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# Biliary cannulation facilitated by endoscopic clip assistance in the setting of intradiverticular papilla

## Divertikül içinde yerleşik papillada endoskopik klip yardımıyla safra yolu kanülasyonu

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*Endoscopic cannulation of the biliary tract may be challenging in cases with juxtapapillary, duodenal diverticula. A 70-year-old woman admitted to the hospital with the diagnosis of choledocholithiasis and acute cholangitis. She was placed on antibiotic treatment and parenteral fluid resuscitation. On endoscopic retrograde cholangiopancreatography, the papilla could not be cannulated because of the duodenal diverticulum. Various attempts at biliary cannulation failed. Endoscopic clips were used for evertion and fixation of a partially everted papilla from the diverticulum and for securing it in an orientation that allowed direct cannulation of the biliary tree. Cholangiography demonstrated multiple calculi within the choledochus. She was discharged from the hospital on the 9th day following endoscopic retrograde cholangiopancreatography in good condition. With this report, we aimed to remind physicians that the clip-assisted method is a safe and effective technique for pancreatic and/or biliary cannulation, and should be preferred in patients in whom cannulation is extremely difficult due to large periampullary diverticula.*

**Key words**: Endoscopic biliary cannulation, duodenal diverticulum, endoscopic clip application, acute cholangitis

*Papilla bölgesinde duodenal divertikül olan hastalarda safra yollarının endoskopik kanülasyonu çok zor olabilmektedir. Yetmiş yaşında bir bayan hasta akut kolanjit ve koledokolithiazis tanılarıyla hastanemize başvurdu. Hastaya sıvı resüsitasyonu ve antibiyotik tedavisi başlandı. Endoskopik retrograd kolanjiyopankreatografide duodenal divertikül nedeniyle safra yolları kanüle edilemedi. Farklı girişimlere rağmen safra yolları kanüle edilemedi. Endoskopik klip yardımıyla divertikülden kısmen everte edilen papilla fikse edildi. Papillanın sabitlenmesi safra yollarının direkt kanulasyonuna imkan sağladı. Kolanjiografide koledokta multiple kalkül izlendi. Sfinkterotomi, safra yollarından taş ekstraksiyonu yapılan hasta Endoskopik retrograd kolanjiyopankreatografiyi takip eden 9. gün iyi durumda taburcu edildi. Bu yazıda, özellikle büyük periampullar divertikül nedeniyle kanülasyonu çok zor olan olgularda, pankreas ve safra yollarının kanülasyonunda etkili ve güvenli bir yöntem olan endoskopik klip yardımıyla safra yolları kanülasyonu yöntemini hatırlatmak istedik.*

**Anahtar kelimeler:** Endoskopik safra yolları kanülasyonu, duodenal divertikül, endoskopik klip uygulaması, akut kolanjit

## INTRODUCTION

Endoscopic cannulation of the biliary tract may be challenging in cases with juxtapapillary, duodenal diverticula, which can be seen in 10-20% of endoscopic examinations (1). However, a success rate of more than 90% in cannulation is possible in experienced hands (2,3) by using some innovative means to solve the anatomical obstacles. In this report, we present a successful biliary cannulation in a difficult case having cholangitis and distorted duodenal anatomy due to a large diveriticulum, keeping the papilla hidden.

## CASE REPORT

A 70-year-old woman admitted to the hospital with complaints of epigastric pain, fever, nausea, and vomiting. Laboratory exams revealed leukocytosis, elevated total and direct bilirubin levels and increased liver enzymes. An upper abdominal ultrasound revealed multiple calculi of various sizes in the main bile duct and mild dilatation of the whole biliary tree. The patient was hospitalized, and medical treatment was initiated with the diagnosis of choledocholithiasis and acute cholangitis. On endoscopic retrograde cholangiopancreatography (ERCP), the papilla could not be cannulated because of the duodenal diverticulum, as the orifice of the papilla was on the inferior rim of the diverticulum (Figure 1). Various attempts were made to

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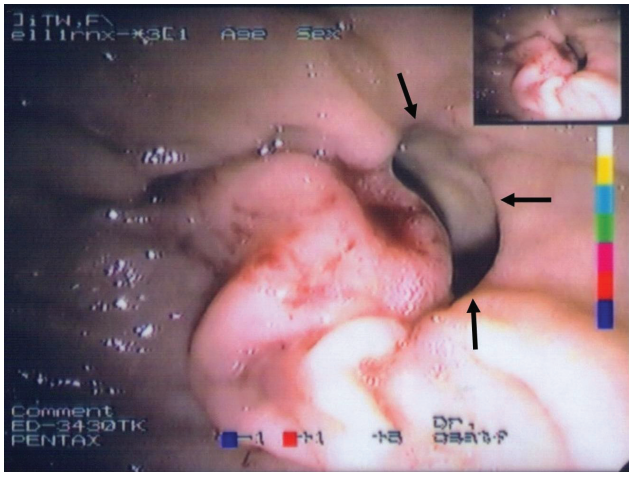


**Figure 1.** Black arrows indicate the diverticulum within the second portion of the duodenum.

evert the papilla out of the diverticulum, such as by deflating the luminal air and using a catheter tip or biopsy forceps to keep the papilla in an orientation so as to facilitate its cannulation. We also performed balloon dilatation of the diverticular rim. On each attempt, the papilla immediately rotated back inside when the mechanical traction or pushing was withdrawn. We also tried to use two devices in one channel (i.e. diagnostic catheter and sphincterotome). However, exposure and alignment of the papillary orifice and ducts were also not possible with this method. Saline solution injection to lift the papilla was not tried as it was considered risky for post-procedure pancreatitis. As a last solution, we planned to use endoscopic clip to aid in the biliary cannulation in this case.

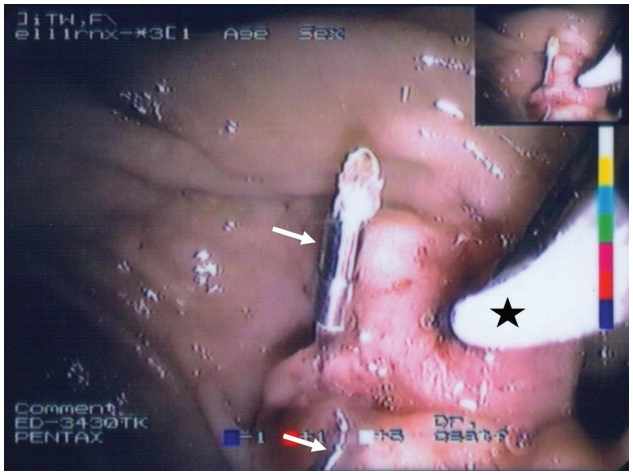


**Figure 2.** White arrows show endoscopic clips applied to the mucosa adjacent to the papilla, *: indicates cannula within the biliary tree.

The endoscopic clip fixing device (Olympus HX-600-090, Olympus America, Inc.; Meliville, NY, USA) was introduced through the duodenoscope (Pentax EPK 700; Tokyo, Japan). When the clip was exposed, it was rotated into the desired position and the mucosa adjacent to the papilla was fixed to the neighboring wall. Eversion of the papilla from the diverticulum was managed using two clips (Figure 2). We then cannulated the biliary tree with the standard sphincterotome. Multiple calculi were demonstrated in cholangiography (Figure 3) and were extracted from the main bile duct. The patient was discharged from the hospital on the 9th day following ERCP in good condition.

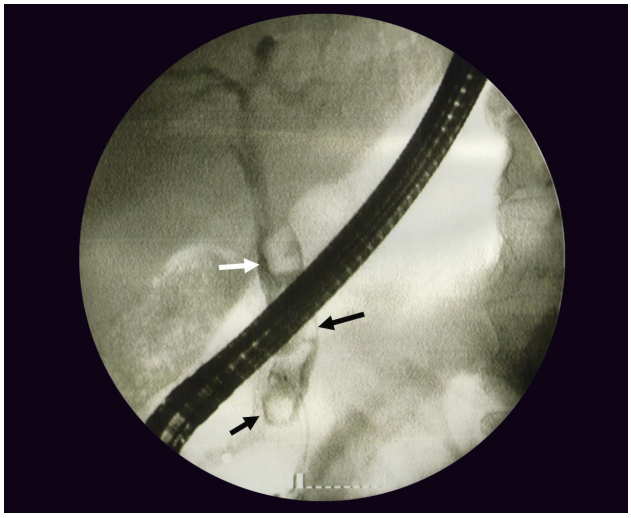

**Figure 3.** ERCP displaying multiple calculi in the choledocus.

## DISCUSSION

Endoscopic clipping devices are helpful for tissue approximation during gastrointestinal endoscopy. Though primary indication for their use is to achieve hemostasis of focal gastrointestinal bleeding, endoscopic mucosal clips have expanded indications for use. New generation endoscopic mucosal clips are 360° rotatable, which helps us to orient the clips in the desired direction. These clips will usually slough spontaneously within four weeks without causing any complications (4).

Cannulation of the ampulla inside a diverticulum is often challenging. There are several cannulation techniques for intradiverticular papilla (5,6). Except for saline injection to lift the papilla, all of these methods were tried, and all failed immediately. Saline injection was not done as it was considered risky for post-procedure pancreatitis. Endoscopic

clip-assisted biliary cannulation was first mentioned by Scotiniotis and Ginsberg (7), who changed the anatomical handicaps of the diverticulum with one mucosal clip (termed tissue remodeling) and performed successful biliary cannulation. We used the same principles and chose a rotatable mucosal clipping device to evert and fix the papilla out from the diverticulum. This helped us to align the biliary tree, followed by a successful cannulation.

The repertoire of potential applications of endoscopic mucosal clips seems to expand continuously. Herein, we aimed to remind physicians of the potential use of endoscopic clips in cases with duodenal anatomy distorted by a large diverticulum, which keeps the papillar structure hidden. The clip-assisted method is a safe and effective technique for pancreatic and/or biliary cannulation, and should be preferred in patients in whom the cannulation is extremely difficult due to large periampullary diverticula.

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