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Dr. Santoshkumar Ambulge
MBBS, DNB (Pediatrics), DNB (Gastroenterology), ESEGH, Consultant Gastroenterologist, Citizen Speciality Hospital and BHEL Govt hospital, Hyderabad, Telangana, India

Dr. Kishore Kumar Reddy YC
MBBS, DNB (Gen. Surgery), DNB (Surgical Gastro), FMAS, FICRS (robotic), Fellow-Hepatology and Liver transplant. Consultant GI, HPB & Liver transplant surgeon Medicover Hospitals, Hi-tech city Hyderabad, Telangana, India

Dr. Rushita Torkadi Ambulge
Assistant Professor, VDGMC, Latur, Maharashtra, India

Dr. Shanthipriya Katta
MBBS, DNB Radiology Fathima Diagnostics, Chandrayangutta, Hyderabad, Telangana, India

Dr. Anveshkumar Ella
MBBS, MS (Gen Surgery) Dr. VRK women's medical college, Aziznagar, Hyderabad, Telangana, India

Corresponding Author:
Dr. Santoshkumar Ambulge
MBBS, DNB (Pediatrics), DNB (Gastroenterology), ESEGH, Consultant Gastroenterologist, Citizen Speciality Hospital and BHEL Govt hospital, Hyderabad, Telangana, India

Common bile duct diameter long-term monitoring following endoscopic sphincterotomy in individuals with common bile duct stones

Dr. Santoshkumar Ambulge, Dr. Kishore Kumar Reddy YC, Dr. Rushita Torkadi Ambulge, Dr. Shanthipriya Katta and Dr. Anveshkumar Ella

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Abstract
Background and objective: In patients with choledocholithiasis, to ascertain the duration required for the common bile duct (CBD) diameter to return to normal following endoscopic sphincterotomy and stone extraction.
Method: Enrolled were patients with CBD dilatation brought on by choledocholithiasis. Before, 1, 3, 6, and 12 months following endoscopic sphincterotomy and stone extraction, CBD diameter was evaluated using transabdominal ultrasonography. This process was repeated until CBD diameter normalized.
Result: Out of the 100 instances who were enrolled over a 12-month period, after one month, 61 (61) patients had their CBD diameter return to normal. After three months, of the 44 patients who were still alive, 36 of them (including 3 whose repeat ERCP indicated choledocholithiasis) had their CBD diameter return to normal. After six months, two of them had dilated CBD without any symptoms and normal liver function tests (LFT); at the 12-month follow-up, the duct had returned to normal.
Conclusion: After the removal of CBD stones, a small percentage of patients (18– at the end of three months) may continue to have asymptomatic CBD dilatation. If symptoms and abnormal LFT are present, a dilated CBD within the first month may be related to retained choledocholithiasis.

Keywords: Choledocholithiasis, endoscopic sphincterotomy, Common bile duct, magnetic resonance cholangiopancreatography

Introduction
The common bile duct (CBD) usually has a small diameter and is composed of a thin layer of smooth muscle and elastic fibers. When stones obstruct the CBD, the pressure from the retained bile leads to its dilation. Following the removal of the stones, doctors endeavor to ascertain the underlying cause for the lack of improvement in the dilated CBD, as well as the timing and extent of any improvement [1, 2]. One week after undergoing endoscopic sphincterotomy and CBD stone extraction, the diameter of the CBD noticeably reduces, as confirmed by ultrasonographic examination. A separate study discovered that 98.3% of participants had a normal CBD diameter six months after the removal of the stone. The majority of investigations that have assessed the dimensions of CBD have employed ultrasonography. These imaging techniques are used to visualize the entire structure of the CBD, identify the segment with the greatest diameter, and provide information about any abnormalities in the CBD.
This study aims to investigate the time required for the common bile duct (CBD) diameter to return to normal after endoscopic stone extraction (ES) in patients with CBD stones. The changes in CBD diameter were examined at 1-, 3-, 6-, and 12-months post-procedure [3, 4].

Material and Methods
This study involved 100 individuals who were admitted to hospital with choledocholithiasis with CBD dilation. We enrolled patients following the successful extraction of stones from the common bile duct (CBD).

Exclusion criteria

1. Contraindication to performing endoscopic retrograde cholangiopancreatography (ERCP)
2. Alternative reasons for biliary dilation
3. Prior gastrojejunostomy surgery
4. Pregnancy
5. Documented hypersensitivity to contrast agents
6. Age below 12 years,
7. Previous sphincterotomy
8. Refusal to provide informed written consent

Results

Table 1: Initial patient features

Age (mean [SD])	61.4 (6.4)
Female gender (n [%])	62 (62%)
Previous cholecystectomy (n [%])	55 (55%)
pancreatitis prevalence(n [%])	4 (4%)
Clinical signs (n [%])	
Abdominal pain	95 (95%)
Jaundice	70 (70%)
Fever	45 (45%)
Nausea and vomiting	59 (59%)
Pruritus Liver biochemistry	34 (34%)
Aspartate aminotransferase (IU/L)	112 (112)
Alanine aminotransferase (IU/L)	136.9 (136.9)
Alkaline phosphatase (IU/L)	756.4 (756.4)
Total bilirubin (mg/dL)	4.0 (4.0)

Discussion

We have demonstrated that following ERCP and stone removal, the continued dilatation of the common bile duct (CBD) does not necessarily indicate the existence of a remaining stone.

However, following sphincterotomy and CBD stone extraction, the presence of jaundice alone was not a dependable indicator of the existence of choledocholithiasis, even when accompanied by high ALP levels and dilated CBD [4, 5].

As far as we know, no study has examined the factors that predict the presence of remaining stones following endoscopic sphincterotomy (ES). Thirteen percent of our patients required a repeated ERCP due to this method. Our research demonstrates that the process of CBD dilation reversal can take as long as 12 months following the complete removal of the stone. However, only 3 patients showed the presence of a retained stone when a repeat ERCP was performed. Although it is possible that there were patients in our study who had asymptomatic retained stones [5, 6].

An accepted procedure for the identification and management of CBD stones is ERCP. US, a non-invasive technique, is also often utilized for dilatation before to cholangiography and the identification of CBD stones. Its specificity ranges from 83% to 97%, while its sensitivity ranges from 40% to 75%. Values can differ by 20% depending on the characteristics of these procedures. This variation has been ascribed to the impact of high-pressure injections of butyl scopolamine and contrast media into the bile ducts [6].

In the current trial, 87% of patients showed a significant decrease in CBD diameter within 24 hours of ES, and by day 7, laboratory and clinical outcomes had improved. Six patients whose CBD diameter had not altered had a second ERCP, which revealed persistent stones (p<0.1). These stones were taken out using a balloon and a basket. Within 24 hours after the second ERCP, the CBD diameter shrank. In line with these conclusions, we discovered that when US was carried out within 24 hours of ES, the CBD recovered to normal and stayed that way for seven days [7, 8].

Due to its high sensitivity and non-invasive nature, ultrasound (TUS) is suggested over invasive methods like endoscopic retrograde cholangiopancreatography (ERCP) for identifying common bile duct (CBD) dilatation. Furthermore, our recent study also demonstrated a robust association between CBD diameters assessed using TUS and those determined using ERCP in previous investigations. Furthermore, studies have demonstrated that the CBD possesses the capacity to rapidly expand and contract [9-11].

Conclusion

In the majority of instances, the CBD diameter will return to its normal size within a month after the removal of choledocholithiasis and in the absence of any remaining stones. An enlarged common bile duct (CBD) can be caused by past choledocholithiasis during the last a year, and may not need any treatment if it is accompanied by signs and elevated alkaline phosphatase levels, it is advisable to consider repeating an endoscopic retrograde cholangiopancreatography (ERCP) after MRCP or EUS evaluation.

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Conflict of interest

None

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