

Difficult common bile duct stones: Case series and literature review

El Mountassir M*, Borahma M, Benelbarhdadi I, Lagdali N and Ajana FZ

Mohammed V University, Ibn Sina Hospital, department of gastroenterology C, Rabat, Morocco

Abstract

About 10% of common bile duct (CBD) stones remain inextirpable in the event of difficult stones. The goal of our work is to evaluate different therapeutic options for managing difficult CBD stones as well as their results. Out of 221 ERCPs, 31 patients (14.02%) were admitted for difficult CBD stones with a female predominance (64.5%). We performed an endoscopic papillary large balloon dilation (EPLBD) after an EST in 61.3% with a mean diameter balloon of 15.8 +/- 1.8 mm and a large sphincterotomy (LS) alone performed in 32.3% associated to endoscopic mechanical lithotripsy in 02 patients. The tapering of the distal CBD was recorded in 5 patients, and it was identified as a limit of stone extraction when it exceeded 2 cm, a plastic stent was deployed and the patients referred for surgery. The success of the Endoscopic retrograde cholangiopancreatography (ERCP) was obtained in 90.3% of patients and was guaranteed by EPLBD and LS.

Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) is the therapeutic option of choice for the treatment of **common bile duct (CBD) stones**, allowing a complete clearance of CBD in more than 90% of cases. However, the presence of difficult stones, particularly a large stone, can limit its results.

Aim of study

The goal of our work is to evaluate different therapeutic options for managing difficult CBD stones as well as their results.

Patients and methods

It was a retrospective study, from March 2019 to March 2020, including all patients with difficult CBD stone defined as a stone diameter ≥ 15 mm, multiple stones, barrel-shaped stones, and tapering or tortuosity of the distal common bile duct, and scheduled for ERCP.

Results

Out of 221 ERCPs, 83 (35.5%) admitted for CBD stones including 31 patients (27.8%) having difficult CBD stones. The mean age patient was 62.8 +/- 18 years, with a sex-ratio F/M of 1.8. with a female predominance (64.5%) and a sex-ratio W/M at 1.9. Clinically, 13 patients (42%) had a gallbladder in place and 04 patients (13%) had a history of endoscopic sphincterotomy (EST). The median diameters of the CBD and stones were 20 mm [16-25] and 16 mm [15-20], respectively. We noticed 6 cases (19.4) of barrel-shaped stones. The tapering of the distal CBD was recorded in 5 patients, and it was identified as a limit of stone extraction when it exceeded 2 cm, a plastic stent was deployed, and the patients referred for surgery. We performed an endoscopic papillary large balloon dilation (EPLBD) after an EST in 19 patients (61.3%) with a mean diameter balloon of 15.8 \pm 1.8 mm and a large sphincterotomy (LS) alone performed in 10 patients (32.3%) associated to endoscopic mechanical lithotripsy in 02 patients.

The success of the ERCP, defined as complete clearance of the CBD, was obtained in 90.3% of patients (N = 28) and was guaranteed by

EPLBD and LS. The hospital stay varied between 24-48 hours and no complication of EPLBD or large sphincterotomy was reported.

Discussion

Large bile duct stones are a known difficulty in endoscopic treatment because of their diameters which remain larger than that of the sphincterotomy which does not generally exceed 12 mm [1]. This difficulty can be overcome either by widening the sphincterotomy (endoscopic papillary large balloon dilation (EPLBD)) or by reducing the diameter of the stones (fragmentation, crushing) with endoscopic mechanical lithotripsy (LM) or intra- or extracorporeal lithotripsy.

(LM) makes it possible to obtain a clearance of the CBD in 68 to 98% but it has the disadvantage of increasing the duration of the procedure with the risk of technical complications (impaction or breaking of the traction cables), or at type of perforations or lesions of the CBD [2]. In our series this technique was used in only two patients.

Endoscopic papillary large balloon dilation (EPLBD), initially described in 2003, consists of a large dilation of the sphincter of Oddi after performing an endoscopic sphincterotomy (ES). It is a technique combining the advantages of papilla dilation and sphincterotomy. It increases the efficiency of stone extraction while minimizing the complications of both techniques. Limited (ES) followed by dilation of the sphincter of Oddi reduces the incidence of post-ERCP pancreatitis, which is seen with dilation alone. This is because (ES) causes a separation between the opening of the pancreatic duct and the common bile duct, which decreases the pressure of the dilation balloon

***Correspondence to:** El Mountassir M, Mohammed V University, Ibn Sina Hospital, department of gastroenterology C, Rabat, Morocco, Tel: 0537272755, E-mail: elmountassirmeryem20@gmail.com

Keywords: endoscopic mechanical lithotripsy, common bile duct, Endoscopic retrograde cholangiopancreatography

Received: December 07, 2020; **Accepted:** December 24, 2020; **Published:** December 29, 2020

and papillary edema on the pancreatic duct [3]. EPLBD also reduces the time required for the procedure and fluoroscopy [4]. It is safer than a large sphincterotomy (LS) (needed to extract the large stone), which can lead to perforation. In our series, (LS) was used in 32.3% of our patients without any noted complications.

Most endoscopists perform a medium-sized of (SE) before EPLBD. This step appears to reduce the rate of complications, especially the risk of bleeding [5]. However, many other studies report comparable results with complete (ES) [6]. In our series, the (ES) was complete and adapted to the size of the stones and the type of the papilla without increasing the rate of complications, especially the risk of bleeding. The size of the macrodilation balloons used in the studies vary from 12 to 20 mm. In our series, macrodilation was achieved in 61.3% of our patients; we used 15.8 ± 1.8 mm diameter balloons. The choice of diameter depends on the size of the large stone and the diameter of the VBP. The diameter of the balloon should not exceed that of the CBD. Some authors limit the size of the balloon to 15 mm for fear of perforation. A large retrospective study showed that dilation with balloons larger than 15 mm had a complication rate comparable to what is described in the literature with smaller balloons [7]. The ideal time to inflate the balloon is not consensual and remains controversial because the studies done in this direction are inhomogeneous. The main goal is the disappearance of the imprint of Oddi's sphincter, the inflation time varies from 0 s to 2 min [8]. A reduced inflation time does not appear to be associated with a higher risk of bleeding. One study prospectively compared dilation times of 30 and 60 s, did not show a significant difference in the clearance of PBV and the risk of complications [9].

Biliary prostheses:

Chan et al. demonstrated the ability of plastic biliary prostheses to reduce the size of stones and facilitate their endoscopic extraction [10].

One or more plastic biliary prosthesis can be placed after failure of the extraction during the first ERCP. The prostheses used are straight prostheses of 10F from 7 to 10 cm or double pigtail prostheses [11,12]. The duration of placement of the biliary prosthesis varies in the literature from 2 to 6 months.

After a first endoscopic failure, the placement of a temporary plastic prosthesis allows complete clearance of the CBD in 73 to 93% with a decrease in the number and size of the stones (or even disappearance) [11,13]. In our series 02 patients benefited from a plastic prosthesis.

Conclusion

The indications of the various methods described above will depend on criteria; patient-related (general condition, comorbidities,

coagulation); anatomical (size of the CBD, presence of a stricture); related to stones (size, shape, location in the intrahepatic bile ducts), and of course to the experience and equipment of the operator.

EPLBD after ES and large sphincterotomy alone are two simple and effective techniques for the endoscopic extraction of difficult CBD stones. In our series, they represent the two most used techniques with a success rate that exceeds 90%.

References

1. Lauri A, Horton R, Davidson B, Burroughs A, Dooley J (1993) Endoscopic extraction of bile duct stones: management related to stone size. *Gut* 34: 1718-1721. [[Crossref](#)]
2. Lee SH, Park JK, Yoon WJ, Lee JK, KonRyu, J, et al. (2007) How to predict the outcome of endoscopic mechanical lithotripsy in patients with difficult bile duct stones. *Scand J Gastroenterol* 42: 1006-1010. [[Crossref](#)]
3. Stefanidis G, Christodoulou C, Manolakopoulos S, Chuttani R (2012) Endoscopic extraction of large common bile duct stones. *World J Gastrointest Endosc* 4: 167-179. [[Crossref](#)]
4. Itoi T, Itokawa F, Sofuni A, Kurihara T, Tsuchiya T, et al. (2009) Endoscopic sphincterotomy combined with large balloon dilation can reduce the procedure time and fluoroscopy time for removal of large bile duct stones. *Am J Gastroenterol* 104: 560-565. [[Crossref](#)]
5. Park SJ, Kim JH, Hwang JC, Kim HG, Lee DH, et al. (2013) Factors predictive of adverse events following endoscopic papillary large balloon dilation: results from a multicenter series. *Dig Dis Sci* 58: 1100- 1109. [[Crossref](#)]
6. Maydeo A, Bhandari S (2007) Balloon sphincteroplasty for removing difficult bile duct stones. *Endoscopy* 39: 958-961. [[Crossref](#)]
7. Youn YH, Lim HC, Jahng JH, Jang SI, You JH, et al. (2011) The increase in balloon size to over 15 mm does not affect the development of pancreatitis after endoscopic papillary large balloon dilatation for bile duct stone removal. *Dig Dis Sci* 56: 1572-1577. [[Crossref](#)]
8. Sakai Y, Tsuyuguchi T, Sugiyama H, Nishikawa T, Kurosawa J, et al. (2012) Endoscopic sphincterotomy combined with large balloon dilation for removal of large bile duct stones. *Hepatogastroenterology* 60: 58-64. [[Crossref](#)]
9. Paspatis GA, Konstantinidis K, Tribonias G, Voudoukis E, Tavernaraki A, et al. (2013) Sixty-versus thirty-seconds papillary balloon dilation aftersphincterotomy for the treatment of large bile duct stones: a randomized controlled trial. *Dig Liver Dis* 45: 301-304. [[Crossref](#)]
10. Chan AC, Ng EK, Chung SC, Lai CW (1998) Common bile duct stones become smaller after endoscopic biliary stenting. *Endoscopy* 30: 356-359. [[Crossref](#)]
11. Jain SK, Stein R, Bhuvu M, Goldberg MJ (2000) Pigtail stents: an alternative in the treatment of difficult bile duct stones. *Gastrointest Endosc* 52: 490-493. [[Crossref](#)]
12. Horiuchi A, Nakayama Y, Kajiyama M (2010) Biliary stenting in the management of large or multiple common bile duct stones. *Gastrointest Endosc* 71: 1200-1203. [[Crossref](#)]
13. Lee TH, Han JH, Kim HJ (2011) Is the addition of choleretic agents in multiple double-pigtail biliary stents effective for difficult common bile duct stones in elderly patients? A prospective, multicenter study. *Gastrointest Endosc* 74: 96-102. [[Crossref](#)]