Sphincterotomy with Large Balloon to Extract Common Bile Duct Stones: Sometimes It Is Better to Get an “Incomplete”

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Received: 13 April 2015 / Accepted: 16 April 2015 / Published online: 12 May 2015
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Pioneers in the practice of endoscopic retrograde cholangiopancreatography (ERCP) taught that complete endoscopic sphincterotomy (EST) was necessary in order to remove common bile duct stones despite its requirement for additional training and the risk of additional complications. Accordingly, in 1977, the endoscopic removal of common bile duct (CBD) stones was restricted to patients post-cholecystectomy or in whom surgery was contraindicated [1].

In 2004, Ersoz et al. [2] introduced the technique of EST followed by large balloon dilation (ESLBD) designed to facilitate the removal of difficult bile duct stones after standard sphincterotomy had failed [2]. In 2006, a review in the Cochrane Database concluded that ESLBD was not only less efficient than standard EST for stone extraction but also increased the risk of pancreatitis. In most of the cases, however, balloon dilation was performed without previous sphincterotomy. The technique was restricted to patients with hemostasis disorders [3]. Nevertheless, with the publication of Ersoz et al., many teams began to realize that the rate of pancreatitis was in fact not so high as long as sphincterotomy was performed before ESLBD. In parallel, the risk of the use of cautery as part of the sphincterotomy procedure was associated with pancreatitis [4]. Thus, the idea to perform minor sphincterotomy in order to avoid hemorrhage and potentially cautery associated with pancreatitis was born.

As a result, reviews of more recently published clinical studies have favored ESLBD, due to its relatively simplicity, lower cost, and faster completion than EST, without any increase in complications. Balloon dilation with partial sphincterotomy, no longer relegated as a salvage procedure, has now become first-line therapy [5–7]. There was, however, no uniformity regarding the optimal size of the sphincterotomy. Some groups safely performed complete sphincterotomy before balloon dilation [8], whereas others performed balloon dilation, both with very good results. Balloon dilation alone (i.e., without sphincterotomy) was associated with twice as many cases of pancreatitis [8, 9]. Extraction of stones after balloon dilation did, however, prevent cholangitis and recurrence [9].

In this issue of *Digestive Diseases and Sciences*, Mu et al. [10] have published an impressive prospective randomized trial of 300 patients with CBD stones. Patients were randomized to complete sphincterotomy ($n = 148$) or ESLBD (small sphincterotomy + balloon dilation; $n = 152$). Success rate was similar in both groups (94 vs. 97 %). Post-ERCP pancreatitis was similar in both groups (6 vs. 7 %), but the ESLBD group had significantly less post-procedural bleeding (7 vs. 1 %; $p < 0.05$). More interestingly, long-term recurrence was significantly less in those undergoing ESLB (1 vs. 7 %; $p < 0.05$), independent of whether the patient ultimately underwent cholecystectomy. The authors postulate that the small sphincterotomy reduced injury to the CBD with less post-inflammatory stenosis and recurrence of symptomatic CBD stones, consistent with data showing that mechanical lithotripsy, which damages the mucosa, is associated with a higher relapse rate [11].

Should we abandon complete sphincterotomy in favor of ESLBD? I think the answer is “yes.” ESLBD appears to be as effective as complete EST in the short term and more

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effective in the long-term while reducing complications. Improved efficacy may very well relate to the improved drainage created by the larger sphincter opening combined with reduced cautery damage to the mucosa. In order to prevent perforation, the size of the balloon should not exceed the diameter of the distal bile duct or 15 mm, whichever is smaller.

To conclude, complete sphincterotomy and mechanical lithotripsy are no longer the standard of care for the extraction of bile duct stones. Short sphincterotomy and ESLBD are likely to emerge as the standard intervention for removing bile duct stones by ERCP.

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