



Periampullary submucosal saline injection to facilitate intradiverticular papillary biliary cannulation

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Periampullary diverticula (PAD) are mucosal outpouchings of the duodenum located in the area of the major papilla. They can be further classified based on the location of the papilla adjacent to, on the rim of, or within the diverticulum. PAD are identified in 5% to 30% of ERCP procedures.¹ Initial studies evaluating the impact of PAD on ERCP demonstrated an association with longer procedure times, high rates of failed cannulation, and increased risk of adverse events.² Although more modern cohorts have suggested the impact of PAD on ERCP is less significant, they can still pose significant anatomic challenges to successful biliary cannulation.³

There are limited comparative data on the best technique to use when difficult biliary cannulation is encountered in the setting of a PAD. Recent guidelines suggest pancreatic duct stent placement followed by precut sphincterotomy or needle-knife fistulotomy.⁴ However, guidelines also acknowledge that the most suitable technique will vary based on patient factors and operator preference. Several additional techniques have been described in largely single-center, retrospective cohorts including use of cap-fitted forward-viewing endoscopes, clip-assisted cannulation, and EUS-guided rendezvous. Depending on individual patient anatomy, operator experience, and comfort, all these techniques can be used. However, they can add significant procedural time and require additional equipment.

Herein we report a simple, safe, and effective technique to facilitate biliary cannulation in the setting of PAD. It can be particularly useful in cases in which the ampulla is located entirely within the diverticulum (Video 1, available online at www.videogie.org). Generally, biliary cannulation in these cases is challenging due to the atypical orientation of the major papilla and intraduodenal biliary segment (Fig. 1). Therefore, an endoscopic injection needle is used to inject normal saline in the submucosal/peridiverticular space with the goal of reorienting the trajectory of the



Figure 1. Major papilla located entirely within a periampullary diverticulum with prominent intraduodenal segment and downward trajectory. The inferior rim of the diverticulum interfered with engaging the papilla with a sphincterotome.



Figure 2. En face reorientation of the major papilla with submucosal saline injection, which subsequently facilitated biliary cannulation with standard devices.

ampulla to allow cannulation with standard devices (Fig. 2). The exact location of injection will vary based on patient anatomy; however, the general principle is the same.

Submucosal injection to facilitate biliary cannulation is not a novel concept, but it is something with which

Abbreviation: PAD, periampullary diverticula.

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many endoscopists are not readily familiar.⁵ Furthermore, some prior reports use lifting agents like sodium hyaluronate, which take significant time to dissipate and risk scar formation.⁶ One of the main advantages of the technique described in this video is that if the maneuver is unhelpful or unsuccessful, the saline quickly dissipates and the endoscopist can proceed with one of the alternative cannulation strategies highlighted previously. Although direct papillary injection has been described previously,⁵ we generally avoid this. However, given the significant variation in papillary and diverticular anatomy, there may be scenarios in which the endoscopist feels this may be beneficial. The use of saline makes this maneuver as safe as possible given its transient nature, which limits pancreatic duct obstruction. For similar reasons, the injection of saline is unlikely to significantly increase the risks of the procedure, including post-ERCP pancreatitis and infection. However, data to derive robust conclusions regarding the safety of this maneuver are not available.

The injection of submucosal saline is relatively simple and intuitive; however, it is not well described, and many pancreaticobiliary endoscopists may not have considered its use. The technique is safe, adds minimal time and cost to ERCP, and can serve as another tool with which to approach difficult cannulation in patients with PAD.

DISCLOSURE

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