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### Dermoid Cyst – Presenting with LLQ Abdominal Pain

Mohammad A. Rattu  
*Jefferson Health NJ*

James A. Espinosa  
*Jefferson Health NJ*

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Rattu, Mohammad A. and Espinosa, James A., "Dermoid Cyst – Presenting with LLQ Abdominal Pain" (2024). *Rowan-Virtua Research Day*. 86.  
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# Dermoid Cyst – Presenting with LLQ Abdominal Pain

**Mohammad Rattu DO. James Espinosa MD**

*Department of Emergency Medicine, Jefferson Health New Jersey*

## Abstract:

Ovarian cysts are fluid-filled structures that may be defined as simple or complex and are often discovered incidentally on imaging. Their etiology can range from physiologically normal (such as follicular or luteal cysts) to ovarian malignancies. They are more common among the reproductive years secondary to endogenous hormonal production however may also occur at any age . Simple cysts more commonly occur among all age groups; mixed cystic and solid and completely solid ovarian lesions however have rates of increased malignancy. The most independent risk factor is age, therefore, post-menopausal women should have proper follow-up secondary to this risk. Some risk factors include infertility treatment, hypothyroidism, pregnancy, tobacco use, tubal ligation and tamoxifen. Among women of reproductive age, ovarian cysts are functional and benign. However, ovarian cysts are prone to complications, some of which include pelvic pain, cystic rupture, hemorrhage and ovarian torsion, which require prompt management[.

## Case Presentation:

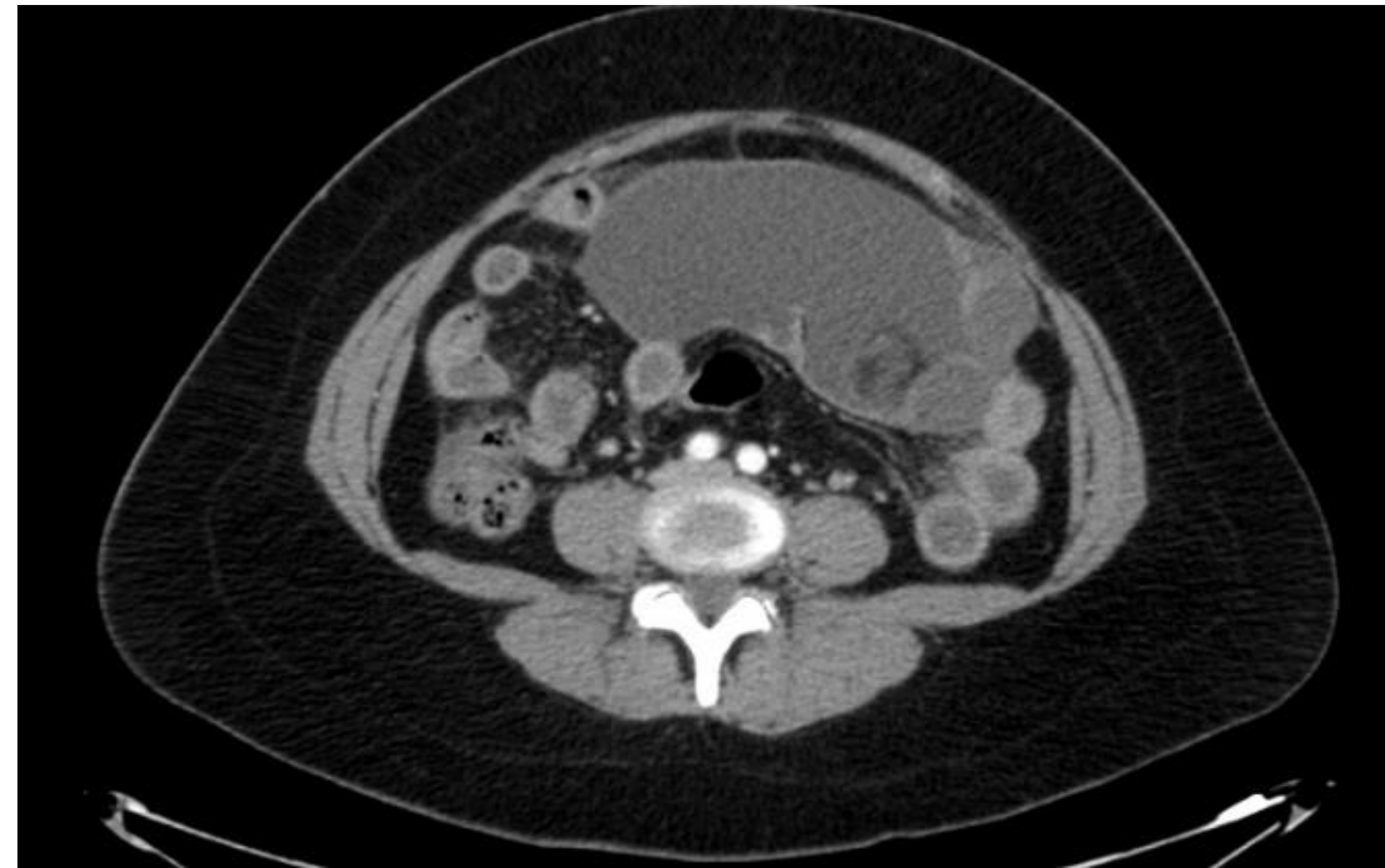
We report the case of a 35yo G2P1102 female with prior history of bacterial vaginosis, type II diabetes who presented to the emergency department for left sided lower abdominal pain, which had been occurring for several hours. She endorsed nausea without episodes of emesis. She had presented that same day earlier to urgent care and had negative pregnancy testing and urine dipstick without concern for urinary tract infection. She did not exhibit any vaginal bleeding or discharge. Her surgical history included C-section and wisdom tooth extraction. Her family history was significant for T2DM, hypertension and hyperlipidemia. She denied any tobacco use and admitted to social alcohol use.

The patient’s vital signs were as follows: heart rate 127 beats per minute, respiratory rate 18 breaths per minute, blood pressure 141/102 mmHg and a temperature 98.9 degrees F, with pulse oxygenation of 100%. Her abdominal exam exhibited tenderness in her left lower quadrant, and without any associated flank pain. Her electrolytes were within normal limits. She had no leukocytosis and her hemoglobin and platelet count were stable. CT abdominal imaging with contrast revealed a multilocular cystic mass at the lower abdomen measuring 16.2cm x 6.9cm x 12.2 cm. This finding was suggestive of a dermoid cyst. She also had a small to moderate amount of ascites reflecting rupture, for which surgical consultation was recommended.

The gynecology team evaluated the patient and administered analgesic medications and intravenous fluids. She was admitted to the observation unit and continued to experience pain despite pain medication regimen. Decision was made to proceed to the operating room for exploratory laparoscopy and removal of her dermoid cyst and ascitic fluid. A large left-sided ovarian cyst and green ascitic fluid was identified during her laparoscopy. Her cyst was drained and removed, alongside her left ovary. The pelvis was irrigated and her case was uncomplicated, including her postoperative course. She was then discharged home in stable condition on postoperative day #1.

## Discussion:

Consisting of ovaries and fallopian tubes bilaterally, the adnexa is a set of structures that is located near the uterus; the ovaries are suspended laterally via the utero-ovarian ligament and connected to the side of the pelvis via in the infundibulopelvic (suspensory) ligament. Among premenopausal women, the ovaries will produce numerous follicles monthly, and one dominant follicle will mature and undergo ovulation. Secondary to the ovulatory process, a fluid-filled sac known as an ovarian cyst may form on one or both ovaries. Adnexal masses are common and approximately 20% of women will develop at least one during their lifespan.



## Discussion:

Ovarian cysts can be classified into gynecological and non gynecological subcategories. The gynecological cysts can be benign or malignant, and associated with pelvic inflammatory disease or ectopic pregnancy. The prevalence of ovarian cysts is unknown as many patients will be undiagnosed and are often asymptomatic. Four percent of women will be admitted to the hospital for an ovarian cyst by the age of 65. The most common tumor among infants and fetuses is an ovarian cyst, with greater than 30% prevalence [6]. Among the United States population, ovarian carcinoma is diagnosed in more than 21,000 women annually and results in 14,600 deaths. Complications of note include cyst rupture, hemorrhage, and ovarian torsion. One study shows that from a random sample of asymptomatic 335 women aged 24 to 40, 7.8% were diagnosed with an adnexal lesion [7]. Post-menopausal women also had a prevalence of 2.5% for simple unilocular adnexal cyst [8]. Most cysts overall are benign and mature cystic teratomas (otherwise known as dermoid cysts) can represent more than ten percent of ovarian neoplasm. Follicular and corpus luteal cysts can result in hemorrhagic cysts however are usually asymptomatic and resolve without treatment [9] Polycystic ovary syndrome (PCOS) appears as enlarged ovaries with multiple small follicular cysts that appear enlarged secondary to express androgen exposure that causes the ovaries to form cysts that increase in size [10].

Menstrual cycles can additionally become irregular and be associated with vaginal bleeding [11]. Complex cysts can develop from the inappropriate growth of cells within the ovary. Dermoid cysts (also referred to as cystic teratomas) contain tissues from all three germ layers (ectodermal, mesodermal, and endodermal) and appear complex but have a variety of appearances secondary to the contained tissue. Rarely, struma ovarii is a specialized teratoma that contains mature thyroid tissue and is present among 5% of ovarian teratomas and diagnosed postoperatively on surgical pathology by the presence of differential thyroid malignancy [12]. Though mostly benign, dermoid cysts can undergo malignant transformation in 1-2% of cases [13][14]

When an ovarian mass is suspected, the emergency physician should determine whether the patient is pre or post-menopausal and pregnancy should be ruled out. Obtaining a complete blood count will evaluate for anemia if concerned for acute bleeding. Urinalysis will determine any concern for urinary tract infections. Endocervical swabs can be collected to assess for any pelvic inflammatory disease. Additional workup includes obtaining cancer antigen 125 (CA125), often performed inpatient or outpatient setting, and is a protein present on the cell membrane of healthy ovarian tissues and ovarian carcinomas. CA125 values are elevated in approximately 85% of patients with epithelial ovarian cancer and the finding of an elevated CA125 is useful when evaluating a postmenopausal female with ultrasound imaging concerning ovarian mass [7,15]. The most common imaging modality for evaluation and differentiation of ovarian pathology is transvaginal ultrasound imaging. This differentiates mass composition (defining cystic, solid, or mixed), the presence of pelvic free fluid and assesses blood flow and vascularity to the ovaries. Benign cysts are thin and will smooth walls without septations or solid components and have internal flow on doppler imaging. Adnexal masses that present with pain are concerning for ovarian torsion, which leads to necrosis and subsequent loss of the ovary. The presence of blood flow on doppler imaging does not fully rule out ovarian torsion. Normal doppler flow when torsion is suspected can be secondary to the dual blood supply provided to the ovary [15]. Cysts that require further evaluation for malignancy are those greater than 10cm in size, complex or multiloculated, papillary or solid components, irregularity, thick septations, presence of ascites, and increased vascularity [4].

An asymptomatic patient can be monitored conservatively with serial ultrasound imaging as the majority will resolve without intervention. Dermoid cysts should have yearly follow up with ultrasound imaging until their surgical removal as well. Indications for surgery include suspected torsion, persistent mass, abdominal pain and suspected malignancy. When surgery is performed in premenopausal females, the priority is to preserve fertility. Malignant change can occur in a few cases of dermoid cysts (associated with extremely poor prognosis) and endometriosis. If an ovarian cyst is suspected to be malignant, the prognosis is usually poor since ovarian cancer tends to be diagnosed in the advanced stages.

Patients who are at high risk for ovarian malignancy should be evaluated for surgical management. Ultrasound characteristics that are suspicious for malignant features, nodular or fixed pelvic masses, ascites and metastatic disease should be referred to. Ultrasound findings include cysts that are larger than 10cm, irregular borders, high color Doppler flow, papillary or solid components and ascitic fluid [4]. The majority of ovarian cysts will regress, however, can also increase in size and cause the ovary to rotate on itself, cutting off circulation and resulting in torsion. Additionally, larger cysts can rupture and lead to life threatening hemorrhage and should be removed to prevent complications.

## Conclusions:

Ovarian cystic teratoma (dermoid cyst) is the most common ovarian tumor, and the complications are rare. This should be recognized by the radiologist in order to avoid inaccurately diagnosing them as malignant lesions. Transvaginal ultrasound imaging is the recommended first-line modality for suspected pelvic mass and surgical intervention may be required for mature ovarian teratomas or endometriomas, especially if large and symptomatic, or if malignancy is suspected. Cases of ruptured cystic teratomas are rare and can easily be misdiagnosed as peritoneal carcinomatosis[21]. Mature cystic teratomas, also called dermoid cysts, are the most common germ-cell ovarian neoplasms in children. On average, ovarian dermoid cysts are slow-growing neoplasms with a mean size between 6.4 and 7.0 cm that enlarge at a rate of 1.8 mm/year; however, these can reach large dimensions. Giant ovarian tumors are defined as those having a maximum diameter equal to or more than 15 cm and may be underreported, particularly in resource-limited areas where tumors might grow unrecognized, and that English-language bias might play a substantial role in literature reviews involving case reports and case series[22].

Transvaginal ultrasound, pelvic ultrasonography, magnetic resonance imaging, or computed tomography. Early recognition of dermoid cysts and prompt intervention are crucial to prevent potential complications [23]. One case of chemical peritonitis and prolonged fever has been described following laparoscopic salpingo-oophorectomy for torsion of a large ovarian dermoid, requiring antibiotics and repeated drainage of the collection as well as re-laparotomy [24]. Though ovarian cysts are mostly benign and can spontaneously resolve, they often can lead to complications such as torsion, rupture, or hemorrhage, requiring urgent medical or surgical intervention.

## References:

Available upon request.