Adnexal torsion presenting as an acute abdomen in a patient with bilateral cystic teratoma of the ovary

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Benign cystic teratomas are the most common ovarian neoplasms in women. Teratomas are usually benign, unilateral, and most often found in young and premenopausal women. Most are 5 cm to 10 cm in diameter when diagnosed, and on sectioning, they usually contain thick sebaceous material, tangled hair, and various dermal structures. One of the major complications seen in cystic teratoma is torsion, a partial or complete twisting of the ovarian suspensory pedicle causing severe pain, nausea, and tissue necrosis. The patient described had bilateral cystic teratomas, one uncommonly large and torsed, causing an acute abdomen. Discussion includes the diagnosis, operative management, and postoperative findings.

(Key words: adnexal torsion, benign cystic teratoma, dermoid cysts, ovarian teratoma)

A previously healthy young woman who is seen in the emergency department with an acute abdomen has had a catastrophic intra-abdominal crisis that requires immediate diagnosis and operative management. Severe pain of acute onset followed by vomiting usually has a gastrointestinal, peritoneal, mesentery, or pelvic organ etiology caused by inflammation, mechanical obstruction, acute distention, or vascular disturbance. History and physical examination, laboratory studies, radiologic evaluation to include abdominal flat-plate, computerized tomography (CT) scan, and ultrasound examination of the abdomen and pelvis will always assist the clinician in making a diagnosis. If disease of the gastrointestinal tract and complication of pregnancy have been ruled out, adnexal causes such as tumor, torsion, or bleeding must be considered. This case report describes a previously healthy, physically active, not sexually active patient with no risk factors in whom acute abdominal pain developed, followed by nausea and vomiting during a 2-mile run.

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Report of case

A 19-year-old nulligravida African American US Army trainee in acute distress was brought to the emergency department by her drill sergeant. This previously healthy young woman had severe lower abdominal pain while she was running with her unit during physical training activity. She immediately felt nausea, followed by four to five episodes of vomiting, at which time she was brought to the hospital. On evaluation, this patient was doubled up into the fetal position and complained of severe abdominal pain. Past medical history was unremarkable. She had no history of fever, chills, diarrhea, or dysuria. The patient was virginal, taking no medication, and her last menstrual period was 1 week before the presenting symptoms. Physical examination revealed positive abdominal rebound tenderness in the right lower quadrant and a palpable firm mass in the lower right side of the abdomen to the level of the umbilicus. Bowel sounds were hypoactive. Pelvic bimanual examination was impossible owing to the patient’s distress. Results of laboratory studies showed no presence of human chorionic gonadotropin and leukocytosis. Radiographic evaluation included a flat-plate film of the abdomen that revealed “teeth” in the left side of the pelvis (Figure 1).

An emergency CT scan of the abdomen confirmed a 14×10×15.2-cm pelvic and abdominal mass to the level of the umbilicus and a 4×4×4-cm left-sided pelvic mass (Figure 2). The diagnosis of acute abdomen due to probable torsion and bilateral ovarian teratomas was made.

The patient was taken to surgery, and the abdominal cavity was explored by use of a low abdominal midline incision. When the peritoneal cavity was entered, a dark purple-to-black large mass in the right side of the abdomen confirmed torsion and necrosis of the right adnexa uteri. The suspensory ligament of the right ovary had a complete 360-degree twist, and the adnexa was necrotic and gangrenous. This pedicle was clamped and ligated proximal to the twisted portion, and the necrotic adnexa uteri was excised. The left ovary was found to have a shiny, white teratoma 4 to 5 cm in diameter. An ovarian cystectomy allowed excision of the intact teratoma and preservation of normal ovarian tissue and fallopian tube.

The pathologic analysis revealed a 16×15×12-cm right ovarian cystic mass (Figure 3) weighing 1167 g and containing skin, cartilage, bone, neural tissue, and respiratory epithe-
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Figure 1. Abdominal flat-plate x-ray film showing teeth in the left side of the patient's pelvis.

Figure 2. Computed tomographic scan of the abdomen and pelvis demonstrating a $14 \times 15$-cm abdominal mass (M) in the patient's right side to the level of the umbilicus, and a $4 \times 4 \times 4$-cm mass in the left pelvis.

Figure 3. Unopened 1167-g right ovary and teratoma; discoloration due to necrosis caused by torsion. Ruler is 15 cm long.

Figure 4. Cystic teratoma $4 \times 4$ cm excised from left ovary. Opened specimen revealed teeth, hair, and thick sebaceous material. Ruler is 15 cm long.
lium. The largest cystic cavity contained 300 mL of serosanguineous fluid, and an additional cystic cavity measuring 9.5 cm in diameter was filled with serosanguineous fluid, hair, and grumouse white material. The intact teratoma excised from the left ovary measured 4.5 × 3.9 × 3.4 cm and, when incised and opened, contained hair and white grumouse material (Figure 4). Also present were several partially formed and well-formed incisor and molar teeth. Histologic examination confirmed bilateral benign cystic teratomas and vascular congestion, edema, and necrosis due to torsion of the right adnexa uteri. The postoperative course was benign, and the patient returned to full duty 6 weeks after surgery.

Discussion
Benign cystic teratomas, commonly known as dermoid cysts, are the most common ovarian neoplasms found in women. These neoplasms originate from primordial germ cells that migrate from the yolk sac to the ovary. Teratomas are characterized by the presence of all three embryonic germ cell layers (ectoderm, mesoderm, and endoderm), and almost all teratomas have a 46,XX karyotype.

Although teratomas may be found in all age groups, more than 80% occur during the reproductive years and approximately 15% occur in postmenopausal women. Although teratomas are almost always benign and usually unilateral, 1% to 2% undergo malignant transformation and 10% to 15% are bilateral. When malignant transformation occurs, it usually occurs in women older than 40 years and most commonly in postmenopausal women.

The risk of torsion with teratomas is approximately 15%. The reason may be the high fat content in teratomas, causing them to float in the peritoneal cavity, promoting twisting or torsion of the adnexa with trunkal movement or physical activity. Torsion of the ovarian suspensory ligament may be partial if the teratoma rotates slightly, or complete if the rotation totally occludes the blood supply to the ovary. Should this occur, ischemia of the adnexal tissue leads to acute pain and adnexal edema due to venous and lymphatic engorgement. Tissue necrosis of the twisted adnexa rapidly occurs, and adnexectomy is usually required.

Once diagnosis of cystic teratoma with torsion is made, immediate surgery is indicated. Laparoscopy may confirm the diagnosis and permit detorsion of a partial adnexal torsion and excision of the teratoma. Salpingo-oophorectomy of necrosed adnexa due to complete torsion is possible through a laparoscopic approach if the teratoma is smaller than 5 cm. Large teratomas, as found in the patient described here, require laparotomy through a low midline abdominal incision, clamping of the torsed pedicle proximal to the torsion, and excision of the necrotic adnexa with the teratoma intact. If a gangrenous necrotic pedicle is untwisted in an attempt to preserve the ovary, the patient is at risk for acute peritonitis and venous embolism; therefore, adnexectomy is mandatory.

Although most authors report that cystic teratomas are bilateral in 10% of patients, 12% of patients in whom cystic teratoma is diagnosed, equal distribution between the left and right ovaries has also been reported when unilateral teratoma is found. One author reported that the right ovary is 1.5 times more likely to undergo torsion than the left ovary.

Comment
The case reported here describes bilateral benign cystic teratomas with torsion and gangrenous necrosis of the large teratoma of the right ovary. The patient was a young healthy woman who had acute onset of severe abdominal pain and vomiting during rigorous physical activity. With an acute abdomen necessitating surgical exploration, x-ray evidence of teeth in the left side of the pelvis and a computed tomographic scan showing a large right-sided abdominal mass and a smaller left-sided pelvic mass confirmed the diagnosis of bilateral teratomas. Adnexal torsion is always a surgical emergency. If the twisted adnexa uteri are necrotic, adnexectomy is the recommended treatment.

References