

Large Solitary Luteinized Follicular Cyst of Pregnancy and Puerperium in Ruptured Ectopic Pregnancy Managed Laparoscopically

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Abstract

Background: Ovarian cysts in pregnancy are encountered in approximately 1 in 100 cases. Of these, most are benign. One such non-neoplastic lesion is Large Solitary Luteinized Follicular Cyst of Pregnancy and Puerperium (LSLFCPP). They are a rare lesion with unknown pathogenesis. They grow rapidly to very large sizes, causing symptoms. They are hormonally inactive. Maternal and fetal outcome is usually unaffected.

Objective: We present a case of a Large Solitary Luteinized Follicular Cyst of Pregnancy and Puerperium encountered incidentally during the management of ruptured ectopic pregnancy. A 25 year old G2A1 with 7 weeks 3 days gestational age by dates presented to the emergency department with the chief complaints of sudden onset of pain in the lower abdomen accompanied by nausea and giddiness since 12 hours. What sets our case apart from rest in literature is it's diagnosis very early in pregnancy. Also, it is, to our knowledge, the only case reported in literature, in an ectopic pregnancy.

Conclusion: LSLFCPP is a rare, yet important entity to be kept in mind when evaluating patients with large ovarian cysts in pregnancy. Comprehensive management is the need of the hour, in order to ensure ideal maternal and fetal wellbeing.

Introduction

Ovarian masses during pregnancy are not uncommon, with incidences ranging from 0.1% [1] to 4.5% [2], with an average incidence of 1% [3,4]. Majority of such cases are detected incidentally due to the routine use of ultrasound in the early first trimester. Majority of them are follicular cysts, benign, small (<5 cm), asymptomatic and resolve spontaneously by mid-second trimester [2]. Any rapid growth or persistence beyond the second trimester is considered to be indicative of malignancy. The overall rate of malignancy in ovarian masses detected in pregnancy is 4% [3]. However, there are a few benign lesions that mimic malignancy due to their rapid growth and large size. Here, we present a rare case of Large Solitary Luteinized Follicular Cyst of Pregnancy and Puerperium (LSLFCPP) that was discovered incidentally during management of an ectopic pregnancy. There are only a handful of such cases published in literature, and pose a challenge due to their similar clinical picture as with malignant ovarian neoplasms.

Case Summary

A 25 year old G2A1 with 7 weeks 3 days gestational age by dates presented to the emergency department with the chief complaints of sudden onset of pain in the lower abdomen accompanied by nausea and giddiness since 12 hours. She conceived spontaneously, her at-home urine pregnancy test was positive after missed period. Patient did not have any prenatal or early antenatal ultrasound done. She had

no other relevant surgical or medical history. Family history was unremarkable.

On examination, she was conscious, coherent and oriented. Patient was pale, with tachycardia (PR-114/min) and was maintaining normal blood pressure and saturations. Respiratory and cardiovascular systems were normal. On abdominal examination, she had diffuse tenderness, guarding and rigidity. On bimanual examination, there was cervical motion tenderness, forniceal fullness with a closed external cervical os and no bleeding per vaginum.

An emergency ultrasound done revealed a bulky uterus with a heterogeneous collection in the pelvis posterior to the uterus, suggestive of hemorrhage due to a suspected ruptured ectopic. Bilateral ovaries were not visualized due to hemoperitoneum. Multiple cystic lesions were noted in right adnexa - suggestive of hydrosalpinx. Preoperative Hemoglobin was 5.5 gm/dl. Coagulation profile, serum electrolytes,

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renal function tests and liver function tests were normal. Serum β hCG was 4,999 mIU/ml, corresponding to 4-5 weeks gestational age.

Based on her history, clinical picture and ultrasound report, a diagnosis of ruptured ectopic pregnancy was made. Patient underwent emergency laparoscopy.

On laparoscopy, she was found to have 1½ - 2 litres of haemoperitoneum with clots (Figure 1).

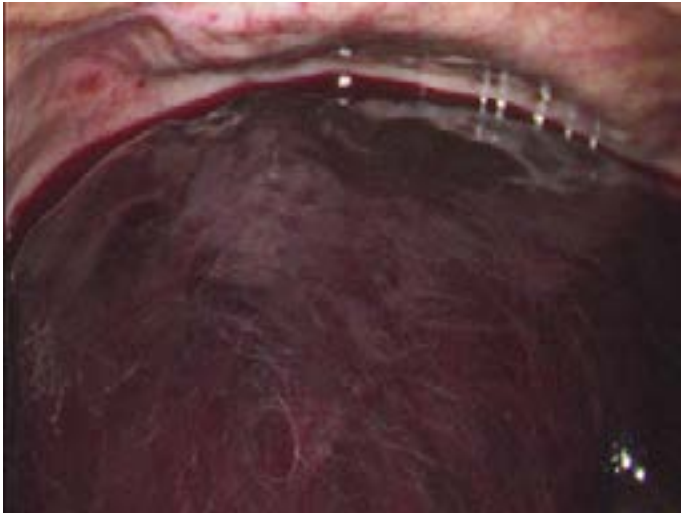


Figure 1: Initial view of abdomen and pelvis showing hemoperitoneum and clots

A left tubal ectopic in the process of tubal abortion was noted at the ampullary end of the left fallopian tube, which was the source of bleeding (Figure 2).



Figure 2: Left ampullary tubal pregnancy in the process of abortion (source of bleeding)

Left ovary appeared healthy. A large, multilocular right ovarian cyst was noted measuring 15x15x12 cm (approximately) containing clear serous fluid (Figure 3).



Figure 3: Large multiloculated right ovarian cyst

There was no torsion (Figure 4) or areas of hemorrhage or necrosis.

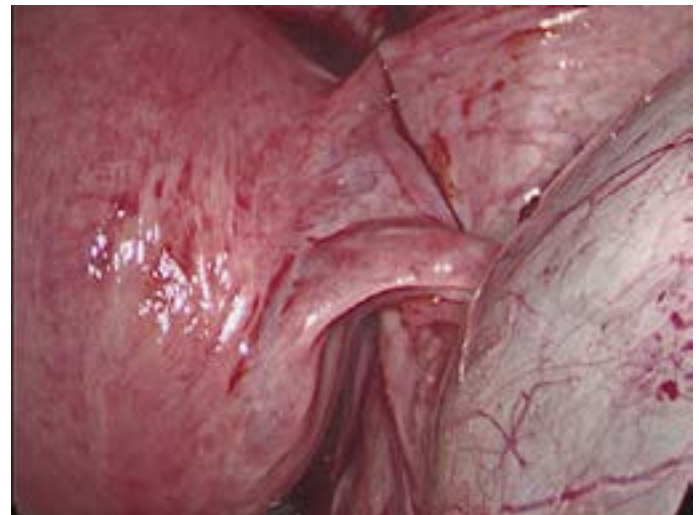


Figure 4: Right ovarian pedicle with fallopian tube with no evidence of torsion

Peritoneal fluid was collected for cytology. Thorough abdominal lavage was done and clots were cleared. Left salpingectomy was done. Right ovarian cystectomy was done, cyst was aspirated within endobag without spillage into abdominal cavity. Cyst wall was retrieved within intact endobag without any cavitory spill. Hemostasis was confirmed. Abdominal drain was kept and ports removed under vision.

To compensate for blood loss, 2 units of packed red cells were transfused intraoperatively. Postoperatively, patient was managed in intensive care and a further 1 unit of packed red cells and 2 units of fresh frozen plasma were transfused.

Retrospectively, serum CA-125 was done, which was reported as 76 U/ml. Patient recovered well from surgery, and was discharged in a stable condition 72 hours after surgery.

The histopathology report of the ovarian cyst revealed fibrin deposition with multiple layers of luteinized theca cells - consistent with a corpus luteal cyst (Figures 5 and 6).

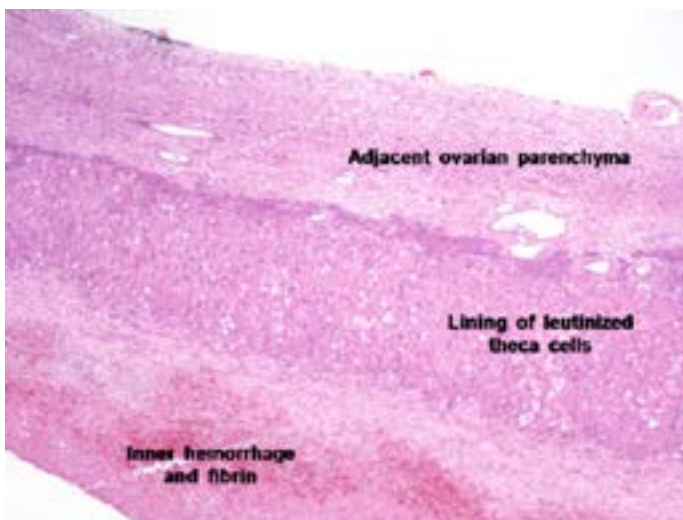


Figure 5: Microscopic examination of cyst wall showing luteinized theca cells (H & E stain 400x magnification)

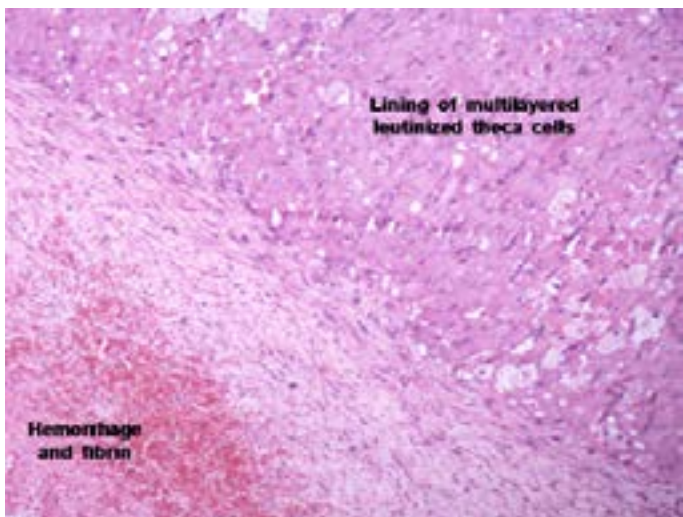


Figure 6: Microscopic examination showing multiple layers of luteinized theca cells (H & E stain 400x magnification)

The ovarian cyst fluid and the peritoneal fluid also had no atypical cells. Patient was asymptomatic on her follow up visits at 1 week and at 3 months post-procedure.

Discussion and Conclusion

Ovarian masses are commonly seen in pregnancy. Functional cysts are the most common pathology, followed by benign cystic teratomas, serous cystadenomas, paraovarian cysts, mucinous cystadenomas and rarely malignant tumours [2]. The majority of adnexal masses in pregnancy are small, <5 cm and resolve spontaneously [2]. Cysts >5 cm also resolve in most cases but they are at high risk of torsion and hemorrhage; and hence greater chances of surgical intervention during pregnancy.

Large Solitary Luteinized Follicular Cysts of Pregnancy and Puerperium (LSLFCPP) are a rare form of solitary follicular cysts [5]. On gross examination, they are large (range - 8 to 55 cm, average - 25 cm), unilateral, unilocular, rapidly growing cysts with a smooth, external

surface. They have thin cyst walls (up to 5 mm thick), and contain clear, serosanguinous or mucinous fluid. The inner cyst lining is also smooth [7].

Histologically, the cyst is lined by one to several layers (usually 10) of luteinized granulosa and theca cells, with no clear differentiation between the two. Nests of luteinized cells can also be seen embedded in the fibrous cyst wall. Cytoplasm is vacuolated, eosinophilic to clear, with characteristic focal marked nuclear pleomorphism and hyperchromasia (bizarre nuclei), and absent mitotic activity [5,7].

They do not cause any maternal or fetal endocrinological changes, and usually have no untoward effects on pregnancy [5], although there have been reports of preterm delivery [2,8]. However, due to their large size, they can become symptomatic, and necessitate surgical removal either antenatally, during cesarean or in the puerperium.

Although the pathogenesis of LSLFCPP is unclear, based on its association with pregnancy, hCG is believed to play a role in its aetio-pathogenesis - either due to increased tissue sensitivity to hCG or due to high levels of hCG in the maternal circulation. However, in our case, the serum hCG level was corresponding to the expected gestational age, and was not overtly elevated. Additionally, the patient had no risk factors for having higher tissue sensitivity to hCG (polycystic ovarian syndrome, diabetes mellitus, ovulation induction) [6]. Case reports on LSLFCPP diagnosed in the puerperium, when the hCG levels are low, may point to an additional unknown etiology [9]. Clement and Scully, who first described LSLFCPP, postulated that the initial development of these cysts may be stimulated by hCG during the antenatal period, and rising pituitary gonadotropins (follicle stimulating hormone / luteinizing hormone) in non-lactating women in the postpartum period, may contribute to their further enlargement [2].

On ultrasound evaluation, they appear to be single, solitary cysts with smooth, thin walls; containing homogeneous anechoic (serous) material [2]. In our case however, the cyst was multilocular, in contrast to the other cases published, where unilocular cysts were reported.

There is no role of tumour markers (CA125, beta hCG, LDH, alpha fetoprotein) in diagnosis or prognosis of LSLFCPP. But, they may help in differentiating it from malignant ovarian neoplasms like granulosa cell tumours [5,7].

Long term follow up of cases reviewed in literature show no recurrence or malignant potential [2,5,7,9].

We searched published literature for reported cases of such type of cysts in early pregnancy. Of the published case reports, none were diagnosed so early in the first trimester (as there are relatively lower levels of hCG in early pregnancy) and none had as large a cyst as was in our case. The largest reported cysts in first and early second trimester are 9.5 cm and 9.0 cm at 14 weeks in two case reports by Hadad, *et al.*

and Fang, *et al.* [2]. Also, to our knowledge, ours was the only case in literature which was diagnosed in a patient with an ectopic pregnancy.

With regards to the differential diagnosis of this type of cyst, Hyperreactio lutealis (HL) is a rare condition seen with elevated levels of hCG like in multiple pregnancies, gestational trophoblastic disease and hydrops fetalis. It is seen in 25% of molar pregnancy and 10% of choriocarcinoma [6]. They are usually bilateral, solid ovarian masses with sheets of luteinized granulosa and theca interna cells [7]. HL was ruled out in our case as it was unilateral and hCG levels were not that high as to explain its occurrence in early pregnancy.

Follicular and corpus luteum cysts of pregnancy are common, but they rarely exceed 4-6 cm in size [8]. Histologically, there are focal areas of stratified polygonal cells, and they stain positive for inhibin and calretinin [7].

Based on ultrasound findings, serous cystadenomas, and less commonly, mucinous cystadenomas are other likely differential diagnoses (unilocular / bilocular anechoic cysts with smooth walls and thin septae) [2]. However, they do not exhibit rapid growth like in LSLFCPP. Histologic findings also differ (distinctive architecture, cilia, uniform single layer of cells lining the cysts) [7].

The most common malignant neoplasm that may be similar to LSLFCPP, and may lead to a diagnostic dilemma, is the rare cystic variant of granulosa cell tumour [9]. On gross morphology, both appear similar. Microscopically, lack of luteinization, presence of granulosa cells (smaller, more uniform, no pleomorphism), grooved nuclei, Call-Exner bodies and mitotic activity differentiate granulosa cell tumours from LSLFCPP [7,9].

LSLFCPP is a rare, yet important entity to be kept in mind when evaluating patients with large ovarian cysts in pregnancy. There can be so many dilemmas when such a cyst is encountered - to determine whether the cyst is benign or malignant, whether to manage conservatively with close follow up or with surgery, and the timing of surgery (antenatal, intra-caesarian or postnatal), the extent of surgery (cystectomy / oophorectomy / radical surgery), the effect of the cyst / surgery on the maternal and fetal well-being. The first, and perhaps most important step, when such a diagnosis is made should ideally be thorough and empathetic counseling. It would be prudent to remember that not all large multiloculated cysts are malignant, and not all cysts require urgent surgery. Although ultrasound can help us positively identify the nature of the cyst in most cases [4], patients should be closely monitored and periodically followed up. The patient must be counseled about potential risks (obstetric complications like preterm labour; ovarian torsion, hemorrhage or rupture; need for emergency surgery) and encouraged to visit the hospital in case she has any symptoms. Although the risk of malignancy is <1% [2], a rapidly growing cyst must not be ignored. Surgery can be done via

laparotomy or laparoscopy. At surgery, comply with all the standards of care so as to retrieve the cyst intact or without spillage. In our case, laparoscopy was done and the cyst wall was retrieved after aspiration of contents within an endobag without any peritoneal spillage.

As there was an ectopic pregnancy, and normal ovarian tissue could be delineated, in our case, cystectomy was done and the normal ovarian tissue was preserved. The pathology report supported the diagnosis of LSLFCPP.

Expectant management of ovarian cysts in pregnancy is successful in most cases, and should be routinely offered [4]. In case of large cysts as well, conservative treatment can be opted for, unless there is torsion or clinical discomfort for the patient, in which case the patient may need surgery during pregnancy.

Comprehensive management is the need of the hour, in order to ensure ideal maternal and fetal wellbeing.

Acknowledgements

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Conflict of Interest Statement

All the authors involved in this case report declare that there is no conflict of interest for this particular study.

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