

Endoscopic Interventions in Patients with External Biliary Fistulas Caused by Iatrogenic Injuries of Biliary Tracts

Uktam Nurmatovich TURAKULOV 

Tashkent Institute of Postgraduate Medical Education, Tashkent, Uzbekistan

Republican Specialized Center of Surgery named after acad. V.Vakhidov, Tashkent, Uzbekistan

Corresponding author's Email: tun_71@mail.ru

ABSTRACT

The aim of this study was to evaluate the frequency and severity as well as to define the best treatment option for patients with iatrogenic injuries. The article presents the analysis of surgical treatment of 49 patients with external biliary fistulas (EBFs) caused by iatrogenic injuries of anhepatic bile-ducts. The causes of strictures and external biliary fistulas formation were intra-operative injuries during cholecystectomy, gastric resection and echinococcectomy. Successful results were achieved in 43 (87.6%) cases using endoscopic transpapillary elimination of external biliary fistulas. Endoscopic manipulations promote the relief of clinical manifestations of CBD cicatricial stricture and provide the choice of the optimal reconstructive surgery.

Original Article

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Keywords

Hepatic Bile Ducts, External Biliary Fistula, Iatrogenic Injuries, Cicatricial Strictures, Diagnostics, Treatment.

INTRODUCTION

Materials of numerous international scientific conferences of hepatopancreatobiliary surgeons which have been hold for recent years attest the relevance of diagnostics and treatment issues of external biliary fistulas (EBF) [1-4]. The questions about errors, dangers, complications and prevention of EBF were always acute and topical. No one, even the most qualified surgeon cannot be totally guaranteed against errors and complications [1, 2, 5-7, 9]. The acuity of EBF is caused by the disease duration and by the development of serious complications such as obstructive jaundice, purulent cholangitis, biliary cirrhosis, portal hypertension and hepatic failure. In majority of cases such type of patients are performed recurring surgeries but the lethality remains high – up to 8-40 % [2]. The main causes of EBF occurrence are surgeries on biliary tracts, liver, stomach and duodenum. Iatrogenic injuries of biliary tracts lead to EBF formation in 40.7 – 43.1% of cases. Residual choledocholithiasis, stenosis of major duodenal papilla or their combination lead to EBF in 25.9 – 26.4% of cases [4-7, 8].

Iatrogenic injuries are a predominant factor of hepaticocholedoch cicatricial strictures formation and they are the causes of EBF development in 82-98% of cases [6]. The frequency of bile ducts injuries makes up 0.2-2.8% from the general quantity of surgeries on the biliary system and lethality after reconstructive-restorative interventions amounts 15-50% [3, 8, 10]. A particularly difficult task is to restore an adequate natural passage of bile at high EBF, at the level of the lobar hepatic ducts. As a rule, it is connected with gross violations of topographic and anatomical relationships in the hepatobiliary zone, massive inflammatory, adhesive and cicatricial processes, a severe general condition of patients caused by recurrent purulent cholangitis [1, 4].

Surgical treatment of patients with EBF has achieved a significant success, but complications associated with stenosis of biliodigestive and biliobiliary anastomosis are developed in 4.5-25% of cases after reconstructive operations on the biliary tracts [4]. The choice of surgeries for this pathology is a matter of debates and the results cannot be considered as satisfactory ones. An intent study of possibilities of new method in the biliary tracts surgery - endobiliary stenting - has been still going on. The problem of further improvement of diagnostic methods and surgical treatment of EBF after iatrogenic injuries of hepaticocholedoch remains relevant. A comparative analysis of the reconstructive surgeries results at EBF is an important help for further improvement of diagnostic methods and surgical treatment of this pathology.

Objective of this investigation is to improve the surgical treatment results of the EBF after iatrogenic injuries of anhepatic biliary tracts with the use of endoscopic technologies.

MATERIAL AND METHODS

Endoscopic treatment as an independent method has been attempted in 49 patients with iatrogenic cicatricial strictures and external biliary fistulas. The important place in the diagnostics of intraoperative injuries, in cicatricial strictures and EBF belongs to endoscopic retrograde pancreatocholangiography (ERPHG). Polypositional fistulography is also informative in recognition of the pathology and at the choice of tactics for its elimination. We performed 49 ERPHG. A subsequent endoscopic papillosphincterotomy (EPST) was performed in 41 patients. Control ERPHG after EPST was performed in 34 patients. Patients with EBF on the background of bile ducts cicatricial stricture were performed bougienage of the stenotic segment by biopsy forceps in the closed and open forms in the combination with the local diathermocoagulation of hard-to-cure scar segment. Then they were performed stenting of the cicatricial strictures area.

Ethical approval

The review board and ethics committee of Republican Specialized Center of Surgery named after acad.V.Vakhidov approved the study protocol and gave permission.

RESULTS AND DISCUSSION

The causes of cicatricial strictures and fistulas formation according to our observations were: bile ducts injuries and their inadequate drainage after cholecystectomy (90.2%), the stomach resection (7.0%) and complications of echinococcectomy (2.8%). In total we performed 49 attempts of endoscopic correction of adequate bile passage through anhepatic bile ducts in patients with stenosis and external biliary fistula (Table 1).

Table 1. An efficiency of bile ducts strictures endoscopic treatment subject to their site level

Stenosis level	Treatment		Treatment		Total	
	abs	%	abs	%	abs	%
Distal part	18	41.9	2	33.3	20	40.8
Middle part	19	44.2	2	33.3	21	42.9
Proximal part	6	13.9	2	33.3	8	16.3
Total	43	87.6	6	12.2	49	100

Endoscopic treatment was performed in 43 patients. In 6 patients we did not manage to insert a conductor through the stenosis zone; in 2 patients it was not possible to install instruments (for the probing) through the conductor or to introduce endoprosthesis.

EPST was performed as a stage of preparation for reconstructive surgery in 22 patients with a combination of cicatricial stricture with stenosing papillitis of the major duodenal papilla and residual calculus which were located below the stricture. 23 endoscopic transduodenal stentings of the external bile ducts stenotic area after primary surgical interventions were particularly singled out. Hepaticocholedoch strictures which were the cause of the EBF were found in all cases. We used the classification of E.I.Galperin at describing the level of hepaticocholedoch stricture [1].

In 6 cases the stricture was located in the confluence zone and had a critical nature which was consisted of the obstructive jaundice progression. The direct bilirubin in these patients was from 200 to 300 $\mu\text{mol/l}$. In 2 patients we observed initial signs of a hepatic failure in the form of encephalopathy, a decrease of albumin levels

below than 30 g/l, a decrease in the prothrombin index below than 82%. We rated the patient's condition as a second class according to the Child-Pugh scheme. The severity of patient's condition besides the obstructive jaundice, in 63.3% of cases was stipulated by purulent cholangitis, hepatic failure. A partial stricture of hepaticocholedoch was revealed in all cases.

In 19 cases the obstruction was located in the fusion zone of the bile duct with the bladder duct. Such position of the defect, in our opinion, is most typical, especially at the stage of the laparoscopic method mastering. All patients in this group were diagnosed promptly and appropriate interventions were performed. In 18 cases an obstruction to the bile outflow was located in the distal part of the choledoch. Exactly in such cases doctors of general surgical departments encounter the problem of recurring interventions. The content of direct bilirubin in these patients was from 300 to 390 μm . They were timely hospitalized to our hospital before the development of liver failure. The endoscopic method including the probing of the stenotic segment in combination with local diathermocoagulation of the hard-bouging cicatricial segment we managed to restore the patency of the hepaticocholedoch and to perform stenting of the stenotic segment and it led to patients' recovery and their discharge after 6-8 days.

The efficiency of drainage was estimated by endoscopic criteria, clinical condition of patients and also by laboratory indicators. Improvement of general condition, appearance of appetite, staining of feces and reduction or disappearance of skin itching were clinical signs of an effective drainage.

During the first three days the activation of patients, a decrease or complete termination of the bile secretion from the external fistula, normalization of the temperature, a decrease in the intensity of icteric staining of the skin and urine were objectively noted. There was a decrease in the level of total and direct bilirubin, normalization of alkaline phosphatase levels, enzymes in laboratory indicators.

Our observations showed that endoscopic treatment was effective almost in all patients with distal stenosis of the bile duct, in 19 from 21 patients with stenosis of the hepaticocholedoch middle part, the effectiveness of endoscopic treatment had been almost the same for these 2 groups of patients. In the treatment of proximal stenosis the success has been achieved in 6 from 8 cases and it differs both from the results of distal stenosis treatment and from the results of middle third stenosis drainage. Thus, the prospect of endoscopic treatment are determined by the localization of the cicatricial process and are less effective in patients with proximal strictures of common bile ducts.

In order to prevent the incrustation of the drainage tube a constant intake of deoxycholic acid drugs was prescribed. It should be noted that complications associated with stents of external bile ducts were not observed. The stents were extracted during duodenoscopy at different periods (from 6 to 10 months). It must also be remembered that endoscopic manipulations can cause a number of complications: duodenal injury, hemorrhage, exacerbation of cholangitis, pain syndrome and pancreatitis. Acute pancreatitis was developed in 18.4% of patients and it was stopped by conservative drugs and in 10.2% - hemorrhage from the EPST zone after endoscopic interventions. Hemorrhage was stopped by the electrocoagulation method [10]. There were no mortality outcomes in this group. Two months after the discharge 12 patients addressed with the signs of restenosis and they were performed a repeated endoscopic dilation. In 7 patients the biliostents independently emerged into the lumen of the intestine after 3 months, but the bile passage remained satisfactory. There is a stable remission at a small extent of stricture and with a greater extent of stricture and the CBD restriction had been noted by the 6th month which required recurring interventions. In 9 patients with a stricture length more than 0.5 cm endoscopic manipulations were ineffective and they were performed reconstructive surgeries. Only 1 from 13 patients who were undergone balloon dilatation without biliostents had a relatively stable improvement, the rest of them were performed double or triple repeated dilation without any effect. They were performed reconstructive surgeries six months later.

CONCLUSION

Thus, the surgery of the external biliary fistula presents great difficulties. The choice of reconstructive and restorative surgeries depends on many factors. The level of fistula, its shape and direction, the cause, the nature of concomitant pathology are distinguished among them. Complex preoperative diagnostic results based on which the surgeon can carefully weighs indications or contraindications to some method of intervention are considerably significant. The use of transduodenal biliostenting makes it an alternative to the complex reconstructive interventions and creates the prospects for improving the treatment results of such complicated pathology as external biliary fistulas. The efficiency analysis of endoscopic treatment of anhepatic bile ducts

iatrogenic strictures showed that regardless to the impressive number of unsatisfactory results, this technique had the advantage of being a stage treatment and under certain conditions provided the treatment of purulent cholangitis and obstructive jaundice. This circumstance is very important at determining further surgical tactics in patients with severe degree of obstructive jaundice and purulent cholangitis. Endoscopic manipulations promote the relief of clinical manifestations of CBD cicatricial stricture and provide the choice of the optimal reconstructive surgery.

DECLARATIONS

Authors' Contributions

All authors contributed equally to this work.

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Competing interests

The authors declare that they have no competing interests.

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