What Is Your Diagnosis?

History

A 10-year-old spayed female Dachshund was examined because of a 7-day history of lethargy, vomiting, and signs of abdominal pain. The referring veterinarian had treated the dog with fluids and antimicrobials. An extrahepatic portovenous shunt anomaly had been corrected 3 years previously with surgical placement of an ameroid constrictor.

On physical examination, the dog had signs of severe depression, was mildly dehydrated, and had signs of pain during palpation of the cranial portion of the abdomen. Examination of results of a serum biochemical profile, CBC, and urinalysis revealed a number of abnormalities including a pronounced inflammatory leukogram, mild anemia, severe hypoalbuminemia, moderate hypoglycemia and hypokalemia, high serum alanine aminotransferase activity, high serum alkaline phosphatase activity, and high resting ammonia concentration. Abdominal radiographs were obtained (Fig 1).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page.
**Diagnosis**

Radiographic diagnosis—An oval gas lucency directly caudal to the dome of the diaphragm and cranial to the stomach (Fig 2).

**Comments**

Abdominal ultrasonography was performed and revealed a small amount of free abdominal fluid. The right liver lobes were surrounded by flocculent fluid, which was encased and separated from the rest of the abdominal contents by a thick capsule. The hepatic parenchyma appeared normal, and the gall bladder was distended but otherwise unremarkable. Cytologic evaluation of the free abdominal fluid revealed mild, nonseptic chronic inflammation.

Subsequent exploratory celiotomy confirmed the presence of a small amount of free abdominal fluid and revealed widespread adhesions throughout the abdominal cavity. The liver capsule was thick and adherent to the stomach and abdominal wall. When these adhesions were broken down, thick mucopurulent exudate was released from around the liver.

Because of the poor prognosis, the owners elected to euthanatize the dog without recovery from anesthesia and declined a postmortem examination. Samples from the perihepatic exudates were obtained during surgery for bacteriologic culture, and *Clostridium perfringens*, identified in our microbiology laboratory with standard biochemical testing, was subsequently isolated. The organism was cultured in thioglycollate enrichment broth and on various plated media; anaerobic growth with copious gas production was evident in the enrichment broth.

The most striking radiographic feature in this dog was the gas pocket associated with or adjacent to the cranial aspect of the liver. Pockets of gas or lucent areas within the solid viscera, the peritoneum, or the urinary tract are uncommon radiographic findings. Gas pockets in the immediate subdiaphragmatic abdominal region may be associated with the liver parenchyma, biliary system, abnormally placed gastrointestinal organs or lung tissue, or peritoneal gas. The gastrointestinal tract is the only abdominal organ system in which gas accumulation is not necessarily pathologic. An upper gastrointestinal series was performed prior to surgery to determine whether the gas pocket seen in the cranial aspect of the abdomen was associated with the stomach or intestine, and we found that it was unrelated to the gastrointestinal tract.1,2

Gas accumulation within the liver parenchyma is uncommon. In the dog of this report, the gas was not actually within the liver parenchyma or the biliary system but was within a perihepatic abscess. Regardless of the location, radiographic detection of gas outside the gastrointestinal tract strongly suggests the presence of gas-producing bacteria. Although cytologic evaluation could have been used to make a diagnosis, we elected not to aspirate the suspected abscess because of the associated risk of iatrogenic abscess rupture and secondary bacterial peritonitis. In this case, we elected to perform exploratory celiotomy to confirm the diagnosis of gas-producing infection and definitively localize the site of the infection.

**References**


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*Figure 2—Same radiographic views as in Figure 1. There is an oval gas lucency (arrows) directly caudal to the dome of the diaphragm and cranial to the stomach on the lateral view and on the midline of the dorsoventral view.*