Splenic laceration following ERCP

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 was advanced through 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 was advanced through 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.

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 splenocolic or gastro-splenic 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).

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

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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.

References
7. Wu WC, Katon RM. Injury to the liver and spleen after diagnostic ERCP. Gastrointest Endosc 1993; 39: 824–827

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