



Perforated Peptic Ulcer Masquerading as Gallbladder Disease: CT Findings

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An 84 year old woman was admitted with acute right upper abdominal pain, nausea and vomiting. Physical examination revealed tenderness of the right upper quadrant. Laboratory tests showed a white blood cell count of 12,900, amylase 359 units and a normal level of bilirubin. Her past medical history included hypertension, chronic atrial fibrillation and chronic leg ischemia. There was no history of previous peptic ulcer.

A plain abdominal radiograph on admission showed a normal gas pattern. The assumed diagnosis was acute cholecystitis but an ultrasound of the abdomen 2 days after admission showed a normal gallbladder. As severe abdominal pain persisted CT was performed after administration of oral contrast material. This study showed a large volume of free fluid surrounding the liver and forming an air-fluid level [Figure]. The fluid had the density of contrast material. The wall of the proximal duodenum appeared thickened and irregular. Although no contrast material was administered intravenously the collecting systems of both kidneys were opacified with contrast material, indicating absorption of extravasated oral contrast material from the peritoneum. Urgent laparotomy revealed perforation of the second part of the duodenum, which was repaired with omentopexy. Recovery was uneventful.

Duodenal perforation, whether due to peptic disease, trauma or instrumentation, is a life-threatening condition [1]. Perforation of the stomach and duodenum occur most often secondary to peptic ulcer disease [2]. The clinical

presentation, aided by abdominal radiographs, will usually lead to the correct diagnosis and subsequent therapy [2]. In the majority of cases CT is not necessary; in some instances, however, a perforated ulcer may present with non-specific symptoms and signs indistinguishable from those of acute pancreatitis or cholecystitis, and CT is then the first examination requested [3].

The clinical presentation of a perforated gastroduodenal ulcer depends on its exact location. Perforations of the stomach and duodenal bulb lead, because of their intraperitoneal location, to intraperitoneal leakage of gas and gastroduodenal secretions. These secretions contain digestive enzymes and hydrochloric acid that have irritant effects on the peritoneum, thereby causing severe abdominal pain and tenderness. In contrast, the duodenal loop beyond the bulbar segment is retroperitoneal, and perfora-



Right upper quadrant pain in an 84 year old woman. CT section of the upper abdomen demonstrates a large volume of free intraperitoneal air and contrast material in the peritoneal cavity, surrounding the liver (L) and creating an air-fluid level (arrow).

tion in this area tends to be locally contained and to be rather insidious in its clinical presentation [4].

The main CT finding of gastrointestinal perforation is the presence of air and/or gastrointestinal contrast material into the peritoneum or retroperitoneum, depending on the site of perforation [5]. In the vast majority of cases, perforation results in free intraperitoneal air [2,5]. This air tends to accumulate along the anterior peritoneal surface of the liver and the mid-abdomen. In order to enhance the sensitivity of CT for detection of free intra- or extraperitoneal air, the scans should also be viewed at "lung window" settings. For visualization of extravasated fluid it is important to opacify the alimentary tract with a sufficient quantity of contrast [5]. However, patients may not be able to cooperate because of pain, nausea or vomiting. Even the administration of contrast material through a nasogastric tube does not always demonstrate extravasation, due to ileus preventing the contrast from reaching the site of perforation [5]. In a recent study, CT was undertaken in 76 patients with proven perforation of the gastrointestinal tract. In 59 of them oral contrast material was given, but only in 12 was extravasation of contrast material detected [5].

Localization of the exact site of perforation can be made when the origin of the leak can be detected. In a series of 11 patients with duodenal perfora-

tion due to peptic ulcer disease the site of extravasation was identified on CT in only 3 patients [2]. In our case the site of leakage was not visualized, but localized thickening of the duodenal wall and the fact that contrast material had reached only the proximal small bowel suggested duodenal perforation.

The differential diagnosis of opacified extraluminal fluid includes extravasated opacified blood or urine (after intravenous contrast administration) [5].

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