

RESEARCH ARTICLE

Pregnancy with Ovarian Mass: A Varied Presentation

¹Sunita Siwach, ²Vijayata Sangwan, ³Pinki Lakra, ⁴Mukesh Sangwan, ⁵Parveen Kundu, ⁶Rajiv Mahendru

ABSTRACT

Objective: Pregnancy with an ovarian mass of 6 cm is a rare condition that sometimes goes unnoticed until term and, at times, leads to an acute surgical emergency. Torsion, rupture, fetal malpresentation, and obstructed labor are main associated complications.

Materials and methods: This was a retrospective study of 14 cases of ovarian masses during pregnancy. All cases with persistent ovarian mass of 6 cm with pregnancy, presented symptomatically or asymptotically, were included in the study. Patients' medical records were analyzed for general profiles, gestation age, clinical presentation, signs and symptoms, investigation, management, and neonatal outcome.

Results: Mean age and parity in the study were 23.92 ± 3.91 and 2.14 ± 2.14 respectively. Only 35.71% were symptomatic, 11 (78.57%) patients were diagnosed with ultrasonography, and in 3 (21.43%), the diagnosis was made incidentally during lower segment cesarean section (LSCS). Patients were managed according to gestation age, presenting symptoms, and nature of mass. Cystectomy was done in 8 (57.14%) patients followed by salpingo-oophorectomy in 4 (28.57%) cases, and detorsion and cystectomy in 2 (14.28%) cases. On histopathology, serous cystadenoma was the most common type (42.85%) followed by dermoid cyst (28.75%), dysgerminoma (7.14%), and mucinous cystadenoma (7.14%). However, two cases could not be assessed due to gangrenous changes of masses. Emergency surgery was required in five cases of torsion; rest of the patients were taken for elective surgery.

Conclusion: Pregnancy is a unique clinical stage with many physiological changes for the mother with her fetus in the womb. It is the maternofetal well-being that is of paramount importance in managing varied presentations of an ovarian mass in pregnancy.

Keywords: Cesarean, Pregnancy, Ultrasonography.

How to cite this article: Siwach S, Sangwan V, Lakra P, Sangwan M, Kundu P, Mahendru R. Pregnancy with Ovarian Mass: A Varied Presentation. *J South Asian Feder Obst Gynae* 2017;9(4):426-430.

Source of support: Nil

Conflict of interest: None

^{1,2,4,5}Associate Professor, ³Assistant Professor ⁶Professor

^{1-4,6}Department of Obstetrics and Gynecology, BPS Government Medical College for Women, Sonapat, Haryana, India

⁵Department of Pathology, BPS Government Medical College for Women, Sonapat, Haryana, India

Corresponding Author: Vijayata Sangwan, Associate Professor, Department of Obstetrics and Gynecology, BPS Government Medical College for Women, Sonapat, Haryana India, Phone: +919992211588, e-mail: vsangwan03@gmail.com

Date of received: 10 November 2017

Date of acceptance: 20 December 2017

Date of publication: April 2018

INTRODUCTION

Pregnancy with ovarian mass or cyst is a rare condition that goes unnoticed, at times, until term. Sometimes, the condition can create acute surgical emergency for a patient. The reported incidence varies from 1 in 81 to 1 in 8,000.¹ Functional cyst remains the most common ovarian cyst followed by dermoid cyst, serous ovarian cystadenoma, and ovarian malignancy.¹ Variable presentations of pregnancy with ovarian mass include mass per abdomen, acute pain abdomen, fetal malpresentation, obstructed labor, or an incidental finding on antenatal ultrasound examination or during LSCS. Ultrasonography is the most commonly used investigative modality; magnetic resonance imaging (MRI) is reserved for complicated cases.^{1,2} Emergency laparotomy or laparoscopy is the treatment of choice in acute conditions. In other conditions, the ovarian mass nature and size are important determining factors for management. The aim of this study is to share our experience regarding variable clinical presentations of ovarian cyst or mass with pregnancy and its management in different perspectives.

MATERIALS AND METHODS

This is a retrospective study conducted in the Department of Obstetrics and Gynecology in a tertiary care center. Medical records of patients were retrieved from the case sheets available in the medical records department. A total of 14 patients were diagnosed as ovarian mass during pregnancy out of 12,684 deliveries. All cases with persistent ovarian masses or cyst > 6 cm with pregnancy, who presented symptomatically or asymptotically, were included in the study. In asymptomatic patients, it was either an incidental finding on routine antenatal ultrasonography or intraoperative finding during LSCS. The records were analyzed for general profile (including age, parity, literacy, residence, and occupation), gestation age, clinical presentation, signs and symptoms, investigation, management, and neonatal outcome.

OBSERVATION

Out of the total 12,684 deliveries conducted in our department from 2011 to 2014, 14 patients were diagnosed as

cases of ovarian mass or cyst with pregnancy. The incidence was 11 cases per 10,000 deliveries. The observations in the study are presented in tabular form. Table 1 shows that the majority of the (64.28%) patients were in the 19- to 24-year age group with a mean age of 21.22 ± 1.71 years. About 71.42% patients were from rural background and 57.14% were illiterate, and the majority (64.28%) of patients was asymptomatic and diagnosed on routine antenatal ultrasound. All symptomatic patients presented with chief complaint of pregnancy with pain in abdomen.

Although 11 patients were diagnosed on ultrasonography, three patients were diagnosed only during LSCS. Serum levels of CA 125 were done in 7 (50%), and, in all these patients, the levels were within normal limits. All these patients were asymptomatic and planned for elective surgery to remove their masses.

Table 2 depicts mode of presentation of all the cases in this study. In three patients, it was an incidental diagnosis made during LSCS, four patients presented with acute pain in abdomen, and seven patients were diagnosed through routine antenatal ultrasound examination.

Lower Segment Cesarean Section

In three patients, the ovarian mass was accidentally diagnosed during LSCS; one patient was taken for LSCS for oblique lie and an 8 to 10-cm size soft solid mass with a smooth surface in the right adnexa was noted, and the other side ovary appeared normal. After the patient consented to have

Table 1: Profile of patients

Profile of patients	No. of patients	% of patients
19–24 years	9 (21.22 ± 1.71)	64.28
25–29 years	4 (25.75 ± 0.95)	28.57
30–35 years	1	7.14
Primigravida	5	35.71
Multigravida	8 (2.8 ± 0.83)	57.14
Grand multigravida	1	7.14
Illiterate	8	57.14
Literate	6	42.86
Rural area	10	71.42
Urban area	4	28.58
Housewife	10	71.42
Labor class	4	28.58
Asymptomatic patients	9	64.28
Symptomatic patients	5	35.71

Table 2: Mode of presentation of patients

Presentation of patients	No. of patients	% of patients
Accidental diagnosis during LSCS	3 (one patient was operated for scar tenderness, but came out as ovarian torsion)	21.42
Acute pain abdomen	4	28.57
Ultrasound diagnosis	7	50.00

surgery, right-sided salpingo-oophorectomy was performed. Histopathological examination revealed that the mass was a dysgerminoma. This patient and her family were counseled regarding this malignancy. Further investigation including a computed tomography scan and testing for tumor markers, lactate dehydrogenase (LDH) and alphafetoprotein (AFP), were done. She was classified as stage 1a and managed accordingly.

The second patient was operated on an emergency basis with a provisional diagnosis of a 38-week pregnancy with previous LSCS with scar tenderness. Intraoperatively, the scar site was normal, and a 6 to 8 cm size simple ovarian cyst was present on the right side, with single turn torsion, detorsion, and cystectomy done. Histopathologically, the mass tested as serous cystadenoma.

The third patient taken for LSCS was a primigravida in her 39th week of pregnancy with breech presentation. During LSCS, a dermoid cyst of 5 to 7-cm size was detected in the right adnexa; this mass was removed intact after consent.

Acute Abdominal Pain

Of the four patients who presented with acute abdominal pain, one had a 12-week pregnancy, two were in second trimester, and one was in the immediate postpartum period. All of these patients had torsion of their ovarian cyst. In three patients, the cysts became gangrenous as shown in Figure 1, and salpingo-oophorectomy was performed in each case. One patient developed ovarian cyst torsion immediately after delivery; thus, detorsion and cystectomy were done. Histopathology testing revealed dermoid cyst in one patient and serous cystadenoma in the postpartum patient. In the other two cases, it was difficult to comment as no healthy tissue was available. Size, gross features, and other surgical details are given in Tables 3 to 5.



Fig. 1: Intraoperative picture showing congested and gangrenous changes in right-sided fallopian tube and ovary with pregnant uterus

Table 3: Presentation and management of patients according to gestation age and intraoperative findings

Period of gestation	No. of patients reported	No. of patients operated and their intraoperative findings
First trimester	Total pts = 3 Acute pain abdomen = 1 USG diagnosis = 2	1 (presented with acute pain abdomen): 7–10 cm cyst with gangrenous changes in Fig. 1 (rest 2 patients kept for surgery in 2nd trimester)
Second trimester	Total pts = 5 Acute pain abdomen = 2 USG diagnosis = 3 (2 pts operated and one for conservative management)	Total pts = 6 Acute pain abdomen: 2 (one had dermoid cyst 5–7 cm with hemorrhagic changes and 7–10 cm cyst with gangrenous changes in second case) Asymptomatic operated for large size: 4 (3 pts had simple cyst of size 12–14 cm, 14–16 cm, 18–20 cm, 1 pt had multiloculated cyst of 22–24 cm)
At term	Total pts = 05 USG diagnosis = 2 During LSCS = 3	Total pts = 06 USG finding: 2 (dermoid cyst 6 cm, simple cyst 7 cm) During LSCS: 3 (solid mass 8–10 cm, dermoid cyst 5–6 cm, simple cyst 6–8 cm with single turn torsion 1) Pt. diagnosed in second trimester operated at term (dermoid cyst 5–6 cm)
Postpartum	Acute pain abdomen postdelivery: 1	Simple cyst 20–24 cm with single turn

USG: Ultrasonography; pts: Patients

Table 4: Gestation age and surgery performed in patients

Trimester of presentation	Gestation age of surgery (wks)	No of patients	Surgery performed
First trimester	12 wk	1	Rt. salpingo-oophorectomy (1; Fig. 1)
Second trimester	14–16 wk	2	Rt. salpingo-oophorectomy (2)
	20–22 wk	2	Rt. ovarian cystectomy (2)
	23–24 wk	2	Rt. ovarian cystectomy (2; Fig. 2)
Third trimester	37–39 wk	3	Rt. salpingo-oophorectomy (1) Rt. side detorsion and cystectomy (1) Rt. ovarian cystectomy (1)
	39–40 wk	3	Rt. ovarian cystectomy (3)
Postpartum	Immediate after delivery	1	Rt. side detorsion and cystectomy (1)

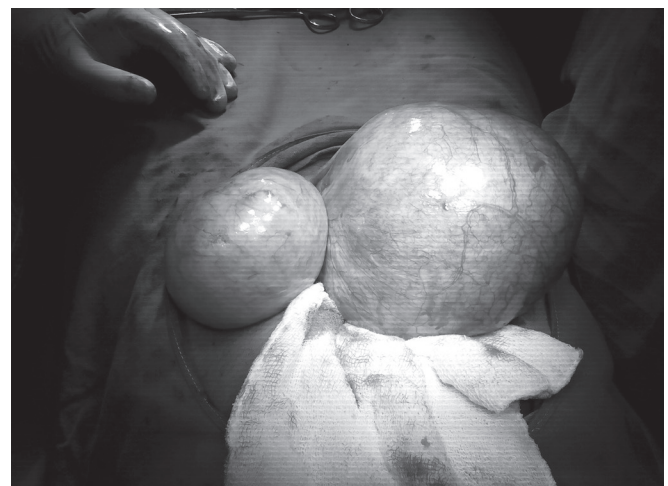
Rt: Right

Table 5: Histopathological presentation of patients

Histopathological findings	No. of patients	% of patients
Serous cystadenoma	6	42.85
Mucinous cystadenoma	1	7.14
Dysgerminoma	1	7.14
Dermoid cyst	4 (one had torsion)	28.57
Hemorrhagic and necrosed tissue	2	14.28

Routine Antenatal Ultrasound Scan

In the other seven patients in whom ovarian cysts were diagnosed through routine antenatal ultrasound testing, further evaluation was done with color Doppler and CA 125 testing. After ruling out malignancy, four of these patients underwent elective surgery in the second trimester (three had simple unilocular cyst of size ranging from 12 to 20 cm and one had a 22 to 24 cm size multiloculated cyst). Figure 2 shows an intraoperative 26-week pregnant uterus with 16 to 18 cm size simple cyst in right adnexa. In all these patients, cystectomy was performed. Histopathology

**Fig. 2:** Intraoperative picture showing 26-week pregnant uterus with simple ovarian cyst impacted in pouch of Douglas

testing revealed serous cystadenoma in three patients and mucinous cystadenoma in one patient.

The remaining three patients underwent emergency LSCS at term. In one patient, it was on demand section and the other two were operated for fetal distress and

nonprogress of labor respectively. After LSCS, cystectomy was performed. The histopathology examination revealed dermoid cyst in two patients and simple serous cystadenoma in one patient.

Outcome

Totally, 12 patients delivered at term (6 via LSCS and 6 via normal vaginal delivery); 2 patients were lost to follow-up, and 6 (50%) patients developed complications due to ovarian mass. Ovarian torsion occurred in 5 (35.71%) patients. It took place in the first trimester in one patient, in the second trimester in two patients, at term in one patient, and in the immediate postpartum period in one patient. Two patients had malpresentation, probably because of ovarian cyst: One had oblique lie and one patient had breech presentation.

DISCUSSION

A total of 12,684 deliveries were conducted from 2011 to 2014. The tabulated incidence and percentage of various pathologies are shown in Table 6.

In the present study, the incidence of serous cystadenoma was greater, while according to literature, the benign dermoid cysts are the most common ovarian masses associated with pregnancy after functional cysts.^{1,5} Dermoid cyst in pregnancy is associated with complications, such as torsion and rupture causing chemical peritonitis and preterm labor.⁵ In this study, among four patients with dermoid cyst, one patient developed torsion and three remained asymptomatic. Serous cystadenomas are thin-walled translucent cysts, usually unilocular, varying in size between 20 and 30 cm, and are often unilateral.⁶ In this study, these cysts presented as asymptomatic simple cyst of the right ovary, with a size ranging from 6 to 20 cm during the pregnancy.

The characteristic features of malignant ovarian tumors during pregnancy include their rarity, early phase of growth, cell differentiation being mainly low-grade malignant, and better prognosis than in the nonpregnant state.^{1,2} Dysgerminoma is the most common ovarian

germ cell tumor coexisting with pregnancy and constitutes 25 to 35% of all reported ovarian tumors.⁷ In the current study, one patient who had a dysgerminoma was diagnosed incidentally during LSCS and was managed accordingly.

The mean age and parity of the patients in the current study were 23.92 ± 3.91 and 2.14 ± 2.14 respectively, and all had spontaneous conception. A study by Chang et al⁴ reported a mean age of 29.4 ± 5.1 years and parity of 0.5 ± 0.8 ,² respectively, and mentioned 6% rise in incidence of torsion with artificial reproductive technology techniques. The young age and high parity in current study were probably because of the patients' rural backgrounds and early age of marriage.

Ultrasonography with color Doppler is the most easily and widely available investigative modality to evaluate position, size, morphology, relationship, and nature of ovarian masses; it is also helpful in follow-up.¹ An article by Naqvi and Kaimal² reported that use of ultrasound diagnoses of 95% of dermoids, 80% of endometriomas, 71% of simple cyst, and correctly raised suspicion of malignancy in all cases of malignant ovarian masses. In the current study, ultrasound was used to diagnose ovarian masses correctly in 11 (78.57%) cases and missed in 3 (21.43%) cases. The MRI is safe in pregnancy and is a better investigative modality for tissue characterization of large masses and paraovarian cysts;^{1,2} however, its easy availability is a limiting factor in developing nations. Serum levels of CA 125 are a marker of epithelial malignancies, and LDH, AFP, and human chorionic gonadotropins are typically markers of germ cell tumors. These markers become altered in pregnancy and other benign conditions like fibroid, menstruation, and endometriosis.^{2,3,7} In the current study, we had normal CA 125 report in all elective cases.

Complications of these ovarian masses include torsion, rupture, and obstetrical complications, such as malpresentations or obstructed labor.¹ Ovarian torsion accounts for 2 to 7% of all surgical emergencies, and the incidence in pregnancy varies from 1 to 10 per 10,000 spontaneous

Table 6: Incidence of different ovarian pathologies with pregnancy and their complications

<i>Pathologies detected</i>	<i>% of different pathologies in present study</i>	<i>% of different pathologies in literature</i>	<i>Incidence in present study (per thousand delivery)</i>	<i>Incidence in literature</i>
Overall incidence of ovarian mass	–	–	1.1	1 in 81 to 1 in 8,000 ¹
Serous cystadenoma (6)	42.85	5–28 ¹	0.47	–
Benign dermoid cyst (4)	28.57	7–37 ¹	0.31	–
Mucinous cystadenoma (1)	7.14	–	0.07	–
Dysgerminoma (1)	7.14	1–8 ¹	0.07	0.04–0.11 ³
Histopathology not identifiable (2)	14.28	–	–	–
Ovarian torsion (5)	35.71	–	0.39	1–10 ⁴
Fetal malpresentation (2)	14.28	–	0.15	–

pregnancies.^{2,4} In the current study, the incidence of torsion was 1.7 per 10,000 deliveries. Incidence increases during pregnancy may be the result of displacement of the adnexa out of pelvis because of the uterus growing and their return to the pelvis following delivery.² Ovarian torsion occurs most frequently in the first trimester, occasionally in the second trimester, and rarely in the third trimester.^{2,4} In the current study, five patients had torsion ovary: One patient in first trimester, two in second trimester, one at term, and one in postpartum period. In the postpartum period, this torsion might result from the availability of space and the downward falling of a huge cyst in pelvis following delivery. Usually, torsion occurs with 6 to 10 cm masses and is rare with >10 cm size masses.^{2,4} In the current study, four patients had a mass that was 6- to 10-cm-sized cysts, and the postpartum patient had a 22 to 24 cm cyst. Symptoms are similar to nonpregnant state, including sharp continuous or intermittent pain, nausea, and vomiting. But, sometimes, these symptoms are difficult to differentiate from common symptoms of pregnancy.^{2,8} In this study, abdominal pain was the presenting symptom in all the patients, but in one patient, the symptoms mimicked features of scar dehiscence, and the patient underwent emergency LSCS for scar dehiscence that proved later to be ovarian torsion. Ovarian masses or cysts potentially can cause malpresentations and obstructed labor.^{1,2} In the current study, there were two cases of malpresentation: One patient had oblique lie and the other had breech presentation. One patient with ovarian cyst underwent emergency LSCS for nonprogress of labor (lack of descent of fetal head). Goh et al⁹ reported a cesarean delivery rate of 25% among women with large adnexal mass due to arrested labor.

According to other articles, an ovarian cyst of 6 cm in early pregnancy is usually a functional cyst as a result of persistent corpus luteum, and resolves normally.^{1,5} Resection is recommended in complicated cases, such as torsion and in cases with suspicion of malignancy. Cyst \geq 10 cm resection is because of fear of malignancy, while cyst up to 5 cm could be left alone.¹ Finally, the approach to management of an asymptomatic, benign adnexal mass during pregnancy requires a balance between maternofetal risks of surgery and the risks caused by the mass *per se*. Management needs to be individualized depending on patients' clinical scenario and gestational age.^{1,2} In the current study, out of 14 cases, 3 patients were diagnosed of ovarian mass during emergency LSCS and managed accordingly. In 11 cases of prior diagnosed ovarian mass, 4 patients were operated for ovarian torsion, 4 were operated for large size (12–24 cm) as given in Tables 3 to 5, and 3 patients managed conservatively until term and underwent cystectomy during emergency LSCS for obstetric indications. Elective surgeries were conducted

in the second trimester, considering maternofetal safety. Emergency surgeries were performed irrespective of gestation age. There is increasing incidence of use of laparoscopy for managing ovarian masses during pregnancy.^{4,10} The extent of surgery depends on the intraoperative features of the mass. Conservative surgery is appropriate (cystectomy), and, in cases of torsion, evidence supports detorsion and cystectomy, if tissue is viable.^{2,10} The current authors performed eight cystectomies, four salpingo-oophorectomies, and two detorsions with cystectomy.

CONCLUSION

Early diagnosis of ovarian mass coexisting with pregnancy is more frequent because of the increase in incidences of first trimester scans. Most of these are functional cysts, which resolve spontaneously. Symptoms of each patient, period of gestation, and character of ovarian mass are the deciding factors for management. Laparoscopic management can be a preferred choice with its availability, especially in an emergency.

ACKNOWLEDGMENT

Authors would like to acknowledge all patients whose varied presentations enriched their knowledge.

REFERENCES

1. Yakasai IA, Bappa LA. Diagnosis and management of adnexal masses in pregnancy. *J Surg Tech Case Rep* 2012 Jul;4(2):79-85.
2. Naqvi M, Kaimal A. Adnexal masses in pregnancy. *Clin Obstet Gynecol* 2015 Mar;58(1):93-101.
3. Xu D, Liang C, He J. Large malignant ovarian tumors during pregnancy: two cases. *Onco Targets Ther* 2014 Nov;7: 2121-2125.
4. Chang SD, Yen CF, Lo LM, Lee CL, Liang CC. Surgical intervention for maternal ovarian torsion in pregnancy. *Taiwan J Obstet Gynecol* 2011 Dec;50(4):458-462.
5. Walid MS, Boddy MG. Bilateral dermoid cysts of the ovary in a pregnant woman: case report and review of the literature. *Arch Gynecol Obstet* 2008 Feb;279(2):105-108.
6. Kolluru V, Gurumurthy R, Vellanki V, Gururaj D. Torsion of ovarian cyst during pregnancy : a case report. *Cases J* 2009 Dec;2:9405.
7. Kwon YS, Mok JE, Lim KT, Lee IH, Kim TJ, Lee KH, Shim JU. Ovarian cancer during pregnancy: clinical and pregnancy outcome. *J Korean Med Sci* 2010 Feb;25(2):230-234.
8. Ventolini G, Hunter L, Drolinger D, Hurd WW. Ovarian torsion during pregnancy. 2007. [cited 2007 Dec 8]. Available from: <http://www.hcplive.com>.
9. Goh WA, Rincon M, Bohrer J, Tolosa JE, Sohaey R, Riaño R, Davis J, Zalud I. Persistent ovarian masses and pregnancy outcomes. *J Matern Fetal Neonatal Med* 2013 Jul;26(11): 1090-1093.
10. Sanaullah F, Trehan AK. Ovarian cyst impacted in the pouch of Douglas at 20 weeks' gestation managed by laparoscopic ovarian cystectomy: a case report. *J Med Case Reports* 2009 May;3:7257.