

ACCIDENTS TO OVARIAN CYSTS *Mishra Jyoti

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INTRODUCTION

Ovulation, a monthly physiological event, is a sequel of fine balance between hormones & local factors. Hormonal imbalance, pelvic infections, diseases of the ovary, use of ovulation inducing drugs & many more factors can lead to formation of ovarian cysts. These cysts occur most frequently in reproductive life, though no one from fetal life till old age is immune to them. The most common types of benign cysts encountered in clinical practice are listed in table 1.

COMMON TYPES OF OVARIAN CYSTS SEEN IN CLINICAL PRACTICE

Table No. 1

- Follicular cyst
- Lutein cyst
- Granulosa lutein
- Theca lutein
- Endometrioma
- Dermoid cyst
- Cyst adenoma
- Serous
- Mucinous

Ovarian cysts may remain asymptomatic for long or may lead to pelvic pain, dysmenorrhoea, dyspareunia, menstrual disturbances, and infertility or pressure effects on adjacent organs. Rarely, these patients report in an emergency room with acute pain in abdomen & sometimes even in shock. The likely causes are shown in table 2.

ACCIDENTS TO OVARIAN CYSTS

Table No. 2

- Torsion
- Haemorrhage
- Rupture
- Infection
- Pregnancy related complications
- Ovarian Hyperstimulation Syndrome (OHSS)

TORSION OF OVARIAN CYST

Also called axial rotation, torsion is known to happen in a normal sized ovary in children & adolescents due to physiological mobility of organs. It is more frequently encountered in women of reproductive age group, with ovarian enlargement. It is most typically seen in a cyst of 10 to 15 cm. size, with a long pedicle lying in abdomen, where there is more space. Hence it is most commonly seen in dermoid cysts due to their small to medium size & high mobility & is least likely in chocolate cysts due to presence of adhesions.

Evidence of axial rotation is seen in 12% of ovarian tumours coming for operation.¹ Adnexal torsion is the fifth most common gynecologic surgical emergency, with a prevalence of approximately 3%.²

Pathophysiology

Precipitating factor is often a sudden twisting movement of the trunk. There is a high probability of this complication during

pregnancy & immediately after delivery, when the pelvic organs are undergoing a rapid change in size. Once begun, the process of torsion is completed by pulsations of the supplying vessels, which transmit their impulse to the pedicle. As the veins get compressed, the cyst gets congested. Lymphatic obstruction leads to oedema. This is followed by interstitial haemorrhage into the substance of the tumour. Due to increasing tension, there is severe abdominal pain. Usually these symptoms bring the patient to the hospital, before arterial occlusion, leading to necrosis sets in.

Another clinical picture is that of frequent attacks of mild abdominal pain, due to intermittent incomplete torsion. Degeneration of cyst wall leads to adhesions, most often with omentum. After acquiring new blood supply, the ovarian mass may sever its pelvic connection & become parasitic.

Diagnosis

Patient is often unaware of the cyst when she is seized with sudden pain. Most of the time, there is a past history of intermittent pain in abdomen. There may be associated nausea, vomiting, and signs of bladder & bowel irritability or vaginal bleeding.

On examination, there is tachycardia, but other vital signs are usually maintained. Per abdomen examination reveals marked muscle guarding & rigidity. A mass arising from pelvis may be felt. On pelvic examination, a tender adnexal mass, separate from the uterus is felt. To ascertain the diagnosis of ovarian cyst, one must palpate its lower rounded pole through the fornix. Large cysts often displace the uterus to the opposite side. Marked tenderness & muscle guarding may impose difficulty in defining the boundaries of the cyst. Sudden, severe abdominal pain in a patient known to have ovarian cyst, should raise high suspicion of torsion.

Differential diagnosis

Ectopic gestation: History of amenorrhoea, a positive pregnancy test & an ectopic gestational sac on ultrasonography help in differentiating these cases from torsion.

Acute PID: Temperature is raised & patient may complain of vaginal discharge. Ultrasonography reveals presence of adnexal mass with free fluid in cul de sac.

Ruptured ovarian cyst: Patient presents with acute pain with varying degree of collapse. If a cyst was known to exist previously, its size is reduced & free fluid can often be demonstrated in cul de sac. Immediate surgery is the treatment in both torsion & rupture of ovarian cyst.

Corpus luteal haematoma: Vaginal bleeding usually follows short period of amenorrhoea. Haemorrhagic shock is seen in rare cases. Treatment requires immediate surgical intervention.

Non-Gynecological conditions: Acute appendicitis, diverticulitis, and ureteric colic, intestinal obstruction has to be differentiated from torsion. Detailed history points towards symptoms specific to each involved organ. Clinical examination, laboratory tests & ultrasonography help in reaching the diagnosis.

Investigations

Leucocytosis is usually seen in patients with torsion of ovarian cyst.

A **pregnancy test** may be required to rule out ectopic pregnancy.

Ultrasonography shows presence of adnexal cystic mass & features of torsion. Simple cysts are unilocular and have a uniformly thin wall surrounding a single cavity that contains no internal echoes. Most commonly, they are functional follicular or luteal cysts or, less commonly, serous cystadenomas or inclusion cysts. Complex cysts may have more than one compartment (multilocular), thickening of the wall, projections (papulations) sticking into the lumen or on the surface, or abnormalities within the cyst contents.

Sonography findings for ovarian torsion vary depending on the degree of vascular compromise. Twisted adnexal masses are frequently midline, cranial to the fundus.³ Nonspecific ultrasound findings include a cystic, solid, or complex mass with free fluid, a diffusely enlarged ovary with peripheral cystic follicles, and marked thickening of the cyst wall. However, these findings may also be found in other conditions such as a hemorrhagic cyst, endometriosis, PID, and ectopic pregnancy.⁴

Colour Doppler provides evidence of decreased or absent blood flow to the ovary. While Doppler may show no flow in the ovary secondary to mechanical torsion of the ovarian vessels, arterial waveforms and color flow have been reported in surgically proven cases of torsion.⁵ Continued flow despite torsion may be due to venous thrombosis causing symptoms prior to arterial occlusion, or due to its dual blood supply from the ovarian artery and the ovarian branches of the uterine artery. If there is flow within a twisted vascular pedicle, a characteristic pattern of circular or coiled twisted vessels, the "**whirlpool sign**", may be found on Doppler.^{3,4}

Treatment:

Once diagnosed, patient needs immediate surgical intervention to preserve ovarian function. Till few years ago, laparotomy was the only approach. With recent advances in the field of endoscopy, laparoscopy has become the main tool in managing cases of twisted ovarian tumours. Irrespective of the surgical approach, salient features of treatment include, untwisting the mass, assessment of tissue viability, cystectomy while preserving the normal ovarian tissue & restoring near normal anatomy.

Laparoscopy

Surgery is performed under general anaesthesia with endotracheal intubation, as this allows better control of respiratory & cardiovascular status of the patient, especially during prolonged surgery. Instruments required are listed in table 3.

SET OF INSTRUMENTS NEEDED FOR OPERATIVE LAPAROSCOPY

Table No. 3

Veress' needle	Scissor
5mm trocar cannula 2	Ally's type grasper
10mm trocar cannula	Fine toothed grasper
Laparoscope (30 degree)	Bipolar cautery
Injection needle	
Suction cannula	

The site of primary port may have to be above the umbilicus, if the cyst is big. Secondary ports may also require higher placement. Cyst appears dark coloured due to venous congestion. Fallopian tube is often involved in the torsion & looks oedematous, but decision to salvage the tube should not be taken until the adnexal mass has been untwisted, as the inflamed tube later regains its normal anatomy in most cases. Supporting with 2 instruments, the cyst can be untwisted completely. Normal ovarian tissue is assessed for viability. If cystectomy seems amenable, the cyst is made steady by holding the ovarian ligament. All except the most benign looking cysts are removed intact either in an endobag or through the cul de sac. A totally benign looking large cyst with thin wall can be punctured with injection needle & fluid aspirated through the attached suction tube. After the cyst becomes lax it is easier to grasp. Small nick is made by scissor & suction cannula is inserted to aspirate the remaining fluid. Laparoscope is then inserted to closely visualize the cyst wall. If the cyst looks benign, the incision is enlarged. Cyst wall is

held by ally's type grasper & stretched out ovarian tissue by a fine-toothed grasper. By gentle traction, the cyst wall is peeled off. Care is taken to progress slowly, releasing one grasper at a time or else there will be difficulty in differentiating between cyst wall & ovarian tissue. Haemostasis is usually not a problem. Any obvious bleeder is tackled by cautery. Edges of the breached ovarian surface may be held together for a few seconds. In a very large defect, suturing may be required.

Excised wall of small cyst is extracted by holding with a claw forceps passed through the 10mm port, under the guidance of a hysteroscope, which has been inserted through a 5mm cannula. In case of spillage into the peritoneal cavity, it is worth giving a lavage with ringer lactate solution. Postoperative recovery is smooth in most cases.

Special attention is needed in cases of **dermoid cyst**. Here attempt should be made to prevent the spillage of cyst contents into the peritoneal cavity. Instead of puncturing the cyst, a very superficial incision is made in the cortex, preferably with CO2 laser. The incision is extended with scissor & aqua dissection, and whole of the cyst is separated. If the cyst ruptures accidentally, thorough peritoneal cavity irrigation with at least 10 liters of Ringer's lactate with direct suctioning of all fatty & epidermal elements prevents the post operative granulomatous peritonitis. Such a cyst is best removed in an endobag.

If the cyst & ovary look necrosed, they have to be completely removed.

Technical difficulties

Placement of trocars: In case of a large cyst lying in abdomen, the primary port needs to be placed higher up. In case of suspected adhesions, Veress' needle is inserted through the Palmer's point (just below the left coastal margin in the midclavicular line). Achieving a good pneumoperitoneum is essential, as the peritoneum tends to be loose in this area. Attempts to push in the 5mm trocar through a loose peritoneum, will lead to pre peritoneal placement, & extra peritoneal emphysema. The 5mm hysteroscope along with its sheath is put in through this side port & under its guidance the 10mm trocar is placed at the location of choice. The position of other secondary ports may be safely decided depending on the size & location of the cyst. Some surgeons use the open (Hasson's) technique for primary port entry.

Untwisting the cyst: The instruments may slip while trying to untwist the cyst. Holding the cyst wall at less tense areas, with ally's type grasper gives a better grip & makes it possible to rotate the cyst.

If there is less space to rotate the cyst, one may need to aspirate the cyst contents prior to untwisting, to reduce the bulk.

Improper tissue planes: Pseudoendometriomas are invaginations of the ovarian cortex, which carry ovarian follicles. Hence there is no true cyst wall, which can be excised. Only aspiration & coagulating the surface is sufficient. Intraovarian cysts are cysts in the ovary where endometriotic tissue reaches by hematogenous route. These cysts are usually free from adhesions & it is possible to strip off the cyst wall. Identification of cyst wall is difficult in dermoid cyst. It is best to remove these cysts in endobag. In functional cysts, the cyst wall may be very thin at places. It is better to excise such areas than to peel them.

Haemostasis: Bleeding can be severe near infundibulopelvic ligament & ovarian ligament. Any bleeding vessels encountered here should be coagulated with bipolar.

Extraction of cyst wall: After grasping a specimen larger than 5 mm channel, the sleeve is slipped upward on the grasper shaft out of the peritoneal cavity. The grasping forceps with the specimen is then pulled out in one motion through the soft tissue of the anterior abdominal wall. Forcep is then reinserted through the exit tract & the sleeve is pushed over it. Initial placement of the trocar sleeve lateral to the deep epigastric vessels avoids going through the rectus muscle. Trocar penetrates the external oblique, internal oblique & transversalis fascia only, thus leaving an easily identifiable tract. Extraction through cul de sac is rarely required.

A large cyst wall may be cut into long strips & then removed. Dermoid cyst, due to its variable consistency, is difficult to extract. The cyst is placed in an endobag, inserted through the 10mm port & the threads are pulled out. As the bag reaches the level of abdominal wound, contents are removed partially & then the bag withdrawn.

Sequelae: Most of these patients, when treated early, resume normal ovarian function & have normal fertility. Cases reporting late may develop ovarian necrosis & sepsis.

HAEMORRHAGIC OVARIAN CYST

Ovary has an outer cortex, rich in primordial follicles & inner medulla, which is more vascular. The outermost connective tissue layer is called tunica albuginea. Unlike male testis, where tunica forms a resistant layer, in females it is poorly formed & is quite distensible. This allows for monthly distension of ovaries by the growing follicle. When a small vessel in the wall of the tumour ruptures, blood may collect into the cyst itself or into the peritoneal cavity. Due to

distensible quality of the tunica, there may not be any pain or tenderness. Bleeding from small vessels is usually self-limiting & only leads to change in colour of the cyst contents. Rupture of bigger vessels or intraperitoneal haemorrhage gives rise to severe pain. These patients may also present with haemorrhagic shock. In the absence of shock, laparoscopy is the preferred approach. Sucking all the blood & clots, clears haemoperitoneum. The bleeding vessel is identified & coagulated and cystectomy is performed.

Corpus luteal haematoma

Sometimes haemorrhage may occur in a normal corpus luteum which fails to resolve & gives rise to corpus haemorrhagicum. Persistent production of hormones leads to increased growth of endometrium. This causes amenorrhoea followed by heavy & prolonged bleeding. There is marked tenderness & on per vaginal examination a tender cyst may be felt through the fornix. Differential diagnosis is with cases of ectopic pregnancy & abortion.

On **sonography**, the combination of clotted blood & liquid contents may appear as: 1) an irregular echogenic area with scalloped edging along the inner walls, 2) a spherical cyst with many lobes, 3) one or more septa within the cyst.⁶

Management

Analgesics & simple observation usually suffices. Follow up sonography after menses, shows resolution of corpus luteum cyst in most cases. Surgery is required if patient presents with acute abdomen & the possibility of torsion or rupture cannot be ruled out. Due to variable presentations of ectopic pregnancy, these patients are often operated for the same. It is only on histopathology, that true nature of pathology is revealed.

RUPTURED OVARIAN CYST

Rupture is more likely to happen if the cyst wall is damaged by previous ischaemic degeneration or if it is malignant. It can also happen spontaneously as is typically seen in the cases of actively growing pseudomucinous cystadenomas, where the epithelial elements of the cyst grow faster than the connective tissue of the capsule. Spontaneous rupture results, discharging pseudomucinous material into the peritoneal cavity. In most cases, there is no serious side effect, but rarely the coagulated pseudomucinous material forms adhesions with omentum & intestines leading to pseudomyxoma peritonei.¹ External factors such as trauma, pelvic examination, coitus or childbirth can also precipitate rupture. During labour the presenting part presses upon the cyst lying in the pouch of Douglas, & can lead to rupture.

Signs & Symptoms

Presentation depends on the contents & size of the cyst. Rupture of a small cyst may cause sudden severe pain without any after effects. There may be a sensation of something giving way, followed by vomiting, diarrhoea, and severe abdominal pain. Because the amount of blood loss is minimal, hypovolemia does not supervene. Peritoneal irritation due to leakage of cyst fluid can lead to significant tenderness, abdominal distension, and hypoperistalsis. If the cyst was known to exist, its size is found reduced & free fluid is seen in the peritoneal cavity.

Worst peritoneal reaction is seen with the rupture of dermoid cyst. Sebaceous material collects into the peritoneal cavity, leading to acute abdomen & fever.

Investigations:

There is often leucocytosis & sonography reveals free fluid in the peritoneal cavity. If urgent sonography is not possible, culdocentesis gives important information to reach a diagnosis.

Management

The aim of treatment is to clear the peritoneal cavity of all the cyst contents along with removal of the cyst. In patients reporting early, laparoscopy is preferred for all its benefits of minimally invasive approach. In late cases, where there is high likelihood of dense bowel adhesions, laparotomy is preferred. After removing the cyst contents, repeated lavage is done, till the peritoneal cavity appears clean. Prognosis in pseudomyxoma peritonei is poor, even after the ovaries are removed.

INFECTED OVARIAN CYST

Infection may happen by direct spread of organisms through adjacent structures as in acute salpingitis or pelvic peritonitis. A cyst, which has undergone ischaemic necrosis, is more likely to get infected with bowel organisms. A cyst, which has been treated by tapping rather than by removal, is more likely to undergo infection. These cases present with fever & abdominal pain. There is leucocytosis & a tender mass is felt through the fornix. Ultrasound documents a tubo - ovarian pathology, with features of a complex mass.

Treatment

Treatment of infection is conservative & consists of intravenous antibiotic coverage, along with supportive therapy. Surgery is indicated only in special circumstances as

when there is evidence of spreading peritonitis despite adequate medical treatment, ruptured ovarian abscess or when diagnosis is in doubt. Some surgeons prefer to do laparoscopy for confirming the diagnosis & draining the purulent fluid along with excision of abscess cavity (necrotic inflammatory exudates). The peritoneal cavity is well irrigated with Ringer's lactate solution. Caution is needed in cases of suspected adhesions. Temperature elevation rarely persists past the first postoperative day.

OVARIAN CYST IN PREGNANCY

The common types of ovarian cysts seen during pregnancy are serous cyst, dermoid cyst & corpus luteum cyst. The incidence of dermoid cyst is two times higher than in non-pregnant state. The incidence of benign ovarian tumours with pregnancy is about 0.2%, 1/3rd being dermoids 1/3rd corpus luteum cysts.⁷

Pathophysiology

Following fertilization the normal corpus luteum continues to grow & forms corpus luteum of pregnancy. If haemorrhage occurs in its substance, then it can become cystic & acquire quite a large size, up to 3-5cms. Such cysts disappear spontaneously at 14-16 weeks.

Any of these cysts can undergo complications like torsion, haemorrhage, rupture & infection. The incidence of torsion is higher during the first trimester when the gravid uterus dislodges the cyst from the pelvis into more spacious abdomen & still higher soon after delivery when pelvic organs are rapidly changing in size.

Cyst can undergo haemorrhage or rupture during labour. Infection is more likely in the puerperium.

Signs & symptoms

Majority of the patients are asymptomatic. During pregnancy the some of the patients may present with urinary retention, mechanical distress due to over distension of abdomen or preterm labour. During labour there is high chance of malpresentation & obstructed labour. If any of the complications occur, patient presents with features of acute abdomen.

Diagnosis is easy in early pregnancy, when one can feel the cyst separately from the uterus. In second trimester, putting the patient in Trendelenburg position, shifts the cyst more towards the abdomen, & becomes more obvious. Ultrasonography helps to confirm the diagnosis.

Differential diagnosis

A complicated ovarian cyst during pregnancy is to be differentiated from ectopic pregnancy, sacculation of gravid uterus, red degeneration of fibroid, acute hydramnios & accidental haemorrhage.

Treatment

Cyst smaller than 5 cms is usually corpus luteum of pregnancy & does not require any treatment. Such a cyst disappears spontaneously by 14 to 16 weeks. A larger cyst can be safely removed after 16 weeks, when placenta has taken over the function of corpus luteum. Cystectomy with ovarian reconstruction is the preferred treatment, but even if ovariectomy is performed, there is no risk to pregnancy. After 28 weeks, it is better to keep the patient under observation. Due to increased risk of complications after delivery, these cysts should be removed early in the puerperium. If complications like torsion, haemorrhage or rupture occur, surgery is done irrespective of the gestational age.

If cyst is not impacted in the pelvis, vaginal delivery may be allowed. Cyst should be removed early in the puerperium,

preferably in the first week. If cyst is found impacted in pouch of Douglas, Caesarean section should be performed. Even if caesarean is done for other obstetric reasons, cyst should be removed at the same time.

Laparoscopic surgery is possible upto 16 weeks gestation. Till then, the size of gravid uterus does not hinder the introduction of trocar at the usual sites.⁸

OVARIAN HYPERSTIMULATION SYNDROME (OHSS)

Introduction of gonadotrophins for ovulation induction, in the treatment of infertility has been a major medical breakthrough in this century. Serious OHSS is an outcome of ovulation stimulation, which can affect 100-200 cases in 100,000 stimulation cycles annually through World Registries of Assisted Conception.⁹

Classification

Schenker & Weinstein have classified OHSS according to the symptoms, signs & laboratory findings¹⁰(table 4).

Table 4. Schenker & Weinstein's Classification of OHSS¹⁰

Mild Hyperstimulation	Grade I - Serum oestrogen > 150micrograms/ day Urine pregnendiol excretion > 10 mg/ day
	Grade II - Grade I with ovarian enlargement / small cysts.
Moderate Hyperstimulation	Grade III - Grade II with abdominal distension
	Grade IV Grade III with nausea, vomiting and/ or diarrhoea
Severe Hyperstimulation	Grade V Grade IV with large ovarian cysts and ascities and/ or hydrothorax
	Grade VI Grade with hemoconcentration, with or without coagulation abnormalities

Golan proposed another classification, where he also included sonographic findings¹¹ (table 5).

Table 5. OHSS classification by Golan et al¹¹

Mild OHSS	Grade I Abdominal distension & discomfort.
	Grade II - Grade I with nausea, vomiting and/ or diarrhoea; ovaries are enlarged 5- 12 cm.
Moderate OHSS	Grade III features of mild OHSS plus ultrasonic evidence of ascites.
Severe OHSS	Grade IV Features of moderate hyperstimulation with clinical ascites and/ or hydrothorax and respiratory difficulties.
	Grade V All of the above plus change in the blood volume, increased blood viscosity due to hemoconcentration, coagulation abnormalities & diminished renal perfusion.

Complications

Vascular complications - Haemoconcentration, thromboembolic phenomena due to coagulation abnormalities may lead to serious cerebrovascular accident.

Liver dysfunction - Although the liver functions are abnormal, morphological changes are seen only at the ultrastructural level. This is a compensatory change in response to increased demand of liver enzymes.

Respiratory complications - Pleural effusion, mechanical distress due to ascites, hydrothorax & Adult Respiratory Distress Syndrome may appear due to OHSS.

Gastrointestinal complications - Pain in abdomen, nausea, vomiting & diarrhoea could be the initial symptoms of OHSS.

Adnexal torsion - Multiple follicular or luteal cysts make the ovaries enlarged. This predisposes them to torsion. Pregnancy further increases the chances. Mashiaeh et al noted torsion in 16% of the pregnant patients compared with 2.3% in the nonpregnant patients.¹²

Prevention of OHSS

Recognition of high-risk patients & following preventive measures are the only ways of reducing the incidence of OHSS.

Young thin patients, presence of polycystic ovaries, oligomenorrhoeic anovulation & use of hMG & GnRH agonists, all increase the risk of developing OHSS.

Other high risk factors include presence of large number of small & intermediate follicles on sonography & serum estradiol levels $>/=2500\text{pg/ml}$, on the day of hCG administration.

More reliable is the slope of rise in E2 concentration, to check if the values are more than doubling. Conception cycles lead to a higher risk of OHSS.

Withholding or delaying hCG, using GnRH agonists to trigger ovulation can prevent OHSS. Follicular aspiration, use of progesterone to support luteal phase, administration of human albumin & glucocorticoids at the time of oocyte recovery is some of the other ways of reducing the chances of OHSS.

Treatment

Treatment is mainly **supportive** to maintain the intravascular volume & avoid the complications of hypercoagulability.

Surgical therapy is indicated only in the following situations-

Intraperitoneal haemorrhage

Rupture of ovarian cyst

Torsion of ovarian cyst

Ectopic pregnancy.

One may choose laparoscopic or laparotomy route, depending on the patient's condition. Just untwisting the enlarged ovary is mostly sufficient to carry on the pregnancy.

CONCLUSION

With increasing use of ovulation inducing drugs, the incidence of ovarian cyst is increasing. Though many factors contribute to it, there are still, not too many effective ways to prevent the occurrence of ovarian cysts. Oral contraceptive pills are known to provide some protection. OHSS can be prevented by close monitoring of all high-risk patients.

Early diagnosis & treatment is the only way of reducing accidents to ovarian cyst & long-term complications like adhesions & infertility.

POINTS TO REMEMBER

Ovarian cysts may remain asymptomatic for long or occasionally present with acute abdominal pain or even shock.

Adnexal torsion is the fifth most common gynec surgical emergency.

Torsion (of ovarian cyst) can occur during pregnancy and immediate post delivery due to a rapid change in pelvic organ size.

Torsion needs differentiation from ectopic pregnancy, acute PID ruptures ovarian cyst, corpus luteal hematoma and non gynecological causes for acute abdomen.

Hemorrhage, rupture and infection of ovarian cyst are other gynecological causes for acute abdomen.

Localized infection and small corpus luteal hematoma can be managed conservatively while torsion and rupture need surgical intervention preferably by laparoscopic approach, occasionally by laparotomy.

Incidence of benign ovarian tumours with pregnancy is about 0.2% and most patients are asymptomatic.

Presence of ovarian cyst during pregnancy can lead to urinary retention, mechanical distress, preterm labour, malpresentations and obstructed labour.

Corpus luteal cysts <5 cms during pregnancy do not need any treatment and regress spontaneously by 14-16 week.

When ovarian cysts persist during pregnancy, cystectomy with ovarian reconstruction is performed after 16 weeks in second trimester.

Emergency surgery is performed when cyst complications occur during pregnancy.

In OHSS due to presence of enlarged ovaries surgery is indicated when rupture, torsion or intraperitoneal hemorrhage occur.

REFERENCES

- 1) Howkins & Bourne Shaw, *Disorders of the ovary*. In Padubidri VG, Daftary Shirish N. Eds. *Shaw's Textbook of Gynaecology, Twelfth Ed.* Churchill Livingstone Pvt.Ltd. New Delhi. 1999: 326.
- 2) Pena J, Ufberg D, Cooney N & Denis A. *Usefulness of Doppler sonography in the diagnosis of ovarian torsion*. *Fertility & Sterility*, 2000; 73(5): 1047-50.
- 3) Dill-Mackay M J, Atri M. *Ovarian Sonography*. In *Ultrasonography in Obstetrics and Gynecology*, Callen PW Ed, 4th Edition. WB Saunders Company, Philadelphia 2000; Ch 31: 872-873.
- 4) Lee EJ, Kwon HC, Joo HJ, Suh JH, & Fleischer AC. *Diagnosis of Ovarian Torsion with Color Doppler Sonography: Depiction of Twisted Vascular Pedicle*. *J Ultrasound Med* 1998; 17: 83-89.
- 5) Rumack CM, Wilson SR, & Charboneau JW. *Diagnostic Ultrasound, 2nd edition*. Mosby, 1998:550-1.
- 6) Cydney Afriat Menihan. *Gynaecologic Pain and Dysfunctional Uterine Bleeding*. In *Limited Sonography in Obstetric and Gynaecologic Triage*. Brogan JE, Barta.SV, Barishek V Eds. Lippincott - Raven Publishers. Philadelphia. 1998; Ch 7:109-110.
- 7) Hopkins MP, Duchon MA. *Adnexal surgery in pregnancy*. *Reprod Med*.1986; 31:1035.
- 8) Rao AR. *Laparoscopic Management of Ovarian Masses*. In Desai SV, Joseph KA. Eds. *Gynecological Endoscopic Surgery- Current concepts*. A FOGSI Publication, Jaypee Brothers, New Delhi. 2002; Ch 3:13.
- 9) Schenker JG, Ezra Ezra. *Complications of assisted reproduction techniques*. *Fertil Steril*, 1994: 61:411-422.
- 10) Schenker and Weinstein. *Ovarian Hyperstimulation Syndrome: a current survey*. *Fertil Steril* 1978; 30: 255-68.
- 11) Golan A, Ron-EI Rherman A. *Ovarian Hyperstimulation Syndrome: an update review*. *Obstet Gynecol Surv* 1989; 44:430-440.
- 12) Ben-Raphael Z, Bider D, Mashiach S. *Laparoscopic unwinding of twisted ischaemic haemorrhagic adnexum after in vitro fertilization*. *Fertil Steril* 1990; 53: 569-571.

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