

## Splenic laceration following ERCP



**Fig. 1** Laceration (4 cm) at the spleen apex following endoscopic retrograde cholangiopancreatography (ERCP) in a 39-year-old woman with acute cholecystitis.

A 39-year-old otherwise healthy woman presented to the hospital with acute cholecystitis and underwent a laparoscopic cholecystectomy. The procedure was technically difficult due to a severely inflamed gallbladder with adherent omentum. There was poor visualization of the cystic duct and bile duct junction, and a subtotal cholecystectomy was carried out. A surgical drain was left at the previous gallbladder bed. On postoperative day 3, the drain output had increased and changed to bilious drainage. On examination, the patient appeared uncomfortable and there were normal active bowel sounds with appropriate tenderness over the port sites. The fluid from the surgical drain tested high for bilirubin, favoring a bile leak. Endoscopic retrograde cholangiopancreatography (ERCP) was carried out with the Olympus TJF 160 V (Olympus, Melville, New York, USA). The patient was put in the prone position and the endoscope passed relatively easily into the duodenum with adequate visualization of the papilla. Initial attempts at biliary cannulation selectively cannulated the central

pancreatic duct. After repositioning of the cannula the bile duct was deeply cannulated and contrast was injected. The common bile duct (CBD) was prominent at 9 mm and there was extravasation of contrast, originating from the middle third of the CBD immediately over the surgically placed drain. An 8 mm biliary sphincterotomy was done and a 10-Fr by 5-cm biliary stent with a single internal flap was placed. The procedure required 90 minutes.

In the post anesthesia care recovery unit, 1 hour after the procedure, the patient developed tachycardia (130 beats/min) and hypotension (85/50 mmHg). Clinically she was arousable and recovering from anesthesia, but she had persistent abdominal pain. The surgical drain output was 140 mL from since the end of the procedure and increasingly sanguineous. The patient's hemoglobin level was 6.4 mg/dL, down from a baseline of 10.4 mg/dL prior to the procedure. She was resuscitated with intravenous fluids and blood products, and was taken to the operating room for emergency laparotomy, which

revealed a clot of > 1 L volume mixed with fresh blood in the left upper quadrant. Closer inspection revealed a 4-cm angled laceration at the apex of the spleen, and splenectomy was carried out (Fig. 1). The patient had an unremarkable recovery from the operation and was discharged on postoperative day 5.

ERCP is an important tool in the management of hepatobiliary and pancreatic conditions. Although associated with a lower morbidity than surgical procedures for similar pathologic conditions, ERCP is associated with a number of distinct complications: pancreatitis (3%–7%), hemorrhage (2%–4%), duodenal or esophageal perforation (< 1%), and an overall mortality of 0.5%–1% [1]. Injuries of the spleen following colonoscopy are more often recognized and reported, but injuries as a result of ERCP remain rare [2]. Time to diagnosis varies from minutes to hours (Table 1). Once the diagnosis is suspected the treatment of choice is splenectomy with overall good outcomes.

The mechanism of splenic injury remains speculative. Three important predisposing factors have been identified: excessive traction of the splenicocolic or gastrosplenic ligament, adhesions causing decreased mobility between the spleen and the surrounding organs, and direct trauma. “Bowing” of the endoscope in the “long” position with torsion on the greater curvature of the stomach has been suggested as a mechanism for splenic capsular tears or vascular avulsion of the short gastric vessels. In patients with smaller abdominal cavities or altered anatomy, the stretching of the greater curvature puts the spleen at increased risk for injury. Additionally, the presence of abdominal adhesions due to previous abdominal surgeries can result in less intra-abdominal plasticity. Finally, technically difficult cannulation of the CBD can lead to a prolonged procedure, requiring greater manipulation of the endoscope, causing the transmission of excessive torque. In the present case, we suspect a combina-

**Table 1** Splenic trauma cases following endoscopic retrograde cholangiopancreatography (ERCP).

Reference	Time to diagnosis	Comorbid condition	Pathologic finding	Therapy
Ong et al. [3]	48 hours	Common bile duct stricture, tumor	Splenic laceration	Splenectomy
Dixon et al. [4]	Immediately after	Symptomatic pseudocyst	Splenic capsular tear	Splenectomy
Cho et al. [5]	18 hours	Choledocholithiasis	Splenic laceration	Splenectomy
Trondsen et al. [6]	15 hours	Choledocholithiasis	Spleen decapsulated	Splenectomy
Wu and Katon [7]	68 hours	Anticoagulation	Splenic capsular avulsion	Splenectomy
Badaoui et al. [8]	20 minutes		Splenic laceration	Splenectomy
Present case	1 hour	Cholecystectomy complicated by bile leak	Splenic laceration	Splenectomy



**Fig. 2** Computed tomography (CT) scan showing a small intra-abdominal cavity.

tion of factors led to the splenic laceration. During the open laparotomy, the patient was noted to have a smaller than usual intra-abdominal cavity (► **Fig. 2**). This probably limited the amount of space available during the normal maneuvers that transmit pressure and force across the greater curvature of the stomach. Delayed diagnosis is common in post-ERCP patients with splenic trauma, because of the lack of awareness of this rare complication. The diagnosis requires a high index of suspicion and splenic injury should be considered when signs of cardiovascular instability, abrupt decrease in hemoglobin, or occult hemorrhage develop following endoscopic procedures.

Endoscopy\_UCTN\_Code\_CPL\_1AK\_2AI

**Competing interests:** None

**A. H. Paredes<sup>1</sup>, A. M. Williams<sup>2</sup>,  
A. E. Vertrees<sup>1</sup>, C. Womeldorph<sup>1</sup>**

<sup>1</sup> Gastroenterology Service, Walter Reed National Military Medical Center, Bethesda, Maryland, United States of America

<sup>2</sup> Department of General Surgery, Walter Reed National Military Medical Center, Bethesda, Maryland, United States of America

## References

- 1 Aliperti G. Complications related to diagnostic and therapeutic endoscopic retrograde cholangiopancreatography. *Gastrointest Endosc Clin North Am* 1996; 6: 379–407
- 2 Ahmed A, Eller PM, Schiffman FJ. Splenic rupture: an unusual complication of colonoscopy. *Am J Gastroenterol* 1997; 92: 1201–1204
- 3 Ong E, Bohmler U, Wurbs D. Splenic injury as a complication of endoscopy: two case reports and a literature review. *Endoscopy* 1991; 23: 302–304
- 4 Dixon E, Graham JS, Sutherland F et al. Splenic injury following endoscopic retrograde cholangiopancreatography: a case report and review of the literature. *JLS* 2004; 8: 275–277
- 5 Cho CL, Yuen KKY, Yuen CH et al. Splenic laceration after endoscopic retrograde cholangiopancreatography. *Hong Kong Med J* 2008; 14: 145–147
- 6 Trondsen E, Rosseland AR, Moer A et al. Rupture of the spleen following endoscopic retrograde cholangiopancreatography (ERCP). *Acta Chir Scand* 1989; 155: 75–76
- 7 Wu WC, Katon RM. Injury to the liver and spleen after diagnostic ERCP. *Gastrointest Endosc* 1993; 39: 824–827
- 8 Badaoui R, Ouendo M, Delcenserie R et al. Injury to the liver and spleen after diagnostic ERCP. *Can J Anaesth* 2002; 49: 756–757

## Bibliography

**DOI** <http://dx.doi.org/10.1055/s-0033-1344021>  
*Endoscopy* 2013; 45: E221–E222  
 © Georg Thieme Verlag KG  
 Stuttgart · New York  
 ISSN 0013-726X

## Corresponding author

**A. H. Paredes**

Walter Reed National Military Medical Center  
 Gastroenterology Service  
 8901 Wisconsin Ave  
 Bethesda, MD 20889  
 USA  
[angelo.h.paredes@gmail.com](mailto:angelo.h.paredes@gmail.com)