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## Percutaneous Approach for Removal of Difficult Common Bile Duct Stones

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See "Usefulness of Percutaneous Transhepatic Cholangioscopic Lithotomy for Removal of Difficult Common Bile Duct Stones" by Jae Hyung Lee, Hyung Wook Kim, Dae Hwan Kang, et al., on page 65-70

Bile duct stone disease is one of the most common problems in medical practice. Surgical common bile duct (CBD) exploration was the procedure of choice for the treatment of bile duct stones a few decades ago. However, endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy has become the treatment of choice for bile duct stones after the development of ERCP techniques. Development of devices and techniques used in endoscopic sphincterotomy and stone extraction has increased the success rate of stone removal.

Meanwhile, endoscopic sphincterotomy may be difficult or impossible in some clinical situations, including duodenal or pyloric stenosis, unusual biliary anatomy, previous gastrointestinal surgery such as Billroth II and Roux-en-Y gastrojejunostomy reconstruction, bilioenteric anastomosis, and patients' intolerance. As a surgical modality, laparoscopic biliary surgery has been widely used. Laparoscopic CBD exploration (transcystic or transcholedochal) is the most commonly used method for managing difficult CBD stones. However, general anesthesia is necessary to perform the surgery and the cost of the procedure is high. The success rate in performing laparoscopic CBD exploration is approximately 86% to 95% with 5% to 18% complication rates.<sup>1</sup> Percutaneous transhepatic stone removal is another important technique among the non-operative managements of bile duct stones. Percutaneous transhepatic stone extraction and expulsion into the duodenum was first reported in 1979.<sup>2</sup> Percutaneous transhepatic cholan-

gioscopy (PTCS) can be combined with these techniques. Balloon dilatation of the sphincter of Oddi has been widely used to facilitate stone removal procedure in order to allow biliary stone passage. Several techniques including basket forceps, electrohydraulic lithotripsy (EHL), and laser lithotripsy are now available for fragmentation of large stones.<sup>3</sup> Variable major and minor complications of this technique including cholangitis, biliary pleural effusion, and self-limiting hemobilia have been reported. Lee et al.<sup>4</sup> reported 100% success rate of PTCS lithotomy for removal of difficult CBD stones in 33 cases. EHL was used in most patients. Complications related with PTCS lithotomy, including fever, pancreatitis, and hemobilia, occurred in 15 patients (45.5%) but were ameliorated with conservative management. The mean procedure number of PTCS lithotomy was 2.8 and the numbers of EHL session were one session in 16, two sessions in nine, three sessions in five, and more than four sessions in two patients. The major indications of PTCS were altered anatomy due to previous stomach surgery (16 cases) and impacted stones (11 cases). Fifteen patients had prior cholecystectomy, but the paper did not mention the presence of gallbladder stone in another 18 patients with intact gallbladder. Because PTCS is an invasive procedure, declining quality of life and requiring additional time for dilatation, maturation and repeated procedure, this procedure should be considered in really difficult cases in which duodenoscope insertion into ampulla is impossible. If biliary cannulation is possible but stone is impacted in CBD, we should know that there are emerging new techniques such as endoscopic biliary lithotripsy using FREDDY laser<sup>5</sup> and direct peroral cholangioscopy (POC) with ultraslim endoscopy.<sup>6</sup> Holmium laser lithotripsy under direct POC using an ultrathin upper endoscope was also reported as an effective and safe technique for removal of difficult CBD stones.<sup>7</sup> Laparoscopic CBD exploration and cholecystectomy are another options if

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the patients have both gallbladder and CBD stones and medical conditions which are tolerable to general anesthesia. Lee et al.<sup>8</sup> reported that laparoscopic CBD exploration is a safe and effective treatment modality for CBD stones not only for younger patients but also for elderly patients (over 70 years). They suggested the laparoscopic CBD exploration as the first treatment strategy for difficult CBD stones as there were no significant differences in mean operation time, postoperative hospital stay, first meal time, recurrence rate, remnant stone, and complication or mortality rates in both groups. Because this study on PTCS lithotomy<sup>4</sup> was a retrospective study conducted between 2008 and 2010, new techniques were not considered and PTCS lithotomy was done in cases with impacted CBD stones regardless of biliary cannulation by conventional ERCP. Nevertheless, this paper confirmed that PTCS lithotomy is a safe and effective treatment modality in difficult CBD stones if conventional ERCP with lithotripsy was impossible.

**Conflicts of Interest** \_\_\_\_\_

The author has no financial conflicts of interest.

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