



**Fig. 8.**—Aggressive angiomyxoma of right hemipelvis.  
**A,** Longitudinal sonogram shows ill-defined mass extending linearly along right lateral pelvis. Mass was clearly separate from both ovaries and was without peristalsis.  
**B,** Enhanced CT scan shows high-attenuation right pelvic mass (arrows) displacing bladder.  
**C,** Coronal T2-weighted MR image shows heterogeneous high-signal-intensity mass (arrows) along side of right pelvic wall.  
**D,** Axial T2-weighted MR image shows heterogeneous high-signal-intensity mass (arrows) along side of right pelvic wall.

cations as the lesser sac [2]; the pleural cavity, because of transdiaphragmatic migration of the tip [1]; and the peritoneal cavity [1]. CSF shunt catheters have been reported to perforate the small bowel [1], inferior vena cava [3], and chest wall [4].

Sonography cannot distinguish between iatrogenic collections such as CSF collections, seromas, and lymphoceles. Sonographically guided fine-needle aspiration of the fluid collection provided definite identification of CSF. The focus of activity on the chest wall along the shunt catheter on scintigraphic evaluation of shunt patency supported the diagnosis of an iatrogenic CSF collection associated with ventriculoperitoneal shunt leakage. This complication of ventriculoperitoneal shunts should be considered when evaluating breast masses in patients with these devices.

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**Aggressive Angiomyxoma of the Female Pelvis: Sonographic, CT, and MR Findings**

A 30-year-old woman presented with sharp, steady abdominal pain localized above McBurney's point, with guarding of the abdomen. The findings of the patient's pregnancy test were negative, and her temperature was 99.5°F (37.5°C). The clinicians considered diagnoses of pyelonephritis, tuboovarian abscess, and appendicitis.

Sonography revealed an ill-defined mass along the right lateral pelvis that was separate from both ovaries and without peristalsis (Fig. 8A). CT revealed a 5- to 6-cm mass of soft-tissue attenuation along the side of the right pelvic wall. Differential diagnoses included endometriosis, abscess, pelvic inflammatory disease, hematoma, or adenopathy. The appendix appeared normal on sonography and CT.

The patient underwent laparoscopy and appendectomy. No signs of pelvic inflam-

matory disease, appendicitis, or abnormal mass were evident. Her symptoms did not resolve postoperatively.

A persistent right pelvic mass was seen on follow-up CT and MR imaging 4 days later. CT (Fig. 8B) showed a 5 × 3 cm high-attenuation right pelvic mass displacing the bladder. T1-weighted imaging showed a homogeneous mass isointense to muscle. T2-weighted imaging revealed a 9 × 7 × 3 cm mildly heterogeneous mass of high signal intensity along the side of the right pelvic wall (Figs. 8C and 8D). A CT-guided core biopsy by an anterior approach was performed. Multiple attempts yielded only minimal grayish material that was myxoid, acellular, and nondiagnostic on pathologic examination. Several passes had no material at all. Follow-up surgical resection 7 weeks later by means of a retroperitoneal dissection along the side of the pelvic wall revealed a specimen that was soft, silvery gray, and squidlike in texture, with loose areolar tissue around it. Final pathologic examination determined that the mass was an aggressive angiomyxoma. The patient's symptoms resolved postoperatively.

Aggressive angiomyxoma is a locally invasive mesenchymal neoplasm found primarily in the pelvis and perineum, with a 6:1 female:male ratio [1]. Ages of presentation range from 16 to 70 years [1, 2], and tumors vary greatly in size and presentation. Studies have shown 33-72%



**Fig. 9.**—Multiple gastric polyps are clearly seen on double-contrast upper gastrointestinal series. Biopsy revealed extramedullary hematopoiesis.

of tumors to recur locally from 10 months to 15 years after excision [1, 2]. Approximately 65 cases of aggressive angiomyxoma have been reported. These tumors are often mistaken clinically for a Bartholin's cyst, abscess, or hernia because patients often present with pain in the perineum, labia, or pelvis.

Grossly, these tumors have smooth, silvery, glistening, gelatinous, bluish gray surfaces; are encapsulated, lobulated, and soft; and are not nodular [2]. Histologically, the tumors consist of small, stellate spindle cells with collagen fibrils in a myxoid stroma and are highly vascular, with dilated, thin-walled vessels and extravasated RBCs [2]. Cytologic findings show the tumors to be hypocellular, with few stellate and spindle-shaped cells on a myxoid background [3]. These findings are nondiagnostic but should rule out lymphoproliferative and metastatic diseases [3].

Sonographic and CT appearances have been described [4]. To our knowledge, ours is the first known MR description of aggressive angiomyxoma. The tumor is unusual; this case was even more rare because the tumor was located in the pelvis rather than in the perineum. Radiologically, aggressive angiomyxoma can, along with neurogenic tumors such as neurofi-

broma or schwannoma, be placed into the differential diagnosis of a pelvic or perineal soft-tissue mass. Suspicion of this entity should be increased when a biopsy yields scant, gelatinous, myxoid material.

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#### Gastric Polyps due to Extramedullary Hematopoiesis

Extramedullary hematopoiesis (EMH) is a rare but well-described compensatory response to bone marrow failure. EMH refers to the formation and development of blood cells from erythroid precursors located in tissues other than the bone marrow. The development of EMH in the gastrointestinal tract is extremely rare. We report the unusual finding of gastric polyps due to EMH in a patient with idiopathic myelofibrosis.

A 56-year-old woman with known myelofibrosis was admitted to the hospital with marked epigastric pain. A double-contrast upper gastrointestinal series revealed gastric polyps (Fig. 9). Gastroscopy confirmed the gastric polyps. Biopsy revealed EMH.

EMH, a compensatory mechanism for insufficient medullary hematopoiesis, occurs in patients with myelofibrosis; neoplastic replacement of the bone marrow (carcinoma,

lymphoma, leukemia); bone marrow destruction by toxins or irradiation; and hemoglobinopathies [1]. EMH is more frequent in adults because children have a large compartment of red marrow.

The most common sites of EMH are the liver, spleen, and lymph nodes. These locations support the theory of the pathogenesis of EMH as a reversion of the liver and spleen to their fetal hematopoietic functions after an unidentified stimulus. Less common locations for EMH include the adrenal glands, kidneys, thymus, pleura, CNS, mesentery, breasts, peripheral nerves, and peritoneal surface. EMH is believed to arise from multipotential stem cells that are present in mesenchymal tissue throughout the body. This origin would explain the wide distribution of EMH and the potential for involvement of any organ system [2].

A review of the medical literature revealed two references to gastric EMH. A 3 × 4 cm submucosal gastric mass of EMH tissue was reported in a patient with chronic myelogenous leukemia [3]. Another patient had EMH infiltrations in the stomach at autopsy. In that patient, the results of an upper gastrointestinal series had been normal [4].

To our knowledge, this report is the first of gastric polyps due to EMH. EMH should be added to the differential diagnosis of gastric polyps in patients with insufficient medullary hematopoiesis.

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