

The Jolting Method: An Efficient Method for Extracting Multiple Common Bile Duct Stones Completely in a Single Procedure

Shun Ishido^{1,2} Masanori Kobayashi^{1,2} Ryuichi Okamoto¹

¹ Department of Gastroenterology and Hepatology, Tokyo Medical and Dental University, Tokyo, Japan

² Department of Specialized Medical Care, Endoscopic Unit, Tokyo Medical and Dental University, Tokyo, Japan

Address for correspondence Masanori Kobayashi, MD, PhD, Department of Gastroenterology and Hepatology, Tokyo Medical and Dental University, 1-5-45 Yushima, Bunkyo-ku, Tokyo 113-0034, Japan (e-mail: mkobayashi.gast@tmd.ac.jp).

J Digest Endosc 2023;14:243–244.

Endoscopic retrograde cholangiopancreatography (ERCP) is used to treat common bile duct stones, but it should be performed a minimum number of times due to high incidence of serious complications.^{1,2} Cholesterol stones are known to be aggregates of multiple stones, and their hard texture can cause clogging if a basket grabs a large amount at once, leading to the need for invasive procedures such as surgery.³ Therefore, these stones must be carefully removed in small amounts, which can be an extremely time-consuming process that requires multiple procedures. In this report, we developed the new method, which can efficiently and completely remove a large number of cholesterol stones in a single procedure.

An 82-year-old male patient with cholangitis caused by a significant number of cholesterol stones that completely filled bile duct was treated with stent placement. After improvement of the cholangitis, we proceeded with ERCP to remove the stones. After the removal of the bile duct stent, an additional endoscopic sphincterotomy was performed with a papillotome (CleverCut 3V, Olympus, Tokyo, Japan). Following this, a dilatation balloon (REN 0.035 10–12 mm, Kaneka Medics, Osaka, Japan) was carefully inserted into the bile duct and gradually inflated to prevent the entrapment of stones. Considering the risk of basket entrapment, the stones were carefully extracted with a retrieval balloon (Multi-3 V Plus, Olympus, Tokyo, Japan), starting from the lower end of the bile duct. Despite repeated balloon sweeping, a significant number of stones remained. At that point, we decided to perform “the jolting method.”

► **Supplementary Video S1** While the retrieval balloon was extracted toward the papilla, it was then carefully “jolted” at

sites of resistance. This motion resulted in the sequential expulsion of stones. By repeatedly applying this method, we were able to successfully remove all stones from the common bile duct during a single procedure (► **Fig. 1**).

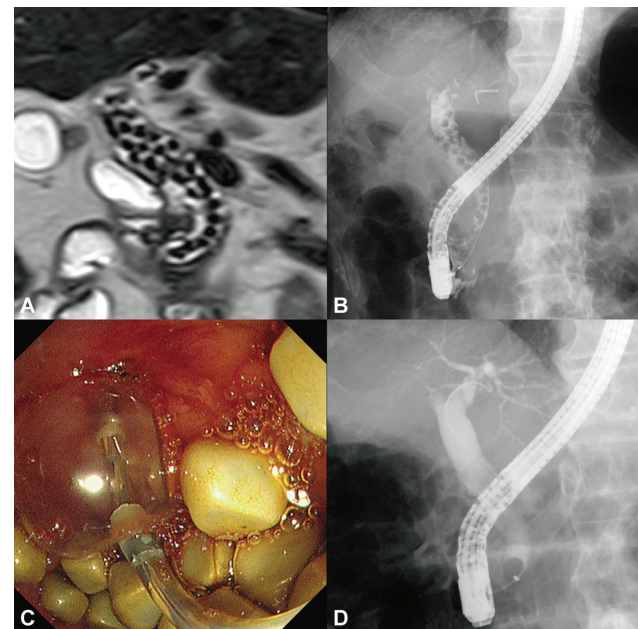


Fig. 1 Multiple stacked cholesterol stones were identified through magnetic resonance cholangiopancreatography (A) and endoscopic retrograde cholangiography (B). The jolting method can efficiently and completely remove a large number of cholesterol stones in a single procedure (C, D).

DOI <https://doi.org/10.1055/s-0043-1777331>.
ISSN 0976-5042.

© 2023. The Author(s).

This is an open access article published by Thieme under the terms of the Creative Commons Attribution License, permitting unrestricted use, distribution, and reproduction so long as the original work is properly cited. (<https://creativecommons.org/licenses/by/4.0/>)

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

Technical Highlights

When performing the endoscopic large balloon dilatation, balloon was carefully inserted into the bile duct, gradually inflating to prevent the potential entrapment of stones.

Considering the risk of basket entrapment, the stones were carefully extracted with a retrieval balloon from near the papilla.

The retrieval balloon was extracted toward the papilla, and then carefully “jolted” at sites of resistance. This motion resulted in the sequential expulsion of stones.

Conclusions

The jolting method enables the efficient extraction of multiple stacked cholesterol stones in a single procedure.

Video Text

Supplementary Video S1

We could successfully extract multiple common bile duct stones completely in a single procedure by *the jolting methods*. Online content including video sequences viewable at: <https://www.thieme-connect.com/products/ejournals/html/10.1055/s-0043-1777331>.

An 82-year-old male patient with cholangitis caused by a significant number of cholesterol stones that completely filled the bile duct was treated with stent placement. After the improvement of the cholangitis, we proceeded with an endoscopic retrograde cholangiopancreatography (ERCP) to remove the stones.

The plastic stents were removed from the bile duct. Cholangiogram revealed a significant presence of cholesterol stones in the bile duct. An additional endoscopic

sphincterotomy was performed. Following this, dilatation balloon was carefully inserted into the bile duct and gradually inflated to prevent the potential trapping of stones. Finally, an endoscopic papillary large balloon dilation was performed. Given the potential risk of basket entrapment, a retrieval balloon was employed to carefully remove stones located at the lower end of the bile duct. Despite repeated attempts at balloon sweeping, a significant amount of stones remained. At that point, we decided to perform “*the jolting method*.” The retrieval balloon was gently extracted until it encountered resistance and then the balloon was “jolted.” This motion resulted in the sequential expulsion of stones located at the lower end of the bile duct. By repeatedly applying this method, we were able to successfully remove all stones from the common bile duct during a single procedure.

Author Contribution

S.I. and M.K. study design and collection of data and writing of the manuscript; M.K. data analysis/interpretation; R.O. study supervision.

Conflicts of Interest

None declared.

References

- 1 Dumonceau JM, Kapral C, Aabakken L, et al. ERCP-related adverse events: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. *Endoscopy* 2020;52(02):127–149
- 2 Christoforidis E, Vasiliadis K, Tsalis K, et al. Factors significantly contributing to a failed conventional endoscopic stone clearance in patients with “difficult” choledocholithiasis: a single-center experience. *Diagn Ther Endosc* 2014;2014:861689
- 3 Kucharski K, Adler DG. Comparison of technical failures and patient-related adverse events associated with 3 widely used mechanical lithotripters for ERCP: insights from the U.S. Food and Drug Administration Manufacturer and User Facility Device Experience database. *Gastrointest Endosc* 2022;96(05):796–800