

Correction of Iatrogenic Damage to the Extrahepatic Bile Ducts and External Bile Fistulas Using a Minimally Invasive Technique

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Abstract The problem of surgical correction of iatrogenic bile duct injuries (IBDI) and external biliary fistulas (EBF) is one of the most urgent issues of abdominal surgery [1,2]. The urgency of the situation in IBDI and EBF is in the duration of the pathology, the increase in chronic obstructive jaundice and subsequent biliary cirrhosis of the liver, portal hypertension, purulent cholangitis, and liver failure. These patients undergo multiple restorative and reconstructive surgeries.

Keywords Iatrogenic, Invasive technique, Fistulas using

1. Introduction

The frequency of intraoperative injuries of the extrahepatic bile ducts reaches 0.2–3% of the total number of operations on the abdominal organs, and reconstructive operations lead to recurrence of strictures of the bile ducts and external bile fistulas (EBF) within 10–12%, and lethality in this case is from 8 to 40% [3,4].

An analysis of the literature shows that in 90% of the cases, IBDI are observed during cholecystectomy. After performing cholecystectomy by laparotomy access IBDI occur from 0.8 to 1%, and using laparoscopic techniques the occurrences of IBDI increase from 0.3 to 3% [3,4]. Of course, the introduction of laparoscopic technology is evidence of the progress of medical science and practice, however, an increase in the number of laparoscopic interventions at the stage of mastering this technique inevitably leads to all kinds of complications. These complications of an iatrogenic nature require repeated high-tech interventions, not to mention the fact that the fate of these patients is sometimes dramatic.

Resections of the stomach lead to IBDI in 0.4–9.1%, which is primarily due to the level of professional training of the surgeon, as well as the severity of the inflammatory-destructive process on the elements of the hepatoduodenal ligament.

Numerous restorative and reconstructive operations performed for this pathology, unfortunately, cannot be considered satisfactory. The possibilities of a relatively new direction in biliary tract surgery, endobiliary stenting, remain controversial [5,6]. As a result, the further improvement of

sparing methods of surgical treatment of iatrogenic injuries of hepaticocholedochus and EBF remains a topical problem, and discussions on this problem should end with an optimal solution.

Objective: Improvement of the results of surgical treatment of iatrogenic injuries of the extrahepatic biliary tract and external biliary fistulas using sparing endoscopic technologies.

2. Material and Methods

Endoscopic retrograde cholangiopancreatography (ERCP) and polypositional fistulography are of decisive importance in the diagnosis of intraoperative injuries, cicatricial strictures, and EBF to clarify the nature of the pathology and the choice of tactics for its elimination. We performed ERCP using a duodenofibroscope with side optics JF-B(B2), JF-10 by Olympus (Japan). In the acad. V. Vakhidov Center 296 studies performed from 2010 to 2022. Of this number, ERCP was combined with subsequent endoscopic papillosphincterotomy (EPST) at 173 patients. Control ERCP was performed after EPST at 94 patients. The bougienage of the stenotic segment was carried out with biopsy forceps with local diathermo-coagulation of the difficult-to-bouginate scar segment. After that, stenting of the stenotic site was performed. Standard endobiliary stents were used.

3. Results and Its Discussion

According to our data, the causes of the formation of

cicatricial strictures and fistulas were: damage to the bile ducts and their inadequate drainage during cholecystectomy (9.2%), resection of the stomach (7.0%) and echinococcectomy (2.8%).

We performed 173 endoscopic transduodenal stentings of stenotic areas of the extrahepatic biliary tract after primary surgical interventions. In all cases, we found hepaticocholedochal strictures which formed an external biliary fistula. In 36 cases, the stricture was located in the confluence zone and was of a critical nature, accompanied by the progression of obstructive jaundice. In this group of patients, direct bilirubin ranged from 200 to 300 $\mu\text{mol/l}$. 13 patients had initial signs of liver failure in the form of manifestations of encephalopathy, a decrease in albumin levels below 30 g/l, and a decrease in the prothrombin index below 82%. In 53 cases, the obstruction was located in the zone of confluence of the cystic duct with the common bile duct. In 71 cases, the bile outflow obstruction was located in the distal part of the choledochus. The content of direct bilirubin in these patients ranged from 300 to 390 $\mu\text{mol/l}$. They were delivered to our hospital before the development of liver failure. Using the endoscopic method, it was possible to restore the patency of the hepaticochol lumen edoch and carry out stenting of the stenotic segment, which led to recovery and discharge of patients after 6-8 days. In order to prevent encrustation of the drainage tube, a constant intake of deoxycholic acid preparations (henochol, chenofalk, ursosan) was prescribed. All these patients were under constant control during postoperative period. There were no complications associated with stenting of the external bile ducts in any of the cases. At different times (from 6 to 10 months), the stents were removed at duodenoscopy.

4. Conclusions

Thus, the cause of intraoperative injuries, cicatricial strictures and external biliary fistulas is tactical and gross technical errors occurring during primary operations, more often during cholecystectomy.

Endobiliary stenting is one of the main methods for correcting iatrogenic damage to the EBD and EBF. In a certain number of cases, they prevent patients from severe and sometimes repeated surgical interventions.

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