

بسم الله الرحمن الرحيم

Sudan University of science and technology

Collage of graduated studies



**Evaluation of Ovarian Cyst in Reproductive Age Using
Transvaginal Ultrasonography**

**تقويم أكياس المبايض للنساء في عمر الإنجاب باستخدام
الموجات فوق الصوتية المهبلية**

***Thesis Submitted for b Partial Fulfillment for
the Requirement of M.Sc. Degree in Medical***

.Diagnostic Ultrasound

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قال تعالى:

(وَعَلَّمَ آدَمَ الْأَسْمَاءَ كُلَّهَا ثُمَّ عَرَضَهُمْ عَلَى

الْمَلَائِكَةِ فَقَالَ أَنْبِئُونِي بِأَسْمَاءِ هَؤُلَاءِ إِنْ

كُنْتُمْ صَادِقِينَ)

صدق الله العظيم

(سورة البقرة الآية 31)

Dedication

To my mother and my father who help me a
lot and encourage me

To my brother and my sister who help me and
give time to finish my work .To my lovely
son

Acknowledgement

To my supervisor which helped me' and
guided me patience to the right way until I
end the research paper

To my teachers for gave me valuable
knowledge that I ever had

To my colleges struggled with them for the
sake of getting

Knowledge' and best interrelationship that can
never be forgotten

To my friends inside and outside they are
 .online with me to encourage me till I end

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List of Abbreviation

TVS	Transvaginal scanning
PP	prep ration patient
US	ultra sound
SARE	Sudan assisted reproductive center
CLC	corpus luteal cyst
HCG	human chorionic gonadotrophin
PCOD	poly cystic ovarian disease
IVC	inferior vena cava
GURHs	gonadotropin-releasing hormones
LH	luteinizing hormone
FSH	follicle-stimulating hormone

ABSTRACT

This study is descriptive study which Continued and carried out from Saoudi hospital ,Asia center and alahfad center.

One hundred female married patient most of them infertile come to ultrasound department for check up were invistegated and evaluated by transvaginal scan because it was more informative protocol . The patient age group was (14-52) year the study was found that most common type were hemorrhagic cyst ovarian in woman is hemorrhagic cyst with high percent which was(50) 50% followed by thecal luteal Which was (20) 20% followed by falliculor cyst which was (7) 7%. And finally poly cystic ovarain disease Which was(4) 4 %

The study We found the nill pares women were more affected by cystic lesion 7 3patient(73%) than multipara only 27 patient (27%) because the multiparas ovaries were active so less formation of cyst lesion table(4.5)

The left and right ovary were same affected by types of cyst .that mean The percent of both ovaries as same 50%-50 table (4.6)

الخلاصة

هذه الدراسة دراسة وصفية في السودان بولاية الخرطوم بالمستشفى

السعودي و مستشفى آسيا التخصصي ومركز الأحفاد لتنظيم الأسرة

ومستشفى السلاح الطبي بقسم النساء والتوليد.

مائة سيدة متزوجة تعالج بقسم النساء تم فحصها وتقييمها بإجراء

مسح الموجات فوق الصوتية المهبليّة لأنها أكثر فاعليّة ودقه وكانت الفئة

العمرية تتراوح بين 14-52 سنة ومعظمهن ينشدن إنجاب أطفال.

وقد وجدت الدراسة أن أكثر أكياس المبايض شيوعاً بين السودانيات هي

المبايض الأكياس الدموية بنسبة (50%)(5) تليها أكياس الجسم الأصفر

الغرابية بنسبة (20%)(20)، ثم تليها الأكياس الجريبية بنسبة (19%)(19)،

وتليها أكياس الجسم الأصفر بنسبة (7%)(7)، وأخيراً كثيرة الأكياس بنسبة (

4%)(4).

وجدت النساء اللاتي لم ينجبن نسبة الاكياس 73% و متعددات الولاده

يصبن بالاكياس بنسبه 27%

و نسبه الاكياس متساويه في المبيضين الأيمن و الايسر 50% table

((4.6

Chapter One

Introduction

Chapter one :interduction

(1.1)Introduction

such hemorrhage pain An ovarian cyst is any collection of fluid surround by a very thin wall, with in ovary any ovarian follicle that is larger than two centimeter termed an ovarian, most ovarian cyst are functional is natured and harmless (benign) some ovarian cyst cause problems cystic Classification (<http://www.wikipedia.org/wiki> (-Ovarian

Follicular cyst cysts form persistent follicle ovarian does not occur it associated with elevated serum estrogen corpus luteum cyst (CLC) from graafian follicle following ovulation. Hemorrhagic ovulation in cyst space. in ovarian parenchyma represent commonest time ovulation the lutein cystic space in ovarian parenchyma represent multiple follicular cyst which when the ovarian are hyper stimulated or over sensitized to human chorionic gonadotropin (hCG) or less commonly. An infertility drug eg. Human menopausal gonadotrophin or porgonal administered in the management of infertility for the purpose of induction of follicular development and ovulation stimulation

But occasionally grow to be several centimeters in diameter polycystic ovarian disease (PCOD) is a complex endocrine disorder characterize. (Rumack, 2011),

By chronic anovulation and elevated serum androgen level (hyperandrogenemia) (cystic adenoma) are the common of cystic ovarian tumor these tumor arise from cells of coelomic peritoneal that cover

the ovary the tumor can secrete either mucinous or serous substance. Ovarian cystic adenocarcinomas typically spread to the peritoneum includingomentum these causes are usually associated with ascites which outline peritoneal structure and permit sonographic detection of peritoneal and omental tumor (DENES 2000)

Transvaginal ultrasound is a type of pelvic ultrasound used to look at woman reproductive organs including the uterus, ovary, cervix and vagina. TVS means across or through the vagina, its excellent method to assess ovary parameters of ovary {length L, width W, depth D} volume $L \times W \times d \times 0.5233$, location, ability / accessibility, the ruler of transvaginal scan for evaluation of adnexal masses include demonstration of original and internal consistency as well for guided aspiration (Kooning) et al 1989)

1.2 Problem:

Insedence of cyst among reproductive age. Detect of cystic lesion
ITdefcult to do by trans abdomen .

1.3 Objective:

1.3.1 General Objective:

- 1- To evaluation deferent type of ovarian cyst. Size - shape – location of cyst.

1.3.2 Specific Objective:

- 1- To detected ovarian cyst, type
- 2- To correlatea ultrasound finding of cyst with age, wight, heigh ,

Chapter Two

Litrure rivew back ground studies

Chapter tow :literature review

2.1Normal Anatomy of Reproductive Female System

2.1.1Uterus

The uterus and vagina are derived from the embryonic müllerian (paramesonephric) ducts as they elongate, fuse, and form a lumen between the 7th and 12th weeks of embryonic development. The uterus is pear-shaped and is the largest organ in the normal female pelvis when the urinary bladder is empty The average menarcheal uterus measures approximately 6 to 8 cm in length and 3 to 5 cm in anteroposterior and transverse dimensions. The size of the uterus varies with age and parity

The uterus consists of a fundus, body, and cervix

2.1.1.1 layers

The uterine muscle consists of three layers, and the outer serosa of the uterus is not visualized sonographically

The middle layer is the myometrium of the uterus. This layer should have a homogeneous echotexture with smooth-walled borders. Any areas of increased or decreased echotexture should be noted and measured.

The inner layer is the endometrium. This layer is thin, compact, and relatively hypovascular. The endometrium is hypoechoic and surrounds the relatively echogenic endometrial stripe, creating a subendometrial halo. The thin outer layer is separated from the intermediate layer by the arcuate vessels . . (Sandra 2012 et.al 2007)

2.1.1.2Blood supply

The normal arcuate vessels are often seen in the periphery of the uterus and should not be mistaken for pathology (Sandra 2012 et.al 2007). The radial arteries arise as multiple branches from the arcuate arteries and travel centrally to supply the rich capillary network in the deeper layers of the myometrium and the endometrium before entering the endometrium, the radial arteries give rise to the straight and spiral arteries of the endometrium. These vessels are most often demonstrated between 1 and 3 weeks after the onset of the last menses. Just before the onset of menses and during menses, these vessels are less apparent. The vasodilating actions of estrogens on the uterus during midcycle and the vasoconstrictions hormonal influences during the late luteal phase before menses explain the normal dynamic changes of these vessels. Calcifications may be seen in the arcuate arteries in postmenopausal women and appear as peripheral linear echoes with shadowing. This is a normal aging process that may be accelerated in diabetic patients. Echogenic foci in the inner layer of the myometrium, which are usually non shadowing, are thought to represent dystrophic calcification related to previous instrumentation. Although they are of no clinical significance, they should be distinguished from calcified leiomyomas. Uterine perfusion (the vascular blood flow within the myometrium) can be assessed by Doppler sonography of the uterine arteries. The Doppler waveform usually shows a high-velocity, high-resistance pattern(Sandra 2012 et.al2007)

2.1.1.3TheUtrus Part

The fundus, body and cervix. The body of the uterus is separated from the cervix by the isthmus at the level of the internal os and is identified by the narrowing of the canal. Tissue echogenicity surrounding the cervical canal should appear homogeneous.

One can frequently visualize cervical inclusion cysts, known as nabothian cysts, near the end of the cervical canal. These are generally less than 1 to 2 cm wide and are anechoic smooth-walled structures with acoustic enhancement posteriorly; they are of no clinical significance and generally are not measured. (Sandra 2012 et al 2007)

The cervix is fixed in the midline, but the uterine body is mobile and may lie obliquely on either side of the midline. Flexion refers to the axis of the uterine body relative to the cervix, whereas version refers to the axis of the cervix relative to the vagina. The uterus is usually anteverted and anteflexed. The uterus may also be retroflexed when the body is tilted post

2.1.2 The Fallopian Tubes:

The fallopian tubes, or oviducts, are coiled, muscular tubes that open into the peritoneal cavity at their lateral end. They are approximately 10 to 12 cm in length and 1 to 4 mm in diameter. The fallopian tubes lie superior to the utero-ovarian ligaments, round ligaments, and tubo-ovarian blood vessels. They are contained in the upper margin of the broad ligament and extend from the cornua of the uterus laterally, where they curve over the ovary.

2.1.2.1 The fallopian tube portion

The fallopian tubes are divided into four anatomic portions: infundibulum (lateral segment), ampulla (middle segment), isthmus (medial segment), and interstitial portion (segment that passes through the uterine cornua). The interstitial portion is the narrowest segment of the fallopian tube. The tube widens as it extends laterally, with the infundibulum being the wide, trumpet-shaped, lateral portion. The infundibulum is often referred to as the flared end of the fallopian tube because it contains fringed extensions, called fimbriae, which move over the ovary, directing the ovum into the fallopian tube after ovulation. The ampulla is the longest and most coiled portion of the fallopian tube and is the area in which fertilization of the ovum most often occurs because it is the most distensible region of the tube. The innermost region of the fallopian tube, with its mucosal layer, runs directly into the mucosal layer of the uterus (the endometrium). The continuous nature of the endometrium and the end cervical canal can act as a pathway for organisms, infection, and hemorrhage, because it is the most distensible.

2.1.2.2 Blood supply

The arterial supply to the uterine tube is via the uterine and ovarian arteries. Venous drain is via the uterine and ovarian veins.

The normal fallopian tubes are difficult to distinguish sonographically from surrounding ligaments and vessels. (Sandra 2012 et.al 2007)

Doppler interrogation may help differentiate prominent blood vessels from the fallopian tubes (Sandra 2012 et.al 2007)

2.1.3The Ovaries:

The ovaries consist of an outer layer or cortex, which surrounds the central medulla. The cortex consists primarily of follicles in varying stages of development and is covered by a layer of dense connective tissue, the tunica albuginea. A single, thin layer of cells known as the germinal epithelium surrounds the tunica albuginea (Sandra 2012 et.al 2007)

The central medulla is composed of connective tissue containing blood, nerves, lymphatic vessels, and some smooth muscle at the region of the hilum.

The ovaries produce the reproductive cell, the ovum , and two known hormones: oestrogen, secreted by the follicles, and progesterone, secreted by the corpus luteum.

These steroidal hormones are responsible for producing and maintaining secondary gender characteristics and for preparing the uterus for implantation of a fertilized ovum; they are also responsible for development of mammary glands in the female (Sandra 2012 et.al 2007)

2.1.3.1Ovarian Ligaments:

The ovaries are supported medially by the ovarian ligaments, originating bilaterally at the cornua of the uterus, and laterally by the suspensory (infundibulopelvic) ligament, extending from the infundibulum of the fallopian to include the urinary bladder, uterus, vagina, and rectum. The ovarian veins follow a slightly different course, as the left ovarian vein drains into the left renal vein, whereas the right ovarian vein drains directly into the inferior vena cava (IVC). supplied to the uterus by the uterine artery, Blood is To the lower extremities. The internal iliac arteries extend into the pelvic cavity, along the posterior wall, and provide multiple branches that

perfuse the pelvic structures which arises from the anterior branch of the internal iliac artery. From the internal iliac artery, the uterine artery crosses above and anterior to the ureter, extending distally to the base of the broad ligament. (Sandra 2012 et.al 2007)

2.1.3.2 blood supply:

The common iliac arteries course anterior and medial to the psoas muscles, providing blood to the pelvic cavity and lower extremities. The common iliac arteries normally bifurcate into the external and internal iliac (hypogastric) arteries at the level of the superior margin of the sacrum. The external iliac arteries course along the pelvic brim and continue inferiorly as the common femoral arteries, supplying blood to the lower extremities. The internal iliac arteries extend into the pelvic cavity, along the posterior wall, and provide multiple branches that perfuse the pelvic structures to include the urinary bladder, uterus, vagina, and rectum. The ovarian veins follow a slightly different course, as the left ovarian vein drains into the left renal vein, whereas the right ovarian vein drains directly into the inferior vena cava. (Sandra 2012 et.al 2007)

2.1.4 The Vagina:

The vagina runs anterior and caudal from the cervix, between the bladder and rectum. Occasionally, sonography is used to characterize a vaginal mass, such as a Gartner's duct cyst. These are the most common cystic lesions of the vagina and usually are found incidentally during sonographic examination. The most common congenital abnormality of the female genital tract is an imperforate hymen that results in obstruction of the uterus or the vagina may result in an accumulation of fluid (hydrometra), blood (hematometra), or pus (pyometra). (Sandra 2012 et.al 2000)



Fig (2-1)Normal Reproductive Female system in anteroposterior section (Sandra 2012 et.al 2000)

2.2Physiology of The Reproductive Female system:

2 cycle: ovarian and uterine controlled by hormonal change.

Ovarian cycle last 28 days normally interrupted only by pregnancy, finally terminated by menopause.

2.2.1The Menstrual Cycle:

A female's reproductive years begin around 11 to 13years of age at the onset of menses (menstruation).

A: Menstruation is a woman's monthly bleeding. When you menstruate, your body sheds the lining of the uterus (womb). Menstrual blood flows from the uterus through the small opening in the cervix passes out of the body through the vagina. Most menstrual periods last from 3 to 5 days. And end around age 50, when menses cease (Sandra 2012 et.al 2007)

Menstrual status menstrual cycle is approximately 28 days in length

menstrual cycle is approximately 28 days in length, beginning with the first day of menstrual bleeding. The length of the menstrual cycle can, however vary considerably from one woman to another.

Menstrual status is described using the terms premenarche, menarche, and menopause. Premenarche is the physiologic status of prepuberty, the time

before the onset of menses. Menarche is the state after reaching puberty in which menses occurs normally every 28 days.

Menopause refers to the cessation of menses. The menstrual cycle is regulated by the hypothalamus and is dependent upon the cyclic release of estrogen and progesterone from the ovaries (Sandra 2012 et.al 2009)

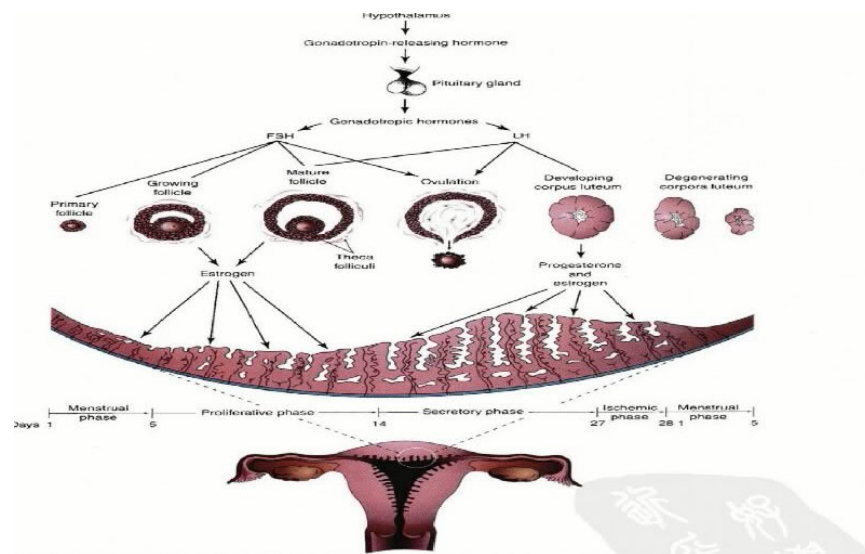


Fig (2-2)During Menstrual Cycle

Schematic drawing of the interrelation of the hypothalamus, pituitary gland, ovaries, endometrial lining. (the developing human clinically oriented embryology 6th ect 1998).

Follicular Development and Ovulation:

During the menarcheal years, an ovum is released once a month by one of the two ovaries. This process is known as ovulation. Ovulation normally occurs midcycle on about day 14 of a 28-day cycle. It is speculated that

ovum release alternates between the two ovaries: one month from the right, the next month from the left.

All ova begin development during embryonic life and remain in suspended animation within a preantral follicle as an immature oocyte until the onset of menarche.

Each female ovary contains approximately 200,000 oocytes at the time of birth. Some of these oocytes will mature and be released from the ovaries during ovulation, whereas others will degenerate.

The process of ovulation is regulated by the hypothalamus within the brain. When a young girl reaches puberty, the hypothalamus begins the pulsatile release of the gonadotropin-releasing hormones (GnRHs), which stimulate the anterior pituitary gland to secrete varying levels of gonadotropins (primarily follicle-stimulating hormone [FSH] and luteinizing hormone [LH]). (Sandra2011 et.al 2000)

Secretion of FSH by the anterior pituitary gland causes the ovarian follicles to develop during the first half of the menstrual cycle. This phase of the ovulatory cycle, known as the follicular phase, begins with the first day of menstrual bleeding and continues until ovulation on day 14. As the ovarian follicles grow, they fill with fluid and secrete increasing amounts of estrogen. (Sandra2011 et.al 2000)

Although typically five to eight preantral follicles will begin to develop, only one usually reaches maturity each month. This mature follicle is known as a graafian follicle and typically measures 2 cm right before ovulation.

As the estrogen level in the blood rises with follicle development, the pituitary gland is inhibited from further production of FSH and begins to secrete LH. The luteinizing hormone level will typically increase rapidly 24 to 36 hours before ovulation in a process known as *the LH surge*. This surge is often used as a predictor for timing ovulation for conception. LH level

usually reaches its peak 10 to 12 hours before ovulation. It is the LH surge, accompanied by a smaller FSH surge, that triggers ovulation on about day 14.

Ovulation is the explosive release of an ovum from the ruptured graafian follicle. Rupture of the follicle is associated with small amounts of fluid in the posterior cul-de-sac midcycle. Some women can tell when they're ovulating. (Sandra 2011 et.al 2000)

2.2.2 Menstruation:

- Days 1 to 14

2.2.3 Proliferative Phase:

- Days 5 to 14
- Corresponds to the follicular phase of ovarian cycle
- Thin endometrium
- Estrogen level increases as ovarian follicles develop.
- Increasing estrogen levels cause uterine lining to regenerate and thicken.
- Ovulation occurs on day 14

2.2.4 Secretory Phase:

- Days 15 to 28
- Corresponds to the luteal phase of ovarian cycle
- Ruptured follicle becomes corpus luteum
- Corpus luteum secretes progesterone
- Endometrium thickens

2.2.5 Endometrial Changes:

Varying levels of estrogen and progesterone throughout the course of the menstrual cycle induce characteristic changes in the endometrium. These changes correlate with ovulatory cycles of the ovary. The typical endometrial cycle is identified and described in three phases, beginning with the menstrual phase.

The menstrual phase lasts approximately 1 to 5 days and begins with declining progesterone levels, causing the spiral arterioles to constrict. This causes decreased blood flow to the endometrium, resulting in ischemia and shedding of the zona functionalis. These first 5 days coincide with the follicular phase of the ovarian cycle. As the follicles produce estrogen, the estrogen stimulates the superficial layer of the endometrium to regenerate and grow. This phase of endometrial regeneration, called the *proliferative phase*, will last until utilization of the graafian follicle around ovulation. With ovulation and luteinization of the graafian follicle, the progesterone secreted by the ovary causes the spiral arteries and endometrial glands to enlarge. This will prepare the endometrium for implantation, should conception occur. The endometrial phase after ovulation, referred to as the secretory phase, extends from approximately day 15 to the onset of menses (day 28). The secretory phase of the endometrial cycle corresponds to the luteal phase of the ovarian cycle.

The sonographic appearance of the endometrium changes dramatically among the three phases of the endometrial cycle. (Sandra 2011 et.al 2000) cycle and should be correlated with the patient's menstrual status. During menses, it is not uncommon to see varying levels of fluid and Developing follicle

Ovulation Corpus luteum Menstruation Endometrium Menstruation Week 1
 Week 2 Week 3 Week 4

2.2.6 The Typical Menstrual Period:

A: During your period, you shed the thickened uterine lining and extra blood through the vagina. Your period may not be the same every month. It may also be different than other women's periods. Periods can be light, moderate, or heavy in terms of how much blood comes out of the vagina. This is called menstrual flow. The length of the period also varies. Most periods last from 3 to 5 days. But, anywhere from 2 to 7 days is normal.

For the first few years after menstruation begins, longer cycles are common. A woman's cycle tends to shorten and become more regular with age. Most of the time, periods will be in the range

2.2.7The problems of women with period:

A: Women can have a range of problems with their periods, including pain, heavy bleeding, and skipped periods.

- **Amenorrhea** the lack of a menstrual period. This term is used to describe the absence of a period in:
 - Young women who haven't started menstruating by age 15
 - Women and girls who haven't had a period for 90 days, even if they haven't been menstruating for long

Causes can include:

- Pregnancy
- Breastfeeding
- Extreme weight loss
- Eating disorders
- Excessive exercising
- Stress

2.3Pathology of the ovary

2.3.1Classification of cystic ovarian diseases:

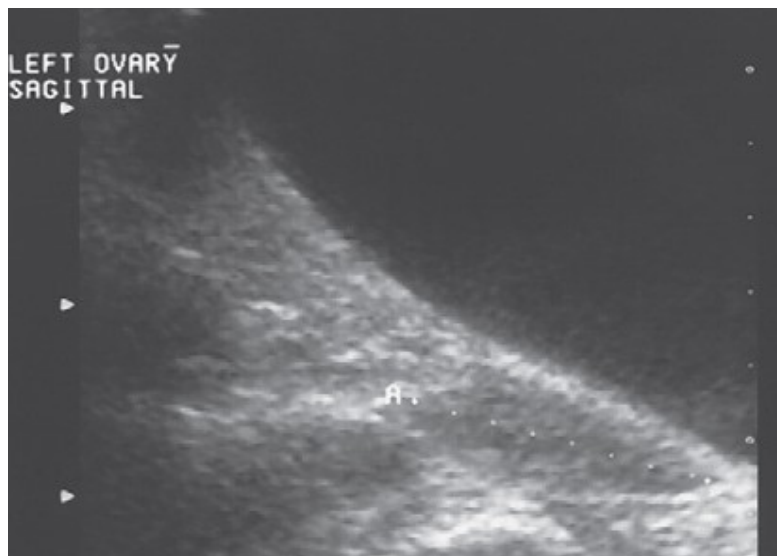
- 1) Neoplastic cyst
- 2) Non Neoplastic cyst

2.3.2Non neoplastic cyst:

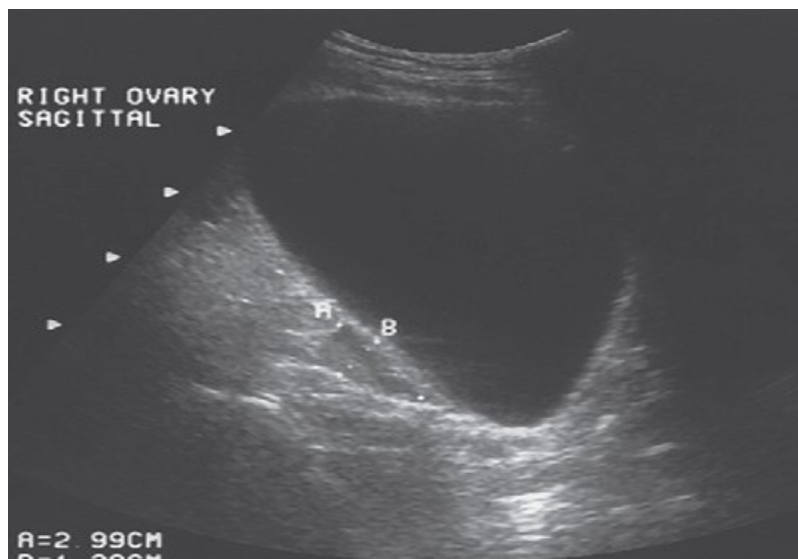
Cystic change occurs with some frequency in graafian follicle and corpora lutea, as group non neoplastic cysts of the ovary are by far the most

common cause of palpable adnexial mass in young women in reproductive age, are considered as Benign Ovarian Disease. (Sandra2011 et.al 2000)

(A)



(B)



Fig(2-3)Normal ovaray on ultrasound image transvers and long tedenal
A, Sagittal image to the right of midline shows the bladder with the right ovary posterior.(Sandra-diagnostic sonography).

The ovarian length (*A*) and depth (*B*) are measured. **B**.Sagittal image to the left of midline shows the left ovary posterior to the urinary bladder. The length (*A*) is measured.(Sandra2011 et.al 2000).

2.3.3Follicle cysts:

These cysts form when the sac doesn't break open to release the egg. Then the sac keeps growing. This type of cyst most often

Gose away in 1to 3 month

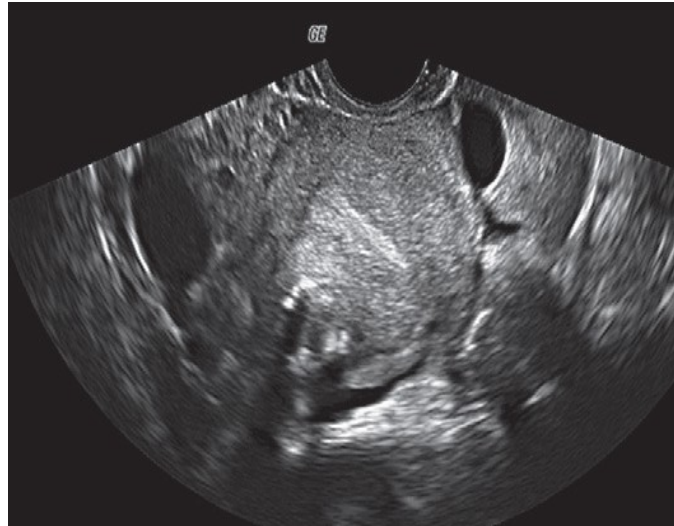


Fig (2-4)follicular cyst (Sandra-diagnostic sonography)

Transvaginal image of the prominent ovaries with multiple follicles allows the visualization of the ovaries with sonography.

The bladder is partially filled. The uterus separates the two ovaries. MI OV

2.3.4 Simple cyste:

An ovary's function is to mature oocytes until ovulation under the influence of luteinizing hormone and folliclestimulating hormone from the pituitary.

At the same time, the ovary synthesizes androgens (male hormones) and converts them to estrogens (female hormones).

Finally, it produces progesterone after ovulation to sustain early pregnancy until the placenta can do so at 10 to 12 weeks of gestation. width × height).

In the adult menstruating female, a normal ovary may have a volume as large as 22 cc,3with a mean ovarian volume of 9.8 ± 5.8 cc. An ovarian volume of more than 8 cc is definitely considered abnormal for the

postmenopausal patient. Consider an ovarian volume more than double that of the opposite side should also be abnormal, regardless of the actual size.

Three-dimensional (3D) ultrasound may provide the most accurate method of ovarian volume measurement by allowing accurate determination of the ovarian long axis and objective calculation of stromal and cystic volume components. Further development in this technology will define future applications.

2.3.5 Corpus Luteum Cysts:

Result from failure of resorption or from excess bleeding into the corpus luteum. These cysts usually are less than 4 cm in diameter and are unilateral. They are prone to hemorrhage and rupture. The presenting feature is often pain.

If the ovum is fertilized, the corpus luteum continues as the corpus luteal cyst of pregnancy during the first trimester of pregnancy, when maximum size is reached by 10 weeks, and resolution occurring by 12 to 16 weeks

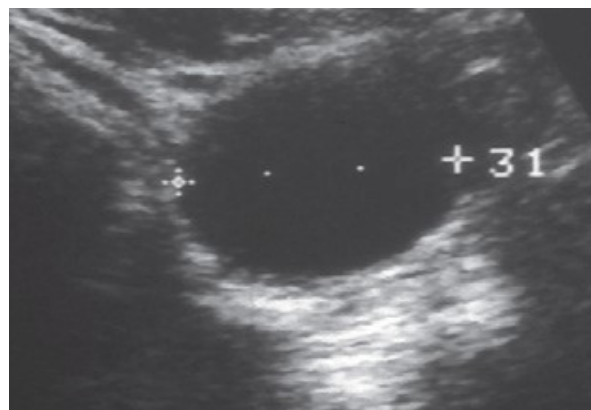


Fig (2-5) corpus luteum cyst on right ovary (Sandra2011 et.al 2000)

2.3.6 Hemorrhagic cyst:

There are asymptomatic, but some may lead to pain, constituting frequent sonographic examinations. Also, surgical intervention may be warranted.

The removal of an ovarian cyst is referred to as ovarian cystectomy.

Hyper stimulation of the ovaries, or ovarian hyper stimulation syndrome, from fertility treatment will also result in the development of multiple,

enlarged follicular cysts. A follicular cyst that contains blood is referred to as a hemorrhagic cyst, and it most often appears complex or completely echogenic depending on the hemorrhagic component present and the stage.



Fig(2-6) Hemorrhagic cyst on left ovary(Sandra2011 et.al 2000)

2.3.7Endometriomas:

These cysts form in women who have endometriosis. This problem occurs when tissue that looks and acts like the lining of the uterus grows outside the uterus. The tissue may attach to the ovary and form a growth. These cysts can be painful and

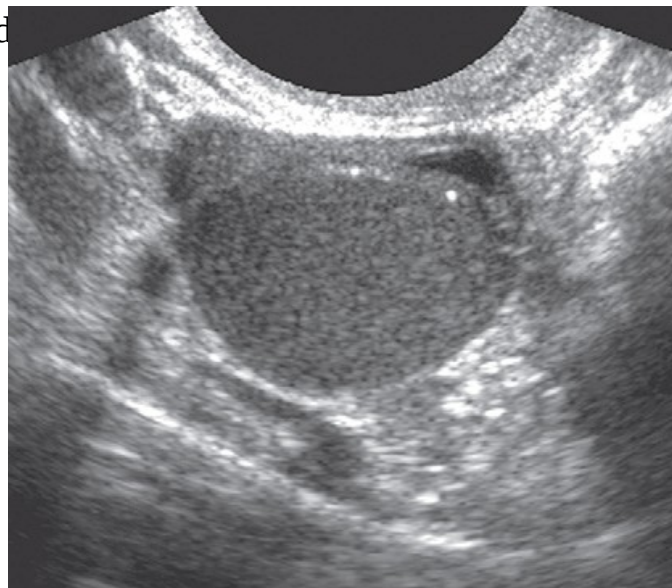


Fig (2-7) Endometriosis cyst on right ovary(Sandra2011 et.al 2000)

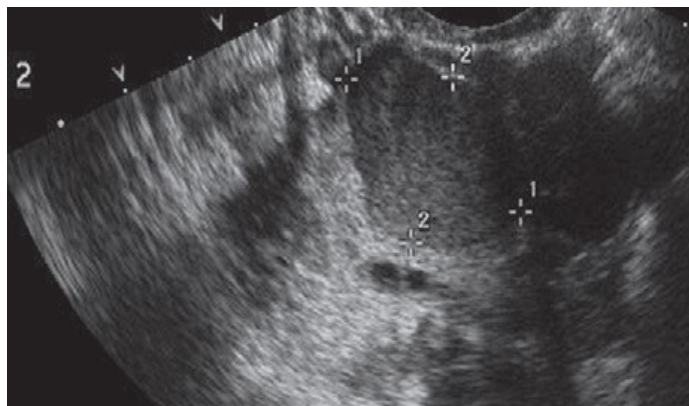
2.3.8Cystadenoma (Serous and Mucinous): Cystadenomas:

These cysts form from cells on the outer surface of ovary. They are often filled with a watery fluid or thick, sticky gel. They can become large and cause pain. (Sandra2011 et.al 2000)

Together, serous cystadenomas and cystic Teratoma comprise most neoplasms of the ovary. 1, 6, 10 Approximately 50% to 70% of serous cystadenomas are benign, occurring more often in women in their forties and fifties as well as during pregnancy.¹ Patients are often asymptomatic. These types of ovarian neoplasms are often large and bilateral. The sonographic appearance of serous cystadenomas is that of a predominately anechoic lesion that contains septations. (Sandra2011 et.al 2000)

Mucinous cystadenomas are often larger than serous cystadenomas and can even reach sizes up to 50 cm.⁶ Mucinous cystadenomas also tend to have septations and papillary projections like serous cystadenomas, but are not as often bilateral. A supportive sonographic distinguishing factor is the presence of internal debris within the mucinous cystadenoma, secondary to the solid components of the material contained within it.

The clinical presentation of these masses is unpredictable, with patients often complaining of pel contain many types of cells. They may be filled with hair, teeth, and other tissues. (Sandra2011 et.al 2000)



Fig(2-8) cyst adenoma on left ovary(Sandra2011 et.al 2000)

2.3.9Teratoma: Cystic Teratoma (Dermoids):

The most common benign ovarian tumor is the cystic Teratoma, or dermoid cyst.⁶ Dermoids result from the retention of an unfertilized ovum that differentiates into the three germ cell layers. Therefore, these germ cell tumors are composed of ectoderm, mesoderm, and endoderm.

Because of the combination of these germ cells, a cystic Teratoma may contain any number of tissues, including glandular thyroid components, bone, hair, sebum, fat, cartilage, and digestive elements. They frequently will contain fully formed or rudimentary teeth as well. Dermoid are commonly found in the reproductive age group but may also be found in postmenopausal patients.⁶ Patients are most often asymptomatic but may suffer from pain associated with torsion or rupture of the mass, the latter of which can lead to peritonitis. Dermoid also have the capability of malignant degeneration These cysts form from cells on that become part of the cyst. They can become large and cause pain. (Sandra2011 et.al 2000)

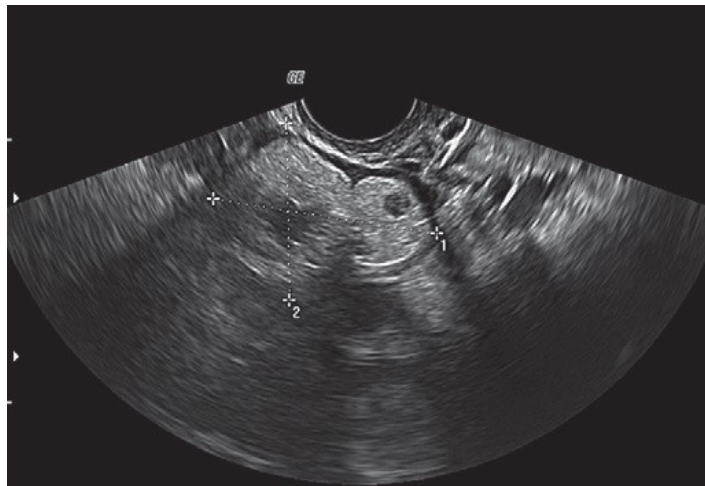


Fig (2-9) dermoid cyst on right ovary(Sandra2011 et.al 2000)

2.3.10 Polycystic Ovarian Syndrome:

(PCOS), which includes Stein-Leventhal syndrome (infertility, oligomenorrhea, hirsutism, and obesity), is an endocrine disorder associated with chronic anovulation. An imbalance of LH and FSH results in abnormal estrogen and androgen production.

The serum LH level is high and the FSH level is low. An elevated LH/FSH ratio is characteristic. Pathologically, the ovaries are rounded, usually two to five times normal size, with an increased number of follicles. Clinically, PCOS encompasses a spectrum of findings from hyperandrogenism in lean, normally menstruating women to obese women with severe hirsutism and oligomenorrhea or amenorrhea, as originally described by Stein and Leventhal.

Manifestations of unopposed estrogenic hyperplasia and endometrial carcinoma occur in a significant proportion of patients, so long-term follow-up is recommended.

PCOS is a common cause of infertility and a higher-than-usual rate of early pregnancy loss. (Sandra 2011 et.al 2000)

Sonographic Findings. On sonography, the ovaries appear normal or enlarged with echogenic stroma. Multiple small follicles are seen, often bilaterally, in the size range of 5 to 8 mm. The reported number of immature follicles varies in the literature from 11 to less than 15. The ovaries have a more rounded shape, with the follicles usually located peripherally, commonly referred to as the “string of pearls.” Small cysts of variable size can also occupy both the sub capsular and stromal parts of the ovary. It is the multitude of these small cysts that contributes to the enlarged size of the ovary. Transvaginal sonography is more sensitive for detecting these small follicles than is transabdominal scanning. The diagnosis of PCOS is usually made biochemically, but sonography is useful. Serial studies show the follicles persist because ovulation does not occur. (Sandra 2011 et.al 2000).

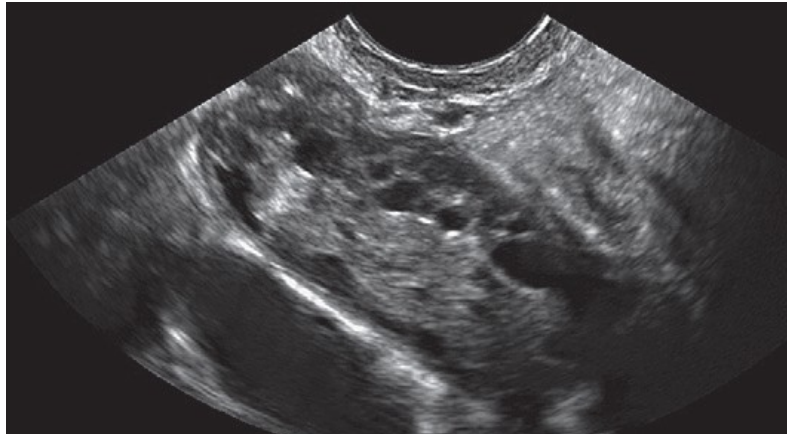
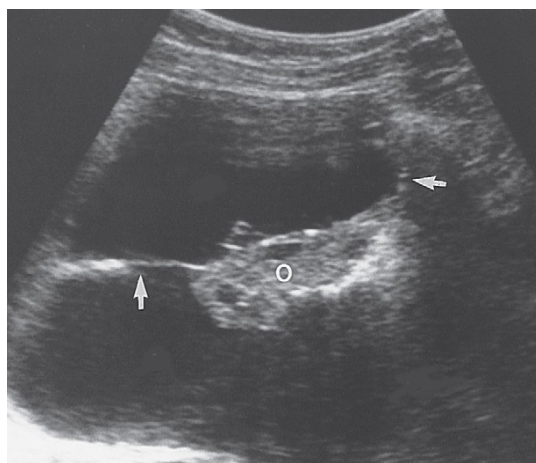


Fig (2-10) mutable follicle on right ovary(Sandra2011 et.al 2000)

2.3.11Peritoneal Inclusion Cysts:

Peritoneal inclusion cysts are lined with mesothelial cells and are formed when adhesions trap peritoneal fluid around the ovaries, resulting in a large adnexal mass. Clinically, most patients have pelvic pain or a pelvic mass.

Sonographic Findings. Peritoneal inclusion cysts (benign cystic mesothelioma) are multiloculated cystic adnexal masses. The diagnosis must include the presence of an intact ovary either within or on the margin of the cyst. The fluid may contain echoes as a result of hemorrhage or proteinaceous fluid (Sandra2011 et.al 2000)



Fig(2-11) peritoneal inclusion cyst on right ovary (Sandra2011 et.al 2000)

symptoms of ovarian cysts:

A: Many ovarian cysts don't cause symptoms. Others can cause:

- pelvic pain and pressure, swelling, or pain in the abdomen, problems passing urine completely ,pain during sex , weight gain , pain during your period , abnormal bleeding , nausea or vomiting and breast tenderness
- An ultrasound. This test uses sound waves to create images of the body.

With an ultrasound, the doctor can see the cysts:

- shape
- Size
- location

2.4Trans Vaginal Ultrasound transducer:

The inclusion of the transvaginal (TV) transducer in standard gynecologic sonography protocols has vastly improved the effectiveness of the pelvic exam. This exam allows the sonographer and physician a better visual survey by shortening the distance from the transducer to the ovaries, uterus, and adnexal regions. The resolution of pelvic structures has improved and the ability to zoom in on smaller objects has been enhanced. This advance in technology brings with it more frequent detection of small tissue differences.



Fig(2-12)

An electronic array transvaginal transducer

2.4.1 Patient Instructions:

After the transabdominal study is completed, the patient is asked to empty her bladder completely. If the bladder is very full from all the fluids ingested before the examination, the patient may void and think the bladder is “empty” because it had been difficult to hold so much urine during the transabdominal ex. Ask the patient to wait a few seconds amination ex. Ask the patient to wait a few seconds amination after her bladder has been emptied and try to void again; this technique is usually successful in completely emptying the bladder. If the bladder is not completely empty, reverberation artifacts may obscure crucial structures, and problem areas may be pushed too far away from the transducer. This is also an opportune time to reiterate the transvaginal procedure, obtain a verbal consent, and answer any questions the patient may have.█

2.4.2 Probe Preparation:

The TV transducer is prepared with coupling gel on the transducer face and then covered with a sterile probe cover. Currently most institutions are using latex-free probe covers to prevent allergic reactions in latex-sensitive patients. Instruct the patient that only a short portion of the end of the transducer is introduced into the vaginal canal, because the length of the probe can be intimidating. After the protective sheath has been put on, any air bubbles should be eliminated to prevent artifacts. A sterile external lubricant is then applied to the outside of the probe cover. This provides lubrication for insertion of the probe and is especially important in older women. If the examination is performed on an infertility patient, the use of water to lubricate the transducer is preferred because water does not have a negative effect on sperm mobility.

2.4.3 Examination Technique:

After the patient has completely voided, she is asked to undress from the waist down, given a gown, and covered with a sheet. The patient position should be supine, knees gently flexed, and hips elevated slightly on a pillow or folded sheets and feet flat on the table, approximately shoulder length apart. The head and shoulders are slightly elevated with a pillow. A slightly reversed Trendelenburg's position may be helpful in lowering the pelvic organs to enhance visualization and detect free intraperitoneal fluid that gravitates to the posterior cul-de-sac. Current ultrasound after her bladder has been emptied and try to void again; this technique is usually successful in completely emptying the bladder. If the bladder is not completely empty, reverberation artifacts may obscure crucial structures, and problem areas may be pushed too far away from the transducer. This is also an opportune time to reiterate the transvaginal procedure, obtain a verbal consent, and answer any questions the patient may have. (Sandra2011 et.al 2000)

An adequate explanation of the procedure is essential. Many patients are apprehensive at any mention of an "internal" examination, and the referring physician may not have explained the possibility of having one. It is important to explain why it is necessary to perform the transvaginal exam and to stress that the examination is a simple, usually painless procedure and that only part of the probe is inserted. Many labs require a verbal or written consent from the patient and examiner for the transvaginal examination. If the examiner is a male, it is essential to have a female staff member in the room during the examination to act as a chaperone. Transvaginal sonography is performed using transducer frequencies of 7.5 MHz or more. These higher frequencies have better near-field resolution, which often permits greater detail of the uterus and adnexal anatomy. (Sandra2011 et.al 2000)

The primary disadvantage of high-frequency transvaginal ultrasound is the limited field of view and penetration

2.4.4 Scanning Planes:

When inserting the transducer in the sagittal plane, the flat part of the transducer is along the top surface of the handle so that the beam is projected in the midline anteroposterior aspect of the body. From the sagittal plane, the transducer is limited in motion because of the vagina. True parasagittal planes are never obtained, but angulation from this central point is considered sagittal imaging. As in the TA examination, oblique angulation is often necessary to visualize the entire uterus and cervix. Sagittal plane. Cervix, end cervical canal, posterior cul-de-sac, uterus (midline, right, and left), endometrium, right ovary and adnexa, and left ovary and adnexa. Coronal plane. Vagina, cervix and posterior cul-de-sac, uterine corpus and endometrium, uterine fundus and endometrium, right ovary and adnexa, and left ovary and adnexa. (Sandra2011 et.al 2000)

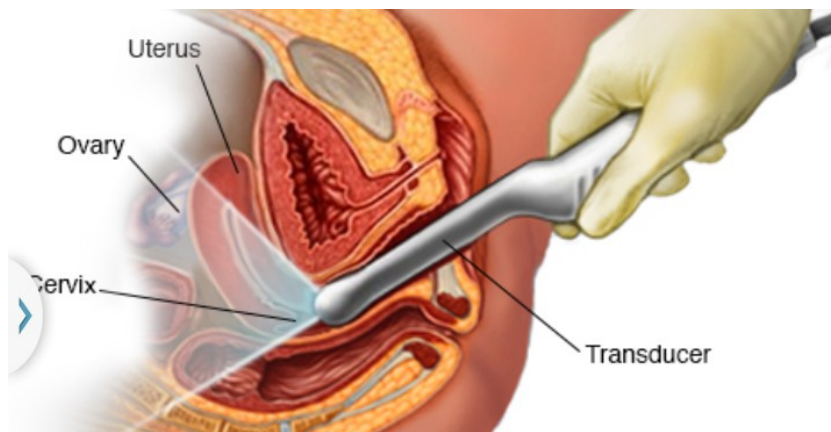


Fig (2-12) Endovaginal (Transvaginal) procedure (Sandra2011 et.al 2008)

2.4.5 Advantage of tranasevaginal ultrasound:

- 1) Perform with pt empty bladder
- 2) Improve resolution and tissue characterization
- 3) Method for evalution.obese patient
- 4) More using patient with bowel ileus or abdominal drain
- 5) Better method for Doppler image
- 6) Better method for guidance procedure
- 7) Better method for direct needle guidance

- 8) Better method for topic pregnancy
- 9) Better method to detect cervix and lower uterus
- 10) Better method for detect placenta prevail
- 11) It is proper for evaluation the ovary
- 12) Monitor infertility disorder

2.2 Previous study:

Describe the role of Tran's vaginal Transducer to assess ovarian cyst in reproductive age was performed by journal obstetrics and gynecology 2013 by Maatha (the scope of this review is to focus on the management of benign ovarian cyst in reproductive age group of woman undergoing art ovarian cyst are common occurrence in this patient population. hemorrhagic cyst is common ovarian cyst the appropriate evaluation include medical history and physical examination, laboratory test and imaging.

There is local study, The role of transvaginal ultrasonography in adnexal pathology. Prepared by Mawia Hamid Awadelkarim, master (M.Sc) in medical diagnostic Alzeam Alazhari University, 2006-2008. The result shows most of the female patients having pcog poly cystic ovary disease are age in the range of 25-34 years old, and the shows pcog poly cystic ovary disease have significant relationship with age and weight variable among nulliparas examined. but different with me in number of patient. Also I found other study have same name it is local study from Alzeam Alazhari University, 2012. The result shows most of the female patients having pcog poly cystic ovary disease.

Chapter Three

Material and Methods

Chapter Three : Material and Methods

3.1Methodology:

3.1.1Study area:

Ultra sound department in Saudi hospital , Asia hospital ,alahfad center and omdurman military hospital .

3.1.2Study population:

Handered woman in reproductive age come to ultrasound department for routine follow up.

3.1.2.1inclision :

Married woman

3.1.2.2exclsion:

Non married woman

3.1.3Method of study:

Ultrasound machine . mindaray Digital Ultrasound Diagnostic imaging system .

656/MG563.5MH-5MH Model: DP-20 Model: DP-20 Model DP-20 QM:26000264 .

Sonoscope: GAIN 160PWR , FREQUANCE 7.8 .

Examined is used T.V.S for Marred patient.

gently and move it to right left to see uterus and ovaries. In this study we use transvaginal technique

- **Preparation:**

Empty bladder of pt .remove skirt and under wear strilise the table and external genitalia and tools(tvs) ,use condom on prop apply jell before and after.

- **Patient position:**

We Put patient on tender buy position.

We insert the prop in to vaginal orifice we move it to right and left to visualize uterus and both ovary clearly.

Chapter Four

Results

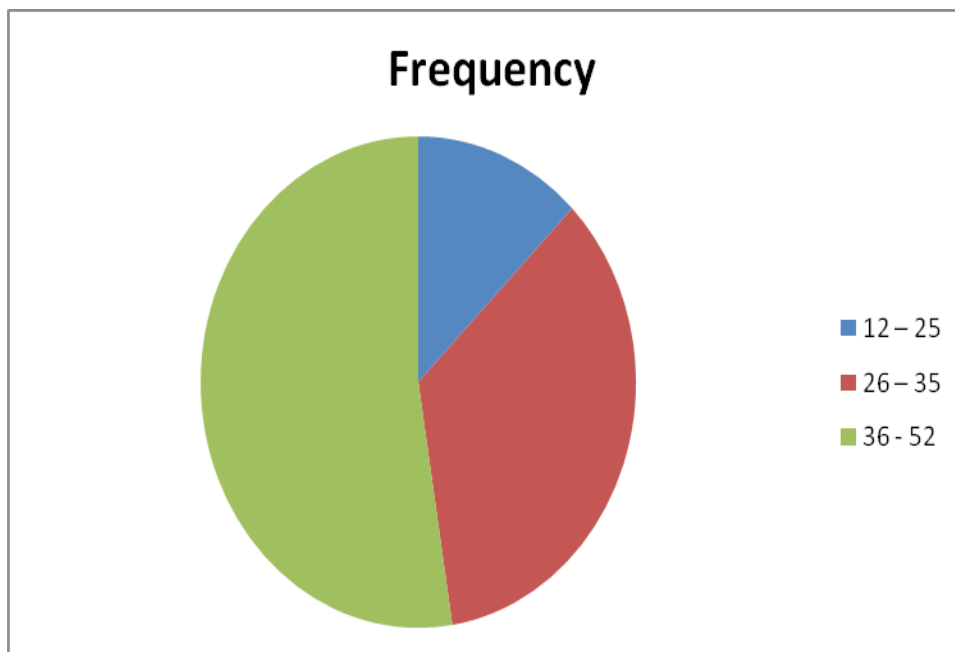
Chapter Four :Results

4.1Result

The following table and graphs show summary of result include distributing or incidence ovarian cyst among Sudanese women in reproductive age (14-52) year.

table(4.1) Showing Distribution of age in patient

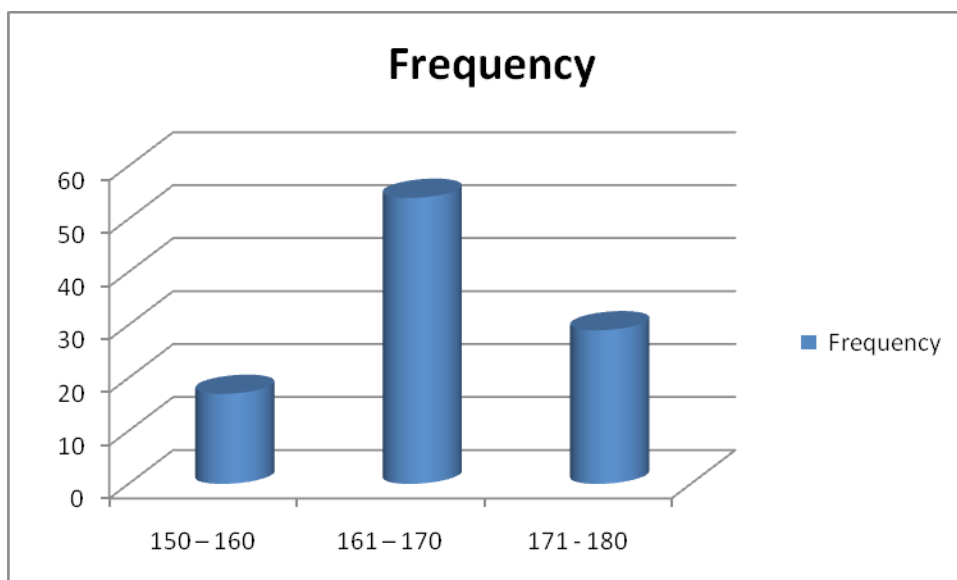
Age (years)	Frequency	Present	Valid Present	Cumulative Present
25 – 12	15	15%	15%	15%
35 – 26	42	42%	42%	57%
52 – 36	63	43%	43%	100%
Total	100	100%	100%	



figer(4.1)Showing Distribution of age in patient

table (4.2)Show the Height Distribution in patient:

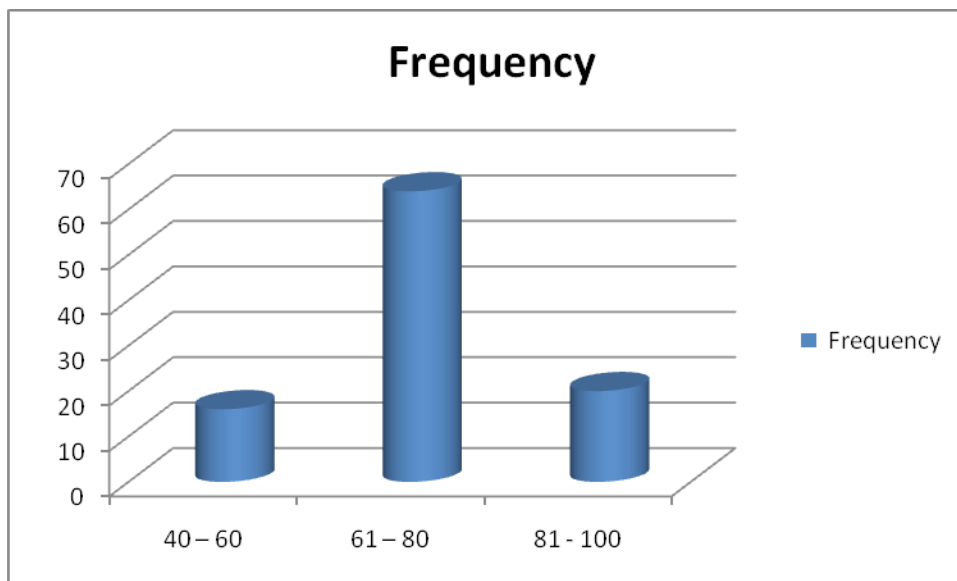
Height (cm)	Frequen cy	Present	Valid Present	Cumulative Present
160 - 150	17	17%	17%	17%
170 - 161	54	54%	54%	71%
180 - 171	29	29%	29%	100%
Total	100	100%	100%	



figer (4.2)Show the Height Distribution in patient:

table(4.3) Weigh Distribution in patient Show the.

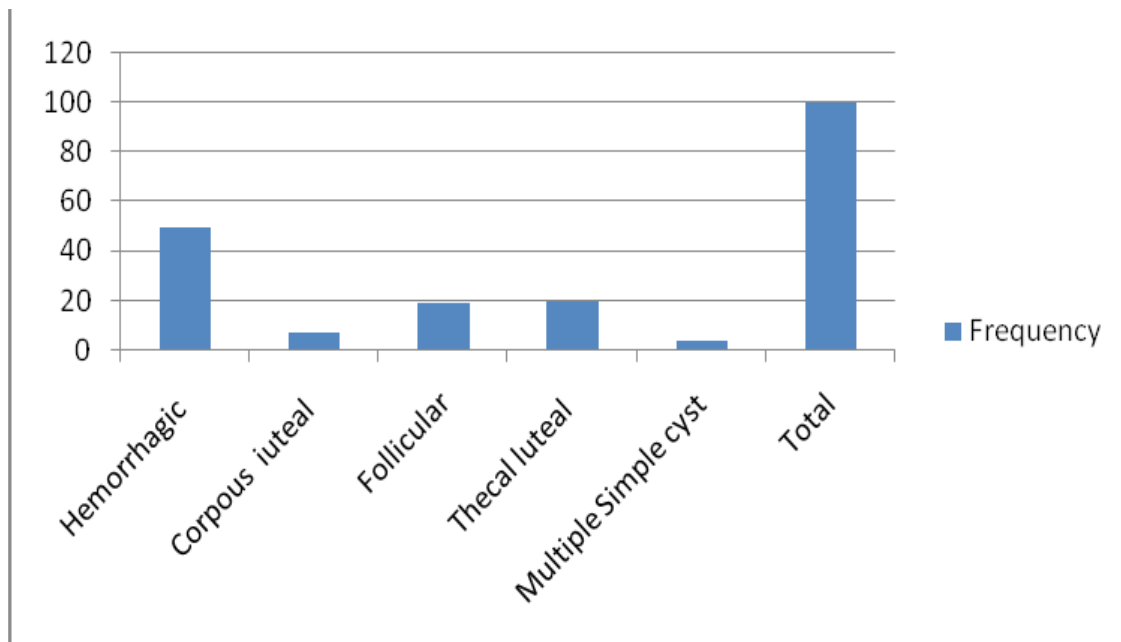
Weigh (kg)	Frequen cy	Present	Valid Present	Cumulative Present
60 - 40	16	16%	16%	16%
80 - 61	64	64%	64%	80%
100 - 81	20	20%	20%	100%
Total	100	100%	100%	



Weigh Distribution in patient Show the (4.3)figer

table (4.4)**Ultrasound Finding Show the Distribution in patient (Cyst Type)**

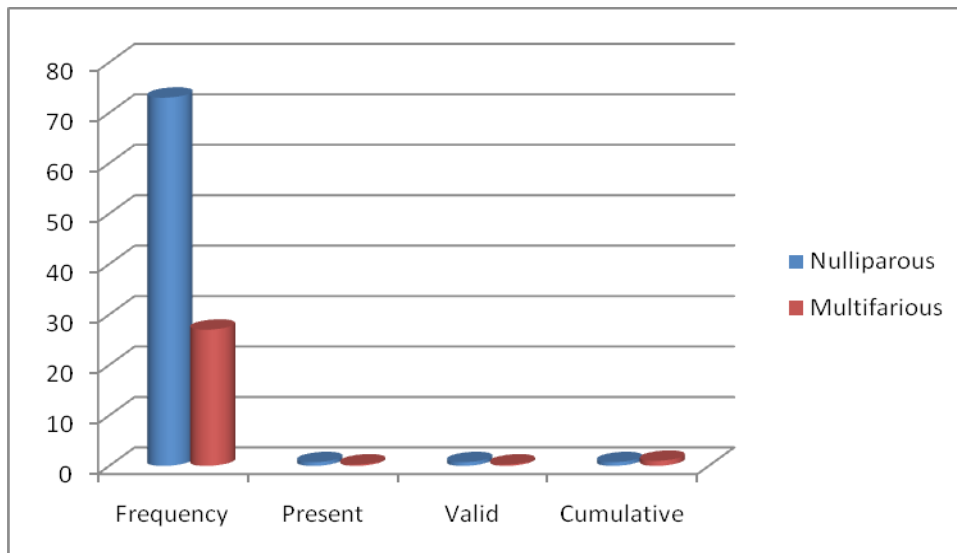
Cyst Type	Frequen cy	Present	Valid Present	Cumulative Present
Hemorrhagic	50	50%	50%	50%
Corpus luteal	7	7%	7%	27%
Follicular	19	19%	19%	76%
Thecal luteal	20	20%	20%	96%
Multiple Simple cyst	4	4%	4%	100%
Total	100	100%	100%	



fig(4.4)Ultrasound Finding Distribution in patient (Cyst Type)

table(4.5) Show the Parity Distribution in patient

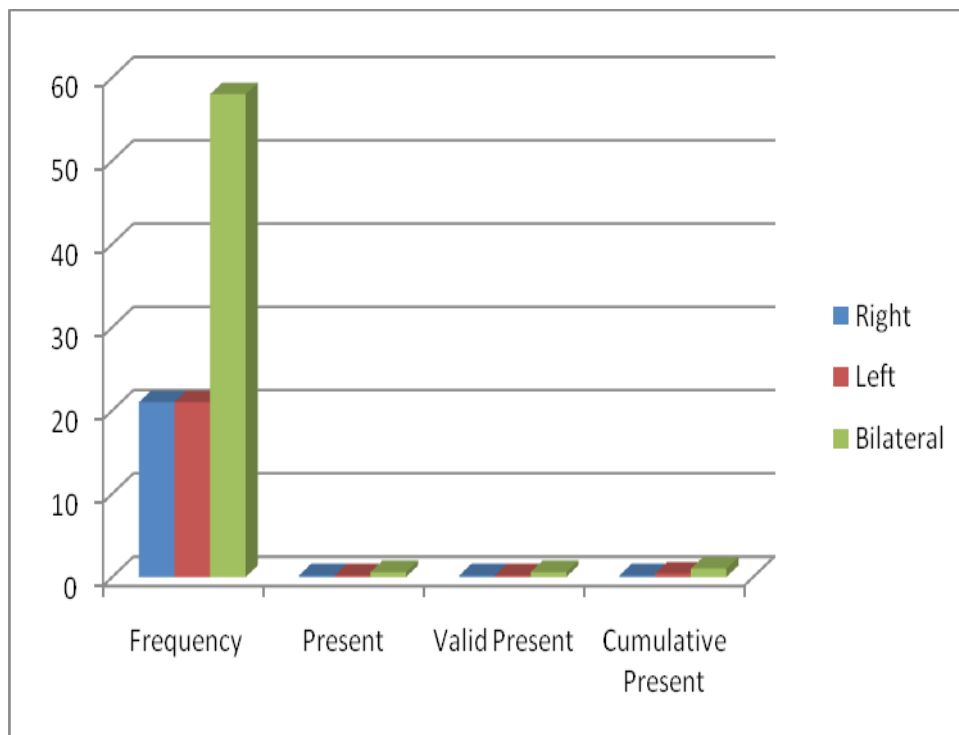
	Frequency	Present	Valid	Cumulative
Nulliparous	73	73%	73%	73%
Multifarious	27	27%	27%	100%
Total	100	100%	100%	



figer(4.5) Show the Parity Distribution in patient

table (4.6)Ultrasound Finding Show the Distribution in patient(cyst location)

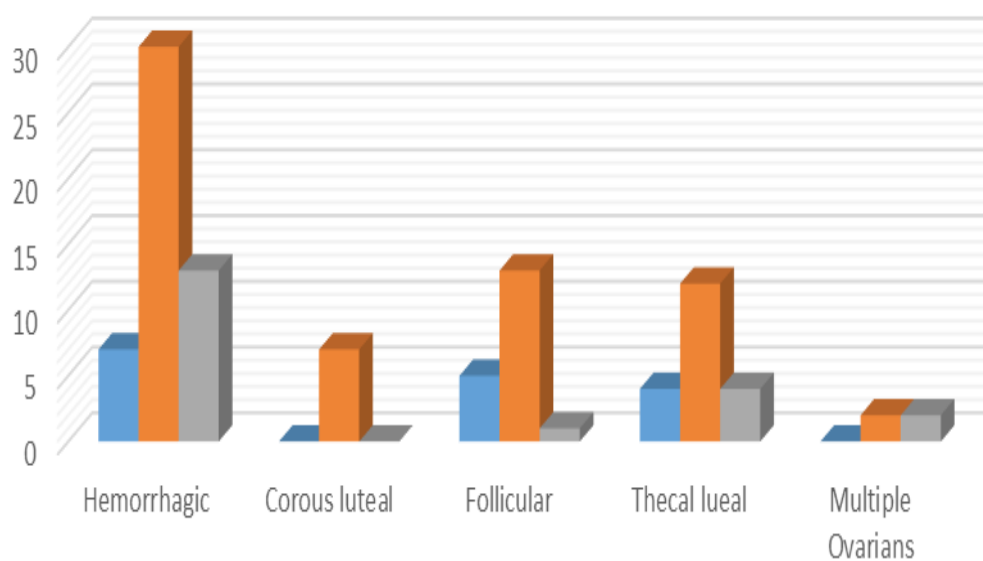
Cyst location	Frequen cy	Present	Valid Present	Cumulative Present
Right	21	21%	21%	21%
Left	21	21%	21%	42%
Bilateral	58	58%	58%	100%
Total	100	100%	100%	



**Ultrasound Finding Show the Distribution in patient(cyst(4.6)
(location**

Table (4.7): Show relation between weight and type of cyst in patient

Type of cyst						
Weight ((kg	Hemorrhagic	Corous luteal	Follicular	Thecal luteal	H emorrhagic	total
40- 60	7	0	5	4	0	16
61- 80	30	7	13	12	2	64
81- 100	13	0	1	4	2	20
Total	50	7	19	20	4	100



Figur (4.7): Show relation Relation between weight and type of cyst in patient

table (4.7) : Shows relation Relation between weight and type of cyst in patient

((Chi- Square Test.)4.7

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.271 ^a	8	.728
Likelihood Ratio	5.496	8	.703
Linear-by-linear Association	.152	1	.696
N of Valid Cases	100		

a. 8 cell (53.3%) have expected count less than 5. The minimum expected count is .68

Chapter Five

Discussion, Concolusion and Recommendation

Chapter Five

Discussion, Conclusion and Recommendation

5.1 Discussion

One hundred Sudanese female married patients were investigated in Saudi hospital and Asia center , alselah altebee and alahfad center.

Enrolled in this study in order to determine common incidence of cystic ovarian diseases in Sudanese women in reproductive age.

The study showed that transvaginal ultrasound is most sensitive, specified, useful and practical imaging test for detection of cystic ovarian information about presence of cyst and more over about the type of cyst.

The study showed that, the most common cystic ovarian in Sudanese women is hemorrhagic cyst with high percentage which was (50) 50% followed by thecal luteal cyst which was (20) 20%, followed by follicular cyst which was (19) 19%, followed by corpus luteal cyst which was (7) 7% and finally polycystic ovarian disease which was (4) 4% table (4-4).

On this study we found that the most common type of cyst was hemorrhagic associated with the most heavy and tall (64) (61-80) Kg And 54 which was 54% (161-170) cm respectively and hemorrhagic cyst. This result was same as obstetrics and gynecology 2013 by Martha found that that the hemorrhagic cyst was most common type of cyst .(journal obstetrics and gynecology 2013)

.We found the null paras women were more affected by cystic lesion 73 patient (73%) than multigravida only 27 patient (27%) because the multigravida ovaries were active so less formation of cyst lesion table (4.5)
The left and right ovary were same affected types of cyst .that mean

The percent of both ovaries as same 50%-50 table (4.6)

There were same obvious study Prepared by Mawia Hamid Awade Alkarim , master (M.SC) in medical diagnostic Alzeam Alazhari university.2006-2008 . The results shows the common adenexal masses was having polycystic ovary disease and shows also transvaginal ultrasound was most sensitive, specific, useful and practical test for detection of adenxal masses with high degree of confidence and very few limitation.(pcog) is the most due to small volume . I found other study have same name it is local study from Alzeam Alazhari University, 2012. The result shows most of the female patients having (pcog) poly cystic ovary disease she differentiate in age of patient

- So the age and height and weight nullparas the pre disposing factor for cystic lesion on ovarian.
- The hemorrhagic type was the most type of cyst.
- Trans vaginal scan the more accurate technique than trans abdominal scan son that any married female in reproductive age with sign and symptoms of infertility should be investigated by Transvaginal scan.

5.2Conclusion:

- In general cystic ovarian disease in Sudanese woman in reproductive age was high incidence.
- The study confirmed the hemorrhagic ovarian disease was most common type of cystic ovarian disease and have high in reproductive age compared to other cystic ovarian disease.
- Transvaginalultrasound transducers modality of choice of gynecology examination noninvasive sensitive low cost imaging high degree of confidence and very few limitations.

5.3Recommendation

- Tran's vaginal ultrasound have high accuracy for detection the gynecology.
- The Trans vaginal transducer must be covered with disposable barrier prior to insertion to avoid the infection.
- The sonographer must be train to give accursed result of the patient scan examination.
- As we are muslim country we must use tvs only for married woman .
- Trans vaginal scan the more accurate technique than trans abdominal scan that any married female in reproductive age with sign and symptoms of infertility should be investigated by transvaginal scan.

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Sudan university

Faculty of radiological science a medical farming

1- Name:.....

2- Age:

3- Weight:

4- Height:

Appendices

استبيان عن حالات انتشار تكيس المبايض لدى السودانيات في عمر الإنجاب(12-
52):

1- الاسم:.....

2- العمر:.....

3- الوزن:.....

4- الطول:.....

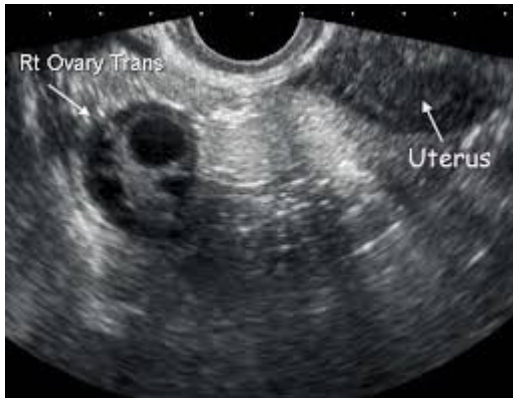
Sonographic finding

1\cyst location

Rt () Lt () Bilatral ()

2\Cyst size

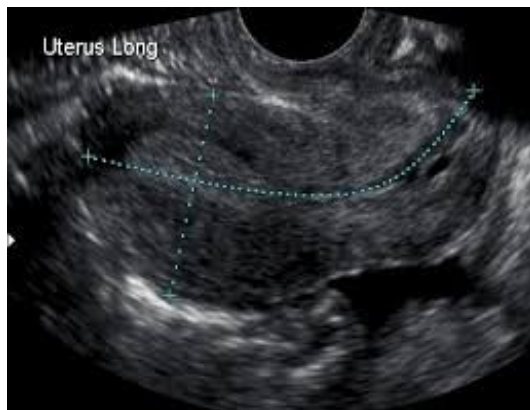
3\Cyst Type



fig(5.1)femal33years have RT ovary Polly cystic ovary disease.



Fig(5.2)female 21 years old have RT ovary corbus luteum cyst .



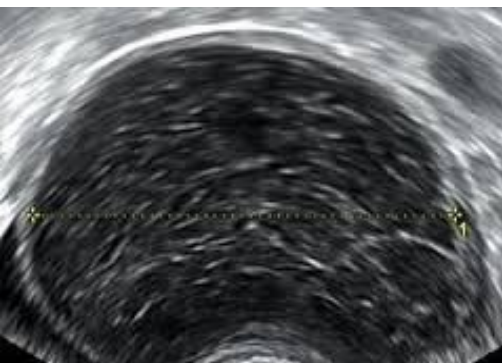
Fig(5.3) female 27 years old have RT ovarian cyst with elongation of the uterus



Fig (5.4)female 42 years old have thecaluteal ovarian cyst on left ovary .



Fig(5.5)femal37years old have LT ovarian simple cyst .



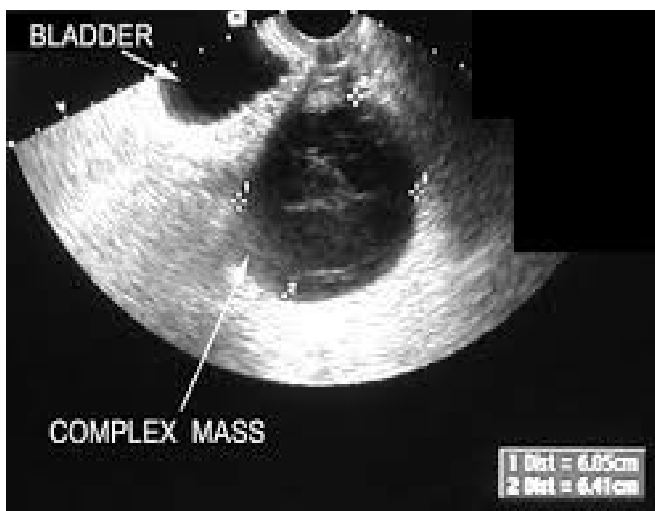
fig(5.6) female 35 years old have RT hemorrhagic ovarian cyst .



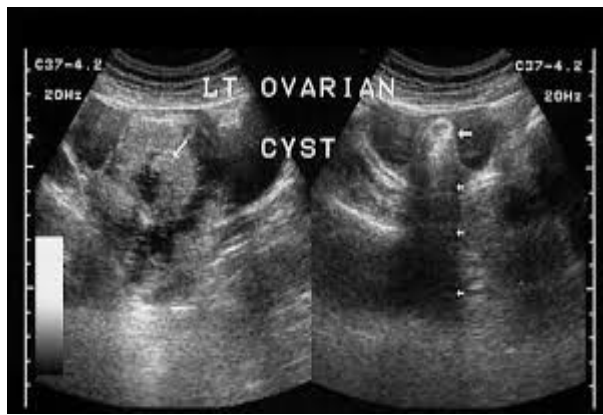
Fig(5.7) female 42 year old have Bi lateral ovarian cyst .



Fig(5.8) female 25 years old have hemorrhagic cyst



Fig(5.9) femal 19 years old have complex mass (dermoid cyst)



Fig(5.10)female 26 years old have LT ovarian cyst (dermoied cyst)

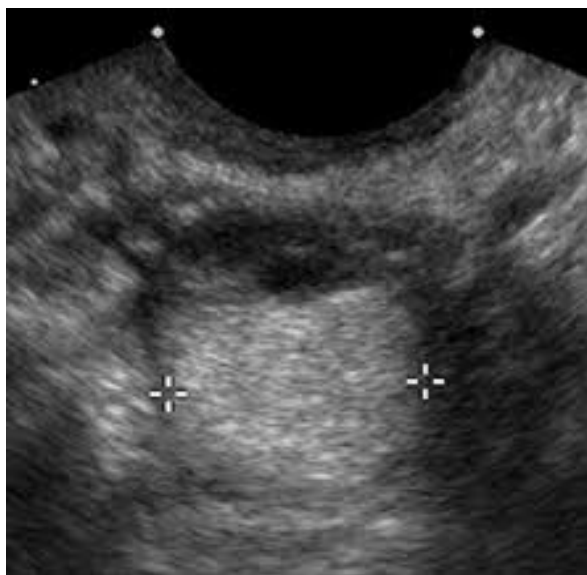


Fig (5.11)femal 34 years old have LT ovarian cyst .



Fig(5.12)femal53 years old have LTovary poly cystic ovary disease



Fig (5.13) femal 28 years old have LThemorragic ovarian cystB

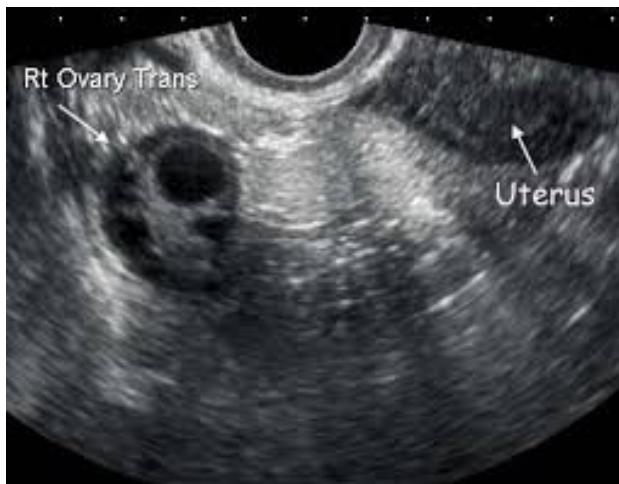


Fig (5.14) female 44 years old have RT poly cystic ovarian disease



Fig(5.15) female 37 years old have RT ovarian cyst



Fig(5.16) female 19 years old have RT ovarian cyst.

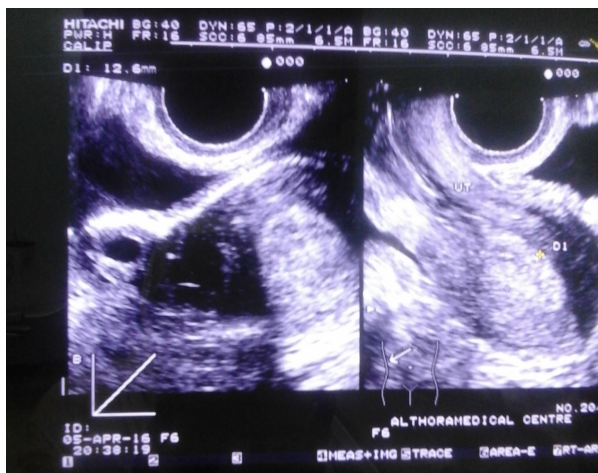


Fig (5 .17) female 22years old ovarian cyst .



Fig(5.18) female 35 years old desmoid cyst



Fig(5.19)female 37 years old ovarian cyst .



Fig(5.20)female 45 years old have ovarian cyst .