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IMMEDIATE AND LONG-TERM RESULTS AND PROSPECTS OF RECONSTRUCTIVE AND RESTORATIVE SURGERY OF THE LIVER AND EXTRA HEPATIC BILIARY TRACTS

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Abstract

The article provides statistics on the volume of surgical interventions on the extrahepatic bile ducts, the number of iatrogenic cicatricial strictures after traditional and laparoscopic cholecystectomies. The authors also provide figures of complications and mortality after various reconstructive and reconstructive interventions for iatrogenic strictures of the extrahepatic bile ducts. The article highlights the causes of hepatic choledochus strictures.

Particular attention is paid to the increase in these complications after laparoscopic cholecystectomy. The article describes the classification of the level of cicatricial stricture of hepaticoholedoch according to E.I. Halperin and N.F. Kuzovlev, which is most convenient for practical application. The results of various reconstructive and reconstructive operations with iatrogenic strictures of hepaticoholedoch are critically evaluated and the importance of new, modern minimally invasive methods is emphasized. It is also emphasized that, despite the introduction of high-tech minimally invasive methods of diagnosis and treatment in surgical hepatology, and the progress in reconstructive surgery of the biliary tract, only the evaluation of the long-term results of treatment in this category of patients can give an objective assessment of the correctness of the chosen direction.

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Introduction

Increased frequency of gallstone disease morbidity, as well as improving biliary tract surgery in recent decades have led to a significant increase in the number of surgical interventions performed. In Uzbekistan around 7-8 thousand operations are performed each year on the organs of bile-excreting system, about 400 thousand operations are performed in the CIS countries and, according to WHO, about 2.5 million - worldwide. Since operations on biliary tract today are performed in almost all hospitals by differently-skilled surgeons, this leads to an increased frequency of various complications, including iatrogenic injuries, which are responsible for the formation of cicatricial strictures of extrahepatic bile ducts [1;2;5;9].

Treatment of patients with injuries and cicatricial strictures of the bile ducts is one of the most difficult problems of biliary tract surgery. Thus, according to a number of authors, the frequency of bile duct injury is 0,2-2,8% of the total number of operations on the biliary system, and mortality at reconstructive and restorative interventions reaches 15-50%, post-operative stricture recurrences occur between 5,8% and 35% of cases [1;6;7;11].

In 95-97% of cases the cicatricial stricture formation is a consequence of iatrogenic bile duct injury, inaccurate surgical manipulations on the duct during the execution of cholecystectomy. The same problem can be caused by stricture development at the choledochotomy hole at application of rough suture material and non-atraumatic needles. In addition, cicatrices choledoch may occur in case of the wrong choice of the diameter of drainage, injury at its removal, at fixation of the drainage with nonabsorbable sutures or rough suturing of choledoch wall to drainage pipe. Rarely strictures are congenital in nature or occur as a result of primary sclerosing cholangitis [2;3;5;14;15;19;20].

One of the reasons for damage of bile ducts is the misperception of their anatomical structure because of edema or infiltration hepatoduodenal zone, anomalies of cystic or hepatic ducts, lack of experience of the surgeon.

In recent years cicatricial strictures of hepaticocholedoch occur in connection with the widespread technique of laparoscopic removal of gall bladder, especially at the stage of learning of this technique. Thus, the frequency of iatrogenic bile duct injuries has been stable in recent decades at 0,05-0,2% rate, and application of laparoscopic cholecystectomy increased this number to to 0,3 - 3% rate [6;7].

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As a result of thermal burn during an allocation of the biliary cyst cervix or hepaticocholedoch wall injury during postoperative period a bile efflux may occur and, subsequently, develop into cicatricial stricture of the bile ducts. In addition, careless imposition of a clips on the cystic duct or cystic artery may lead to partial or complete compression of the bile duct, especially in congenital anomalies of the bile ducts.

Until recently even the leading hepatologist surgeons believed that the greatest difficulty of surgical interventions are observed at the treatment of patients with cicatricial strictures of the bile ducts [1, 9, 23]. However, recent decades show that together with the significant development in medical science and surgical technology, including in hepatobiliary surgery, the most complex interference have occurred in liver and extrahepatic bile ducts in a wide variety of diseases. The development of such techniques as liver transplantation, surgery of tumors and cysts of the liver, and endovisual and radioendovaskular surgery, application of new surgical materials, along with the undoubted success and renewed hopes also poses a number of challenges related to eliminating the inevitable complications.

Paying tribute to the thorough study and development of reconstructive hepatobiliary surgery it must be noted that many issues in this direction are far from being resolved, and some of them are in their infancy. This is especially true for iatrogenic cicatrical injuries of bile ducts [23, 30, 39, 40].

The frequency of bile duct injury during open cholecystectomy is approximately 1:400 [37]. Similar frequency was observed at laparoscopic cholecystectomy (1:200-1:400) [36, 40]. According to various authors mortality at reconstructive and restorative interventions reaches 15-50% [16, 30, 40].

Leading hepatologist surgeons insist that using the principle of prevention of liver and biliary tract diseases and prevention of development of severe consequences of surgical interventions in this anatomically sensitive area, it is possible to achieve the lowest mortality [21, 31]. However, unfortunately, the leading hepatology centers continue to accumulate the new clinical data on the treatment of patients with bile duct strictures, continuously and critically reinterpreting views on key issues of this problem.

Restoring the adequate bile secretion is a great difficulty. The main casuses of the difficulty are gross violations of topographic and anatomical relationships and

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commissural processes at the gates of the liver, severe general condition of patients caused by prolonged mechanical jaundice and recurrent purulent cholangitis [12, 19].

The issues of tactics of surgical treatment of this most severe group of patients has repeatedly been the subject of discussion at numerous conferences and symposia. As a result, a significant progress has been achieved in reconstructive surgery of biliary tract associated primarily with active introduction of modern methods and radioendovascular endoscopic surgery, application of precision technology and biomaterials [18, 38]. However, despite this fact, reconstructive operations on bile ducts in 4,5-25% of cases are accompanied by the development of constrictions of the biliary-enteric and bilio-biliary anastomoses [19], repudiating the results of reconstructive surgery and exacerbating the severity of the condition of patients. In the long-term periods the primary reason of unsatisfactory results of reconstructive operations on bile-excreting system is reflux - cholangitis, leading to restenosis and cholangiolitic abscesses [3, 13, 30]. Frequency of cholangiolitic restrictures in the long-term period of observation is 8,4-28,3% [23]. Smaller percent in the structure of complications is occupied by relapse cholelithiasis, cholangiogenic abscesses of the liver, biliary sepsis.

In this regard, the issues such as the choice of optimal technology of reconstructive restorative interventions, indications for trans hepatic bile duct draining, defining the role and place for endoscopic methods of correction remain disputable.

Thus we must recognize that only the study of long-term results of treatment of this category of patients can provide an objective assessment of the correctness of the chosen direction.

Diagnostic activities at patients with cicatricial strictures of the bile ducts are aimed at establishing a causal factor, the level of the stricture, the length of the affected area, the definition of the bile duct condition above and below the level of destruction.

To streamline the terminology describing the level of bile duct strictures many classifications have been suggested. So far, the most attractive and easy to use is the classification by H. Bismuth (1982), whereby cicatricial strictures are divided into five types: type 1-2 - low strictures and type 3-4-5 - high strictures. However, the author does not address the subtle details of the location of the site of

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narrowing in the proximal segments in the gate area of the liver, which drastically reduces the possibility of using this classification in selecting the optimal method of reconstruction of the bile ducts above the bifurcation.

The most feasible and practical is the classification by E.I. Galperin and N.F. Kuzovlev [9], which divides cicatricial strictures into:

• Strictures of type 0 (zero type) (the free segment of the common hepatic duct less than 1 cm or stricture confluent)

1. Bifurcational
2. Sub-bifurcational (subconfluent)
3. Monoductal
4. Biductal

• Strictures of type 1 (the free segment of the common hepatic duct is of the length of 1 to 2 cm)

• Strictures of type 2 (the free segment of the common hepatic duct is of the length of not less than 2 cm).

Besides consideration of the levels of layout and extention of choledoch strictures some authors propose to add to the classification the clinical factors. Ratchik V.M. et al. [24] propose a modified classification by Shalimov A.A. [29] taking into account the clinical and anatomical features. The authors by the etiology divide iatrogenic strictures (surgical history), inflammatory strictures (cholelithiasis, chronic pancreatitis, peptic ulcer, etc.).

By localization: low (supraduodenal part of the choledoch), medium (hepaticocholedoch area), high (lobar hepatic ducts - the gate area of the liver).

By prevalence of duct lesion: 1st degree - less than 2 cm, 2nd degree - less than 3 cm, 3rd degree - more than 3 cm.

By cholestasis intensity: partial (transitory bilirubinemia of up to 50 micromole/l, moderately increased alkaline phosphatase), total (refractory bilirubinemia of more than 50 micromole/l).

By clinical course: stage of formation of cicatricial stricture (narrowing of the ducts from 1/3 to 2/3 of the diameter) - is characterized by cholangitis occurences, intermittent jaundice, stage of evident signs (narrowing of ducts over 2/3 of the diameter) - characterized by jaundice, skin itching, cholangitis, multiple organ failure [8].

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To date ERPHG is considered the optimum method of investigation of extrahepatic bile duct. This method allows to fully investigate all segments of bile-excreting system. If in some cases ERPHG is impossible, then it is complemented by percutaneous transhepatic cholangiography (PTC) which significantly supplements the information on the status of the bile ducts.

Great value in the study of bile duct strictures is also contributed by magnetic resonance imaging, multislice computer tomography with biliary tract contrasting. Magnetic resonance cholangiopancreatography, being a non-invasive technique of visualizing the bile ducts, has gained popularity in recent years as an accurate method of assessing biliar anomalies [12, 32].

Thus, it is assumed that the successful solution of the issues of reconstructive surgery of biliary tract is directly dependent on the quality of preoperative diagnostics, detailed study of the nature, mechanisms of development of pathological processes. Along with this, in many cases the results of a diagnostic method are studied beyond their pathogenetic connection and interdependence. This raises a number of discussions and creates certain difficulties in formulating an optimal solution.

Currently hepatologist surgeons are mentioning several problems associated with surgical correction of cicatricial stricture of the bile ducts:
1 – possibility of recovery operations through the implementation of bilio-biliar anastomoses or surgical intervention using autovenous inserts or allogeneic materials;
2 - the need of application of a frame drainage for the imposition of BDA;
3 - types of frame drainages, duration of their presence in the biliary tract, the diameter of the tube and the material for its production;
4 - the advantages of using for jejunal BDA or KDP;
5 – choice of the optimal method of reconstructive and restorative operations at duct injury and the timing and phasing of these operations;
6 - the role and place of radiological and endoscopic techniques in correction of cicatricial stricture of the bile ducts [4, 7, 11, 21].

Each case faced by a surgeon in such situations during the operation is strictly individual, forcing to choose the optimal way out of a number of variants of surgical interventions [14, 15].

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In recent years for improving immediate and long-term results of the operations and prevention of digestive-biliary reflux various operations are offered with the formation of the valves in the area of anastomosis between the bile ducts and various segments of the gastrointestinal tract.

This idea still attracts the attention of many surgeons and requires new experimental clinical studies. This, apparently, reasons the attempts of antireflux surgery and the development of so-called "areflux" BDA with the formation of valves between the bile ducts and small intestine.

At the same time, the role of pathologic reflux is still under discussion [17, 31].

One of the promising directions in reconstructive surgery of cicatricial strictures is application of different materials and allogeneic biotransplantants.

Surgical interventions, often performed at elderly patients with severe concomitant pathology under emergency indications, are accompanied by a large number of complications, and the mortality reaches 15-30%.

In this connection in recent years a growing interest is arisen by non-invasive methods of restoration of bile secretion and, primarily, endoscopic interventions. At present endoscopic methods of diagnostics and treatment play an important role at hepatopancreabiliar system diseases. With regard to therapeutic possibilities of endoscopic methods, along with the traditional methods sanitization of hepaticocholedoch and restoration of an adequate passage of bile, such as EPST, nasobiliar drainage, clinical practice widely uses new endoscopic interventions: mechanical lithotripsy, duodenobiliar drainage of hepaticocholedoch using transpapillar endoprosthesis, diatermic widening of a narrowed BDA and cicatricial strictures of the bile ducts [27, 35].

Application of these methods allows to easily and quickly prepare the patients with symptoms of MFs, purulent cholangitis, PPN for the upcoming scheduled or deferred surgical interventions. In most cases the above endoscopic interventions may be an alternative to surgical interventions [26, 27].

To date it became apparent that despite the introduction of high-tech, minimum-invasive diagnostic and treatment methods into surgical hepatology, the progress in reconstructive surgery of biliary tract, only the study of long-term results of treatment of this category of patients can provide an objective assessment of the correctness of the chosen direction.

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