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Study on Benign Ovarian Cyst and Adnexal Torsion in Tertiary Care Hospital



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ABSTRACT

Background: Ovarian cysts are the most common cause of adnexal torsion. Many ovarian cysts are benign, but few are cancerous hence early detection is necessary. Ovarian torsion is the rare gynecological emergency that may elude diagnosis leading to delayed operative intervention and ovarian resection. Adnexal torsion occurs when the ovary or fallopian tube turns around and forms a knot. Rupture of cyst and torsion are the major damages which may lead to lower unilateral abdominal discomfort. **Objective:** This study was conducted for early detection of ovarian tumour and to prevent infertility in women. **Method:** A prospective, observational, descriptive study was conducted for studying clinical and pathological findings of ovarian cyst and adnexal torsion. **Result:** The study included 211 cases of ovarian cyst, 79 patients had adnexal torsion. Surgical procedures were performed and patients operated by using aspiration (29) laparoscopy (59), Cystectomy (66), Cystectomy + Single intrauterine gestational sac (11) Oophorectomy (7) and Salpingo-oophorectomy (39). **Conclusion:** Patients with right ovarian cyst and adnexal torsion were high compared to left ovary. Occurrence rate of adnexal torsion is high in pregnancy followed by post-menopause, pre-menopause, and non-pregnant women of reproductive age. In early diagnosed ovarian cyst cases, only the cyst was removed and the ovary was retained, in the cases where necrosis of the ovary had occurred due to ischemia, the ovary was removed.

1. INTRODUCTION

Benign ovarian cysts/non-cancerous ovarian cysts are a fluid-filled sac that forms on the ovary or inside the ovary. Any ovarian follicle larger than 2cm is considered as an ovarian cyst; while some ovarian cysts can be very small, others can be larger. Ovarian cysts larger than 5cm generally need to be removed surgically.

Ovarian cysts most often occur during a woman's childbearing age, in spite of this fact they can affect any woman between 18-45years of age. Some ovarian cysts cause symptoms such as sudden severe pain and bleeding also associated with vomiting and low grade fever. There are 5 types of ovarian cysts:

- **Functional cysts:** These cysts are normally a part of menstruation, and is not caused by disease, which can be cured. Functional cysts can be further sub-divided into 3 types: (a) Graafian follicle cysts, which form when ovulation doesn't occur, and a follicle doesn't release its eggs, but instead develops into a cyst, or when a mature follicle collapses on itself. These ruptures, usually in the middle of the menstrual cycle during ovulation, it can cause sharp, severe pain in the lower abdominal side of the ovary on which the rupture has taken place, though usually, this type of cyst doesn't produce symptoms and disappears on its own. (b) Corpus luteum cysts, which occur after an egg has been released from a follicle. The follicle then turns into a secretory gland and begins producing a large amount of estrogen and progesterone. If the patient doesn't get pregnant then the ruptured follicle breaks down and disappears. However, sometimes it fills with fluid/blood and forms into a cyst that remains in the ovary. In most cases, the type of cyst does not produce symptoms, though it has the capacity to grow up to 10 centimeters in diameter and twist the ovary, causing pelvic or abdominal pain. In addition, the blood-filled cyst may rupture, causing internal bleeding and sharp, sudden pain. (c) Hemorrhagic cysts, which occur when a blood vessel in the cyst wall breaks and blood enters the cyst, in some cases causing abdominal pain. As the blood collected within the ovary, clots; occasionally, the cysts can rupture, and blood can enter into the abdominal cavity. Those ruptures can be very painful, though ruptured hemorrhagic cysts are relatively uncommon; and most of these cysts shed away on their own, though some require surgery.

- **Dermoid cysts:** These cysts contain matured skin, with hair follicles, sweat glands, (sometimes) a clump of hair, and pockets of sebum, fat, bone, teeth, eyes, cartilage and thyroid tissue.
- **Endometrial cysts:** These cysts are caused due to endometriosis. They form when a patch of endometrial tissue becomes transplanted and grows within the ovaries. Blood can accumulate for about a months or years and turns brown. When it ruptures, it enters into the pelvis and in between the bladder, bowel and the uterus. Treatment usually can be either medically/surgically.
- **Pathological cysts:** They are found in cases of polycystic ovary syndrome (PCOS), which is a hormone-related condition, or are associated with the development of tumours.
- **Ovarian carcinoma:** Ovarian cancer can be either benign/malignant. Most often, ovarian cancer is formed on the uppermost layer of the ovary, while cancers are those that form in the egg-producing cells or the supportive tissues that are surrounding the ovaries, which are rare.

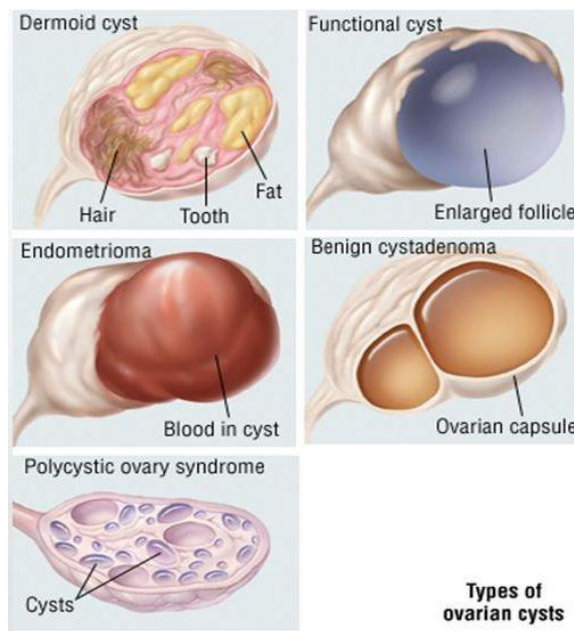


Fig No: 1

The most accurate way to get the picture of the ovary and cyst is with a vaginal sonography. This test uses a small instrument, which is comfortably passed into the vagina. The instrument bounces harmless sound waves of the uterus, fallopian tubes, and ovaries, which forms a picture which can be seen on a monitor. A sonographic picture allows the doctor to accurately determine the size of the cyst and in order to detect whether it is filled with fluid or solid mass. Certain

types of ovarian cysts, depending on which types of cells in the ovary are overgrowing, will make fairly authentic patterns on a sonogram.

Surgery may be considered necessary only if a cyst appears suspicious for cancer on the sonograph, if it causes severe pain, and if it continues to grow, or if it does not dissolve away within 8 weeks. Number of studies shows, those cysts that persist longer than 8 weeks without reducing in its size, those types of cysts have a greater likelihood of being abnormal. This does not mean that it's cancerous, but it's rather an abnormal growth of the cells within the ovary that will never dissolve away. If still, they are in place, these cysts may continue to grow in and causes abdominal discomfort or twist the ovary and destroys it due to ischemia. Also, in very rare instances (< 5%), cases, cysts may be cancerous, and early detection and removal is required. Instruments are now available that enables the gynecologist to remove a cyst through small incision in the abdomen, which will preserve the normal, healthy ovary. This type of procedure is known as laparoscopic surgery and removing the cyst, is called a cystectomy. The thinned out ovarian layer/tissue is cut open, and the cyst is gently excoriated away from inside the ovary. The cystic fluid is then removed with a suction device. The cyst will then look like a deflated balloon and can easily be removed through the small laparoscopic incision.

Rarely, if the cyst has destroyed the entire normal ovarian tissue, it may be inevitable to get rid off the entire ovary and it is possible to do this, with laparoscope. Many ovarian cysts are asymptomatic but few others causes swelling or pain in the abdominal region, dull ache in the lower back and thighs, burning micturition, pain during sexual intercourse, pain during menstrual cycle, abnormal bleeding ,breast tenderness, nausea and vomiting. Twisting of an ovary (adnexal torsion) is uncommon but is more likely to occur in the women of reproductive age. It usually occurs when there is a problem within the ovary. The following conditions which make it more likely for adnexal torsion are; (a) Pregnancy, (b) Use of hormones to trigger ovulation (for infertility problems), (c) Enlargement of the ovary, usually due to non-cancerous (benign) tumours or cysts. Ovarian cysts should normally be assessed using transvaginal ultrasound, as this appears to provide more details and hence offers greater sensitivity than the transabdominal method. Larger cysts may also need to be assessed transabdominally. It has also been suggested that colour-flow doppler sonography may be of benefit in assessing ovarian cysts.

(i) Surgery to untwist the ovary: If ultrasonography supports the diagnosis, women are treated immediately. One of the following procedures is used to try to untwist and thus save the ovary:

(a) **Laparoscopy:** Doctors may make one or more small incisions in the abdomen. They then insert a viewing tube (laparoscope) through one incision. Using instruments threaded through other incisions, they try to untwist the ovary and, if also twisted, the fallopian tube. Laparoscopy is done in a hospital and usually requires a general anesthetic, but it does not require an overnight stay. (b) **Laparotomy:** Doctors make a larger incision in the abdomen. A laparoscope is not used because doctors can directly view the affected organs. Because the incision is larger, it requires an overnight stay in the hospital. (ii) If an ovarian cyst is present and the ovary can be saved, the cyst is removed (called **cystectomy**). (iii) If the blood supply was cut off and tissue died, removal of the fallopian tubes and ovaries (**salpingo-oophorectomy**) is necessary. (iv) If an ovarian tumour is present, the entire ovary is removed (called **oophorectomy**).

Pathophysiology:

1. Pathology of Disease: In affected ovary, venous and lymphatic outflow becomes compromised due to torsion of suspensory ligament pedicle.

- Can lead to edema, increased pressure in ovary, ischemia and infarction.
- Incomplete torsion leads to lymphatic obstruction and ovarian edema.

2. Incidence, Prevalence

- 3% of gynecologic surgical emergencies
- 80% occur in reproductive aged women
- >90% related to cysts and neoplasms
- 10-20% associated with early pregnancy (6-14 weeks)
- Right ovary more commonly affected

3. Risk Factors:

Patient age - may limit possible causes

Anatomic:

- Malformed or elongated fallopian tubes

- Pregnancy, secondary to combination of enlarged corpus luteum cyst and ovarian supporting tissue laxity.

Medical:

- Early pregnancy due to progesterone stimulation
- Ovarian tumours
- Ovarian cysts
- Ectopic pregnancy
- Hydrosalpinx

Iatrogenic:

- Pelvic surgery (ex: tubal ligation) increases adhesion risk
- Increased cysts from ovulation induction for infertility treatment (ovarian hyperstimulation syndrome)

4. Morbidity / Mortality: Infection, Peritonitis, Sepsis, Adhesions, Chronic pain, Infertility, Death. (Rare)

Diagnostics

1. History:

- Sudden onset of severe, sharp, stabbing abdominal pain
- Often unilateral; worsens over hours.
- Pain radiates to back, pelvis, or thighs.
- Associated symptoms: nausea, vomiting, fever
- History of ovarian or fallopian tube disease, prior ovarian torsion, prior pelvic surgery

2. Physical Examination

- Non-specific, unilateral pelvic pain
- Tender adnexal mass
- Fever can occur with ovarian necrosis

3. Laboratory evaluation:

- Urine pregnancy test
- Urinalysis
- CBC with differential, if infectious process suggested
- Tumour markers, if tumour suggested

4. Diagnostic imaging:

- Ultrasound
- Doppler sonography (method of choice) can depict blood flow, and predict viability of adnexal structures
- Flow does not exclude ovarian torsion, but can indicate ovarian viability
- Twisted vascular pedicle
- Cystic mass
- Free pelvic fluid
- Enlarged ovary
- Grayscale transvaginal ultrasound preferred imaging modality for adnexal masses
- CT and MRI helpful if ultrasound findings non-diagnostic.

2. MATERIALS AND METHODS

2.1 Study design, Setting and Study population

The present study was observational, prospective and descriptive; and was carried out in gynecology and female surgery ward. The study was conducted in Narayana Hrudayala-Malla Reddy hospital in the study period between December 2012- March 2016. Two hundred and eleven patients (n=211), were enrolled in the study.

2.2 Data collection

Medical case sheets, drug charts and their laboratory investigations were recorded in self-designed standardized performa and were analyzed. Demographics (Age, Sex), Chief complaints, Current diagnosis, medical history, medication prescribed (dose, route of administration,

frequency, indication, therapy duration, marketing categories [generic/branded]) surgical procedures performed were collected.

2.3 Ethical considerations

The study was conducted only after obtaining approval from institutional research and ethics committee.

2.4 Statistical analysis

Observational study was done to view and record the data, prospective study was done to check the outcome and descriptive statistics were applied on the study to collect the data using Microsoft excel software; and the results were applied in percentage.

3. Scope of the study:

- (a) Early detection can prevent the ovary from necrosis and avoid infertility.
- (b) If detected in pregnant women the baby can be saved.
- (c) To find the incidence of Adnexal torsion, and if treated earlier can prevent from peritonitis and internal hemorrhage.
- (d) Detection of benign and malignant tumour.

4. RESULTS

Table No. 1:

Ovarian cyst	Patients (n=211)	Percentage
1. Functional	113	53.5%
2. Dermoid	64	30.3%
3. Endometrial	15	7.01%
4. Pathological	19	9.1%
5. Ovarian carcinoma	--	-

Table No. 2:

Adnexal torsion	Patients (n=79)	Percentage
1. Right ovary	77	97.4%
2. Left ovary	2	2.6%
3. Bilateral	-	-

Table No. 3: Occurrence rate

Occurrence rate	Patients with ovarian cyst (n=132)	%	Patients with adnexal torsion (n=79)	%
1. Pregnant women	-	0%	11	13.9%
2. Non-pregnant women	86	65%	22	27.8%
3. Pre-menopause	14	11%	19	24.1%
4. Post-menopause	32	24%	27	34.2

Table No. 4: Causes of adnexal torsion

Cause	Patients	Percentage
1. Dermoidcyst	64	81%
2. Mucinosi scystadenoma	15	19%

Table No. 5:

Clinical symptoms	Patients positive with symptoms	Percentage
Abdominal pain	211/211	100%
Abdominal tenderness	211/211	100%
Nausea and vomiting	211/211	100%
Fever	8/211	3.79%
Diarrhea	5/211	2.36%
Cervical motion tenderness	198/211	93.83%

Table No. 6: Size of the cysts

Size	Patients (n=211)	Percentage
1) <3 cm	132	62.5%
2) 3-5 cm	36	17.2%
3) 5-7 cm	29	13.7%
4) >7 cm	14	6.6%

Table No. 7: Ultrasound (To confirm adnexal torsion)

	Patients	Percentage
1) Relative enlargement of ovary	68/211	32.2%
2) Abnormal vascular flow	64/211	30.3%
3) Ovarian edema	89/211	48.1%
4) Fluid around ovary	70/211	33.1%
5) Abnormal ovarian location	79/211	37.4%
6) Presence of ovarian cyst	211/211	100%

Table No. 8: Doppler

Blood flow in and out of the ovary	Patients (n=64)	Percentage
1) Mild	11	17%
2) Moderate	49	77%
3) Severe	4	6%

Table No. 9: Surgical procedures

Surgery	Patients (n=211)	Percentage
1) Aspiration (transvaginal ultrasound-guided aspiration)	29	13.74%
2) Laparoscopy	59	27.96%
3) Cystectomy	66	20.85%
4) Cystectomy +Single intrauterine gestational sac	11	15.63%
5) Salpingo-oophorectomy	7	3.34%
6) Oophorectomy	39	18.48%

5. DISCUSSION

Early diagnosis prior to surgery shows possible preservation of the ovary. Majority of the ovarian cyst are benign in nature and the torsion occurred in 79 cases and were due to medium sized cysts (above 5cm) [1, 15, 19]. And the cause of adnexal torsion was due to dermoid and mucinosis cyst adenoma cysts. High number of patients had a clinical symptoms of sever sudden unilateral abdominal pain with nausea & vomiting. As all the adnexal torsion had cyst above the size of 5cm they were surgically removed. In our study 11 pregnant patients had cyst and adnexal torsion, the cyst was removed by cystectomy with the baby who all were removed by single intrauterine fetus corresponding in-between 32-38 weeks of gestation in 7 patients and 4 patients had abortion who were in-between 8.2-19 week of gestation week. The decision to preserve the ovary, adnexa, opening of torsion, abortion should be made by the patients. If the patients make decision to be treated with delay it may lead to necrosis. [1]

6. CONCLUSION

Patients with right ovarian cyst and adnexal torsion were high compared to left ovarian cyst. Occurrence rate of adnexal torsion is high in pregnancy followed by post-menopause, non-pregnant women of reproductive age and pre-menopausal patients. In early diagnosed ovarian cyst cases, only the cyst was removed and the ovary was retained. In few cases due to late to decreased blood flow in and out of the ovary (ischemia) it leads to necrosis hence either the ovary was removed by Oophorectomy or both the ovary and the fallopian tube was removed using Salpingo-oophorectomy. Considering the fact that most of ovarian masses were benign and occurred during the reproductive age Aspiration, Laparoscopy, Un-torsionand Cystectomy was done. The decision of removal of ovary was done based on patient's interest and the patients who were at risk of developing peritonitis.

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