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CHOICE OF SURGICAL TACTICS AT THE STAGE OF PREOPERATIVE PREPARATION OF PATIENTS WITH BILIARY SEPSIS

WYBÓR POSTĘPOWANIA CHIRURGICZNEGO NA ETAPIE PRZEDOPERACYJNEGO PRZYGOTOWANIA U PACJENTÓW Z POSOCZNICĄ W NASTĘPSTWIE ZAKAŻENIA DRÓG ŻÓŁCIOWYCH

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ABSTRACT

Introduction: There is a problem of choosing the optimal method for eliminating choledocholithiasis in accordance with one. The lack of satisfactory results from the use of existing methods of surgical correction explains the constant interest of specialists to this problem, requires the improvement of the commonly accepted and the search for new approaches to the treatment of this concomitant disease.

The aim: To substantiate the use of individual assessment at the stage of preoperative preparation for the purposeful differential tactic of surgical treatment of the biliary sepsis.

Materials and methods: The basis of our research was the results of the analysis of treatment of 112 patients with biliary sepsis who were on treatment from 2010 to 2017 in the surgical clinic № 2. An assessment of systemic inflammation performed according to the recommended criteria of the Chicago Interventional Conference on Intensive Care (USA, 1992). The systemic inflammatory response syndrome (SIRS) was determined in the presence of 2 or more symptoms: 1) t body $> 38^{\circ}\text{C}$ or $< 36^{\circ}\text{C}$, 2) heart rate > 90 / min; 3) breathing frequency > 20 / min; 4) white blood cell count $> 12 \times 10^9$ / l or $< 4 \times 10^9$ / l; or $> 10\%$ immature forms (SOFA score $4, 27 \pm 0.6$ points).

Results: Based on the received pre-operative score, we proposed to optimize the differentiated selection of individualized surgical tactics, taking into account the available baseline conditions, to radically eliminate the cause of biliary sepsis and evaluate the measures of initial conservative therapy. In the course of work, anamnestic unit, clinical unit, laboratory-instrumental block used. The initial severity of the condition of each particular patient is calculate according to the received sum of points for each information block, which allows at the stage of preoperative preparation to standardize all patients in accordance with their score.

Conclusion: Thus, the ball assessment of the severity of the condition of patients allows us to determine not only the optimal tactics, the size and type of surgical correction, but also to determine the effectiveness of the selected composition of preoperative preparation and postoperative treatment, carrying out its dynamic assessment.

KEY WORDS: acute cholangitis, biliary sepsis

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INTRODUCTION

Biliary sepsis (BS) - a set of systemic inflammatory reactions that occur in response to a local infectious process in the biliary tract [1].

According to modern ideas, there is a close pathogenetic relationship between mechanical jaundice (MJ), acute cholangitis (AC) and biliary sepsis (BS): under certain conditions, MJ can be complicated by the development of AC, which in some cases is transformed into BS. So, if GC is a localized pathological process, the basis of which is the inflammatory effect of the bile duct, then the BS is a systemic inflammatory reaction of the organism to the purulent process located in the bile ducts [2]. Accordingly, BS is a qualitatively new pathological state, is fundamentally different from GC and therefore requires special approaches to diagnosis and treatment. Thus, established that cholestasis and biliary tract infection are factors contributing to the transformation of MJ in AC, but with the help of these factors, it is impossible to explain the existing

differences in terms of the occurrence and severity of AC course in patients with MJ of different genesis. Among the factors of pathogenesis that contribute to the development of the BS, a special role is played by: - ischemia of the liver with MJ, which causes inhibition of the function of hepatocytes and RES cells (Kupffer cells, sinusoidal endothelium, Ito cells, Pit cells) that provide local immunity activity [5]. The phenomenon of enterogenous bacterial translocation, associated with the cessation of bile into the intestine, as well as damage to the membranes of the enterocytes of the mucous membrane, which determines the possibility of germs into the portal and further - systemic blood flow, which leads to the development of the syndrome of the systemic inflammatory response (SIRS). Reducing the portal blood flow with increasing MJ due to the partial effect of "dumping" blood leads to the generalization of infection and the development of SIRS. Biliary hypertension, which increases with AC, as pressure from the secretory pressure of the bile is supplemented by the colonization of bile ducts

by gas-forming bacteria, leads to stretching in the hepatic beams of the intercellular cracks and a breakthrough into the Disse space in the liver sinuses of infected bile. Cholangiovenous and cholangiolymphatic reflux, which arise in AC as a result of a sharp (over 300 mm water) increase in pressure in the bile ducts, accompanied by a massive release into the systemic circulation of mycorrhiza and endotoxins, enhances the development of SIRS. The significance of these factors in the pathogenesis of the BS is evident, but a number of issues concerning the characteristics of the development of the SIRS are unclear and require further resolution. Thus, extremely insufficiently studied mechanisms that determine the developmental time and the severity of bacteriocholia in progressive cholestasis in patients with MI, which is the cause of various types of diseases of the organs hepatopancreatoduodenal zone. Also little studied and interpreted contradictory ways of development of both portal and systemic bacteremia and endotoxemia in progressing AC [6].

Biliary sepsis (as a systemic inflammatory reaction in AC) has its own peculiarities that distinguish it from ordinary sepsis: often a lightning-fast, frequent development of liver abscesses, multiple organ failure syndrome, the presence of a pronounced secondary immunodeficiency, primarily due to inhibition of the reticuloendothelial system of the liver [4].

Interest in the BS is largely determined by the unsatisfactory results of treatment over the past 20 years, as evidenced by high numbers of lethality - from 11% to 64% in multiple organ failure by 3-4 systems, even with timely surgical procedures. At the same time, the largest percentage of deaths are given to emergency operations (33.0-60.0%) due to severe concomitant pathology. When refusing surgical treatment, acute purulent cholangitis gives 100% lethality [7].

Preoperative preparation of the BS is limited to the most necessary and carried out for a short time, pursuing the main goal - stabilization of hemodynamics. Surgical treatment, initiated within 24 hours from the time of admission, yields the best results with a mortality rate of 17.0%. Delay with operation up to 72 hours increases the mortality to 50.0%. In order to prepare patients with BS, a preliminary decompression of the biliary system proposed. The implementation of the first stage of decompression operations dictated by the need for restoration of liver functions and the normalization of homeostasis, as the high mortality after radical operations in patients with BS, in many respects, is due to the discrepancy between the compensatory capacity of the liver and the weight of surgical intervention. Long-term obstructive cholestasis and ascending biliary infection accompanied by severe disorganization of the structure and function of the liver, which leads to the fact that even a minimal trauma and anesthesia may appear as a trigger for the development of numerous complications: liver failure, peritonitis, and bleeding, leading to high lethality, even after palliative surgery - 30% [3].

As an alternative to the surgical method of decompression in the preparation of patients for radical surgical intervention used through the hematopoietic cholecystoholan-

giostomy or through the hematopoietic papilloproctectomy. This procedure, in most observations, allows to achieve an adequate decompression of the biliary system and to gain time for the correction of concomitant pathology. To date, there are two main accesses to the biliary duct system, which allow for revision and rehabilitation of the common liver and bile ducts by minimally invasive methods. The first one - due to papillary access, combines endoscopic methods of audit and sanitation of the common bile duct by means of the influence on the sphincter of Oddi:

- 1) ERCPG in conjunction with EPST;
- 2) ERCPG in conjunction with endoscopic balloon papilodilation;
- 3) ERCPG in conjunction with nausea bleeding drainage or endoprosthesis (as a temporary measure for unsuccessful endoscopic extraction of stones).

The second - flow access, combines the methods of audit and sanitation of the common bile duct through the hole in its wall during a laparoscopic operation or operation with minilaparotomic access, as well as in the postoperative period:

- 1) through the bladder duct,
- 2) by choledochotomy.

There is a problem of choosing the optimal method for eliminating choledocholithiasis in accordance with one. The lack of satisfactory results from the use of existing methods of surgical correction explains the constant interest of specialists to this problem, requires the improvement of the commonly accepted and the search for new approaches to the treatment of this concomitant disease.

THE AIM

To substantiate the use of individual assessment at the stage of preoperative preparation for the purposeful differential tactic of surgical treatment of the BS.

MATERIALS AND METHODS

The basis of our research was the results of the analysis of treatment of 112 patients with BS who were on treatment from 2010 to 2017 in the surgical clinic № 2.

An assessment of systemic inflammation performed according to the recommended criteria of the Chicago Interventional Conference on Intensive Care (USA, 1992). The systemic inflammatory response syndrome (SIRS) was determined in the presence of 2 or more symptoms: 1) $t_{body} > 38^{\circ}C$ or $< 36^{\circ}C$, 2) heart rate $> 90 / min$; 3) breathing frequency $> 20 / min$; 4) white blood cell count $> 12 \times 10^9 / l$ or $< 4 \times 10^9 / l$; or $> 10\%$ immature forms (SOFA score 4, 27 ± 0.6 points).

RESULTS AND DISCUSSION

The method of ballroom individual assessment at the stage of preoperative preparation, which substantiates the purposeful selection of differentiated surgical tactics. Directly determines the method of its realization in accordance with

Table I. Anamnestic block of the developed scale.

Age	60-69 years		70-79 years		80-↑ years			
	1		2		3			
Sex	female			male				
	1			2				
Duration of cholestasis (days)	1-7		7-14		14-21		↑ 21	
	1		2		3		4	

Table II. Clinical block of the developed scale.

Fever °C	37-37,9		38-38,9		39 ↑	
	1		2		3	
Diuresis ml	1000-700		700-500		300 ↓	
	1		2		3	
Liver cirrhosis	compensation		subcompensation		decompensation	
	1		2		3	
Diabetes mellitus	compensation		subcompensation		decompensation	
	1		2		3	
Heart failure	HF I		HF II		HF III	
	1		3		5	

Table III. Laboratory and instrumental block of the developed scale.

Leukocytosis, 10 ⁹	9-14,9		15-19,9		20 ↑			
	1		2		3			
Bilirubinemia, μmol / L	50-99		100-199		200-299		300 ↑	
	1		2		3		4	
Prothrombin index, %	90-80		79-60		59-40		↓ 39	
	1		2		3		4	
USG criteria	destructive cholecystitis		Diameter of TBT 10-20 mm		Diameter of TBT ↑ 20 mm			
	2		2		3			

the initial severity of the condition of patients with the BS in the form of a ball assessment according to the criteria of 3 blocks of primary information for a particular patient:

- 1) Anamnestic,
- 2) Clinical,
- 3) Laboratory and instrumental blocks.

The anamnestic information unit (Table I) consists of a ballroom assessment of the criteria: age (gradation at age intervals: 60-69, 70-79, over 80 years), sex (female, male), duration of jaundice (1-7, 7-14, 14-21, more than 21 days).

The clinical information block (Table II) consists of the following criteria: temperature (37-37.9, 38-38.9, over 39 °C), diuresis (1000-700, 700-500, less than 300 ml per day), evaluation clinically significant concomitant somatic pathology (liver cirrhosis, diabetes in the stage of compensation, subcompensation, decompensation, heart failure - HF1, HF2 - 2A (2 bales), 2V (3 bales), HF3).

Laboratory-instrumental information unit (Table III) consists of the following criteria: the value of peripheral

leukocytosis (9-14,9; 15-19,9; more than $20 \times 10^9 / l$); total bilirubin (50-99, 100-199, 200-299, more than 300 μmol / L) and the prothrombin index (90-80%, 79-60%, 59-40%, less than 39%), the results of the USG study (signs of destructive cholecystitis - increase in size, thickening and wall infiltration, inequality, fuzziness and double contour, positive ultrasound Murphy symptom, presence of echo changes in the parevasical zone, signs of degree and duration of jaundice per diameter TBT - 10-20mm, more than 20mm).

The initial severity of each individual patient hospitalized in the clinic will be calculate according to the amount received for each information block, which allowed us at the stage of preoperative preparation to standardize all patients according to their score in the following groups:

- 1) Low risk of postoperative complications (A) - 10-15 points;
- 2) Average risk of postoperative complications (B) - 16-25 points;

- 3) High risk of postoperative complications (C) - 26-30 points;
- 4) Super-high risk of postoperative complications (D) - 31 points and above.

Based on the received pre-operative score, we proposed to optimize the differentiated selection of individualized surgical tactics, taking into account the available baseline conditions, to radically eliminate the cause of BS and evaluate the measures of initial conservative therapy.

In the course of work, anamnestic unit, clinical unit, laboratory-instrumental block used. The initial severity of the condition of each particular patient is calculate according to the received sum of points for each information block, which allows at the stage of preoperative preparation to standardize all patients in accordance with their score.

Based on the received preoperative score, one can optimize the differential choice of surgical tactics and preoperative preparation of patients with BS.

- 1) group A with low risk of postoperative complications (10-15 points) shows the implementation of a one-stage radical elimination of the causes of purulent cholangitis by surgical techniques (laparotomy, low-invasive - laparoscopic, endoscopic), based on the conditions of a separate surgical clinic, depending on its equipment, accumulated experience performing similar interventions and qualifications of the prepared surgical team;
- 2) in the groups of high-C (26-30 points) and ultra-high-D (31 balls and above) the risk of postoperative complications shows a unambiguous choice of the stage tactics of surgical treatment: at stage 1, low-traumatic palliative spontaneous dosage biliary decompression is performed by non-invasive technologies (endoscopic - stenting, EPST in addition to the displays by nocobiliary drainage), and already in 2 stages after stabilization of the functional state of the liver and reduction of the ball scoring of the initial severity of the condition of the patient with BS, to carry out radical treatment to eradication of biliary pathology invasive or traditional open methods depending on the conditions of surgical clinics;
- 3) group B in the average (16-25 points) of the risk of postoperative complications requires a dynamic assessment of the severity of the condition under the influence of initial preoperative conservative therapy. If in the monitoring process the score decreases, the patient may perform a one-stage radical elimination of the cause of the BS. If in the dynamics of the assessment does not change, then patients need unambiguous implementation of the stage tactics of biliary decompression with the predominant use of low-traumatic sparing dosage surgical techniques.

More rational method for treating of biliary sepsis is a surgical intervention from the mini-accessory in conjunction with supra-duodenal choledochotomy and the extraction of concrements by the Fogarty catheter and the Dormita basket, with the washing of the bile ducts with a warm solution of furatsillin it was known [3]. Unfortunately, there are currently not enough publications that would point to a differentiated approach to the treatment of cholangitis.

In this regard, it is promising to conduct research aimed at the selection of differentiated treatment in severe biliary sepsis against acute cholangitis with the use of mini-access.

Hawasli et al. note that in the acute blockade of the distal part of the common bile duct (acute biliary pancreatitis, acute obstructive cholangitis), the EPST is carried out as an emergency procedure. We have shown that all patients in accordance with the given scale may be divided into groups that would require urgent surgical intervention. It is also recommended to use different techniques and methods of surgical intervention, depending on the severity of the patient's condition.

A.M. Paganini, E. Lezoche argue that the stenosis of a large duodenal papilla shows EPST, which can be performed both before and after cholecystectomy. According to Y. Ochi, K. Mukawa et al. Endoscopic balloon dilatation is indicated for the treatment of cholelithiasis complicated by mechanical jaundice, with pronounced disturbances of the coagulogram (liver cirrhosis, coagulopathy, constant admission of anticoagulants), as well as in the narrow general bile duct containing small concrements. In all other situations, in the presence of appropriate equipment, removal of choledocholithiasis may occur intraoperatively during laparoscopic or with mini access to cholecystectomy.

We have recommended in patients with a low risk of postoperative complications provide an one-step radical elimination of the causes of purulent cholangitis by surgical techniques (laparotomy, noninvasive - laparoscopic, endoscopic). In a group of moderate risk of postoperative complications, recommended to conduct dynamic assessments of the severity of the condition. If the risk in the dynamics decreases, patients undergo one-step radical correction. If in the dynamics of the assessment does not change, then patients need unambiguous implementation of the stage tactics of biliary decompression with the predominant use of low-traumatic sparing dosage surgical techniques. In patients of the high-risk group, according to our data, we provide a step-by-step surgical treatment with the use of initially less traumatic palliative sparing metered biliary decompression with minimally invasive technologies is recommended, and after stabilization of the functional state of the liver, a radical elimination of biliary pathology by a minor invasive or traditional open method, depending on the conditions of the surgical clinic.

CONCLUSIONS

Thus, the ball assessment of the severity of the condition of patients allows us to determine not only the optimal tactics, the size and type of surgical correction, but also to determine the effectiveness of the selected composition of preoperative preparation and postoperative treatment, carrying out its dynamic assessment.

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According to the order of the Authorship.

Conflict of interest:

The Authors declare no conflict of interest.

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