

Feasibility of Endoscopic Papillary Large Balloon Dilatation After Prior Billroth II Gastrectomy and Considerations for Endoscopists

In patients whose gastrointestinal anatomy has been altered by stomach surgeries, such as Billroth II (B-II) gastrectomy or Roux-en-Y anastomosis, the removal of bile duct stones is more difficult than in patients with normal anatomies, because of the long access route and inverted direction of approach to the papilla of Vater.^[1-3] With this in mind, many trials aimed at overcoming these problems have been carried out, and various techniques and devices dedicated to altered anatomies have been developed. Endoscopic papillary large balloon dilatation (EPLBD) is one of these techniques that appears to be an effective and safe means of removing of bile duct stones after a B-II gastrectomy.

The article published in this issue of The Saudi Journal of Gastroenterology provides evidence that EPLBD with or without endoscopic sphincterotomy (EST) is a feasible method for treating these cases. Thirty patients with large bile duct stones (≥ 10 mm) and markedly dilated common bile ducts were enrolled in this study, which had an overall success rate of 96.7% (29/30 patients). Only two cases of mild pancreatitis were developed after the procedure, and these could be treated through conservative management alone. These promising results, involving a high success rate and low complication rate, are in accordance with other reports, which are summarized in Table 1.

An interesting aspect of this article is that 11 cases of EPLBD alone, rather than EPLBD with preceding EST, were included. Although the advantage of addressing EPLBD alone is not fully elucidated to date, several reports have suggested that the use of EPLBD alone is not inferior to the use of conventional methods.^[4-6] In fact, the use of EST is an important factor in increased complication rates and procedural times of endoscopic retrograde cholangiopancreatography (ERCP) in B-II patients, because EST with inverted direction is a major obstacle to this procedure. Jang *et al.*^[4] have reported that EPLBD alone is

a safe and highly effective method with a low incidence of complications (5.0%) in patients with prior B-II gastrectomy. Even though no comparison between the two methods was made in this study, the low complication rate in the EPLBD alone group could be presumed to be connected to these findings. Further study of this topic should be carried out.

Although EPLBD appears to be an effective and safe method, evidence to guide the proper selection and technique of EPLBD in order to prevent complications, is still limited. A recently published multicenter retrospective study from Korea and Japan investigated 946 patients who underwent EPLBD for large common bile duct (CBD) stone removal.^[7] Ninety-five (10%) of the patients experienced complications, including bleeding, pancreatitis, bowel perforation, and cholangitis, in the study, and four patients died as a result of multiorgan failure following bowel perforation and massive bleeding. Liver cirrhosis, full EST, large stone size (≥ 16 mm), and distal CBD stricture were independent risk factors in complications after EPLBD. Based on these results, the researchers recommended the following: (1) the selection of suitable candidates (ie, EPLBD should be reserved for patients with a dilated CBD, but avoided in patients with distal CBD strictures); (2) the avoidance of full EST immediately before large balloon dilatation, to prevent perforation and bleeding; (3) the gradual inflation of the dilating balloon, to allow for the recognition of a narrowed distal CBD; (4) the discontinuation of inflation when resistance is encountered in the presence of a persistent balloon waist; (5) the inflation of the dilation balloon to a level that does not go beyond the maximal size of the upstream dilated CBD; and (6) the conversion to alternative stone removal or drainage methods when difficulty in the removal of a stone is encountered. These considerations should be addressed before performing procedures.

Another important aspect of performing ERCP in B-II patients is accessing the papilla of Vater. Because patients with prior B-II gastrectomy or Roux-en-Y anastomosis usually have long afferent loops, the insertion of an endoscope is difficult and sometimes fails. A prospective, randomized trial by Kim and his colleagues^[8] was performed to compare the clinical outcomes of forward and side-viewing endoscopes for ERCP in patients with B-II gastrectomies. It concluded that forward-viewing endoscopes were superior to side-viewing endoscopes in terms of success and complication rates.

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Table 1: Published reports about the feasibility of EPLBD for bile duct stone removal in patients with prior Billroth II gastrectomy

Authors (year)	Additional procedures plus EPLBD	Patients (N)	Endoscope used (N)	Stone diameter (median, range)	Balloon diameter (median, range)	Success rate (%)	Mechanical lithotripsy (N)	Complication (N)
Kim <i>et al.</i> ^[9] (2008)	RP	9	S; 9	12 (8-20)	12.5 (12-16.5)	89	1	None
Itoi <i>et al.</i> ^[10] (2010)	EPLBD alone NKS-GW assisted	11	F; 8 S; 1 Others; 2 ^a	13.5 (7-30)	15 (10-20)	100	2	None
Kim <i>et al.</i> ^[11] (2011)	NKS-GW assisted	16	S; 16	13.7 (10-25)		100	1	Minor bleeding; 1
Choi <i>et al.</i> ^[12] (2012)	RP NKS-biliary endoprosthesis assisted	26	F; 13 S; 13	12 (10-25)	12 (10-15)	100	3	None
Jang <i>et al.</i> ^[4] (2013)	EPLBD alone NK for fistulostomy	40	S; 40	10.5 (5-28)	12 (10-17)	100	1	Pancreatitis; 2 Asymptomatic hyperamylasemia; 3

EPLBD: Endoscopic papillary large balloon dilation, F: Forward-viewing endoscope, NK: Needle-knife, NKS: Needle-knife sphincterotomy, RP: Rotatable papillotome, S: Side-viewing endoscope. ^aOne case of anterior oblique-viewing endoscope and one case of single balloon enteroscope

In many studies, including the present article, however, side-viewing endoscopes have been preferred, due to the large working channel and the presence of an elevator lever, and despite the high risk of bowel perforation. Although there were no cases of severe complications such as perforations in the studies summarized in Table 1, endoscopists should always be careful about perforation when using side-viewing endoscopes.

To date, no consensus guidelines for the removal of bile duct stones in patients with gastrointestinal anatomies altered by prior stomach surgeries have been established. Recently, many studies have been performed that have investigated feasible techniques and have found that EPLBD with or without EST is an effective and safe method for the retrieval of large bile duct stones. However, more detailed evidence is still needed as a basis for standardized recommendations.

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