no problems during the examination, and afterwards the patient was stable and returned in good condition to the floor. One hour later he developed hemorrhagic shock. Peritoneal aspiration showed the presence of blood. Emergency laparotomy was carried out, and rupture of vessels of the gastroplenic ligament, 1.5 cm from the gastric border, was found. The vessels were ligated and a small hole of the ligament was repaired. The patient did well and was discharged 15 days after surgery.

Two possible pathogenetic mechanisms to be considered are that the lesion was made by tension on the greater curvature of the stomach by the endoscope during the duodenal exam, or that there was excess tension on the stomach wall by inflated air. Obviously those two mechanisms would apply only if there were a peculiar anatomical configuration of the vessels or a preexisting lesion (atherosclerosis, inflammatory processes, adhesions, etc.) that could decrease the elasticity of the vessel walls.

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The use of frozen sections during gastrointestinal endoscopy

To the Editor:

The diagnosis of malignant-appearing lesions in the course of an endoscopy by the usual means of biopsy requires formalin fixation and hematoxylin eosin staining, causing a delay in further investigation and treatment of the patient. The routine use of frozen sections is not widely accepted in endoscopy of the gastrointestinal tract for immediate histologic confirmation of a malignant lesion. In order to investigate the reliability of frozen section technique, we performed biopsies in 29 consecutive patients undergoing endoscopy. The specimens were submitted for both frozen section and formalin fixation. A correlation between the two methods was made.

In 29 consecutive patients in whom malignancy was diagnosed or suspected during the course of endoscopy five small tissue fragments were taken for formalin fixation and five for frozen section. The latter tissue fragments were all placed on a 0.5-cm thick, preliminarily frozen layer of “Tissue TEK II OCT Compound” and then put on the object disk in the cryocut. The tissue was frozen on top of this protective layer and stained in the usual manner.

Table 1 shows the location of the tumor and the histologic diagnosis by both methods. There was complete correlation between both methods.

Endoscopy is widely used on an ambulatory basis, and frequently the gastroenterologist is the first to discover a malignant lesion. The usual method of histologic confirmation requires a delay of several days. Our series has shown that the frozen section method is both efficient and reliable, allowing a final diagnosis in less than 1 hour. This permits the referral of the patient to immediate admission, further investigations, and appropriate surgical treatment. We therefore recommend the use of frozen sections as a routine technique in the endoscopic diagnosis of gastrointestinal tumors. However, it is also advisable to avail oneself of simultaneous biopsies for the formalin fixation method to confirm the diagnosis made from the frozen section tissue fragments.

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<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No. of cases</th>
<th>Diagnosis by frozen section</th>
<th>Diagnosis by standard technique</th>
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<tbody>
<tr>
<td>Adenocarcinoma of esophagus</td>
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<tr>
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<tr>
<td>Adenocarcinoma of sigmoid colon</td>
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Massive dilation of the pancreatic duct associated with large calculi

To the Editor:

The demonstration of pancreatic calcification on a plain abdominal radiograph is the simplest and most reliable indication of chronic pancreatitis. Unfortunately, it is not always immediately evident that the calcific foci have a pancreatic origin, especially if concretions are discrete and mobile. The unique radiologic features of such a case are presented for your readers.

A 35-year-old housewife presented with a 20-year history of recurrent epigastric pain associated with nausea and vomiting. This pain often radiated through to the back and lasted between 1 and 5 days. In the interval phase she remained completely well. There was no history of alcohol, trauma, medication, or helminthic infestation. Congenital ptosis of the left eye was repaired during childhood. Her mother and grandmother had had adult onset diabetes mellitus, and her son as well as an older brother had also experienced episodic abdominal pain.

Examination was unremarkable. Urinalysis, full blood count, erythrocyte sedimentation rate, serum amylase, liver enzymes, routine biochemistry, chest x-ray, and upper gas-
Intestinal endoscopy were normal. The abdominal radiograph demonstrated large facetted and laminated calculi in the mid-upper abdomen (Fig. 1) whose position altered in sequential x-rays. The sonographic features were assessed as being compatible with calculi within either a common bile duct or pancreatic pseudocyst. Endoscopic retrograde cholangiopancreatography (ERCP) demonstrated a normal, rapidly emptying biliary system. The main pancreatic duct was enormously dilated (3.75 cm) and contained laminated facetted calculi measuring up to 2.5 cm in diameter (Fig. 2). Large calculi were also present in the pancreatic side ducts within the head of the gland. Fasting and postprandial blood sugars, serum lipids, and urinary amino acid profile were normal. A secretin-pancreozymin pancreatic function test yielded the following concentrations: bicarbonate, 37.4 mEq/liter (normal, >60); amylase, $2.5 \times 10^3$ U/ml ($>5$); trypsin, 550 ($>2000$); and lipase, $232 \times 10^3$ IU/liter ($>400$).

The patient developed a continuous fever following the ERCP, and a laparotomy for presumed sepsis revealed a sterile 5-cm abscess in the head of the gland that was drained. Needle aspiration of the main duct withdrew clear pancreatic juice. A lateral pancreaticojejunostomy was performed electively 3 months later, and the calculi, shown to contain calcium and magnesium carbonate, were removed (Fig. 3). She remains well 6 months after the procedure. Abdominal radiography and sonography of her son were normal, but her brother refuses similar evaluation.

The diameter of the main pancreatic duct and the large facetted and laminated, freely mobile calculi are probably unique radiologically. The latter have many of the features of gallbladder calculi, but the biliary system was completely normal at cholangiography. Remarkably, the patient did not have clinically overt pancreatic dysfunction despite the severely disordered ductal anatomy.

A dilated duct system containing large peripherally dense concretions is found in hereditary pancreatitis, and some patients, as here, have had associated ocular developmental abnormalities. Unfortunately, this patient’s family could not be completely assessed, but the index case herself did not exhibit the aminoaciduria sometimes found in these subjects. Characteristically, the calculi in hereditary pancreatitis are rounded, while those described here were facetted.

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ERCP in the diagnosis of obstructive jaundice following cholecystectomy

To the Editor:

Endoscopic retrograde cholangiopancreatography (ERCP) is a widely used technique in investigation of obstructive jaundice. Neoplasms of the head of the pancreas and of the extrahepatic biliary tree are known to cause slowly progressive jaundice, while choledocholithiasis is the most common cause of rapidly increasing icterus. We describe the combination of clinical, biochemical, and ERCP signs after a complicated cholecystectomy in a recent case of ours.

A 36-year-old Bedouin woman, mother of 15 children, was admitted electively for cholecystectomy because of recurrent right upper abdominal pain accompanied by nausea and vomiting. Ultrasound examination of the abdomen revealed the presence of two stones in the gallbladder. On examination an oval mass was palpable in the right hypochondrium. All laboratory examinations were within the normal range.

The patient was operated upon 2 days after admission. At surgery the cystic duct was found to be delicate, and in face of the normal value of alkaline phosphatase and the absence of jaundice, no intraoperative cholangiogram was performed. On the second postoperative day the patient was afebrile but complained of right upper quadrant pain, and icterus was noticed. Blood examinations revealed a rise in bilirubin to 9.4 mg/dl and slight elevation of transaminases. Alkaline phosphatase was found to be four times the normal value. The possibility of a retained stone was raised, and therefore an emergency ERCP was performed. This examination revealed cut-off of the proximal common bile duct (CBD, black arrow). White arrow denotes a normal pancreatic duct (PD).

Figure 1. ERCP demonstrating cutoff of the proximal common bile duct (CBD, black arrow). White arrow denotes a normal pancreatic duct (PD).

The patient was immediately taken for reoperation with the presumptive diagnosis of inadvertent common bile duct ligation. This diagnosis was confirmed intraoperatively. Both ends of the common bile duct were identified and anastomosed end to end with a T-tube stent. Cholangiography performed through the T-tube during surgery disclosed the re-established integrity of the biliary tree.

The postoperative course was uneventful. Bilirubin declined to normal value on the fourth day. The patient was discharged from the hospital in good condition on the 14th postoperative day after a second normal T-tube cholangiogram.

Cholecystectomy is a frequently performed procedure in general surgery. In some cases it may be extremely difficult and may be associated with injury to the extrahepatic biliary tree. These injuries occur in approximately 0.2% of patients having elective biliary tract surgery and include stricture, leak, and ligation.1,2 In our case, right upper quadrant pain and obstructive jaundice rapidly developed after cholecystectomy. ERCP, by revealing the cutoff of the proximal choledochus, established the diagnosis of inadvertent ligation of the common bile duct and was helpful in making the decision for the best therapeutic approach.

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