

RECURRENT RESIDUAL CHOLEDOCHOLITHIASIS AFTER CHOLECYSTECTOMY – ENDOSCOPIC EXPLORATION OF BILE DUCTS PERFORMED 6 TIMES

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ABSTRACT

Introduction. Recurrent residual choledocholithiasis refers to the presence of concretions in the bile ducts found in patients who have undergone cholecystectomy. The incidence of recurrent cholithiasis is estimated to be 2–10%, whereas the incidence of recurrent cholithiasis after endoscopic retrograde cholangiopancreatography (ERCP) amounts to 4–24%.

Aim. The aim of this paper was to analyze the case of a patient with recurrent choledocholithiasis after laparoscopic cholecystectomy, who underwent endoscopic exploration of the bile ducts performed 6 times, including endoscopic sphincterotomy (ES) and biliary prostheses.

Case study. A 49-year old patient was admitted to the Teaching Hospital showing symptoms of extrahepatic cholestasis. On admittance, she reported nausea lasting for a few days, meteorism and strong pain typical of biliary colic, located in her right epigastric region and irradiating to her spine. Additionally, she complained of a bitter taste in her mouth and bitter belching. The patient had been operated on 9 years before for acute cholecystitis.

Results and discussion. This presented case poses a question for a clinician concerning the risk factors for recurrent choledocholithiasis. In the majority of cases, i.e., as many as 80%, recurrent cholithiasis is detected within 3 years following ERCP with sphincterotomy. The risk of choledocholithiasis recurrence after endoscopic evacuation of the stones is within the range of 4–24%. The identification of factors causing

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this disease will contribute to its prevention, early diagnosis and treatment of any further recurrences and complications from choledocholithiasis. Data from published literature prove that damage to the sphincter causes chronic cholangitis, which then contributes to the formation of concretions. Other risk factors include dilated bile ducts and performed cholecystectomy. All these factors occurred and were observed in the analyzed patient.

Conclusions. The basic treatment for this recurrent disease is ES performed during an ERCP procedure. This case emphasizes those problems associated with the prevention and treatment of recurrent choledocholithiasis.

Key words: recurrent residual choledocholithiasis, cholecystectomy, endoscopic retrograde cholangiopancreatography, endoscopic biliary sphincterotomy

INTRODUCTION

Choledocholithiasis is defined as the presence of concretions in the extrahepatic (choledocholithiasis), or intrahepatic bile ducts (cholangiolithiasis). Primary choledocholithiasis is rarely observed. Most frequently, the stones originate in the gallbladder, and this condition is referred to as a secondary choledocholithiasis. A separate problem is posed by choledocholithiasis in patients who have undergone cholecystectomy, with the incidence being estimated to be 2–10%. Stones in the bile ducts may be residual, and so overlooked during the therapeutic procedure; less frequently they form anew during various periods of time following cholecystectomy. Thus, it is vital to perform thorough diagnostics in order to detect symptoms which might suggest recurrent cholithiasis in patients qualified for cholecystectomy. Endoscopic retrograde cholangiopancreatography (ERCP) with endoscopic sphincterotomy (ES) are standard procedures in the management of recurrent residual choledocholithiasis. Despite the high level of efficiency of such treatment, we observe the recurrence of the disease in some patients – this condition is then referred to as the so-called recurrent residual choledocholithiasis [1–10].

AIM

The aim of this work is to analyze an untypical case concerning a patient with recurrent choledocholithiasis after laparoscopic cholecystectomy, who underwent endoscopic exploration of the bile ducts performed 6 times, including ES and biliary prostheses.

CASE STUDY

A 49-year old patient was admitted to the Teaching Hospital showing symptoms of extrahepatic cholestasis. On admittance, she reported nausea lasting for a few days,

meteorism and strong pain typical of biliary colic, located in her right epigastric region and irradiating to her spine. Additionally, she complained of a bitter taste in her mouth and bitter belching. She negated the existence of any comorbidities and long-term use of medication. The patient had been operated on 9 years before for acute cholecystitis. Classic cholecystectomy had been performed at that time. Afterwards, this patient was frequently hospitalized for recurrent choledocholithiasis. The first hospitalization occurred 3 years after cholecystectomy. She then reported pain in her epigastric region with the co-occurring jaundice. Abdominal ultrasonography (USG) revealed a dilated common bile duct measuring 10.7 mm. Laboratory tests detected typical features of cholestasis. ERCP with sphincterotomy of the papilla of Vater was performed, resulting in a free outflow of bile. This dilated common bile duct was additionally controlled by a Dormia basket. When the symptoms subsided, the patient was discharged in a good general condition. She was advised to follow a hepatic diet. 5 years after the first endoscopic revision of her bile ducts, the patient was hospitalized, exhibiting symptoms of mechanical jaundice. She was again qualified for the ERCP examination, which then revealed the scar resulting from the previous papillotomy. An injection of dye showed dilated bile ducts measuring more than 2 cm, and two ballotting stones more than 1 cm in diameter (Fig. 1) were detected.



Fig. 1. ERCP image demonstrating choledocholithiasis before sphincterotomy

Sphincterotomy was performed again, these stones were broken up and evacuated with a Dormia basket, thus obtaining a free outflow of bile. Due to bleeding from the incised papilla, revision of the dilated bile ducts was postponed. A control examination revealed the bile ducts orifice obstructed with concretions. Extraction with a Dormia

basket was performed, which allowed an evacuation of other stones with diameters exceeding 1 cm and numerous smaller stones. In order to protect the patient from the recurrence of bile ducts obstruction, an 8.5 F Oasis prosthesis of 5 cm was placed. During hospitalization, the patient developed iatrogenic acute pancreatitis; 6 months later, the patient underwent another endoscopic revision of the bile ducts. During that procedure the prosthesis was removed, ES was performed, obtaining a free outflow of a large number of asymptomatic stones, and dilated bile ducts were controlled with a balloon. After 1.5 years, following the last ERCP examination, the patient was hospitalized once again showing symptoms of recurrent choledocholithiasis. A heightened activity of hepatic enzymes was then detected. ERCP revealed significantly dilated bile ducts (up to 3 cm), with numerous soft stones up to 2 cm in diameter (Fig. 2). The papilla of Vater was incised again and these stones were evacuated. This examination led to complications involving another iatrogenic acute pancreatitis.



Fig. 2. ERCP image demonstrating recurrent choledocholithiasis

During the last hospitalization, the following departures from the normal condition were detected: yellowish discoloration of the skin and sclera, post-cholecystectomy scar, and palpable pain in the epigastrium. Laboratory tests revealed: elevated parameters of the inflammatory condition: CRP – 167.02 mg/L, WBC – $12.92 \times 10^3/\mu\text{L}$, procalcitonin (PCT) – 0.64 ng/mL; parameters indicating damage to the hepatic cells: AspAT – 422 U/L, ALAT – 598 U/L, GGTP – 440 U/L. Gastroscopy and colonoscopy did not reveal any pathology. Abdominal computed tomography (CT) showed quite numerous lymph nodes up to 10 mm in size, located along the inferior caval vein and between the vein and aorta. Additionally, in the cortex of the inferior pole of the right kidney a lump 11 mm in size and of the density of 45 HU (Hounsfield Unit)

was revealed. It was most probably angiomyolipoma. The patient was qualified again for retrograde cholangiopancreatography. A significant dilation of the bile ducts with a large stone of 3–4 cm was detected. The stone was removed, together with other numerous soft stones. Thick bile was obtained for microbiological tests. Multi-bacterial infection was discovered – a very significant increase of *Escherichia coli*, *Klebsiella oxytoca* and *Enterococcus faecalis*. Bacterial colonies were sensitive to, among others, amoxicillin with clavulanic acid, cephoperazon, ceftriaxone, ciprofloxacin and doxycyclin, and they were resistant to ampicillin and amoxicillin. The patient was treated with complex and targeted antibiotic therapy. Hospitalization led to a gradual stabilization of the laboratory parameters indicating cholestasis and inflammation. The patient was discharged in a good general condition, and advised to report for further controls to the Gastroenterology Outpatient Clinic.

RESULTS AND DISCUSSION

This described case poses several important questions for a clinician. First of all, what are the risk factors for the recurrence of choledocholithiasis after ERCP with sphincterotomy? How does one detect and control patients with recurrent choledocholithiasis? The risk of the recurrence of choledocholithiasis after the endoscopic evacuation of the stones is estimated to be 4–24% [2]. In the majority of cases (about 85%), recurrent choledocholithiasis occurs within 3 years following ERCP. Risk factors for recurrent cholithiasis are especially important in the case of young and healthy patients, since the identification of such factors would facilitate preventing, early diagnosis and treating for further recurrences and complications resulting from choledocholithiasis. In the subject literature, it is reported that damage to the structure of the Oddi's sphincter leads to an increased susceptibility to chronic cholangitis, which then contributes to the formation of new stones. Further, the dilated common bile duct is colonized by pathogenic bacteria [6]. The longer the period of time since sphincterotomy and the larger the number of endoscopic revisions of the dilated common bile ducts, the more frequently pathogenic bacterial flora develops. Also, this pathogenic bacterial flora becomes more diversified and resistant to medication. This is confirmed by the analyzed case, since after the endoscopic exploration of the bile ducts and sphincterotomy performed 6 times, three Gram-negative bacterial strains were cultured in the bile (*E. coli*, *K. oxytoca* and *E. faecalis*).

It is worth noting, that chronic cholangitis after ES creates favorable conditions for the formation of easily broken up, soft, “clay-like” conglomerates. Such concretions were observed in the described case. Maceration of larger conglomerates, however, for instance with a Dormia basket results in releasing the bacteria contained within them. Thus, it has been concluded that sphincterotomy should be avoided in young people (20-, 30-years old), and concretions should be removed from bile ducts after balloon dilation (balloon plasty) of the Oddi's sphincter [6]. We should, however, re-

member about certain limitations of balloon dilation, which, on the one hand reduces the frequency of complications during ERCP, but, on the other hand, is a slightly more difficult procedure than ES. It is mostly applicable for evacuating small stones, whose diameters do not exceed 8 mm, and in the case of patients with duodenal diverticulum, flat papilla of Vater, cirrhosis, and portal hypertension. It is believed that in the case of stones larger than 10 mm, and such concretions repeatedly occurred in this patient, sphincterotomy should be performed. The risk of choledocholithiasis recurrence is also increased by the previously performed cholecystectomy. Removing the gallbladder increases the frequency of peripapillary diverticula being formed, as well as of large choleliths and bile duct dilation. This is most probably associated with a lack of the protective function of gallbladder motor capacity, which facilitates the clearing of the bile ducts, prevents the formation of new choleliths, and washes out the existing ones [1, 8, 10]. Another risk factor for recurrent cholithiasis is the dilation of the common bile duct above 15 mm. Hence, it is so important to constantly control and observe patients who report, in the interview, originally dilated bile ducts and cholecystectomy. It has been noted that intraductal ultrasonography (IDUS) imaging could be employed as a helpful tool in reducing the frequency of early recurrences of cholithiasis after ERCP [8]. This technique enables one to visualize even very small concretions in the bile ducts. It is believed that not removing very small fragments of concretions, invisible during cholangiography, may contribute to their early recurrence [7, 8]. It is estimated that the risk of cholelith recurrence following IDUS procedure is only 1.9%, whereas it increases to 14.7% when IDUS is not performed.

When discussing the aforementioned problem, further management of this group of patients should be considered. How to prevent further recurrences? Is chronic administration of available cholagogic and cholepoietic medication significant? What are the possibilities of invasive operative therapy? Complications of recurrent choledocholithiasis cannot be overlooked, especially secondary biliary cirrhosis, as well as the risk of enterobiliary, acute cholangitis or acute biliary pancreatitis. With respect to available literature on this subject, contradictory reports may be found. Treatments with a combination of endoprotheses and oral ursodeoxycholic acid or placebo were compared. No statistically significant difference in treating choledocholithiasis was found [4]. On the other hand, research assessing the effect of combined treatment (i.e., stenting combined with ursodeoxycholic acid and Rowachol) in managing recurrent choledocholithiasis in elderly patients, confirmed the effectiveness of such therapy [3]. It seems that we should wait for further developments with respect to the effectiveness of known pharmacological agents, or for the introduction of a new generation of medication reducing bile lithogenicity.

Operative treatment procedures for recurrent choledocholithiasis involve, among others, choledochoduodenostomy or choledochenterostomy with Roux-en-Y reconstruction. It has been shown that the frequency of recurrent choledocholithiasis

after choledo-duodenal anastomosis in elderly patients amounts to 2.4%. Complications of side-to-side anastomosis should be paid attention to, among others, hepatic abscesses and the so-called “sump syndrome”. Hence, an end-to-side anastomosis is a better solution. Naturally, the worst types of complications involve single cases of iatrogenic cholangioma, developing even many years after the performed surgical procedure [5].

It appears that in the case of recurrent choledocholithiasis, retreatment with ERCP is a reasonable and safe therapeutic procedure, especially when compared to invasive operative methods [9].

CONCLUSIONS

1. In managing recurrent choledocholithiasis, endoscopic exploration of the bile ducts is a golden standard.
2. After ES in patients with recurrent choledocholithiasis, microbiological tests of bile should be performed.

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