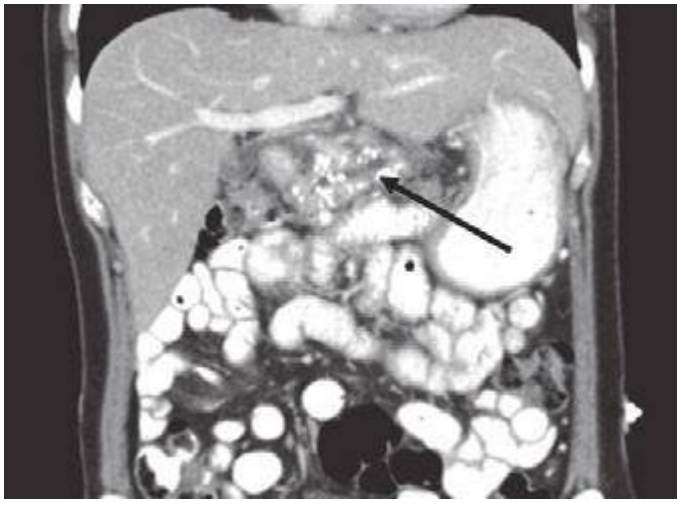
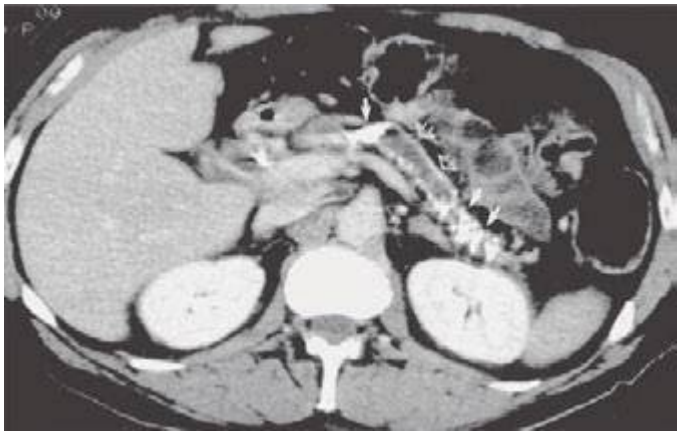


A



B

C

FIGURE 371-4 ***A.*** Chronic pancreatitis and pancreatic calculi: computed tomography (CT) scan. In this contrast-enhanced CT scan of the abdomen, there is evidence of an atrophic pancreas with multiple calcifications and stones in the parenchyma and dilated pancreatic duct (*arrow*). ***B.*** In this contrast-enhanced CT scan of the abdomen, there is evidence of an atrophic pancreas with multiple calcifications (*arrows*). Note the markedly dilated pancreatic duct seen in this section through the body and tail (*open arrows*). ***C.*** Chronic pancreatitis on magnetic resonance cholangiopancreatography (MRCP): dilated duct with filling defects. Gadolinium-enhanced magnetic resonance imaging/MRCP reveals a dilated pancreatic duct (*arrow*) in chronic pancreatitis with multiple filling defects suggestive of pancreatic duct calculi. *(A, C, courtesy of Dr. KJ Mortele, Brigham and Women's Hospital; with permission.)*

pseudocyst and pancreatic cancer, CT may show calcification, dilated ducts, or an atrophic pancreas. Although abdominal CT scanning and MRCP greatly aid in the diagnosis of pancreatic disease, the diagnostic test with the best sensitivity and specificity is the hormone stimulation test using secretin. The secretin test becomes abnormal when ≥60% of the pancreatic exocrine function has been lost. This usually correlates well with the onset of chronic abdominal pain. The role of endoscopic ultrasonography (EUS) in diagnosing early chronic pancreatitis is still being defined. A total of nine endosonographic features have been described in chronic pancreatitis. The presence of five or more features is considered diagnostic of chronic pancreatitis. EUS is not a sensitive enough test for detecting early chronic pancreatitis alone **(Chap. 370)** and may show positive features in patients who have dyspepsia or even normal aging individuals. Recent data suggest that EUS can be combined with endoscopic pancreatic function testing (EUS-ePFT) during a single endoscopy to screen for chronic pancreatitis in patients with chronic abdominal pain. Diffuse calcifications noted on plain film of the abdomen usually indicate significant damage to the pancreas and are pathognomic for chronic pancreatitis (Fig. 371-4*A*). Although alcohol is by far the most common cause of pancreatic calcification, such calcification may also be noted in hereditary pancreatitis, posttraumatic pancreatitis, hypercalcemic pancreatitis, idiopathic chronic pancreatitis, and tropical pancreatitis.

Complications of Chronic Pancreatitis The complications of chronic pancreatitis are protean and are listed in Table 371-7. Although most patients have impaired glucose tolerance, diabetic ketoacidosis and diabetic coma are uncommon. Likewise, end-organ damage (retinopathy, neuropathy, nephropathy) is also uncommon. A nondiabetic retinopathy may be due to either vitamin A and/or zinc deficiency. Gastrointestinal bleeding may occur from peptic ulceration, gastritis, a pseudocyst eroding into the duodenum, arterial bleeding into the pancreatic duct (hemosuccus pancreaticus), or ruptured varices secondary to splenic vein thrombosis due to chronic inflammation of the tail of the pancreas. Jaundice, cholestasis, and biliary cirrhosis may occur from the chronic inflammatory reaction around the intrapancreatic portion of the common bile duct. Twenty years after the diagnosis of calcific chronic pancreatitis, the cumulative risk of pancreatic carcinoma is 4%. Patients with hereditary pancreatitis are at a 10-fold higher risk for pancreatic cancer.

TREATMENT CHRONIC PANCREATITIS

STEATORRHEA

The treatment of steatorrhea with pancreatic enzymes is straightforward even though complete correction of steatorrhea is unusual. Enzyme therapy usually brings diarrhea under control and restores absorption of fat to an acceptable level and affects weight gain. Thus, pancreatic enzyme replacement has been the cornerstone of therapy. In treating steatorrhea, it is important to use a potent pancreatic formulation that will deliver sufficient lipase into the duodenum to correct maldigestion and decrease steatorrhea. In an attempt to standardize the enzyme activity, potency, and bioavailability, the U.S. Food and Drug Administration (FDA) required that all pancreas enzyme drugs in the United States obtain a New Drug Application (NDA) by April 2008. Table 371-8 lists frequently used formulations, but availability will be based on compliance with the FDA mandate. Recent data suggest that dosages up to

TABLE 371-7 COMPLICATIONS OF CHRONIC PANCREATITIS

Chronic abdominal pain	Jaundice
Narcotic addiction	Retinopathy
Diabetes mellitus/impaired glucose tolerance	Biliary stricture and/or biliary cirrhosis
Gastroparesis	Pseudocyst
Malabsorption/maldigestion	Metabolic bone disease
	Pancreatic cancer