

## Early Surgical Management for Periapillary Retroperitoneal Perforation Caused by Endoscopic Sphincterotomy: A Report of a Case

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### Abstract

A 67-year-old woman was admitted to our hospital for surgical management of cancer of the ascending colon. On admission, she had cholangitis due to choledocholithiasis. Abdominal computed tomography, ultrasonography, and magnetic resonance showed cholelithiasis, choledocholithiasis, and multiple liver tumors. Colonoscopy showed advanced cancer of the ascending colon. Because of acute obstructive suppurative cholangitis, endoscopic sphincterotomy was performed. During the procedure, periampullary retroperitoneal perforation was identified on radiologic examination. Because computed tomography had shown extravasation of contrast medium and widespread pneumoretroperitoneum, an emergency operation was performed 2 hours after perforation. After cholecystectomy and choledocholithotomy had been performed and all bile duct stones had been removed, periampullary perforation was readily identified close to the duodenal diverticula and easily repaired. The postoperative course was uneventful. This patient could resume oral feeding soon after the operation, and colonic surgery could be performed immediately thereafter. Therefore, early surgical management is a possible first choice of treatment in patients with remaining biliary disease after periampullary perforation.

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**Key words:** periampullary retroperitoneal perforation, surgical treatment, endoscopic sphincterotomy

### Introduction

Although endoscopic retrograde cholangiopancreatography (ERCP) is an extremely useful and safe procedure in most cases, ERCP-related perforation occurs in about 1% of patients and has a high mortality rate of 16% to 18%<sup>12</sup>.

Stapfer et al.<sup>1</sup> have classified ERCP-related perforation into four types (types 1 to 4) according to anatomic location. Periapillary perforation (type 2), occurring at the sphincter of Oddi, is the most common<sup>3</sup> and can be often managed conservatively<sup>1-3</sup>. However, some patients who require surgery because of failed nonsurgical management have poor outcomes<sup>1</sup>.

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Fig. 1 During ERCP, periampullary retroperitoneal perforation was identified radiologically.

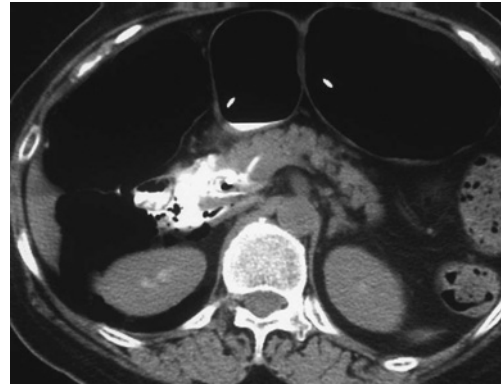


Fig. 2 CT scan after ERCP showed extravasation of contrast medium and widespread pneumoretroperitoneum.

We report on a patient who underwent early surgical treatment for periampullary perforation after endoscopic sphincterotomy. We also review the literature and discuss the efficacy of early surgical treatment.

### Case Report

A 67-year-old woman was admitted to our hospital for evaluation and surgical management of cancer of the ascending colonic in November 2007. On admission, she complained of right hypochondralgia, a high-grade fever, and jaundice. Results of laboratory studies were as follows: aspartate aminotransferase (AST), 116 IU/L; alanine aminotransferase (ALT), 365 IU/L; alkaline phosphatase (ALP), 820 IU/L; gamma glutamyl transferase (GGT), 458 IU/L; total bilirubin, 7.1 mg/dL; serum amylase, 1,065 IU/L; white blood cell count (WBC), 16,100 / $\mu$ L; C-reactive protein (CRP), 7.7 mg/dL; and carcinoembryonic antigen (CEA), 6.2 ng/dL. Abdominal computed tomography (CT), ultrasonography (US), and magnetic resonance (MR) showed cholelithiasis, choledocholithiasis, and multiple liver tumors. Colonoscopy showed an advanced cancer of the ascending colon.

Because of acute obstructive suppurative cholangitis, endoscopic sphincterotomy was performed urgently. During the procedure, periampullary retroperitoneal perforation was identified radiologically (**Fig. 1**). Therefore, the procedure was immediately halted, and a nasobiliary drain was placed. A CT scan after ERCP showed extravasation of contrast medium and widespread pneumoretroperitoneum (**Fig. 2**).

To manage the remaining biliary disease and advance the date of colonic surgery, an emergency operation was performed 2 hours after perforation. Laparotomy revealed pneumatosis and hematoma in the retroperitoneum (**Fig. 3a**). After cholecystectomy and choledocholithotomy had been performed in the standard manner, all bile duct stones were removed with an intraoperative cholangioscope. As the dorsal wall of the duodenum was exposed toward the papilla, periampullary perforation was readily identified close to the duodenal diverticula (**Fig. 3b**) and easily repaired with 3 Vicryl 3-0 sutures. The injection of contrast material into bile duct through a nasobiliary tube showed no evidence of retroperitoneal leakage (**Fig. 4**). Drains were placed close to the duodenal suture at the end of this procedure. The postoperative course was uneventful, and oral feeding was resumed on postoperative day 5. Furthermore, the patient could undergo colonic surgery immediately.

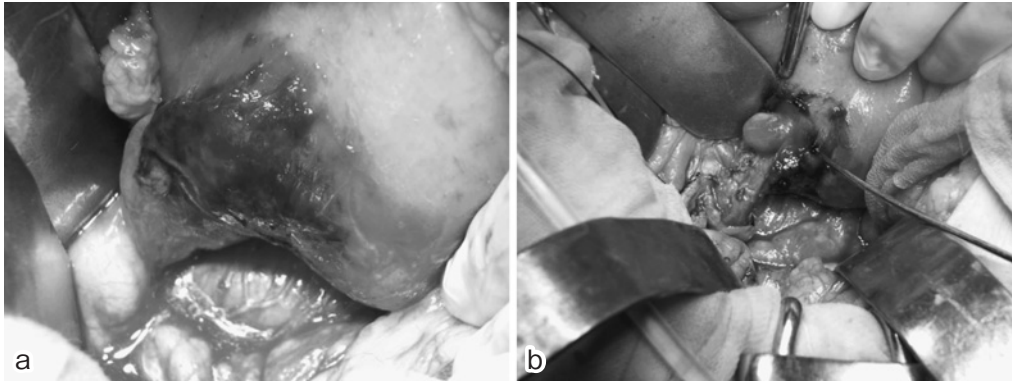


Fig. 3

- a: Laparotomy revealed pneumatosis and hematoma in the retroperitoneum.
- b: Periampullary perforation was readily identified close to the duodenal diverticula.



Fig. 4 The injection of contrast material into the bile duct through a nasobiliary tube showed no evidence of retroperitoneal leakage.

### Discussion

Although management of type 2 duodenal perforation after endoscopic sphincterotomy can be conservative or surgical, conservative treatment (antibiotics, a nothing-by-mouth regimen, and nasogastric tube insertion) is the initial method of choice and is usually successful when perforation is

diagnosed early<sup>1-3</sup>. If type 2 perforation is recognized during sphincterotomy, the procedure should be immediately halted, and subsequent biliary drainage with a nasobiliary tube is recommended<sup>3</sup>. Enns et al.<sup>2</sup> have reported that all 13 patients with sphincterotomy-related perforation were initially treated conservatively and that treatment was successful in 6 patients (46%). Stapfer et al.<sup>1</sup> have also reported that nonsurgical management is successful in most patients (62%) with type 2 injuries because type 2 lesions tend to seal spontaneously.

However, failure of conservative management leads to late surgical exploration and is associated with high rates of death, postoperative complications, and reoperation, and prolonged hospitalization because of severe peritonitis. In one series, a delay of surgery for more than 24 hours after perforation was associated with a higher mortality rate, and all deaths were caused by progressive sepsis or multiorgan failure<sup>4</sup>. However, it is extremely difficult to identify patients in whom nonsurgical management will be unsuccessful. Although periampullary perforation can be diagnosed with ERCP by experienced endoscopists, the presence and quantity of retroperitoneal air at an early stage does not correlate with the severity of complications or the need for surgery<sup>5</sup>. Therefore, if conservative treatment is chosen, frequent careful reevaluations are required until the patient recovers.

Early surgical management for type 2 perforation is considered safe and effective. First, this procedure can repair periampullary injuries completely. Recent

advances in pancreatic surgery have led to organ-preserving procedures, such as duodenum-preserving pancreatic head resection, which allow us to understand the detailed surgical anatomy of the duodenal papillary region and readily approach the periampullary region<sup>6,7</sup>. Moreover, inflammatory damage of the duodenal wall immediately after perforation is usually mild so that primary repair is possible. Transduodenal operative repair has recently been introduced as a novel technique that allows clear visualization of the area between the perforation and the terminal portion of bile duct and Wirsung duct, enabling complete repair of perforation<sup>8</sup>. Second, this early surgery is associated with a rapid recovery and a low morbidity rate. Some authors have concluded that early surgical management itself is safe and effective and that only advanced age contributes to poor outcomes<sup>8,9</sup>. It has also been reported that patients treated surgically can resume eating earlier than can patients treated conservatively<sup>9</sup>. In fact, our patient recovered quickly after the operation and could resume eating on postoperative 5 day. Third, operative intervention may be necessary to resolve the remaining biliary disease after perforation. Kayhan et al.<sup>3</sup> have discussed the optimal timing of a second ERCP procedure after an ERCP-related perforation and have suggested that therapeutic ERCP can be repeated from 11 to 15 days after perforation. However, some patients in their study refused a second ERCP attempt. Because our patient had colon cancer as well as biliary diseases, early surgical treatment allowed us to treat the biliary diseases simultaneously and to proceed with a colonic surgery immediately.

Although early operative intervention might be considered overtreatment in some cases, the risk of this treatment is acceptable when a quick recovery

can be expected and when a delay in treatment may result in death<sup>8</sup>. Therefore, early surgical management is a possible initial choice in patients with remaining biliary disease after periampullary perforation.

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