

# Large Epidermal Inclusion Cyst Presenting as a Pelvic Mass

Paul D. Silva, MD; Rachael Summers, BS; Modupe Omole, MD; Scott Chapman, MD

## ABSTRACT

**Introduction:** Epidermal inclusion cysts are common discrete nodules often formed in areas of previous trauma or surgery. A literature review indicated that large epidermal inclusion cysts of the pelvis are extremely rare. Accordingly, we present a case of a woman with a large pelvic epidermal inclusion cyst of the vaginal cuff, along with imaging studies and a review of the literature.

**Case Presentation:** A 49-year-old woman, 13 years after vaginal hysterectomy, was found to have a 7-cm soft tissue pelvic mass, discovered on a computed tomography (CT) scan performed for abdominal pain. The transvaginal ultrasound showed typical findings of an unruptured epidermal inclusion cyst with a hypoechoic background with diffuse small variable echodensities (some intense echogenic reflectors), a thin wall, and no internal Doppler flow. A 7-cm epidermal inclusion cyst was removed laparoscopically from her vaginal cuff without complication.

**Discussion:** Epidermal inclusion cysts of clinical significance are rarely formed at the vaginal cuff or elsewhere in the pelvis. Increased utilization of abdominal/pelvic CT imaging is increasing the frequency in which benign pelvic cysts are encountered. The trauma of surgery may sequester portions of vaginal epithelium, which may form epidermal inclusion cysts. As the cyst increases in size, the cyst may be viewed as an incidental pelvic mass requiring clinical decision making.

## INTRODUCTION

Epidermal inclusion cysts are discrete nodules with the wall composed of mature squamous epithelium.<sup>1</sup> They may be formed from areas of previous trauma,<sup>1</sup> which may cause the epidermis to sequester in the dermis allowing for slow growth of the lesion through sloughing of dead cells centrally.

Epidermal inclusion cysts commonly have been found on the vulva and clitoris from trauma from birth, episiotomies, or female genital mutilation.<sup>2</sup> A literature review indicated that large cysts of this type are rarely located in the upper vagina or pel-

• • •

**Author Affiliations:** Department of Obstetrics and Gynecology (Silva, Summers, Omole) and Department of General Surgery (Chapman), Mayo Clinic Health System, Franciscan Healthcare, La Crosse, Wis.

**Corresponding Author:** Paul D. Silva, MD, 191 Theater Rd, Onalaska, WI 54650; phone 608.392.5012, fax 608.392.5784, e-mail silva.paul@mayo.edu.

vis,<sup>2</sup> although it is possible that with the increased use of imaging for diagnostics, they may occur more commonly.<sup>3</sup> Only 1 previous case report has described a large pelvic epidermal inclusion cyst located on the vaginal cuff status post hysterectomy.<sup>2</sup> That case report describes a 3.3-cm cyst that was found incidentally on a transvaginal ultrasound exam. Accordingly, we report a 7-cm vaginal cuff epidermal inclusion cyst that presented on a contrast-enhanced computed tomography (CT) scan performed for upper quadrant abdominal pain.

## CASE REPORT

A 49-year-old woman, gravida 3 para 3, presented with back pain and pressure-like abdominal pain, mainly located in her upper abdomen. The patient had a vaginal hysterectomy 13 years prior because

of vaginal prolapse. She had a history of elevated liver enzymes in the past, which remained mildly elevated. The patient had a previous diagnosis of non-alcoholic fatty liver disease with a prior ultrasound showing diffuse fatty infiltration of the liver. Significant other past medical history included chronic low back pain with right-sided radicular symptoms; a recent magnetic resonance imaging (MRI) of the lumbar spine was negative. The patient's height was 168 cm, weight 100 kg, and BMI of 36 kg/m<sup>2</sup>. She was afebrile and had mild right upper quadrant tenderness on exam. Her white blood cell count was normal.

A right upper quadrant ultrasound showed no new findings. A CT scan noted a 7 x 4.5 x 4.5-cm smooth soft tissue mass in the midline in the posterior inferior pelvis that appeared to be separate from the ovaries (Figure 1). The mass was further characterized by transvaginal ultrasound as a 6.5 x 4.8 x 5-cm posterior inferior cystic pelvic mass with a hypoechoic background and multiple small punctate echodensities (some of these were quite intense echogenic reflectors), and no internal Doppler flow that

**Figure 1.** Computed Tomography Scan with IV Contrast



Image shows a 7 x 4.5 x 4.5-cm smooth nonenhancing posterior mid-line pelvic soft tissue mass.

**Figure 2.** Transvaginal Ultrasound

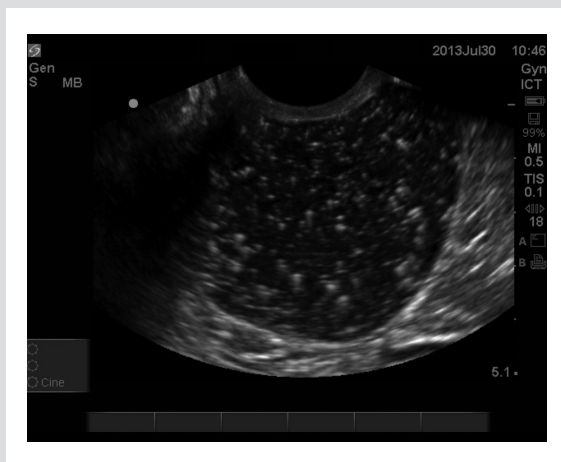


Image shows a 6.5 x 4.8 x 5.0-cm posterior inferior cystic pelvic mass with multiple variable small echodensities and a thin wall.

appeared to be separate from the ovaries (Figure 2). A bimanual exam palpated a cystic mass at the apex of the vagina, mildly tender to touch. Due to the pelvic location of the mass, a CA-125 was evaluated, which came back within normal limits. A colonoscopy also was performed in which 3 benign polyps were removed. There was no evidence of diverticulosis.

The patient continued to have symptoms of bloating and fullness, which extended throughout the abdomen. Also, because of the large size of the mass, it was decided to proceed to surgery. Since the mass had benign features (thin wall, no internal Doppler flow, normal CA-125), a laparoscopic approach was used. An 8-cm retroperitoneal mass was encountered in the area of the pouch of Douglas. The mass appeared cystic and closely

connected to the posterior vaginal wall and vaginal cuff. The mass could not be removed without entering the vaginal cuff, and therefore the surgeon felt the mass arose from the vaginal wall.

Gross examination of the mass showed a tan-gray smooth walled 7.4 x 5.1 x 4.4-cm cyst filled with tenacious tan-yellow debris. Final pathology was reported as a benign squamous inclusion cyst (epidermal inclusion cyst).

## DISCUSSION

Epidermal inclusion cysts can be found wherever there is squamous epithelium, presumably from sites of trauma including surgery.<sup>1,2</sup> Trauma is thought to result in sequester of the epithelium in the subepithelial tissue with subsequent slow growth through central accumulation of sloughed dead cells. In 1 review of epidermal inclusions cysts undergoing sonography for characterization, locations included 4 cases from the head or neck, 4 from the upper extremities, 2 from the chest wall, 1 abdominal, 3 from the buttocks, 2 from the inguinal or scrotal area, 2 from the sacrococcygeal area, and 6 from the lower extremities.<sup>4</sup> The largest cyst noted in this review<sup>4</sup> was 6 cm. The mass found on our patient was unusual with regard to size, having a largest diameter of 7.4 cm. In the pelvic area, epidermal inclusion cysts commonly form at an episiotomy scar or female genital mutilation sites. These cysts can continue to grow and cause mass-like effects or become infected and cause pain.<sup>2</sup> Although epidermal inclusion cysts are generally benign, squamous cell carcinomas have been reported.<sup>2</sup> On an ultrasound, epidermal inclusion cysts typically image as hypoechoic masses with variable echogenic foci without color Doppler signals;<sup>4</sup> this was the case in our patient (Figure 2).

In the preoperative differential diagnosis, benign cystic teratoma (dermoid cyst) initially was considered. However, benign cystic teratomas almost always are ovarian, and the ovaries appeared separate on the CT scan and sonogram, making this diagnosis unlikely. Benign cystic teratomas often are predominated by skin elements, so part or all of the tumor may have an ultrasound appearance similar to an epidermoid inclusion cyst (echogenic lines and dots).<sup>5,6,7</sup> A CT scan of a benign cystic teratoma often will identify calcifications or areas of fat components. These were not present in our case.<sup>7</sup>

Pelvic abscess also was considered initially in the preoperative differential diagnosis. Abscesses may contain variable echodensities with some strong echoflectors, possibly due to gas-forming organisms. The enhanced CT scan features for an abscess are characterized as thick-walled and rim enhancing.<sup>8</sup> The patient's mass was thin-walled and not rim enhancing (Figure 1), making this diagnosis unlikely. Also, clinically there was no fever or elevated white blood cell count, and there was little tenderness on pelvic exam.

Vaginal cysts are almost always benign and can be categorized into Müllerian duct cysts, epidermal inclusion cysts, Gartner duct

cysts, Bartholin cysts, and endometriotic cysts.<sup>9</sup> In one review of vaginal cysts, it was reported that Müllerian cysts occurred in 19 patients (44%), Bartholin cysts in 3 (7%), epidermal inclusions cysts in 10 (23%), Gartner cysts in 5 (11%), endometrioid in 3 (7%), and unclassified in 3 (7%).<sup>9</sup> In this review, 3 out of the 10 epidermal inclusion cysts were located at sites of episiotomies or lacerations.<sup>9</sup> Müllerian cysts are derived from the paramesonephric duct remnants.<sup>10</sup> Müllerian cysts have been located throughout the vagina.<sup>10</sup> Gartner duct cysts, derived from Wolffian/mesonephric duct remnants, usually are located on the anterolateral wall of the vagina.<sup>10</sup> Bartholin glands are derived from urogenital sinus; Bartholin cysts are found in the caudal, inferior, and posterior portion of the vagina<sup>10</sup> and also can be considered as vulvar cysts.

A literature review revealed the only other report of an epidermal inclusion cyst appearing as a noticeable pelvic mass on imaging. The lesion measured 3.3 cm as compared to the 7.5-cm mass found in our patient. The previous case report indicated the patient's status also was post hysterectomy (6 years), with an asymptomatic mass found incidentally on transvaginal ultrasound imaging.<sup>2</sup> Our patient's mass also was found incidentally, when an enhanced CT scan was performed for upper abdominal pain. With advances in imaging and increased utilization, many incidental findings are being reported.<sup>3</sup>

With the increasing rates of using imaging to aid in diagnosis of abdominal pain, epidermal inclusions cysts may more commonly be found to enter the clinical decision-making process. In a retrospective chart review of abdominal/pelvic CT scan findings, it was reported that 56.3% patients had incidental findings.<sup>3</sup> In determining the significance of pelvic cysts found on CT scan, based on current literature it is thought that adnexal cysts with no complex features <3.5 cm do not require follow-up or intervention.<sup>11</sup> Our patient's mass was larger and was not characterized as a cyst on CT scan, but rather a soft tissue mass. Ultrasound was helpful to redefine it as a cystic mass with benign features (a thin wall and no internal Doppler flow). However, due to its large size and unclear preoperative diagnosis, the patient was offered removal. The benign ultrasound findings led to using a laparoscopic approach with some confidence. Perhaps this report may help in better defining preoperatively the diagnosis of large pelvic epithelial inclusion cysts in the future.

**Funding/Support:** None declared.

**Financial Disclosures:** None declared.

## REFERENCES

1. Section 9. Benign Neoplasms and Hyperplasias. In: Suurmond D, ed. *Fitzpatrick's Color Atlas & Synopsis of Clinical Dermatology*. 6th ed. New York: McGraw-Hill; 2009. <http://www.accessmedicine.com/content.aspx?alD=5202138>. Accessed October 27, 2014.

2. Kodama M, Hirota K, Oshima M, Funato T. Laparoscopic resection of an epidermal inclusion cyst at the vaginal cuff. *J Minim Invasive Gynecol*. 2010;17(3):393-396.
3. Thompson RJ, Wojcik SM, Grant WD, Ko PY. Incidental findings on CT scans in the emergency department. *Emerg Med Int*. 2011;2011:624847. doi:10.1155/2011/624847.
4. Lee HS, Joo KB, Song HT, et al. Relationship between sonographic and pathologic findings in epidermal inclusion cysts. *J Clin Ultrasound*. 2001;29(7):374-383.
5. Garcia-Rodriguez L, Pawa S, Michel M, Campbell B. A case of dermoid cyst compressing the airway. *WMJ*. 2012;111(6):289-292.
6. Siu SS, Tam WH, To KF, Yuen PM. Is vaginal dermoid cyst a rare occurrence or a misnomer? A case report and review of the literature. *Ultrasound Obstet Gynecol*. 2003;21(4):404-406.
7. Ekici E, Soysal M, Kara S, Dogan M, Gokmen, O. The efficiency of ultrasonography in the diagnosis of dermoid cysts. *Zentralbl Gynakol*. 1996;118(3):136-141.
8. Hiller N, Sella T, Lev-Sagi A, Fields S, Lieberman S. Computed tomographic features of tuboovarian abscess. *J Reprod Med*. 2005;50(3):203-208.
9. Pradhan S, Toban H. Vaginal cysts: a clinicopathological study of 41 cases. *Int J Gynecol Pathol*. 1986;5(1):35-46.
10. Epelman M, Dinan D, Gee M, Servaes S, Lee E, Darge K. Müllerian duct and related anomalies in children and adolescents. *Magn Reson Imaging Clin N Am*. 2013;21(4):773-789. doi: 10.1016/j.mric.2013.04.011.
11. Shaaban A, Rezvani M. Ovarian cancer: detection and radiologic staging. *Clin Obstet Gynecol*. 2009;52(1):73-93.

advancing the art & science of medicine in the midwest

**WMJ**

*WMJ* (ISSN 1098-1861) is published through a collaboration between The Medical College of Wisconsin and The University of Wisconsin School of Medicine and Public Health. The mission of *WMJ* is to provide an opportunity to publish original research, case reports, review articles, and essays about current medical and public health issues.

© 2014 Board of Regents of the University of Wisconsin System and The Medical College of Wisconsin, Inc.

**Visit [www.wmjonline.org](http://www.wmjonline.org) to learn more.**