STATE OF THE ADAPTIVE MECHANISMS IN THE COMBINATION OF HYPERTONIC DISEASE WITH CHRONIC PANCREATITIS

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The investigation of patients with hypertonic disease and concomitant chronic pancreatitis in a phase of unstable remission was conducted. Here were found a violation of the adaptation mechanisms in the form of disorders of the autonomic regulation, antioxidant defense, imbalance of kallikrein-kinin system, signs of endogenous intoxication.

Key words: hypertonic disease, chronic pancreatitis, autonomic nervous system, antioxidant system, kallikrein-kinin system, endogenous intoxication.

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ACUTE CHOLECYSTITIS IN PATIENTS WITH LIVER CIRRHOSIS: PECULIARITIES OF DIAGNOSIS AND MINIMALLY INVASIVE TREATMENT

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Surgical treatment of acute cholecystitis (AC) in patients with liver cirrhosis is accompanied by large number of complications. Within last 15 years, 94 patients with AC conditioned by liver cirrhosis underwent treatment in the department: 76 patients underwent laparoscopic cholecystectomy (LCE), 5 (6.2 %) – conversion to open operation. 22 patients with obstructive jaundice firstly underwent endoscopic transpapillary procedures and in 0.1–5 days – LCE. Postoperative complications developed in 22 (27.2 %) cases: 3 (3.7 %) patients had intraabdominal hemorrhage, 9 (11.1 %) – ascitic fluid leakage through drainage and ports, 3 (3.7 %) – oesophageal varices bleeding, 7 (8.6 %) – cardiac pulmonal and others complications. 2 (2.5 %) patients died due to the progression of hepatocellular failure, caused by bleeding from oesophageal varices after the operation. The number of intra- and postoperative complications can be reduced by precise ultrasound with colour doppler of hepatoduodenal region and abdominal wall, as well as by the fulfilment of the recommendations of Baveno Consensus.

Key words: acute cholecystitis, liver cirrhosis, laparoscopic cholecystectomy.

Acute cholecystitis (AC) is the most frequent life-threatening surgical complication of cholelithiasis, which generally occurs more often among patients with liver cirrhosis (LC) [6, 12]. LC and accompanying portal hypertension (PH) complicates considerably surgical management of this category of patients, due to complicated conditions in which operations are performed and severe patient condition that may lead to a large number of surgical and nonsurgical complications as well as potentially fatal consequences. Until recently, operations, including laparoscopic cholecystectomy (LCE), were performed with caution in patients with LC due to the high risk of occurrence of intraoperative excessive bleeding from abdomen wall veins (varices), omentum, hepatoduodenal ligament and gallbladder bed [11], leakage of ascites through wound sutures and by drainages. However, an introduction of non-invasive highly informative diagnostic methods (colour Doppler, spiral contrast enhanced computed tomography (CT), magnetic resonance imaging (MRI) and magnetic resonance cholangiopancreatography (MRCP) and the development of laparoscopic techniques provided the possibility of successful treatment of patients with AC accompanying LC [2].

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The goal of our investigation is to develop a tactics of diagnostics and treatment of the patients with acute cholecystitis accompanying liver cirrhosis by means of minimally invasive techniques.

Patients and methods. During the last 15 years, 2183 patients with AC were treated in the Department of Surgery № 1 LNMU; in particular, AC accompanied LC in 94 cases. Among the latter group prevailed males: 60 (64 %) patients. Age of the patients ranged from 35 to 71 (54.0 ± 6.3) years. 29 (31 %) patients had biliary obstruction and jaundice. All patients were diagnosed with LC (first occurrence in 14 patients) by means of biochemical, immunological, and histological (pre-operative percutaneous puncture biopsy and/or peri-operative biopsy of the liver) investigations. LC was complicated by portal hypertension in 85 patients: oesophageal varices – in 48 (51 %) patients, ascites – 11 (12 %), pleural effusion – 5 (5 %), splenomegaly – 24 (26 %), hypersplenism – 23 (24 %), caput medusae – 9 (10 %), and umbilical hernia – 6 (6 %). All patients underwent ultrasonography with the careful investigation of organs of hepatopancreatobiliary system and abdominal wall and the determination of the parameters of portal, hepatic and splanchnic blood circulation, i.e. diameter and measurements of blood flow in portal, splenic and main hepatic veins, celiac trunk, as well as common hepatic and mesenteric arteries [1]. Contrast enhanced CT was additionally performed in 11 patients, MRI and MRCP – in 6. In order to determine the degree of oesophageal varices and severity of portal hypertension, 63 patients underwent oesophagastroduodenoscopy, 31 patients – X-ray examination of oesophagus and stomach with barium. The severity of LC was determined in accordance with Child–Pugh criteria, whereas the degree of hepatic failure and encephalopathy – according to SAPS II, MELD, Glasgow Coma Scale, and West Haven Criteria scales [14].

Data analysis and statistical tests (Student’s t-test, Mann – Whitney U-test, χ²-test) were performed in SPSS 11.5 for Windows. Spearman’s rank correlation coefficient and Pearson correlation coefficient were used to assess the relationship between variables.

Results and discussion. According to the criteria of Tokyo Guideline (TG13) [13] 63 (67 %) patients had a mild form of AC, 21 (22 %) – moderate, 10 (11 %) – severe. Paravesical and retrovesical abscesses occurred in 6 (6 %) cases; 6 (6 %) patients had local peritonitis, 2 (2 %) – diffuse peritonitis; and 2 (2 %) – ascites-peritonitis. In case of biliary obstruction, 5 (5 %) patients had acute biliary pancreatitis and 6 (6 %) – cholangitis in addition to jaundice. Etiological factors that led to the development of LC were alcoholic hepatitis (47 %), viral hepatitis (44 %), thrombosis of splenic and/or portal veins (4 %), Budd – Chiari syndrome (1 %), idiopathic (4 %). According to the Child–Pugh classification, liver cirrhosis in the compensation stage (Type A) was established in 70 (74 %) patients, in subcompensation stage (Type B) – in 20 (21 %), in decompensation stage (Type C) – in 4 (4 %). According to the West Haven criteria, hepatic encephalopathy (at least minimal) was detected in all patients upon admission; in particular, 73 (78 %) patients were diagnosed with Grade I encephalopathy, 17 (18 %) – with Grade II, and 4 (4 %) – with Grade III. Concomitant diseases were detected in 63 (67 %) patients, i. e. coronary heart disease and arterial hypertension (46 patients), morbid obesity (5 patients), peptic ulcer of stomach or duodenum (4 patients), diabetes mellitus (4 patients), bronchopulmonary diseases (4 patients), goitre (3 patients) etc. Due to LC and significant number of concomitant diseases, the ASA score of patients was as follows: 52 (55 %) patients were classified in class II, 32 (34 %) patients in class III and 10 (11 %) patients in class IV, which was taken into account in the preparation to operation, choice of the method and medications used for anaesthesia in order to prevent complications connected with disorders of liver function, reduction of liver blood supply, and aggravation of hepatic failure.

By means of transabdominal ultrasonography, there were investigated peculiarities of portal, hepatic and splanchnic blood circulation in addition to changes in gallbladder, bile ducts and pancreas. In 73 (78 %) patients, there were found dilated veins in the region of hepatoduodenal ligament and Calot’s triangle, which was taken into consideration during laparoscopic dissection. Using Doppler, there were detected the
typical changes in blood circulation, which indicated the reduction of portal blood flow with the dilation of portal and lienal veins, the reduction therein of the flow velocity and the increase of the blood flow in hepatic artery, so called «arterialisation» of hepatic blood flow. Derived parameters, i.e. resistive index, pulsation index, hepatic-portal ratio, total volume of liver blood supply, Doppler perfusion index, index of hyperaemia, also changed in a typical manner [1, 3, 4]. The severity of hemodynamic disorders was correlated with the severity of LC, according to Child – Pugh classification.

Screening of oesophageal veins by means of endoscopy [7, 9] and X-ray investigation with barium showed that 58 (62 %) patients had oesophageal varices; in particular, Grade I (small varices – varices extending just above the mucosal level) was detected in 36 (38 %) patients; Grade II (medium varices – varices extending for less than 50 % of the luminal diameter of distal part of oesophagus) – in 15 (16 %); Grade III (large varices – varices extending for more than 50 % of oesophagus) – in 7 (8 %) patients. Half of the patients with the Grade II and almost all with the Grade III had high-risk “red” stigmata, which are an important predictor of variceal haemorrhage: red wale markings, cherry red spots, and telangiectasias. In 22 patients, there were detected the signs of portal hypertensive gastropathy of a mild degree (pink in center mosaic) in stomach, whereas in 17 patients – moderate and severe gastropathy (flat red spots and diffuse red mosaic). In 2 patients with a risk of bleeding or the presence of stigmata of the recent bleeding, endoscopic band ligation of oesophageal varices was immediately performed. Pre-endoscopy infusion of erythromycin was given.

According to the algorithm developed in the clinic, the necessary complex of primary diagnostics was carried out for all patients within two hours upon admission, which allowed to establish accurate diagnosis and to begin the therapy immediately.

22 (23 %) patients that were admitted with the signs of biliary hypertension and obstructive jaundice initially underwent therapeutic ERCP. Endoscopic procedure was performed under deep sedation or under narcosis in order to minimize traumatisation of oesophageal varices. As a result, no bleeding occurred during the intervention. In one case (patient with LC of type C), double pig-tail stent was placed in gallbladder after lithoextraction. This provided its decompression and the regress of inflammatory changes in gallbladder wall. After successful bile ducts clearance or liquidation of Vater's papilla stenosis, 17 patients underwent LCE in 0.1–5 days.

In general, AC-related surgical intervention was performed in 81 cases in the period up to 5 days upon admission; specifically, 7 patients with peritonitis were operated within 6 hours after brief preparation. Laparoscopic interventions in patients with LC differed significantly from the standard LCE, which is related not so much to the changes in the liver tissue itself (it becomes dense, is easily traumatized, and bleeding from vessels of the gallbladder bed is more difficult to stop), as to the changes connected with portal hypertension. Due to the formation of portosystemic shunts, dilation of veins is observed in the navel area (recanalisation of umbilical vein in Cruveilhier – Baumgarten syndrome with formation of caput medusae) that increases the risk of massive bleeding as the first trocar is entered. Therefore, during ultrasonography and colour Doppler we determined the condition of abdominal wall vessels chose and marked entrance points for trocars, which allowed to avoid the injury of vessels and significant uncontrollable bleeding from the abdominal wall. In 34 (42 %) patients, umbilical and subxiphoid ports were created not along midline, but so that it would be possible to pass around considerably dilated vessels. Two trocars in the right subcostal region were placed under direct visualization with translumination of abdomen wall in order to avoid the prevalent abdomen wall varices [11]. At the end of operation, special attention was directed to the inspection of the place of the removal of trocar, since the reduction of intraabdominal pressure can induce massive bleeding in post-operative period [2] and this may not be immediately diagnosed. Minor haemorrhages from the vessels were in addition sutured through the abdominal wall after the removal of trocars in 20 (25 %) patients.

Certain technical problems occurred in 23 (28 %) patients during the dissection triangle of Calot to identify cystic duct and artery. In case of AC, they are caused by
the presence of hard inflamed masses in the region of Calot’s triangle, as well as by the presence of dilated veins in the anterior the hepatoduodenal ligament. The injury of these veins causes profuse bleeding; so, uncontrollable electrocautery or application of clips in such circumstances could cause the injury of bile ducts and vessels. Dilated veins also do not allow perform the revision of common bile duct by means of cholecdochotomy. Pre-operative diagnosis of these changes with the help of ultrasound and Doppler as well as careful dissection of tissues allow to prevent the aforementioned complications. Excessive bleeding (135.0 ml ± 45.2 ml) from the dilated veins in hepatoduodenal ligament occurred in 13 (16 %) cases. Some authors suggest the limitation of intervention to subtotal cholecystectomy in complex anatomic conditions in order to avoid the conflict with vessels in the presence of hard masses [2, 10].

Further technical problem with cholecystectomy in case of LC is fibrosis of liver tissue [5, 8, 11] that worsens the conditions for haemostasis and cholestasis with gallbladder bed. Massive bleeding (164.0 ml ± 49.6 ml) from the tissue of the liver was detected in 26 (31 %) patients, whereas bile leakage (100–180 ml) – in 5 patients within 2–6 days after operation. Hence, 7 patients with the poor portal blood circulation according to Doppler results and with the high risk of haemorrhage underwent mucosalization, so that a part of gallbladder wall remained on the liver that was afterwards carefully coagulated. Bipolar electrocautery or LigaSure device occurred to be the safest.

In the presence of ascites, an operation of type Kalb was performed in 7 (8 %) cases after successful removal of gallbladder, i. e. – parietal peritoneum was cut at the back surface of abdomen wall more laterally than the upper pole of kidney. After the placement of drains in 14 (17 %) patients in order to create the venous shunts, flap of greater omentum was fixed with the help of clips to the diaphragmatic surface of the liver and diaphragm, i. e. omentohepatophrenopexy was performed. This step was simplified by the fact that at the time of revision of abdominal cavity there were detected the adhesions of omentum with liver surface and abdominal wall, which were not split apart but on the contrary were used for fixation. In 7 cases (9 %), for the patients with a high risk of haemorrhage from oesophageal varices, operation was complemented by devascularisation of pericardial part of the stomach with reduction of lienal blood flow by means of left gastric artery and vein and short gastric veins were clipped and ligated [4].

Conversion to an open operation was performed for 3 (4 %) patients due to the presence of hepatoduodenal ligament masses and for 2 (2 %) patients with injury of dilated collateral vessels in this region and massive haemorrhage.

In postoperative period, the therapy started before the operation was continued. Corresponding ASAE, ASGE, and Baveno [7, 9, 14] recommendations were taken into account. Besides analgesics, antibiotics and infusions, the patients with high risk of variceal haemorrhage were given vasopressin or terlipressin, somatostatin analogs, nonselective β-blockers and nitrates. Treatment of hepatic encephalopathy included the use of lactulose, antibiotics that inhibit the growth of ammoniagenic bacteria in the gut, ornithine-aspartate and ornithine-ketoglutarate, as well as glutargin. Correction of anaemia and hypoxia was achieved by packed red blood cells transfusion. In 17 (21 %) patients, there was detected an excessive ascitic fluid leakage through drainage and ports in postoperative period. Except sodium-free diet, aldactone and other diuretics were used for the treatment of ascites syndrome. Intravenous infusion of albumin, fresh frozen plasma, Aminoplasmal Hepa, Hepasol Neo, and Infesol were given for the treatment of hypo- and dysproteinemia.

Investigation of portal blood circulation on the 4th–7th day after operation showed the improvement of blood supply of the liver due to blood flow in portal vein, although its diameter remained unchanged.

Postoperative complications developed in 22 (27 %) patients; in particular, intraabdominal haemorrhage that required relaparoscopy – in 3 (4 %) patients, excessive ascitic fluid leakage through drainages and ports delayed wound healing because of wound infection – in 9 (11 %), oesophageal varices bleeding – in 3 (4 %), cardiac pulmonal and others complications – in 7 (9 %). Two patients died due to the aggra-
vation of hepatocellular failure that was accompanied by oesophageal veins bleeding after the operation.

The comparative analysis of the results of laparoscopic operations in patients with AC is provided in Table. In patients with LC, LCE is associated with more intra-operative blood loss that required blood transfusion during and after the operation. They had higher conversion rate and postoperative morbidity that influenced mortality and total length of stay in the hospital.

Cholecystectomy in patients admitted with acute cholecystitis

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Cirrhotics (n = 94)</th>
<th>Noncirrhotics (n = 2183)</th>
<th>χ²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cholecystectomies</td>
<td>81 (86.2 %)</td>
<td>2006 (91.9 %)</td>
<td>0.303</td>
<td>&gt; 0.25</td>
</tr>
<tr>
<td>Surgical time, minutes</td>
<td>102.0 ± 31.7</td>
<td>48.0 ± 19.3</td>
<td>&lt; 0.05</td>
<td></td>
</tr>
<tr>
<td>*Haemorrhage &gt; 250 ml, patients</td>
<td>27 (33.3 %)</td>
<td>21 (1.0 %)</td>
<td>267.923</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>*Transfusions, patients</td>
<td>6 (7.4 %)</td>
<td>7 (0.3 %)</td>
<td>58.142</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>*Conversions, patients</td>
<td>5 (6.2 %)</td>
<td>51 (2.5 %)</td>
<td>3.930</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>*Complications, patients</td>
<td>22 (27.2)</td>
<td>122 (6.1 %)</td>
<td>39.727</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>*30-day mortality, patients</td>
<td>2 (2.5 %)</td>
<td>11 (0.5 %)</td>
<td>4.504</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Length of hospital stay, days</td>
<td>8.50 ± 2.52</td>
<td>4.20 ± 1.21</td>
<td>&lt; 0.05</td>
<td></td>
</tr>
</tbody>
</table>

*Percentage is calculated with respect to the number of operated patients.

In conclusion, liver cirrhosis is not a contraindication to the performance of laparoscopic cholecystectomy and therapeutic ERCP. This holds also in the case of acute cholecystitis that remains more or less the only indication to cholecystectomy in patients from class B and C cirrhosis. It is important to take into account considerable changes in anatomy and physiology, occurring due to liver cirrhosis and portal hypertension that are correlated with the severity of these conditions, as well as potential complications that may occur alongside corresponding preventive methods in order to determine successful treatment strategy. Besides, significant role is played by timely diagnostics, including ultrasonography with colour Doppler, as well as treatment that take into account recommendations of Baveno Consensus with regard to application of minimally invasive endoscopic and surgical techniques.

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В. І. Коломійцев. Гострий холецистит у хворих на ЦП: особливості діагностики і лікування


ГОСТРІЙ ХОЛЕЦИСТИТ У ХВОРИХ НА ЦИРОЗ ПЕЧІНКИ: ОСОБЛИВОСТІ ДІАГНОСТИКИ І МІНІІНВАЗИВНОГО ЛІКУВАННЯ

В. І. Коломійцев (Львів)

Хірургічне лікування гострого холециститу (ГХ) у хворих на цироз печінки супроводжується великою кількістю ускладнень. Протягом 15 років у клініці проходили лікування 94 хворих на ГХ на фоні цирозу печінки. При кольоровій допплерографії виявлено розширення вен у гепатодуоденальній зв’язці та черевній стінці і їх локалізацію, що враховано при плануванні операції. Лапароскопічна холецистектомія (ЛХе) виконана у 76 хворих, конверсія на відкриту операцію – у 5 (6,2 %). У 22 хворих з обтураційною жовтянкою спочатку проводили ендоскопічне транспапілярне втручання, а через 0,1–5 діб – ЛХе. Післяоперативні ускладнення розвивалися у 22 (27,2 %) хворих, з них у 3 (3,7 %) була інтраабдомінальна кровотеча, у 9 (11,1 %) – тривале підтікання асцитичної рідини дренажами і портами, у 3 (3,7 %) – кровотеча з вен травоходу, у 7 (8,6 %) – серцево-легеневі та інші ускладнення; 2 (2,5 %) хворих померло через прогресування гепатоцеллюлярної недостатності, що супроводжувалося кровотечею з вен травоходу після операції. Зменшити кількість інтра- і післяоперативних ускладнень дозволяє прецізійне ультрасонографічне дослідження гепатобіліодуоденальної зони і черевної стінки з кольорової допплерографією, а також використання рекомендацій консенсусів Baveno.

Ключові слова: гострий холецистит, цироз печінки, лапароскопічна холецистектомія.

ОСТРЫЙ ХОЛЕЦИСТИТ У БОЛЬНЫХ ЦИРОЗОМ ПЕЧЕНИ: ОСОБЕННОСТИ ДИАГНОСТИКИ И МИНИИНВАЗИВНОГО ЛЕЧЕНИЯ

В. И. Коломийцев (Львов)

Острый холецистит (ОХ) и его хирургическое лечение у больных цирозом печени сопровождаются большим количеством осложнений. В клинике за последние 15 лет проходили лечение 94 больных с ОХ на фоне цироза печени. При цветной допплерографии выявлено расширение вен гепатодуоденальной звёздца и брюшной стенки и их локализацию, что было учтено при планировании операции. Лапароскопическая холецистэктомия (ЛХЭ) включена у 76 больных, конверсия на открытую операцию – у 5 (6,2 %). У 22 больных с обтурационной жёлтухой на начальном этапе проводили эндоскопическое ретроградное транспапиллярное вмешательство, а через 0,1–5 сут – ЛХЭ. Послеоперационные осложнения развивались у 22 (27,2 %) больных, из них у 3 (3,7 %) было внутривенное кровотечение, у 9 (11,1 %) – длительное истечение по дренажам и портам асцитической жидкости, у 3 (3,7 %) – кровотечение из вен пищевода, у 7 (8,6 %) – сердечно-легочные и другие осложнения; 2 (2,5 %) больных погибло от прогрессирования гепатоцеллюлярной недостаточности, что сопровождалось кровотечением из вен пищевода после операции. Уменьшить количество интра- и послеоперационных осложнений позволяет прецизионное ультрасонографическое исследование гепатобилиодуоденальной зоны и брюшной стенки с цветной допплерографией, а также использование рекомендаций консенсусов Baveno.

Ключевые слова: острый холецистит, цирроз печени, лапароскопическая холецистэктомия.