

The Preoperative Diagnosis of Primary Ovarian Pregnancy

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Background: Ovarian pregnancies comprise 0.15% of all pregnancies and 0.15–3% of ectopic gestations, with an incidence of up to 1/7,000 deliveries.

Case: A single case of an ovarian gestation consistent with Spiegelberg's four criteria in a primigravida without prior gynecological, medical, or surgical history is presented. Presumptive diagnosis was by thorough clinical examination with a single, palpable, adnexal mass in a patient with BMI of 19, supported with serial ultrasound and quantitative β HCG-enabled preoperative diagnosis.

Conclusion: Primary ovarian pregnancy may occur without any classical antecedent risk factors. Ultrasonography can be a useful adjunct to clinical presentation and physical examination in allowing the preoperative diagnosis of ovarian gestation.

Key words: ectopic pregnancy ■ ovarian pregnancy ■ nulliparity ■ ultrasonography

Ovarian pregnancies occur in 0.15–3% of ectopic gestations. As with tubal ectopic gestations, ovarian gestations may involve multiple gestations or be part of heterotrophic gestations. Presenting symptoms typically include the triad of pelvic mass, abdominal pain, and abnormal vaginal bleeding.¹ Tubal ectopic gestations are associated with gynecologic histories of tubal pathology, sterilization, prior ectopic gestation, endometriosis, and infertility. The literature shows a strong association between multiparity and IUD usage in cases of ovarian gestations.² The precise location and size of an ectopic gestation may impact treatment: a cornual ectopic may be hysteroscopically resected, whereas a mid-isthmic ectopic of <3.5 cm may respond to methotrexate. A single case of an ovarian pregnancy preoperatively diagnosed in a primigravida within four months of initiation of coital activity is presented.

CASE REPORT

A 21-year-old primigravida, at 6 + 2/7 weeks' estimated gestational age by last normal menstrual period presented to her obstetrician complaining of three days of vaginal bleeding, without abdominopelvic pain and quantitative β HCG of 1650 mIU/mL. Abdominal ultrasound showed a heterogenous 5.6-x-4.4-x-3.8-cm right ovary with normal vascular flow on Doppler, and a 1-cm thick curvilinear fluid collection laterally. The uterus was normal, with a 6-mm endometrial stripe. The patient declined further examination at this time, presuming an intrauterine gestation given the lack of abdominopelvic pain. She represented three weeks later with new-onset right lower quadrant pain, rebound and continued vaginal bleeding. Transvaginal ultrasound showed a persistent 4.9-x-4.8-x-3.5-cm right adnexal mass perceived as arising from the right ovary, with active high velocity, low resistance blood flow, RI of 0.33 and PI of 0.4. The mass was further described as having bizarre swirling echogenicity around a central 1-cm sonolucent structure. The adjacent right ovary was similar in size to the left ovary measuring

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2.3 x 1.7 x 1.7 cm and 2.3 x 1.7 x 2.1 cm, respectively. Thirty-seven milliliters of fluid were visualized in the posterior cul de sac. The uterus and left adnexa were unchanged. Quantitative β HCG was 1,429.6 mIU/mL. The patient was referred to a gynecologist. Her unhampered pelvic examination, given a body mass index (BMI) of 19, revealed a single palpable 6-cm right adnexal mass. A diagnosis of right ovarian ectopic gestation was made. The patient was admitted for surgical treatment. Considering the size of the mass and the development of an acute abdomen, methotrexate was not an option.

At laparoscopy, 150 ml of blood was found in the posterior cul de sac (Figure 1). Bowel adhesions in the right lower quadrant and of the left ovary to the mesovarium were visualized. The right fallopian tube was followed out to the fimbriated end. The 6-cm diameter right ovary had an irregular surface with multiple follicles completely encasing what was in reality an ovarian gestation (Figure 2). Visualization during the procedure demonstrated findings that fulfilled three of Spiegelberg's four criteria: 1) normal fallopian tubes; 2) a gestation that occupies the normal position of the ovary; 3) the ovary is connected to the uterus via the utero-ovarian ligament. Minilaparotomy was performed. The gestation, intact in its gestational sac, was easily shelled out of the encasing ovarian tissue (Figure 3). Frozen pathology confirmed a right ovarian gestation, demonstrating ovarian tissue histologically present in the wall of trophoblastic tissue of the gestational sac fulfilling

the fourth of Spiegelberg's criteria.³

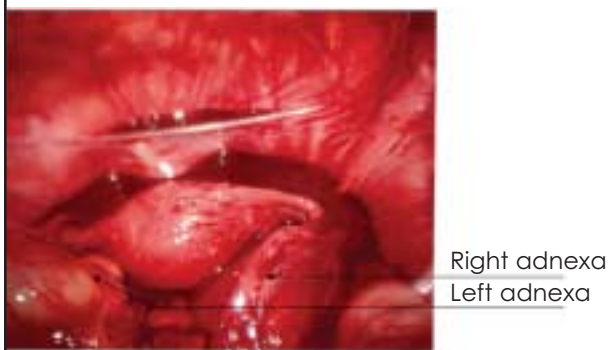
The patient did well postoperatively. Postoperative day 13 (POD13) quantitative β HCG was <5 mIU/mL. She continues to do well seven months later.

DISCUSSION

This case has several points of interest. The late age of initiation of intercourse at 21 years of age and nulliparity (in the absence of infertility) are contrary to the published cases in which an ovarian ectopic is associated with multiparity, IUD or assisted reproductive technology usage. The classic triad of pelvic pain, abnormal bleeding and a palpable pelvic mass is more frequently associated with a tubal ectopic gestation than an ovarian gestation. Ovarian pregnancies are twice as likely to be diagnosed at surgery (for a ruptured corpus luteum or tubal ectopic) or following pathologic review of what appears to be a hemorrhagic ovarian cyst (up to 72% of some case series), rather than preoperatively.^{4,6}

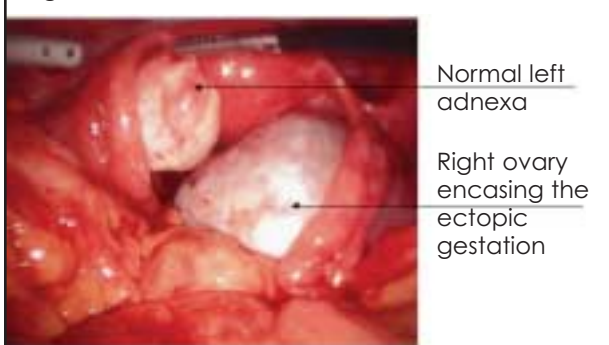
Given a positive quantitative β HCG without an intrauterine gestation, the presumptive diagnosis is ectopic gestation, with embryonal carcinoma and choriocarcinoma possible; however, the latter two diagnoses would present as a rapidly growing pelvic mass, with primarily solid or combined solid and cystic lesions on ultrasound. Furthermore, on examination, ascites, pleural effusion and organomegaly would be found. In this case, none of these criteria were met. The ultrasonographic findings of a prominent wide echogenic ring surrounding an echolucent center did not correlate with the expected ultrasonographic appearance of an ovarian gestation. A tubal gestation exhibits a thin tubal ring. A distended fallopian tube may occupy the normal pelvic position of the ovary, elevating the ovary cephalad: two masses should be palpable. However on an adequate bimanual examination only one right sided pelvic mass was palpated. Corpus luteum may give similar physical findings; however, ultrasound performed

Figure 1. Blood-filled cul de sac



Right adnexa
Left adnexa

Figure 2. The adnexa



Normal left
adnexa
Right ovary
encasing the
ectopic
gestation

Figure 3. Ovarian pregnancy



Normal
ovarian tissue
Ectopic
gestation
underlies clots

above the discriminatory threshold of 1,200 BHCG did not show an accompanying intrauterine gestation. The echogenic ring of a corpus luteum on ultrasound tends to be less marked than that of an ovarian gestation but more marked than that of a tubal gestation.⁵ In this case, the peritoneal fluid was probably the result of leakage from the ovarian pregnancy, not from a ruptured ovarian cyst.

Informed usage of transvaginal ultrasound can assist in making a correct definitive diagnosis of an ovarian pregnancy, helping to rule out a hemorrhagic corpus luteum or a tubal ectopic gestation. Even in circumstances in which ovarian pregnancy might not be expected, such as absent history of tubal pathology, sterilization, endometriosis, infertility (or treatment thereof), prior ectopic gestation, nulliparity and lack of IUD usage, appropriate studies such as high-resolution transvaginal ultrasound and color Doppler complement bimanual examination, permitting a correct preoperative diagnosis of an ovarian gestation, potentially preventing rupture and thence a surgical emergency.

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