METHODS FOR TREATMENT OF EXTRAHEPATIC BILE DUCT AFTER IATROGENIC LESIONS - OUR EXPERIENCE IN RECONSTRUCTIVE BILE SURGERY

Dimitar Stoykov[*,1] **and Polina Marinova**[*]
[*]First Surgical Department, Medical University Pleven, Pleven, Bulgaria.

ABSTRACT AIM To analyse our ten years' experience with iatrogenic injuries of the choledochal duct. **MATERIAL AND METHODS** For ten years 12754 patients were operated for diseases of the gallbladder and biliary tree in the surgical department of MU-Pleven. In thirteen (0.01%) reoperations for iatrogenic injuries of external biliary ducts were performed. Types of injuries according to Bismuth and Strasberg scale, methods of reconstruction, LOS, mortality were analysed. **RESULTS** Presented in the following order: number of cases, (Bismuth), operation, LOS. 1. Two pts., Portal lesion of CHD, (E2, E3), Roux-en-Y CHJejunostomy, 12.5 days 2. Two pts., Right Hepatic Duct injury. (E4), Kehr, 9.5days 3. Four pts, Middle third of ChD (E1), Kehr 8.5 days 4. Two pts. Middle third of ChD (E1), Kehr +Omentum, 9.5days 5. Two pts. Distal third of ChD (E1), Choledochoduodenostomy+Kehr, nine days 6. One pt. Total extirpation of ChD (E3-E1), Roux-en-Y ChJejunostomy, nine days No deaths occurred. **CONCLUSIONS** Type of reconstruction depends on the type of injury, patient's general condition, and surgeon's experience. Highly qualified hepatobiliary surgeons in specialised centres can achieve good results.

KEYWORDS treatment of extrahepatic bile duct, reconstructive bile surgery

INTRODUCTION

Lesions of ductus choledochus are most common complications of gallbladder surgery. The latter especially became more frequent after the widespread of laparoscopic technique in biliary surgery. According to various authors, the complications of extrahepatic bile duct represent 0.4 - 0.8% of all mini-invasive gallbladder procedures. Often these complications are a problem of considerable technical difficulty leading to severe complications and a high lethality rate. That is why the case keeps the attention of surgeons in their quest to find the best solution for each case.

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[1]Dimitar Stoykov, First Surgical department Medical University Pleven, Bulgaria,
E-mail: inkov@mysurgery.bg

MATERIAL AND METHODS

For the 10-year period 2007-2016 in the First Surgical Clinic of UMHAT - Pleven was operated in total 12754 patients with diseases of the gallbladder and bile ducts. In 10 of them /0,01%/, re-laparotomy was required because of iatrogenic lesions of ductus choledochus.

To this group, we have added three patients with iatrogenic lesions of ductus choledochus, operated in hospitals from the regions near the district of Pleven and translated to us.

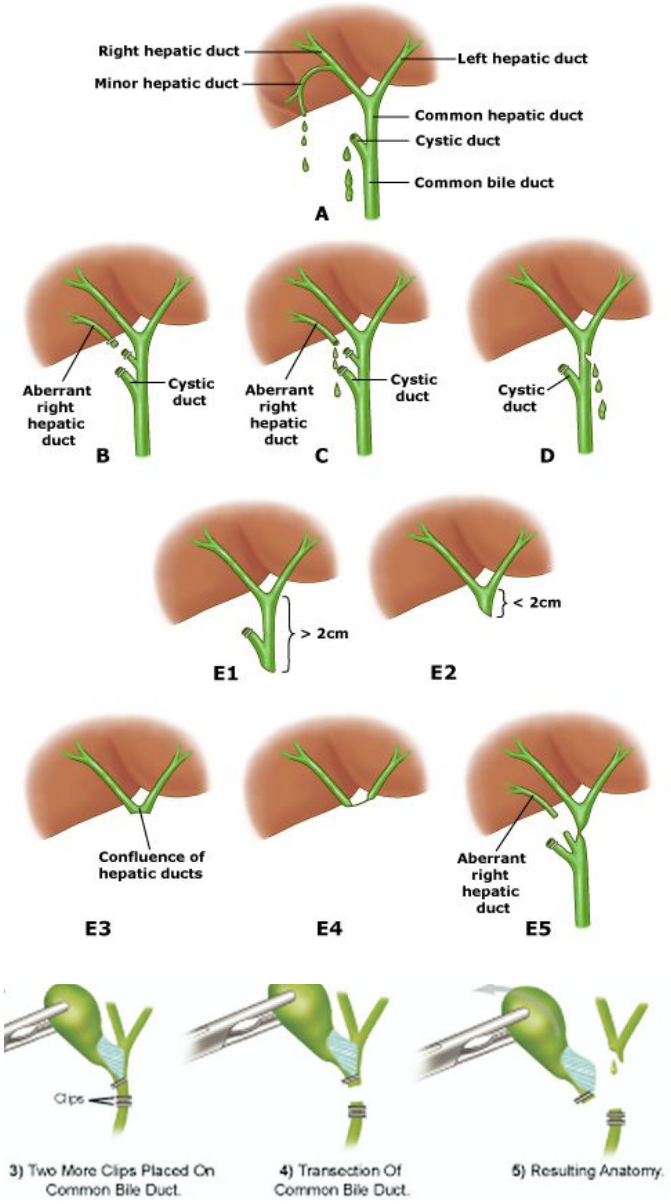
The classifications used for the description of iatrogenic injuries are based mainly on the classification of H. Bismuth from 1982. One of the most widely used modifications is that of Strasburg (1995).

Type A: Bile leakage from the cystic duct or from "Lushka's tubules" into the gallbladder bed. Type B: Occlusion of part of the biliary tree, most often of the aberrant right branch.

Type C: Transference between clips of an aberrant right branch of the right hepatic duct.

Type D: Side damage to ductus choledochus.

Type E: Damage of ductus choledochus with subtypes of Bismuth 1-5 classification.



E1: Transection of more than 2 cm from the confluence of extrahepatic bile ducts.

E2: Transection of less than 2 cm from the confluence.

E3: Transection of the liver hilum of both hepatics ducts.

E4: Transection in the liver hilum over the confluence of both hepatic ducts.

E5: Type C plus damage of ductus choledochus.

In laparoscopic surgery, the most common cause of mechanical injuries of extrahepatic bile ducts is the operator's mistake and incorrect recognition them for a cystic duct. The type of these damages is presented by Aaron M. Williams (2014) in Figure 2.

RESULTS AND DISCUSSION

The significant part of the iatrogenic damages of ductus choledochus is diagnosed intraoperatively. Only three patients transferred from other hospitals were diagnosed during the postoperative period based on leakage from the drainage or clinical and laboratory data for mechanical jaundice.

In our study, the results of distribution by level and type of injury are presented in Table 1. The significant part of the lesions 6/46% / are in the middle part of ductus choledochus. On second place are the injuries in the area of porta hepatis- in total four patients /31% /. In the distal part of the extrahepatic biliary tree, the iatrogenic lesions are described in 2 patients (15%) and in one (7%) there is total extirpation of ductus choledochus.

The treatment of the patients in this study was only operatively. The type of surgery depends on the type of lesion, the local status of extrahepatic bile ducts and the general condition of the patient.

The main aim of the surgery is to restore the normal flow of bile to the digestive tract. The most physiological pathway is to the duodenum, but in cases where it is impossible to perform anastomoses with the jejunum. As an extreme and temporary option, external drainage is accepted, but it is justified only when another surgical solution is not within the capabilities of the operating team. This external drainage is temporarily accepted to a hepatic lesion-borne lesion by placing one drain in each of the hepatic ducts and the later they were exteriorised.

After six days the patient was operated, and hepatico-jejuno anastomosis was performed.

The type of surgery in other patients depends on:

1. The type of damage of extrahepatic bile ducts;
2. Local status;
3. The general condition of the patient.

Figure 1:

Table 1 Iatrogenic lesions of extrahepatic bile ducts.

	Type of damages	Cases	Type of reconstruction
1	Lesion at porta hepatis	2	Hepaticojejunostomy Roux-en Y loop
2	Right hepatic duct lesion	2	Repair with Kehr drainage
3	Middle part	6	4 Repair with Kehr drainage 2 Repair with Kehr drainage+ patch from greater omentum
4	Distal 1/3 part	2	Holedochoduodenostomy with Kehr
5	Total extirpation	1	Hepaticojejunostomy Roux-en Y loop
6	TOTAL	13	

Figure 2:

First of all, in the choice of intervention, there is the option of restoring the normal passage through ductus choledochus, most often reconstruction on Kehr drainage was performed. This is possible when the missing portion of the main bile duct is less than two centimetres. This variant we applied to 10/77%/ of the patients in our series. Such a solution we have applied to the lesion of the right hepatic duct (Fig. 2), the damage in the middle part of the bile duct, as well as in the distal part of ductus choledochus. Interestingly, 2 of the patients with injuries in the middle part of ductus choledochus have a defect of over 2 cm (Fig.1). In these patients we were not able to connect the two ends of ductus choledochus completely, as the uncovered part of it is repaired over Kehr drainage and for better hermetization we used the patch or greater omentum. In both patients, the postoperative period was good, without any leakage from the contact drainage. The drainage function was observed for six months, and after drainage control, the drains were removed. The purpose of Kehr drainage to be placed for a long period was to allow the connective tissue around the drain to become thicker for better prevention of stenosis after drain removal. Terminolateral hepaticojejunostomy with U-loop was administered to the two patients with hepatic portal lesions and the patient with total extirpation of ductus choledochus.

Side by side hepato jejunal anastomosis. An absorbable 5-0 monofilament interrupted stitches leaving the knots outside the anastomotic lumen. Percutaneous and endoscopic methods for the treatment of iatrogenic lesions of the central bile duct have not been used.

CONCLUSION:

Iatrogenic damages of extrahepatic bile ducts are a severe therapeutic problem. Sometimes they are also a severe interdisciplinary case involving gastroenterologists, nephrologists, anaesthetists and others.

In our opinion, the most correct, physiological and long-lasting solution is only surgical repair. However, it should only be performed by highly qualified hepatobiliary surgeons. Appropriately selected and successfully implemented a technical operating method is a guarantee for the better surgical outcome, without any troubles in problem solution.

Fig 3: by Miguel Angel Mercado and Ismael Domínguez

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Authors' Statements

Competing Interests

The authors declare no conflict of interest.

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