance is a good alternative to traditional endoscopic methods, provides a steady outflow of bile, accompanied by fewer manifestations of hepatodepressive syndrome.

Conclusions

1. Laparoscopic decompression of the common bile duct by forming a hepaticojejunoanastomosis is accompanied by faster recovery of liver function, manifested by a steady decrease in prothrombin time, INR index and increase of serum total protein and albumin level in comparisson with endoscopic methods in patients with inoperable periampullary tumors.

2. The prothrombin time and INR index are significantly higher, the content of total protein and albumin in the serum – lower after endoscopic decompression in this period in comparisson to laparoscopic decompression.

3. A half of a year after the intervention after endoscopic decompression, the indicators of hepatodepressive syndrome significantly worth, which is associated with the development of complications in 30.0% of patients.

Perspectives for further research. The obtained results require next investigations for futher clinical wider introduction of the laparoscopic method of decompression of the common bile duct in patients with inoperable periampullary tumors.

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