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SUDAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

College of Graduate Studies

Evaluation of late stage pregnancy bleeding using Ultrasoud

تقويم النزيف في المراحل الأخيرة من الحمل باستخدام الموجات فوق الصوتية

Thesis submitted for partial fulfillment Master (M.Sc)degree in medical diagnostic ultrasounography

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بسم الله الرحمن الرحيم

الآيات

قال تعالى :

1. (خَلَقَكُم مِّن نَّفْسٍ وَاحِدَةٍ ثُجَّعَلَ مِنْهَا زَوْجَهَا وَأَنزَلَ لَكُم مِّنْ الأَنْعَامِ ثَمَانِيَةَ أَزْوَاجٍ يَخْلُقُكُمْ فِي بُطُونِ أُمَّهَاتِكُمْ خَلْقًا مِن بَعْدِ خَلْقٍ فِي ظُلُمَاتٍ ثَلاثٍ ذَلِكُمُ اللَّهُ رَبُّكُمْ لَهُ الْمُلْكُ لا إِلَهَ إِلاَّ هُوَ فَأَنَّى تُصْرَفُونَ (6).) الزمر

2. (إِنَّ اللَّهَ لاَ يَخْفَى عَلَيْهِ شَيْءٌ فِي الأَرْضِ وَلاَ فِي السَّمَاءِ (5) هُوَ الَّذِي يُصَوِّرُكُمْ فِي الأَرْحَامِ كَيْفَ يَشَاء لاَ إِلَهَ إِلاَّ هُوَ الْعَزِيزُ الْحَكِيمُ (6)). آل عمران

3. (اللَّهُ يَعْلَمُ مَا تَحْمِلُ كُلُّ أُنثَى وَمَا تَغِيضُ الأَرْحَامُ وَمَا تَزْدَادُ وَكُلُّ شَيْءٍ عِندَهُ بِمِقْدَارٍ (8) عَالِمُ الْغَيْبِ وَالشَّهَادَةِ الْكَبِيرُ الْمُتَعَالِ (9))الرعد .

صدق الله العظيم

Dedication

I dedicate this work to spiritof my father and my mother. And to my family, teachers and friends.

You are always in mind and that encourages me to do the best in my life.

Acknowledgments

I first and mostly thank God for enabling me to complete this work . I sincerely thank Dr. Mona Ahmed Mohammed, the supervisor of my thesis for her continuous help, supervision and guidance.

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Many thanks to the staff of the Elsaudi Hospital especially the X- Ray and Ultrasound Department staff for their help and co-operation to achieve my work .

And last but not least I would like to thank the panel who are here today to discuss my thesis .

Abstract

This study is looking into the ultrasound findings of the causes of vaginal bleeding in late pregnancy in Elsaudi Hospital in Omdurman city.

The objective of this study was to determine the causes of vaginal bleeding in late pregnancy to find out Sonographical markers if any. It was carried out on 30 pregnant women complaining of vaginal bleeding in the second and third trimester in Omdruman city Hospital. The study was conducted from June to November 2014. The machine used in the study was Toshiba with 3-7.5 MHz , probes were convex with frequencies ranging from 3-4MHz and convex with frequencies up to 7.5 MHz. All pregnant women were prepared by emptying their bladders and using trans-

abdominal and trans-vaginal probes for scanning, women were scanned in supine position.

This study, concluded that placenta previa is the commonest cause of late pregnancy vaginal bleeding which is constitute 53.3%, other causes of vaginal bleeding include placenta abruption, 45.6% and uterine trauma 1.1% .

The study also revealed that the incidence of vaginal bleeding in late pregnancy is more common in patients aged 18 to 37 years.

The study showed that most pregnant women were multigravida (83.3%) and the majority were from lower socioeconomic class (63.3%).

ملخص البحث

هــذا البحــث اهــتم بدراســة نتــائج الموجــات فــوق الصــوتية لحــالات النــزف المهبلــي الغيــر طبيعــي فــي مدينــة امــدرمان. إن الهــدف مــن هــذه الدراســة هــو الكشــف عــن أســباب النــزف المهبلــي الغيــر طبيعــي بواســطة الموجــات فــوق الصــوتية. عــدد الحوامــل الــذين أجريــت علــيهم الدراســة ثلاثــون حامــل يعــانين مــن النــزف المهبلــي الغيــر طبيعــي فــي مستشــفى امــدرمان . هــذه الدراســةِ أجريــتْ فــي الفتــرة مــن يونيــو إلــى نــوفمبر 2014م . الجهــاز الــذي أســتعمل فــي هــذه الدراســةِ توشــيبا وأمــا المســبار كَــان محــدّب بتــردد يتــراوح مِــن3- 4 ميغــاهيرتز واخــر بتــردد 7,5 ميغــاهيتز. جميــع الحوامــل تــم تحضــيرهن بعــدم مــلء المثانــة وباســتخدام المسبار البطني والمهبلى. كُلّ الحوامل تم َسحهن فى وضع الاستلقاء على الظهر.

خلصت الدراسة إلى أن السبب الرئيسى فى النزف المهبلى الغير طبيعى هو مشكلات حالا ت تقدم المشيمه التى شكلت 53,3%, من الاسباب. أما العوامل الاخرى فتمثلت فى انفصال المشيمه 45,6% والاصابه 1,1%.

وتوصلت الدراسة إلى أن معظم الحوامل اللاى يعانين من النزف المهبلى الغير طبيعى كانت اعمارهن ما بين(18-37) سنه .

وأظهرت الدراسة أن نسبة النزف المهبلى الغير طبيعى عالية بين ربات البيوت والاى انجبن اكثر من مره وتصل نسبتهن إلى 83,3% والنسبة مرتفعة فى دوات الدخل المنخفض ويمثلن 63,3% .

List of abbreviations:

CL	**Corpus Luteum**
DUB	**Dysfunction Uterine Bleeding**
EP	**Ectopic Pregnancy**
EH	**Endometrial Hyperplasia**
GTD	**Gestational Trophoblastic Disease**
HCG	**Human Chorionic Gonadotripin**
HM	**Hydatidiform Mole**
IUCD	**Intra Uterine Contraceptive Device**
IUFD	**Intra Uterine Fetal Death**
KHz	**Kilo Hertz**

PPH **Post Partum Hemorrhage**

PCOD **Polycystic Ovarian syndrome Disease**

SPSS **Statistic Package for Social Studies**

TAS **Trans Abdominal Sonogram**

T VS **Trans Vaginal Sonogram**

AUB **Abnormal Uterine Bleeding**

Ca **Cancer**

V.B **Vaginal Bleeding**

M.C **Menstrual Cycle**

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Chapter 1

Introduction

Chapter one

INTRODUCTION

1-1 Introduction

Bleeding may occur at various times in pregnancy. Although bleeding is alarming, it may or may not be a serious complication. The time of bleeding in the pregnancy, the amount, and whether or not there is pain may vary depending on the cause. Bleeding in the first trimester of pregnancy is quite common and may be due to the following Miscarriage (pregnancy loss) Ectopic pregnancy (pregnancy outside the uterus, usually in the fallopian tube) Gestational trophoblastic disease (a rare condition that may be cancerous in which a grape-like mass of fetal and placental tissues develops) Implantation of the embryo in the uterus Infection Bleeding between the uterine wall and placental membrane (sub chorionic hemorrhage or hematoma) Normal changes in the cells of the cervix due to pregnancy(Richard S- 2007)

The initial management of significant bleeding in late pregnancy is similar regardless of the etiology. Visual estimates of blood loss should be recorded but may be inaccurate or fail to account for concealed hemorrhage. Hypotension, tachycardia, and maternal symptoms of hemodynamic instability are ominous indicators, and women with these signs require immediate intravenous access, fluid resuscitation, and the availability of blood products. Baseline laboratory

tests include hematocrit, platelet count, fibrinogen level, coagulation studies, blood type, and antibody screen. Women who are Rh negative should receive Rh (D) immune globulin (Rhogam); a Kleihauer-Betke test should be performed to determine the appropriate dose; Continuous fetal monitoring is recommended. Decelerations or loss of variability may resolve with adequate maternal resuscitation; however, a persistently no reassuring fetal heart rate tracing may require urgent cesarean delivery before the etiology of the hemorrhage is established

Under normal circumstances, a woman's uterus sheds a limited amount of blood during each menstrual period; bleeding that occurs between menstrual periods or excessive menstrual bleeding is considered to be abnormal vaginal bleeding. Once a woman enters menopause and the menstrual cycles have ended, any bleeding, other than the small amount that may occur in women on hormone therapy, is considered abnormal. (Richard S- 2007)

Vaginal bleeding can occur during pregnancy for many reasons, Twenty to twenty-five percent of women have spotting or bleeding during pregnancy. This can be caused by many reasons, some women have implantation bleeding during early pregnancy. This usually occurs during the first few weeks of pregnancy. You may notice slight bleeding around the time of the period was supposed to arrive. This happens because the fertilized egg is attaching to the uterine wall. Sometimes light bleeding or brown spotting will follow this. (Mohan H – 1999)

In general any vaginal bleeding that is not normal menstrual bleeding may be abnormal and must be investigated, as excessive heavy menstrual bleeding (menorrhagia), all types of miscarriage, all types of placenta previa and abruption placenta, fibroids and polyps, ectopic pregnancy and molar pregnancy, cancer of the cervix, cancer of the uterus, IUFD and ovaries Masses others like perforation of the uterus due to surgery or I.U.C.D. (Mohan H – 1999)

1.2 Ultrasound Imaging

The use of ultrasound machine in the investigation is important because it is non invasive, easy to conduct, with no hazard to patient and accurate to identified the causes of abnormal vaginal bleeding. Abnormal vaginal bleeding is one of the major health problems in the world especially in the developing countries, like Sudan. This is because it is one of the major causes that increase the maternal mortality rate which jumped to 1000 deaths per 100000 women in the last years, prior was 500 deaths in every 100000 women (Sudan Medical Journal, 2008).0mdruman is very big town in Khartoum State of about 1500,000 population most of habitant are poor. As far as we know, no previous study was conduct in this area; therefore, evaluation and investigation of abnormal vaginal bleeding causes are important. (Stewart C, 1991)

Effective management of vaginal bleeding in late pregnancy requires recognition of potentially serious conditions, including placenta previa, placental abruption, and vasa previa. Placenta previa is commonly diagnosed on routine ultrasonography before 20 weeks' gestation, but in nearly 90 percent of pregnants it ultimately resolves. Women who have asymptomatic previa can continue normal activities, with repeat ultrasonographic evaluation at 28 weeks. Persistent previa in the third trimester mandates pelvic rest and hospitalization if significant bleeding occurs. Placental abruption is the most common cause of serious vaginal bleeding, occurring in 1 percent of pregnancies. Management of abruption may require rapid operative delivery to prevent neonatal morbidity and mortality. Vasa previa is rare but can result in fetal exsanguinations with rupture of membranes. Significant vaginal bleeding from any cause is managed with rapid assessment of maternal and fetal status, fluid resuscitation, replacement of blood products when necessary, and an appropriately timed delivery

Vaginal bleeding after mid pregnancy is associated with maternal and fetal risks. Maternal morbidity may be caused by acute hemorrhage and operative delivery, and the fetus may be compromised by uteroplacental insufficiency and premature birth. Optimal management of late pregnancy bleeding depends on accurate identification of the cause and a timely intervention specific to its severity (Sudan Medical Journal, 2008).

Physicians frequently order an ultrasound (US) evaluation when a pregnant patient develops vaginal bleeding. In the second and third trimesters, bleeding can be a result of abnormal placentation, such that sonographic findings are often crucial in guiding emergent obstetrical management. Initial clinical data to obtain include the amount of bleeding, the presence and severity of associated pain, and subjective assessment of fetal movements. Potentially serious etiologies during the second and third trimesters include placenta previa, placenta accreta, placental abruption, and vasa previa. When placenta accreta occurs, it is most commonly associated with placenta previa.

However, the highest risk of life-threatening bleeding from accreta typically occurs intrapartum or immediately postpartum, eg, with attempted placental removal. Light vaginal bleeding or bloody vaginal discharge (“bloody show”) can accompany preterm labor and cervical incompetence as the cervix begins to dilate and cervical veins bleed; however, contractions or pain are likely the more predominant symptoms.

The initial management of significant bleeding in late pregnancy is similar regardless of the etiology. Visual estimates of blood loss should be recorded but may be inaccurate or fail to account for concealed hemorrhage. Hypotension, tachycardia, and maternal symptoms of hemodynamic instability are ominous indicators, and women with these signs require immediate intravenous access, fluid resuscitation n, and the availability of blood products. Baseline laboratory

tests include hematocrit, platelet count, fibrinogen level, coagulation studies, blood type, and antibody screen. Women who are Rh negative should receive Rh_o(D) immune globulin (Rhogam); a Kleihauer-Betke test should be performed to determine the appropriate dose. Continuous fetal monitoring is recommended. Decelerations or loss of variability may resolve with adequate maternal resuscitation; however, a persistently no reassuring fetal heart rate tracing may require urgent cesarean delivery before the etiology of the hemorrhage is established.

Placenta previa is a placental implantation that overlies or is within 2 cm (0.8 inches) of the internal cervical os. The placenta is described as a complete previa when it covers the os and as a marginal previa when the edge lies within 2 cm of the os. When the edge is 2 to 3.5 cm (1.4 inches) from the os, the placenta may be described as low lying[5] *(Figure 1)*. Transvaginal ultrasonography allows precise assessment of the distance between the internal os and the placental edge.

1.3 Problem of the study:

Bleeding in the late pregnancy my lead to severe complication cause maternal death or fetal . when we detected it early we can avoid or minimize the complications.

1.4 General objective of the study:-

To evaluate the role of ultrasound in detecting of the late pregnancy bleeding problems .

1.5 Specific objective

-To assess the placenta previa in related with the late pregnancy bleeding.

-To evaluate the placenta abruption.

-To study the associated trauma.

1.6 Overview of the study

This study consisted of five chapters with Chapter one is an introduction which includes (problem and objective of the study), Chapter two is a literature review which includes (Anatomy, physiology, Pathology and previous study), Chapter three about research methodology, Chapter four deals with result and Chapter five include discussion, conclusion and recommendation .

Chapter 2

Literature review

Chapter 2

Literature review

2.1 Literature review

There are many studies carried on abnormal vaginal around the world, the Goldstein was refer to {Abnormal uterine bleeding (AUB) is highly prevalent and an important factor in female health; up to one in 20 women aged 30–49 visits her general practitioner because of menorrhagia and AUB accounts for 20% of visits to the gynecological outpatient department (Goldstein, 2004 and Royal College of Obstetricians and Gynaecologists, 2006).}

Emanuel and Cornelis said that {Apart from hormonal disbalance, intrauterine abnormalities are the leading cause of AUB: more than 40% of the referred women with AUB are reported to have intrauterine abnormalities (Emanuel et al., 1995 and Cornelis et al., 2006).

Bronz and Elysia Moschos reveal that {Evaluation of the endometrium by transvaginal Ultrasonography is currently the imaging method of choice in the diagnostic workup for abnormal uterine bleeding (Bronz et al., 1997, Elysia Moschos et al., 2009).}

In Sudan also there are many studies carried on the issue, Abu baker said that {most causes of abnormal vaginal bleeding were related to pregnancy problems which constitute 59% (Abu baker Adam, Ultrasound finding of abnormal vaginal bleeding in Abu Gebiha Area, M.Sc Research in diagnostic ultrasound, College of medical Radiologic science, Sudan University, 2007) }.

Motaz Bashir said that {most causes of abnormal vaginal bleeding was related to pregnant and its complications constitute 91%, (Motaz Basheir, Ultra sound finding of abnormal vaginal bleeding in El Nohoud city, M.Sc Research in diagnostic ultrasound, College of medical Radiologic

science, Sudan University, 2010)}.

2.2 Role of Ultrasound :

Ultrasound is the preferred imaging modality for the diagnosis and monitoring of pelvic organs. Pelvic ultrasound can help to identify and evaluate a variety of urinary and reproductive system disorders in both sexes without even the minimal risks associated with x-ray exposure. Ultrasound imaging, formed by exposing part of the body to high-frequency sound waves to produce pictures of the inside of the body. Because ultrasound images are captured in real-time, they can show the structure and movement of the body's internal organs, as well as blood flowing through blood vessels. (Stewart C, Benjamin R – 1991)

Ultrasound scanners consist of a console containing a computer and electronics, a video display screen and a transducer that is used to scan the body and blood vessels. The transducer is a small hand-held device that resembles a microphone, attached to the scanner by a cord. The transducer sends out high frequency sound waves into the body and then listens for the returning echoes from the tissues in the body. The principles are similar to sonar used by boats and submarines. (Stewart C, Benjamin R – 1991)

In an ultrasound examination, a transducer both sends the sound waves and records the echoing waves. When the transducer is pressed against the skin, it directs small pulses of inaudible, high-frequency sound waves into the body. As the sound waves bounce off of internal organs, fluids and tissues, the sensitive microphone in the transducer records tiny changes in the sound's pitch and direction. These signature waves are instantly measured and displayed by a computer, which in turn creates a real-time picture on the monitor. One or more frames of the moving pictures are typically captured as still images. (Stewart C, Benjamin R – 1991).

Doppler ultrasound, a special application of ultrasound, measures the direction and speed of blood cells as they move through vessels. The movement of blood cells causes a change in pitch of the reflected sound waves (called the Doppler Effect). A computer collects and processes the sounds and creates graphs or color pictures that represent the flow of blood through the blood vessels.

Medical imaging uses frequencies that are much higher than 20 kHz; the range normally used is from 3 to 15 MHz. These frequencies do not occur in nature and it is only within the last 50 years that the technology has existed to both generate and detect this type of ultrasound wave in a practical way. (Barness E, Spicer D – 2004)

2.3 Anatomy Internal Genital Organs

2.3 .1 Vagina:

The vagina is an elastic fibro muscular canal extending upwards and backwards forms the vulva at an angle of 60-70 degrees to the horizontal, although it is not straight as it is generally supposed but angled backwards. The vagina pierces the triangular ligament and the pelvic diaphragm. The level of these structures being approximately 1 and 2.5cm, respectively from its lower end. The vagina has blind upper and except in so far that the cervix with its external os projects through its upper anterior wall. (Roger W, Peter L – 1996)

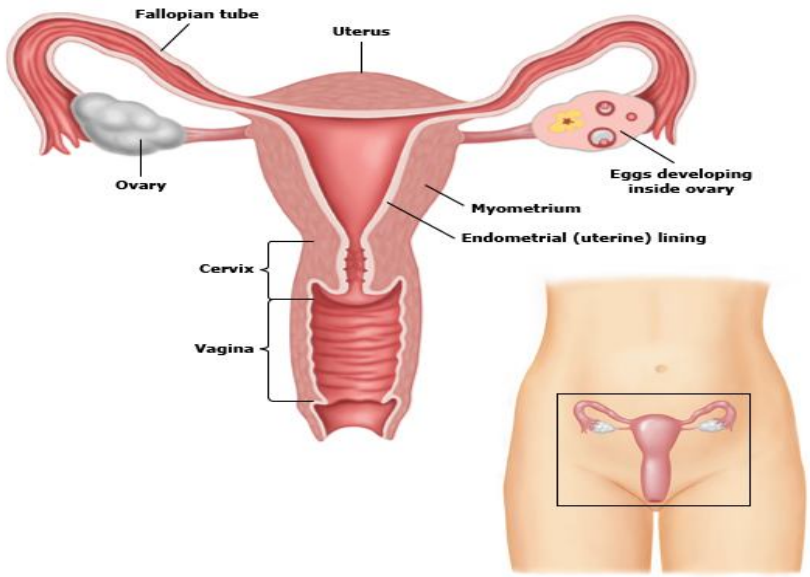


Diagram (2-1)cross sectionshowed Reproductive System- (www.womaen.webmd.com)

The vault of the vagina is divided into four areas according to their relations to cervix, the posterior fornix, which is capacious, the anterior fornix that is shallow and the two lateral fornices. Because the cervix is inserted below the vault, the posterior vaginal wall is approximately 10cm, where as the anterior wall is approximately 8cm, in length. (Roger W, Peter L – 1996)

The introitus is functionally closed by the labia, which are in contact with each other. Moreover, the lumen of the vaginal is ordinarily obliterated by the anterior and posterior walls lying in opposition. In its lower parts it appears H-shaped on cross-section with lateral recesses anteriorly and posteriorly. When, however, a woman is in the knee-chest, sim's or kneeing position and the labia are separated, the vaginal balloons out. This is a result of a negative intra-abdominal pressure, transmitted to the vagina causing entry of the air. Exceptionally, such air can enter the uterus, tubes and peritoneal cavity. (Roger W, Peter L – 1996)

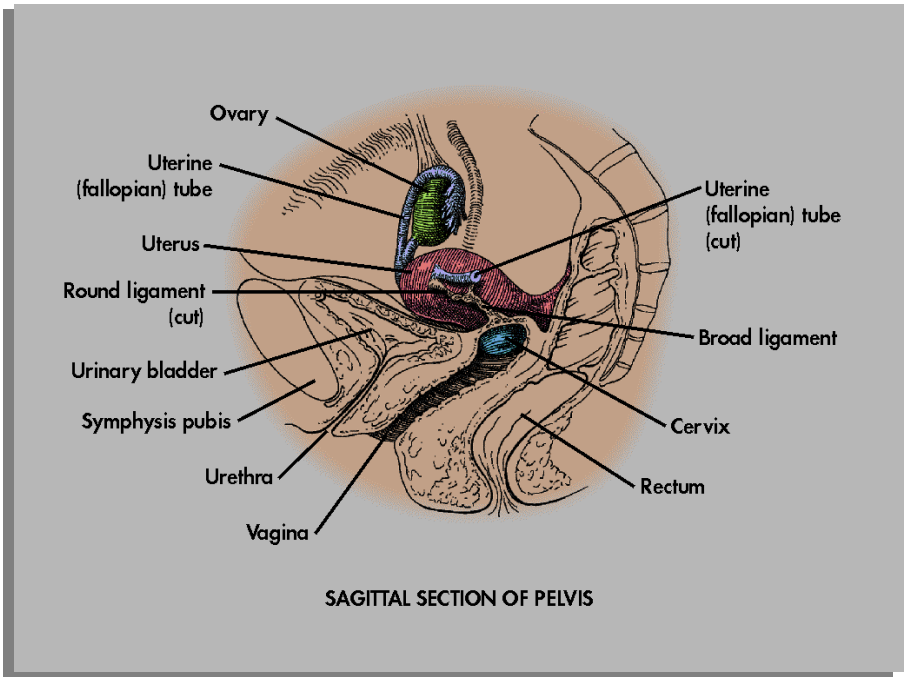
If the walls are separated, the vagina of the nulliparous married women has a diameter of approximately 4-5cm at its lower and end and is twice as wide at its upper end. Although the width and length of the vagina show considerable individual variations, anatomical shortness or narrowness is rarely a cause of difficulty or pain on coitus because the vagina is distensible and

accommodates itself. The functional width is determined to a large extent by the tone and contractions of surrounding muscles.

A raised double column formed by underlying fascia can often be seen running sagittaly down the anterior wall and there is a less definite median ridge on the posterior wall. Running circumferentially from these columns are folds of epithelium (rugae) which account in part for the ability of the vagina to distend during labour. (Roger W, Peter L – 1996)

2.3.1.1 The supports of the Vagina:

The vagina is supported in its upper part by the lower components of the transverse cervical ligaments, which fuse with its fascial sheath. Below this it is held by the fibers of the lavator's ani which are inserted into its side walls, by the urogenital diaphragm, and by the peroneal muscles. The anterior vaginal wall, urethra and bladder base are supported by the pub cervical fasica and also, it is said, by posterior vaginal wall and perineal body on which they rest when the woman is standing, the posterior vaginal wall rests on recto-vaginal fascia and perineal body. The support, which the perineal body gives to the vaginal wall, is minimal and the pelvic diaphragm does not sustain and cradle the pelvic viscera as is so often supposed. The latter offers no more than an elastic foundation to which the important inelastic ligaments are attached. (Roger W, Peter L – 1996)



SAGITTAL SECTION OF PELVIS

Diagram (2-2)showed Sagital section of pelvis – (www.imagingconsult.com)

2.3.1.2 Vascular Connections:

1-Arterial:

These are: the vaginal artery mainly, branches of the uterine artery, branches of the internal pudendal artery, and twigs from the middle and inferior rectal arteries.

2-Venous:

A plexus of veins around the vagina connects with those around the bladder and rectum, and ultimately drains into the internal iliac veins by branches, which mainly accompany corresponding arteries.

2.3.1.3 Lymphatic drainage:

The lymphatics of the lower vagina accompany those of the vulva to the inguinal nodes. The drainage of the upper is the same as that of the cervix, to the internal iliac (hypo gastric), external iliac, obturator and sacral nodes.

2.3.2 Uterus:

The uterus is a thick walled, muscular, hollow organ shaped like a pear, its tapering end being the

cervix, which projects into the upper vagina. The measurements were formerly given as 3x 2x1 inches. But this understates its size. Their dimension varies but the nulliparous organ measure approximately 8-9cm (3.5inch) in overall length, 6cm (2.5in) across its widest part and 4cm (1.5inches) from before backwards in its thickest part. It weight 45-55g. The wall is 1-2cm thick, so the length of normal uterine cavity, including the cervical canal, is not less than 7.5-8cm. The uterus is made up of a body or corpus, isthmus and cervix. The part of the body situated above the level of insertion of the fallopian tubes is described separately as the fundus, especially during pregnancy. The area if insertion of each fallopian tube is termed the cornu. The opening of the cervix into the vagina is the external os. The cavity of the uterus is triangular in shape when seen from the front, but is no more than a slit when seen from the side. It communicates with the vagina through the cervical canal, and with the lumen of each fallopian tube at the cornua. (Richard S-2007)

2.3.2.1 Special features of each part of the uterus:

I- Corpus (including fundus):

The corpus makes up two thirds or three quarters of the uterus of the mature woman. The main muscle coat (myometrium) is lined by endometrium a specialized form of mucous membrane. The later varies in thickness from 1-5 mm according to the phase of the menstrual cycle. It is covered by a single layer of cuboidal or columnar epithelium which dips in to form simple un branched tubular or spiral glands, some of which are so long that they extend from the surface to the myometrium. The glands lie on a stroma, which is made up of loosely vessels, lympathics and

leukocytes. Stromal cells are spindle- or star- shaped with little cytoplasm so, in microscopic sections, it is the dark staining, small round or oval nuclei, rather than the cell outlines, which are seen. The endometrium and, to a lesser extend, the myometrium show cyclical histological and functional changes related to menstruation. (Richard S- 2007.

II- Isthmus:

The isthmus is an annular zone, measuring no more than 0.1-0.5cm from top to bottom in the non-pregnant uterus, which lies between the cervix and the corpus. The obvious constriction between the uterine cavity and the cervical canal is the anatomical internal os and the isthmus is below this. The junction between the isthmus and the cervical canal proper, which is only recognized microscopically, is the histological internal os. The mucous membrane of the isthmus is intermediate in structure and function between that of the corpus and that of the cervix. The importance of the isthmus is that it is the area, which during late pregnancy and labour becomes the lower uterine segment. (Richard S- 2007)

III- Cervix:

The cervix is barrel-shaped, measuring 2.5-3.5cm from above downwards. Half of it projects into the vagina (vaginal cervix or portivaginalis) while half is above the vaginal attachment (supervaginal cervix). The vaginal part is covered with squamous epithelium continuous with that of the vagina. The supervaginal part is surrounded by pelvic fascia except on its posterior aspect where it is covered with the peritoneum of the pouch of Douglas. A spindle-shaped canal, disposed centrally connects the uterine cavity with the vagina. The part of the cervix is composed mainly of involuntary muscle, many of the fibers being continuous with those in the corpus. The lower half has a thing peripheral layer of muscle (the external cervical muscle) but is otherwise entirely

composed of fibrous and collagenous tissues. (Richard S- 2007)

The mucous membrane lining the canal (endocervix) is thrown into fold, which consists of anterior and posterior columns from which radiate circumferential folds to give the appearance of tree trunk and branches, hence the name arbor vitae. Historical the endocervix differs considerably from the endometrium. It is covered by a single layer of more cuboidal 'basal' or 'reserve' cells from which new surface cells are believed to develop and which can undergo squamous metaplasia. (Richard S- 2007)

The surface epithelium dips down to form complicated glands and crypts, which are said to number approximately 100. They penetrate the fibro muscular tissue and lie in a stroma more fibrous and dense than that of the endometrium. The epithelium of these glands is taller than that of the endometrial glands and the nuclei are always basal in position. (Richard S- 2007)

2.3.2.2 The support of the uterus:

The uterus is held in a position of ante flexion and ante version by its weight, by the round ligaments, which hold the funds forwards, and by the uterosacral ligaments, which keep the supravaginal cervix far back in the pelvis. The broad ligaments and their cellular tissues also have a steadying effect on the uterus.

The round and broad ligament do not, however, have any significant action in preventing descent of the uterus. This function is performed almost entirely by the transverse cervical ligaments and their posterior extensions – the uterosacral ligaments. These ligaments also contribute to support the vaginal vault, which is also important in preventing uterine prolaps.

(Richard S- 2007)

2.3.2.3 Vascular Connection:

I- Arterial:

Uterine and ovarian arteries.

II- Venous:

Pampiniform plexuses in board ligament.

Uterine and ovarian veins.

Vaginal plexus and vertebral plexuses.

2.3.2.4 Lymphatic drainage:

I- Cervix:

Paraervical plexus.

External iliac and internal iliac (hypogastric) nodes.

Obturator nodes.

Sacral nodes.

II-Corpus:

The same as the cervix also the aortic nodes (via lymphatics accompanying the ovarian vessels) and the superficial inguinal nodes (via lymphatics in the round ligament). (Richard S- 2007)

2.3.3 Fallopian Tubes:

2.3.3.1 General description:

The tow fallopian tubes are oviducts, which extend from the ovaries to the cornua of the uterus, one on either side. They are somewhat tortuous and their outer parts curve backwards. Each lines in the free upper border of the broad ligament and, when straightened is 10cm in length. Its lumen communicates with the uterine cavity at its inner end and with the peritoneum cavity at its outer, and thus provides the final section of an open, or potentially open, canal, which lead from the exterior to the abdominal cavity. The fallopian tube is divided into four parts. (Richard S- 2007)

2.3.3.2 Interstitial or intramural parts:

This only 1-2cm in length and is the part which transverse the uterine wall. It was a very narrow lumen (1mm in diameter) and is different from the remainder of the tube in that it is without a peritoneal coat, and in that, the outer longitudinal muscle has disappeared to cover the uterus. (Richard S- 2007)

I-Isthmus:

This is the straight and narrow portion adjacent to the uterus and measures 2-3cm. It has thick walls but the lumen is so narrow that it only admits the finest probe (1-2cm in diameter). (Richard S- 2007)

II-Ampulla:

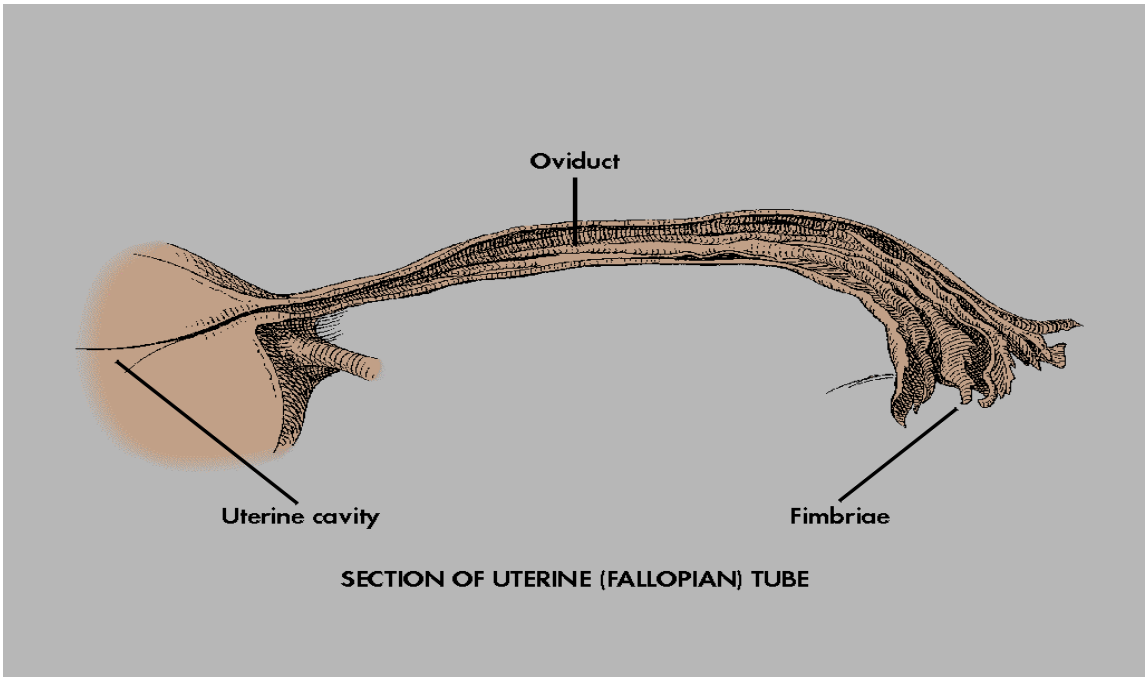
This is the wider, thin-walled and tortuous outer portion approximately 5cm in length, which lead to the infundibulum.

III-Infundibulum:

This is the trumpet-shaped outer end with an opening into the peritoneal cavity (abdominal ostium). The latter is surrounded by fronds or fimbriae, one of which is longer than the others and is directed towards the ovary. (Richard S- 2007)

2.3.3.3 Structure:

Except for a narrow a strip opposite to its attachment to the broad ligament, the extra uterine part of the fallopian tube is covered with peritoneum. Beneath this are an outer longitudinal layer and an inner circular layer of involuntary muscle. Zone is thick at the isthmus and thin at the ampulla. It is separated from the mucosa lining the lumen (endosalpinx) by a delicate connective tissue submucosa. The tube is lined by columnar epithelium supported by a thin stroma, about half of the epithelial cells especially the outer parts of the tube are ciliated and create a current. This combined with peristaltic action of the muscle propels the ovum towards the uterus. (Richard S- 2007)



SECTION OF UTERINE (FALLOPIAN) TUBE

Diagram(2-3)showedSagitalSection Fallopian Tube – (www.diagnosticimaging.com)

2.3.4 Ovaries:

2.3.4.1 General Descriptions:

The two ovaries are mainly solid ovoid structures, approximately 3.5cm in length and 1.5-2.5cm in thickness. Each weights 4-8g, the right tending to be larger than the left. They are attached to the back of the broad ligament by the mesovarium, one on either side of the uterus. Each is suspended form the cornu of the uterus by an ovarian ligament. The surface of an adult active ovary is corrugated, and is pale except where there happens to be some structure such as a corpus luteum. The ovary is the only organ in the abdomen, which is not covered by peritoneum. The part of the ovary attached to the mesovarium is the helium and all nerves and vessels enter and leave at this point. In the hilum and adjacent mesovarium are small collections of hilus cells, which may be homologous to the interstitial cells of the testis. (R J Last – 2005)

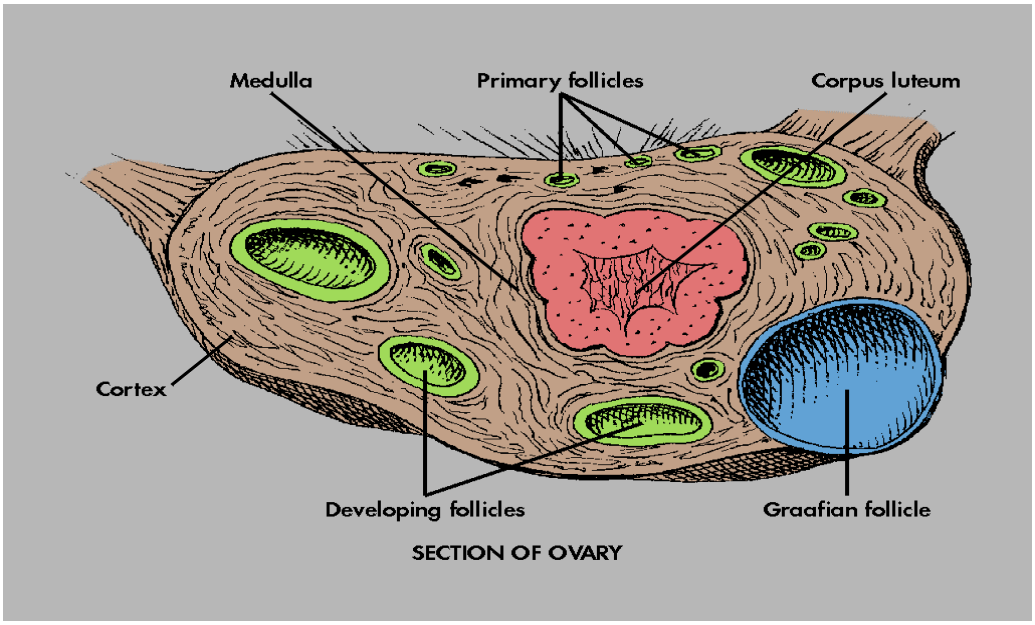


Diagram (2-4) Cross section ovary – (www.diagnosticimaging.com)

2.3.4.2 Structure:

The ovary has a cortex (outer zone) and medulla (inner zone) but they are not clearly defined. Both areas have a connective tissue stroma in, which can be found blood vessels, nerves and graafian follicles in varying stages of development together with their derivatives – corpora lutea and corpora albicantia. Primordial follicles are mostly found in the cortex is covered with germinal epithelium, which consists of a single layer of low cuboiudal cells but is only seen in early life. Later, the ovary is coated only by the connective tissue tunica albuginea. It is now recognized that the germinal epithelium does not give rise to germ cells, so many prefer to cell it surface epithelium, The tunica albuginea is not well developed and as resistant as the comparable structure in the testis, so distention of the ovary by ripening follicles or by pathological states does not cause pain. Even when the tunica is unusually thick, as in the skin- leuenthal syndrome, it does not prevent ovulation. (R J Last – 2005)

2.3.4.3 Vascular connection:

I-Arterial: Uterine and ovarian arteries.

II-Venous: Pampiniform plexus, ovarian vein and uterine vein.

2.3.4.4 Lymphatic drainage: Aortic nodes (via lymphatics accompanying the ovarian vessels) and external iliac nodes. (R J Last – 2005).

2.4 Reproductive Physiology:

In the normal female between the age of 9 and 16, cyclic changes occur in the ovaries and uterus in response to endocrinologic activities. These cyclic changes are known as the menstrual cycle and represent the reproductive phase of a female's life cycle. The changes associated with the endometrium are known as the endometrial cycle. The purpose of the ovarian cycle is to provide a suitable ovum for fertilization, whereas that of the endometrial cycle is to provide a suitable site in which the blastocyst can implant and develop properly. Since the endometrial changes are regulated by the ovarian hormones, the two cycles are intimately related. (Guyton, Hall – 2000)

The typical menstrual cycle is 28 days however variations are very common and normal. For the purpose of description, the 28 day "idealized" cycle is used. The cycle is divided into four or five phase. It is customary to assign the first day of menstruation as the first day of the cycle. (Guyton, Hall – 2000)

2.4.1 Ovarian Cycle:

Throughout the reproductive years, at the onset of each menstrual cycle, a number of small, immature follicles known as primary or primordial follicles undergo growth and development. The

hormonal stimulus that activates the follicular process is mediated by follicle-stimulating hormone or FSH which is secreted by the anterior pituitary gland. With each menstrual cycle, there is usually only one mature follicle, known as the dominant or Graffian follicle, which makes its way to the surface of the ovary where it appears as a transparent cyst. The mature preovulatory follicle contains the ovum at one end and a cystic cavity or antrum at the other. There are several layers of specialized cells known as theca and granulosa cells which secrete estrogen, progesterone and luteinizing substances. (Guyton, Hall – 2000)

The ovum is released from the mature follicle during ovulation. Ovulation normally occurs on day 14 which is the mid-point of the idealized cycle. Following ovulation, the ruptured dominant follicle becomes the corpus hemorrhagicum which is then followed by the corpus luteum. The corpus luteum (CL) secrets progesterone (as well as estrogen) which is absolutely necessary to maintain the endometrium for successful implantation. If fertilization does not occur, the CL undergoes regressive, progesterone output is diminished, and by the end of the cycle complete regression occurs. The failing CL triggers endometrial sloughing and menstrual bleeding ensues. The end point of the regressing CL is the corpus albicans, which is a small fibrous area in the cortex of the ovary. (Guyton, Hall – 2000).

2.4.2 Endometrial Cycle:

With each menstrual cycle and in step with ovarian, the functional layer of the endometrium undergoes changes characterized by regeneration, proliferation, secretory activity, necrosis, and sloughing. During menstruation, the functional layer of the endometrium is sloughed off and a long with blood, passes into the vagina. Following menstruation, a new functional layer begins to form from the basal layer. Primed by estrogen secreted by the ovary, the endometrium

progressively thickness throughout the proliferative and secretory phases. (Guyton, Hall – 2000).

Following ovulation and the formation of the CL, the endometrial glands exhibit secretory activity. If fertilization does not occur, the corpus luteum undergoes regressive changes, and the endometrium, supported by the hormonal output of the ovary, beings to “shrink”. The shrinking is due to the loss of tissue fluids and secretions which occurs secondary to the drop in estrogen. Estrogen has a “water-retaining” effect on tissues whereas progesterone is a factor in the secretory activity of the gland. As the endometrium shrinks, the spiral arteries kink resulting in vascular stasis followed by ischemia, necrosis, sloughing and bleeding. . (Guyton, Hall – 2000).

The menstrual cycle is a continuous ongoing cycle but for descriptive purpose it is divided into specific phases based on hormonal levels, and events occurring in the ovary and endometrium. The hormonal relationships and the effects of these hormones on the receptor tissues and organs are considered with these phases in mind. The “ideal” 28 day cycle will be considered although in relating the length of the normal menstrual cycle may vary considerable. (Guyton, Hall – 2000)

2.4.3 Phase of the Menstrual Cycle:

I-Menstrual Phase (Day 1 to 5):

Synonyms: menstruation, menses, period. Characterized by uterine bleeding and endometrial sloughing. The serum level of estrogen is low at the beginning menstrual cycle. A low estrogen level signals the hypothalamus to release gonadotriopin-releasing hormone (GnRH). The hypothalamus is considered the biologic clock which primes the cycle. When the neurohormonal axis is functioning properly, there are pulsatile which induce regular monthly cyclical secretions from the pituitary in the form of FSH and LH. The pituitary output of FSH and LH act directly on the ovary to produce a mature follicle in one ovary and to cause ovulation. GnRH induces the

anterior pituitary to secrete FSH and luteinizing hormone (LH). Under the influence of FSH, numerous primordial follicles begin to develop and grow, and secrete estrogen. (Guyton, Hall – 2000).

II- Follicular/ Proliferative Phase (Day 6 to 13):

Characterized by development and growth of primordial follicles (process of folliculogensis) and by recognization of proliferation of the functional of the functional layer of the endometrium. The developing follicles secrete increasing amounts estrogen. For reasons largely unknown, a single dominant follicle emerges and the other developing follicles regress and become atretic. The dominant follicle continues to grow towards the surface of the ovary. There is negative feedback loop in the hormonal axis such that increasing serum levels of ovarian hormones cause decreasing secretions from the hypothalamus and pituitary.

Just prior to ovulation, the rising serum levels of estrogen induce a surge in the pituitary output of LH. This “extra squirt” of LH is very important for ovulation. LH also includes the dominant follicle and corpus luteum to secrete progesterone. (Guyton, Hall – 2000)

III-Ovulation (Day 14):

Characterized by the release of the mature oocyte of ovum.

Ruptured, dominant follicle becomes the corpus hemorrgaoum, and then the corpus luteum. Suppression of ovulation is the primary mechanism of action of oral contraceptives. A dominant follicle fails to emerge, ovulation is suppressed and there is no corpus luteum formation. A practical method of detecting ovulation is the shift in basal body temperature from a relatively constant lower during the preovulatory phase to a slightly higher level early in the postovulatory

phase. The typical upward shift is 0.3 degrees Celsius and is measured by a special thermometer with 0.1 degree gradations. The increase in the basal body temperature is caused by the thermogenic action of progesterone. The rise in basal body temperature may provide evidence for the development of a corpus luteum and the secretion of progesterone and is therefore considered a clinical sign of ovulation. (William F- 2003)

IV-Luteal/secretory phase (Day 15 to 25)

Characterized by formation of the corps hemorragicum and corpus luteum, and secretory activity of the endometrial glands. The CL secretes progesterone and estrogen. The functional layer of the endometrium thickness and secretes large amounts of lubricating mucous. If fertilization does not occur, the CL begins to regress after day 20-21 and the levels of estrogen and progesterone gradually decrease. If fertilization occurs, the conceptus moves into the uterus and implantation occurs between day 21 and 25. The trophoblastic cells of the blastocyst secrete human chorionic ganadotrpin (HCG) which signals the CL to maintain its hormonal output of progesterone. HCG is necessary to maintain, the hormonal output of the CL which in turn is necessary at this stage to maintain the decidual reaction of the endometrium. Later in pregnancy (at about 3 months), the placenta secretes sufficient amounts of estrogen and progesterone to maintain the decidua and the CL atrophies to become the corpus albicans (small area of scar tissue in the cortex of the ovary). (William F- 2003)

V-Ischemic Phase (Day 26 to 28):

Synonym: premenstrual phase.

Characterized by further regression of the CL and shrinking of the endometrium accompanied by

vascular stasis and ischemia in the last few days. (William F- 2003)

Estrogen and progesterone levels rapidly diminish resulting in the loss of tissue fluids and of secretory activity. The endometrium consequently shrinks resulting in kinking of the spiral arteries. This leads to vascular stasis, ischemia and necrosis. (William F- 2003)

With tissue necrosis and associated hemorrhaging, the process of menstrual bleeding begins and a new menstrual cycle is under way. (William F- 2003)

2.4.4 Gynecological Endocrinology:

The structure directly involved in the regulation of the menstrual cycle and in reproductive physiology are the hypothalamus, pituitary gland, ovary, and trophoblast of the early blastocyst if the patient is pregnant. (William F- 2003).

I-Gonadotropic- Releasing Hormone:

The hypothamus secretes gonadotropic releasing (GnRH) that control gonadotropin release (FSH and LH). GnRH is secreted in a pulsatile manner; the amplitude and frequency of the secretions vary throughout the cycle. One pulse every hour is typical of the follicular phase; one pulse every 2-3 hours is typical of the luteal phase. The amplitude and frequency are regulated by feedback of estrogen and progesterone and neurotransmitters within the brain. (William F- 2003)

GnRH stimulates the synthesis and release of both FSH and LH from the same cell in the anterior pituitary. With GnRH stimulation, there is a rapid (30mintue) increase in serum FSH and LH with a later (90 minute) release of LH. Improper amplitude or frequency of GnRH may be a

factor in infertility. (William F- 2003)

II-Follicle Stimulating Hormone and Luteinizing Hormone:

The anterior pituitary secretes follicle stimulating hormone (FSH) and luteinizing hormone (LH). There are FSH receptors primarily in the cell membrane of the granulosa cells which line the walls (single layer) of the ovarian follicles. FSH acts primarily on the granulosa cells to simulate follicular growth and also stimulates formation of LH receptors. FSH stimulates follicular growth and also stimulates formation of LH receptors. FSH stimulates follicular growth by increasing both FSH and LH receptor content in granulose cells. This action is enhanced by the estrogen being produced by the granulosa cells. (William F- 2003)

LH receptors exist in theca cells at all stages of the cycle and on granulosa cells after the follicle matures under the influence of FSH and estrogen. With sufficient number of LH receptors on the granulosa cells, LH acts directly on the granulosa cells to cause luteinization (i.e. formation of the corpus luteum) and the formation of progesterone. LH increases steadily until mid cycle when there is a surge, which is accompanied by a lesser surge of FSH. LH initiates luteinization and progesterone production in the granulosa cells. The preovulatory rise in induce the mid cycle FSH peak. (William F- 2003)

III-Estrogen:

All least six different estrogens level has been isolated from the plasma of human females. However, only three are present in significant quantities. These are beta-estrodiol, estrone, and estriol. Of these, beta-estrodiol (or simply, estradiol) exerts the major effect. As reference is made to estrogens in subsequent discussions, keep in mind that estradiol s the principle estrogen.

Estrogen is secreted by the granulosa cells of the ovarian follicles and the corpus luteum. Estrogen stimulates follicle growth and increases FSH action on the granulosa cells. The follicle destined to become dominant secretes the greatest amount of estrogen, which, in turn, increases the density of the FSH receptors on the granulosa cell membrane. Rising estrogen levels result in negative feedback on FSH secretion levels; this halts the development of other follicles, which then become atretic. The follicular rise of estrogen exerts a positive feedback on LH secretion. LH levels rise steadily during the late follicular phase. FSH induces the appearance of LH receptors on granulosa cells. Estrogens rise rapidly, reaching a peak approximately 24-26 hours before ovulation. Major physiological effects of estrogen.

include:

Development and maintenance of female reproductive structures.

Development of female secondary sex characteristics.

Development of breast.

Control of fluid and electrolyte balance.

Increase protein anabolism. (William F- 2003)

IV-Progesterone:

Progesterone is secreted by the maturing follicle just prior to ovulation and by the corpus luteum following ovulation. Peak levels of progesterone are attained 8-9 days after ovulation, which approximates the time of implantation of the blastocyst. Progesterone is also synthesized by the placenta around the end of the first trimester to term. Major physiological effects of

progesterone include:

Prepares the endometrium for implantation.

Maintains the decidua during pregnancy.

Prepares breasts to secrete milk for lactation. (William F- 2003)

V-Human Chorionic Gonadotripin (hCG):

HCG is biochemically similar to LH. It is secreted in early pregnancy by the trophoblast of the blastocyst (the trophoblast forms the chroion which differentiates into the villous chorion frondosum (which becomes the placenta) and the smooth chroion or chorion leave (which joins with the amnion to form the amniochorionic membrane). HCG maintains corpus luteal function until the placenta is established and begins to manufacture estrogen and progesterone. (William F- 2003).

2.5 PATHOLOGY

2.5 .1 Abnormal vaginal bleeding includes:

Pregnant related complications

In women of reproductive age, the possibility of pregnant related bleeding must always be considered in any patient with abnormal uterine bleeding. Condition such as miscarriage, ectopic pregnancy and gestational trophoblastic disease may present as complaint related to abnormal menstruation. (Robbins C- 1999)

2.5.1.1 A Miscarriage

Is a loss of a pregnancy before 20 weeks of gestation, or also may be referred to as an "early pregnancy loss". There are many words that define miscarriage including threatened, spontaneous, complete, incomplete, criminal, illegal, habitual, induced, elective, therapeutic, inevitable, missed, and septic. Miscarriage may be spontaneous (occurring naturally) or induced (elective or therapeutic). Missed abortion is fetal demise for a period of more than 8 weeks without the onset of labour or the expulsion of products of conception. From the clinical standpoint, inevitable abortion describes a patient who presents with profuse vaginal bleeding and cramping, rupture of membranes, and a dilated cervix. Habitual miscarriage is three consecutive spontaneous abortions and requires detailed medical evaluation for causes; incompetence of the cervix is the most common cause of habitual miscarriage occurring in the second trimester. (Robbins C- 1999)

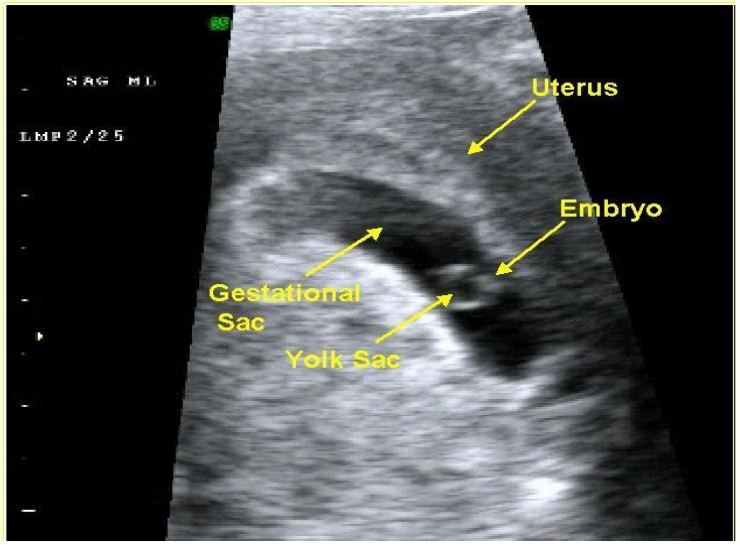
2.5.1.1 B ultrasound finding

- Empty uterus with clean endometrial stripe.

- Moderate to bright endometrial echoes.

- Presence of trophoblastic Doppler waveforms surrounding the endometrium normally persists for 3days post SAB.

-

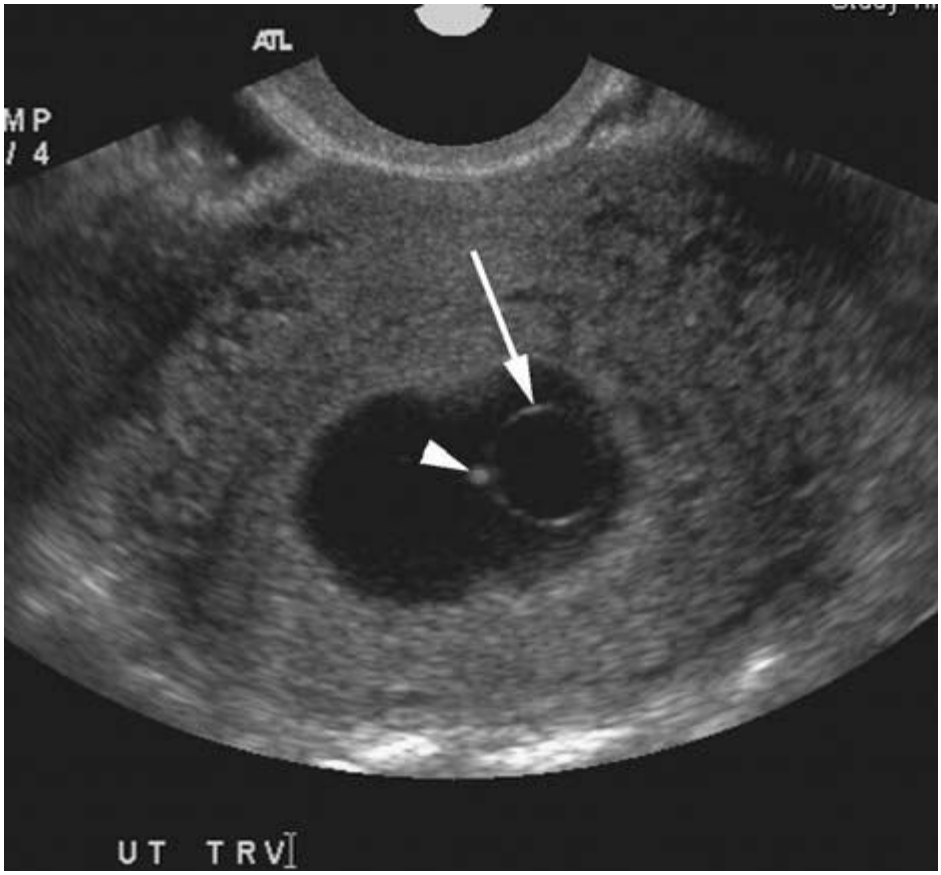


Ultrasound ImageTA (2-1) Missed Miscarriage – (www.ultrasound-image.com)

Presence of gestational sac with or without fetal component

- Gestational sac identified in the cervix or lower uterine segment.

- No identifiable embryo in a gestational sac of 25mm or larger. (Bates J -2006).



Ultrasound Image (2-2) Incomplete Miscarriage – (www.ultrasoundimage.com

2.5.1.2 A ECTOPIC PREGNANCY

An ectopic pregnancy is defined as implantation of the fertilized ovum outside the uterine cavity.

A total of 93% of ectopic pregnancies are tubal Ectopic pregnancies can present with abdominal pain with or without vaginal bleeding. Particular groups of patients are at high risk and include those with previous tubal pathology or surgery, and those with an intrauterine contraceptive device. The possibility of an ectopic pregnancy should be considered in high-risk patients with a positive pregnancy, even in the absence of symptoms. (Mohan H – 1999).

2.5.1.2. B Ultrasound findings of ectopic pregnancy :

Traditionally, the findings of a positive pregnancy test and an empty uterus seen at the time of ultrasound scan have been synonymous with the presence of an ectopic pregnancy. However, with the use of trans-vaginal ultrasound around 85% of ectopic can be directly visualized at the initial ultrasound scan. (Carol A, Ronald L – 1980)

A pseudo-sac is visible within the uterus in10–29% of ectopic pregnancies, and this finding should not be mistaken for an early gestational sac. The pseudo-sac represents the accumulation of non-clotted blood within the uterine cavity. A single rim of thin endometrium surrounds it and the shape of the sac reflects the shape of the uterine cavity. In longitudinal section, the pseudo-sac will appear elongated and thin, whereas a gestational sac appears more circular. However, the presence of chorionic tissue, which forms an echogenic rim around the gestation sac, helps to establish the correct diagnosis of intrauterine pregnancy. On Doppler examination, a pseudo-sac will typically appear a vascular, whereas high velocity peri-trophoblastic flow surrounds an early gestational sac. (Carol A, Ronald L – 1980).

Visualization of the corpus luteum can aid detection of an ectopic pregnancy because around 78% of ectopic pregnancies will be ipsilateral to the corpus luteum. It can sometimes be difficult to

differentiate the corpus luteum from the ectopic pregnancy. The ‘sliding organs sign’ can be used to distinguish a bulging corpus luteum from an ectopic pregnancy, using this technique, gentle pressure with the tip of the probe is used to observe whether the mass moves separately from the ovary. The presence of fluid in the pouch of Douglas is associated with 20–25% of ectopic pregnancies.

Blood and clots appear as hyperechoic fluid on ultrasound, the presence of which is suggestive of tubal abortion or a ruptured ectopic. However, blood in the pouch of Douglas can also be seen in a woman with a ruptured corpus luteum cyst. False-positive diagnosis of an ectopic can result from a static loop of bowel, hydrosalpinx, adhesions or an endometrioma. Direct ultrasonic visualization of the ectopic pregnancy is essential not only to

facilitate diagnosis but also to decide upon the best management option. Morphology of ectopic pregnancies varies and the relative frequency of different morphological features will depend on accessibility of the ultrasound service, quality of the equipment and the experience of the sonographers. (Carol A, Ronald L – 1980) .

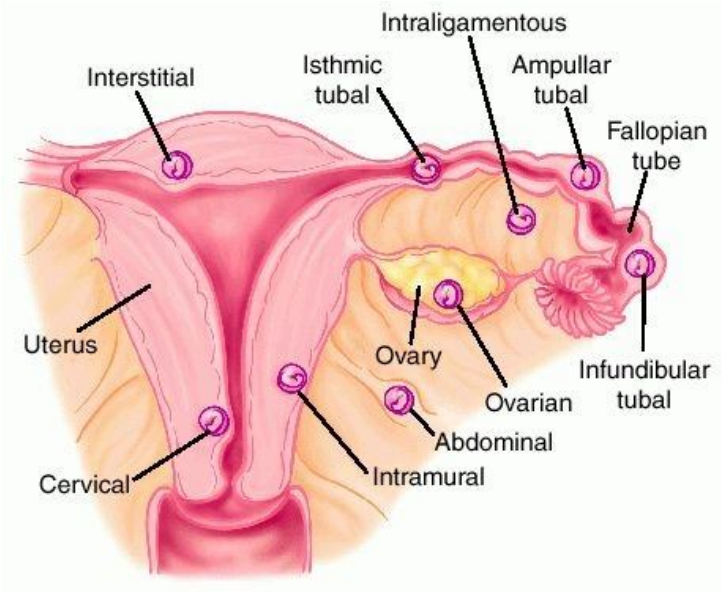
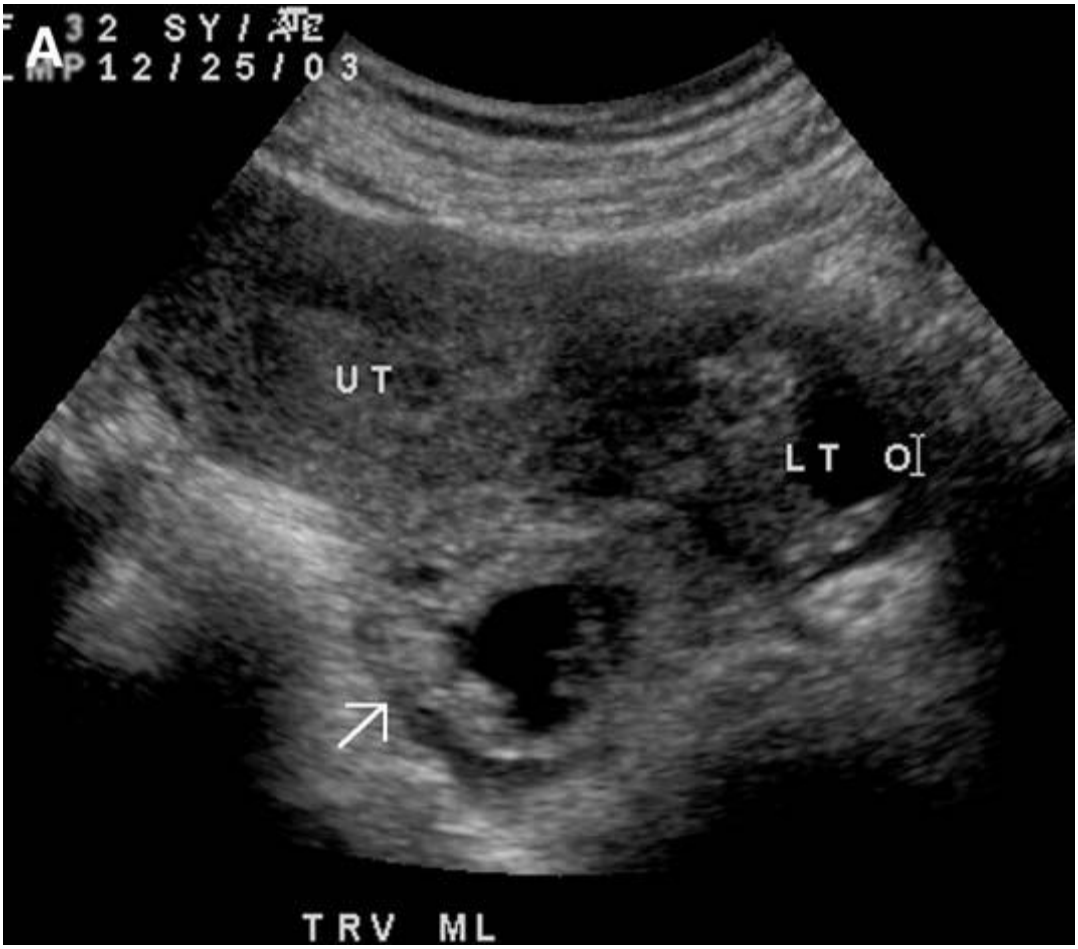


Diagram (2-5)showed Ectopic Pregnancy Location- (www.imagingconsult.com)



Ultrasound Image (2-3)showed Ectopic Pregnancy – (www.ultrasoundimagegallery.com)

2.5.1.3 A Gestational Trophoblastic Disease:

Gestational trophoblastic disease (GTD) is the general term for a spectrum of proliferative trophoblastic abnormalities originating from placental trophoblasts. The clinical classification of GTD includes hydatidiform mole (HM) and gestational trophoblastic neoplasia (GTN). Placental-site trophoblastic neoplasia is the rarest and most fatal form of GTN. (Robbins

C- 1999)

HM may be complete (true or classical), or incomplete (partial). Complete HM is characterized mainly by proliferation of the trophoblast, absence of villous blood vessels, absence of fetus, cord, or amniotic membrane, and normal karyotype (all the chromosomes are paternally derived). Very rarely, a true HM may coexist with a normal fetus and placenta. As one of the pathologic criteria of true HM is absence of fetal tissues (fetus, cord, or amniotic membrane), it is presumed the mechanism for this situation is development of a dizygotic twin pregnancy with normal development of one zygote and molar development of the other. (Robbins C- 1999)

2.5.1.3.B ultrasound finding:

Ultrasound is important for the diagnosis of HM because signs and symptoms are nonspecific however less than 60% of cases exhibit the classic sonographic appearance of “bunch of grapes or the “snowstorm” appearance. (Simpson L Lynn – 2004)

Early HM (<10 weeks LMP) may exhibit a spectrum of sonographic appearances which indicate a nonviable pregnancy but are otherwise nonspecific for molar pregnancy. An empty gestational sac having an abnormally thickened trophoblastic ring or a homogeneous, echogenic intrauterine soft tissue mass with or without visible cysts is highly suggestive of complete HM. The classic sonographic appearance of HM applies to pregnancies diagnosed in the late first trimester and early second trimester. TAS will typically show an enlarged uterus filled with echogenic tissue of relatively low attenuation. TAS transducers with sufficient resolution will be able to resolve the vesicular nature of the molar tissue and show its multicystic nature. EVS with its inherent high resolution is able to show with high definition the vesicular tissue. (Simpson L Lynn – 2004)

The multicystic appearance of HM has been coined the “bunch of grapes” appearance

whereas the more echogenic TAS appearance of the molar tissue has been dubbed the “snowstorm appearance”. The snowstorm description was initially based on the appearance of the molar tissue imaged with bistable technology. The use of this terminology persists today however the application of the term is less relevant.

2.5.1.4 Placenta previa:

Placenta previa describes a placenta that partially or completely covers the internal os. Three degrees of placenta previa are generally described:

A. Complete or Total Previa

The internal os is completely covered by the placenta. Complete placenta previa may be either symmetric or asymmetric. A symmetric placenta previa is indicated when the central portion of the placenta is over the os and equal portions of the placenta appears to be attached to the anterior and posterior walls of the lower uterine segment. With asymmetric, complete placenta previa, the placenta is predominantly anterior or posterior in relation to the internal os. (Robbins C- 1999)

B. Marginal Previa

The internal os is only partially covered by placenta.

C. Low-Lying Placenta

The placenta is close to the edge of the internal os but does not extend over it. Low lying placentas generally convert to higher positions by 34 weeks gestation. The incidence of placenta previa at the time of delivery is reported to be about 1%. Three factors which increase the relative risk of placenta previa are advanced maternal age, parity, and smoking. Nulliparous women are twice more likely to have placenta previa than women delivering for the first time. A possible reason for this association is endometrial scarring

which occurs with increasing age or repeated pregnancies. The scarring is thought to cause inadequate placental blood supply, for which the placenta compensates by becoming thinner and occupying a greater

surface area of the endometrium. A consequence of greater placental surface area attachment is an increased chance for encroachment over the internal os. (Robbins C-1999) .

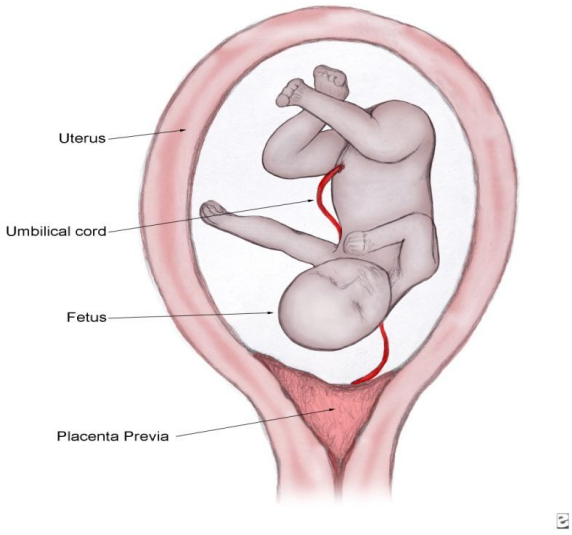
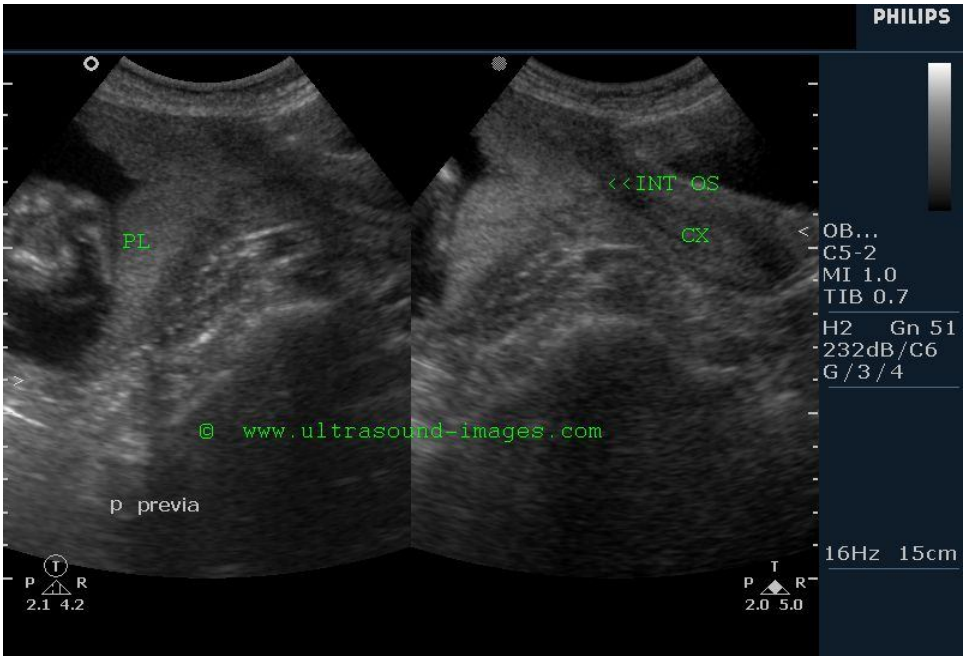
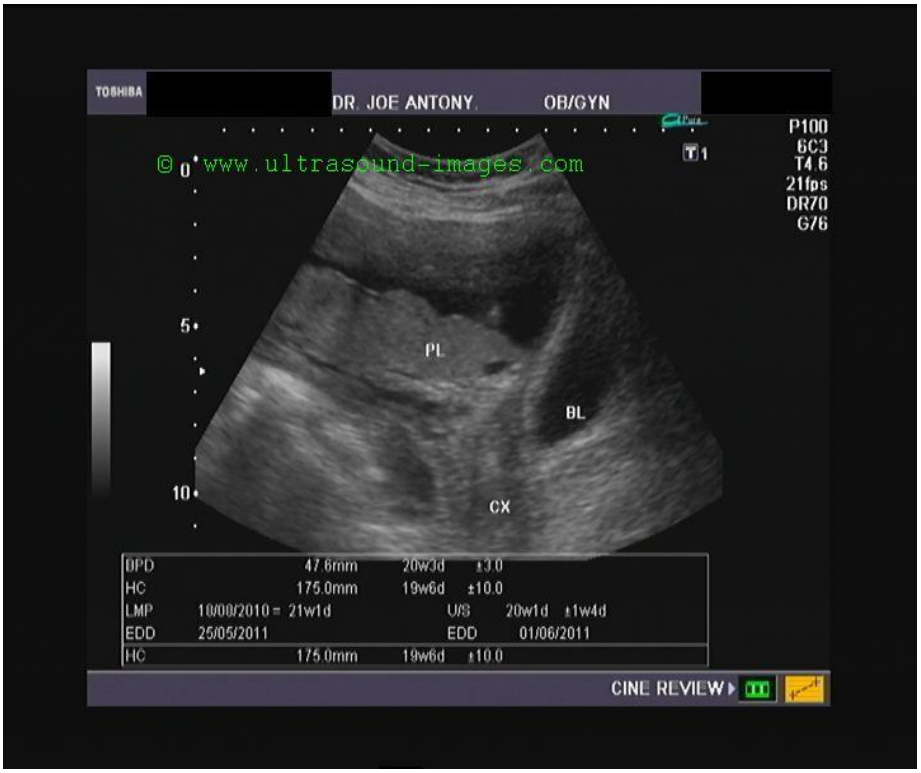


Diagram (2-7)showed Complete Placenta Previa – (www.ultrasoundimagegallery.com)



Ultrasound Image(2-4) Complete Placenta Previa - (www.ultrasound-image.com)



Doppler ultrasound (2-5) Incomplete Placenta Previa - (www.ultrasound-image.com)

2.5.1.5.A Abruption placenta

Placental abruption is defined as separation of the placenta prior to the delivery of the fetus. Other terms abruptio placentae

< Abruption placenta

< Accident hemorrhage

< Premature separation of the normally implanted placenta.

Placental abruption can be a life threatening situation for mother and fetus with a reported prenatal mortality rate of up to 25%. The clinical diagnosis of placental abruption is established on the basis of antepartum hemorrhage (APH) in association with abdominal pain, uterine hypertonicity (rigid or stiff uterus), uterine tenderness, and variable evidence of maternal hypovolemia, i.e. shock. A normal ultrasound exam (negative findings) does not rule out the diagnosis since the diagnosis of placental abruption is a clinical diagnosis (sensitivity of ultrasound is reported to be between 2 and 20%). (Mohan H – 1999)

Placental abruption is clinically diagnosed in about 1% of all pregnancies although evidence suggests that minor degrees of abruption occur much more frequently. Maternal conditions most commonly associated with placental abruption include advanced maternal age (even with no underlying disease process), hypertensive disease, any disease that predisposes one to hypertension e.g. connective tissue diseases, renal disease, vascular disease), cigarette smoking, drug. In most patients with placental abruption, some of the blood insinuates itself between the chorioamniotic membrane and uterus, escapes through the cervix, and appears externally, resulting in vaginal bleeding.

Occasionally, the blood does not escape externally but is retained between the detached placenta and the uterine wall, leading to concealed hemorrhage. Concealed hemorrhage is likely due to fetal parts that block the area of the internal cervical os, thereby preventing any outflow. In concealed hemorrhage, there is no external bleeding, but uterine rigidity and tenderness are likely to be pronounced. Placental abruption with concealed hemorrhage carries with it much greater maternal problems because the extent of the hemorrhage is not appreciated, so blood replacement is commonly insufficient. All degrees of premature separation of the placenta may occur, from an area only a few millimeters in diameter to the entire placenta. The placenta separating at its margin may disrupt the marginal sinus. Although marginal sinus rupture was formerly classified as a separate clinical entity, it represents placental separation limited to the margin of the placenta and likely manifesting as a subchorionic hematoma on ultrasound if blood does not escape readily from the uterus. (Mohan H – 1999) .

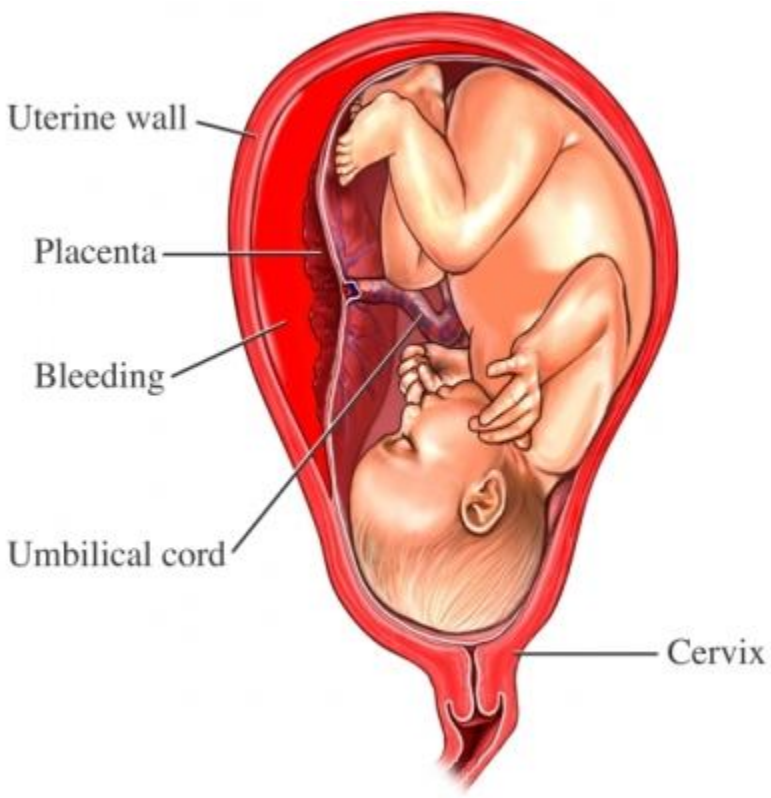
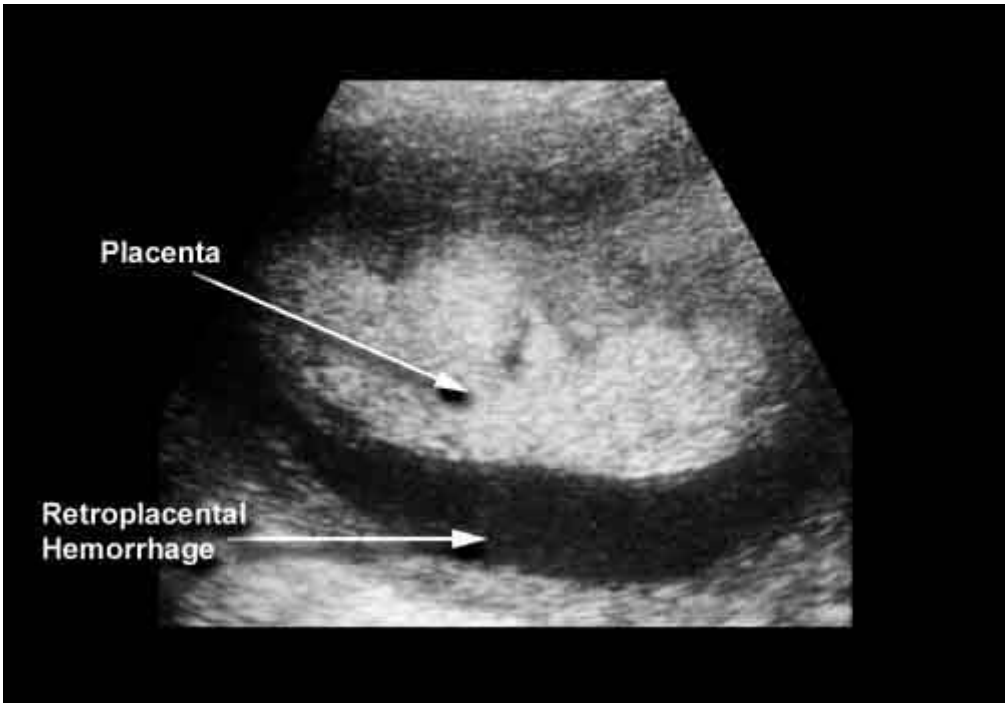


Diagram (2-7) showed **Abruption placenta -** (www.ultrasoundimagegallery.com)

2.5.1.5 B ultrasound finding:

The sonographic manifestations of placental abruption are a retroplacental hematoma and/or subchorionic hematoma. Ultrasound assessment should include measuring the size of the hematoma and observing changing in the appearance of the hematoma on serial studies. (Chudleigh T, Thilaganathan B – 2004)



TAS Ultrasound Image (2-13) **Abruption placenta – (www.diagnosticimaging.com)**

2.5.2 Abnormal uterine bleeding:

Abnormal uterine bleeding is a descriptive term applied to any alteration in the normal pattern of menstrual flow. However, from a practical point of view abnormalities in menstrual flow may take from of excessive flow, prolonged flow or inter menstrual bleeding. Menorrhagia is one of the commonest gynecological complaints seen in practice as accounts for approximately 15 per cent of all referrals to a general gynecologic clinic. Among women aged 16 to 45 years it has an incidence of around 30 per cent and remains the commonest indication for hysterectomy. The average menses lasts for 3-7 days with a mean blood loss of 35 ml. Menorrhagia is generally define as blood loss of greater than 80 ml is women who loose this amount or more will

consistently have a lower hemoglobin and heamatocrit value . Abnormal uterine bleeding can be classified as organic and non organic. At least 50 per all women with menorrhagia have no identifiable pathology (non-organic). This pattern is called dysfunction uterine bleeding (DUB). Most cases of DUB (at least 85%) are due to a failure of ovulation as a result of an alteration in neuro-endocrinological function, ThereforeDUB can be further classified as anovulatory or ovulatory. (Robbins C-1999).

2.5.3 Organic causes:

The major organic causes of abnormal uterine bleeding include the following condition. Local disorder (uterine malformation , myoma or fibroids , adenomyosis ,endocervical polyps , endometrial polyps ,hyperplasia , IUCD , PID , malignant of the cervix or uterus hormone producing tumor and trauma). (Robbins C – 1999).

2.5.4 Uterine malformation

A congenital uterine malformation is a deviation in the shape or structure of the uterus that occurred during a woman's own prenatal development. Exposure to certain chemicals may cause congenital malformations, such as if the woman's mother took a drug called DES while pregnant.

Some type's congenital uterine malformations can increase the risk of miscarriages or preterm delivery. Specific malformations include septate uterus, bicornuate uterus, unicornuate uterus, arcuate uterus, didelphic uterus, or T-shaped uterus. (Robbins C – 1999)

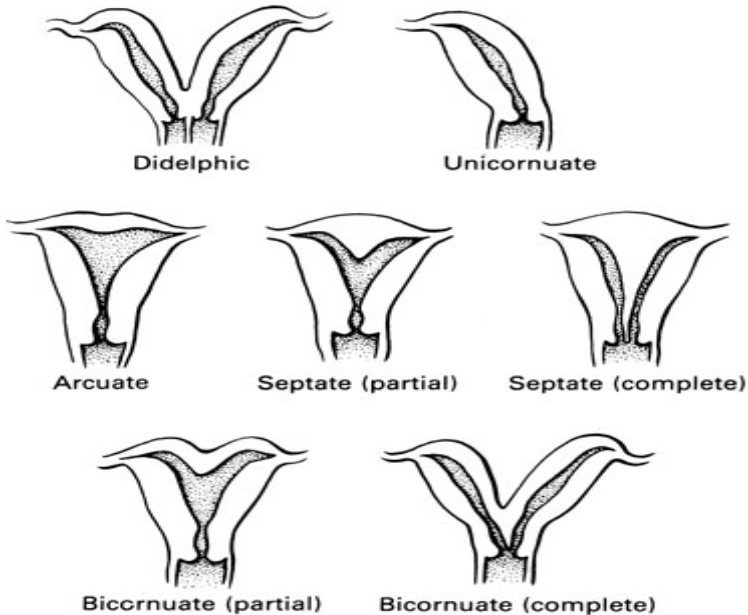


Figure (2-1) Uterine Anomalies – (www.imagingconsult.com)

2.5.5 A **Fibroid:**

Myomas or myoma are benign tumors arising from smooth muscle. A myoma is composed mainly of smooth muscle with varying amounts of fibrous tissue. Myomas may also be referred to as leiomyomas and fibromyomas. “Fibroid” is a popular slang referring to a myoma of the uterus (fibroid is the word generally used in the clinical setting by sonographers and gynecologists). Myomas can occur in any structure with smooth muscle including the fallopian tubes, bladder and gastrointestinal tract. The most common location for myomas is the body of the uterus. (Robbins C – 1999)

Myomas are the most common masses of uterine origin and are one of the most frequent abnormalities palpated in the pelvis. The exact incidence of myomatous disease of the uterus is uncertain but it is diagnosed in about 20% to 25% of women 35 years of age or older; the incidence is up to seven times higher in black women compared to Caucasians.

Evidence strongly suggests that uterine myomas are dependent on estrogen for growth as they are rarely found before puberty and stop growing and atrophy after menopause (in well documented cases, new myomas rarely appear after menopause). (Robbins C – 1999).

During pregnancy, when blood estrogen levels are sustained and relatively high, there is often rapid growth of myomas. They are frequently diagnosed in conditions of hyperestrogenism including an ovulation, endometrial polyps, and endometrial Hyperplasia.

Hyperplasia. Myomas respond to GnRH agonists which have an antiestrogenic effect. Estrogen receptors have been shown to be higher in myomas compared to normal myometrium. Although myomas are associated with conditions involving high levels of estrogen, they are also found in women with normal cycles who exhibit no hormonal imbalance. Myomas may occur singly but are usually multiple (as many as 100 or more have been found in a single uterus). They vary in size from less than 1 cm to huge masses measuring over 20 cm. (Robbins C – 1999)

2.5.5 There are 4 general locations for fibroids:

1- Subserosal - on the outside surface of the uterus

2- Intramural - within the muscular wall of the uterus

3- Submucous - bulging in to the uterine cavity

4- Pedunculated fibroid – within out wall of the uterus.

- The only type that is supposed to have a large impact on reproductive function (unless they are large or numerous) is the submucous type that pushes in to the

uterine cavity. These are much less common than the other 2 types of fibroids.

- Because of their location inside the uterine cavity, submucous fibroids can cause fertility problems and miscarriages
- Submucous fibroids can often be surgically resected to improve fertility. (www.diagnosticimaging.com)

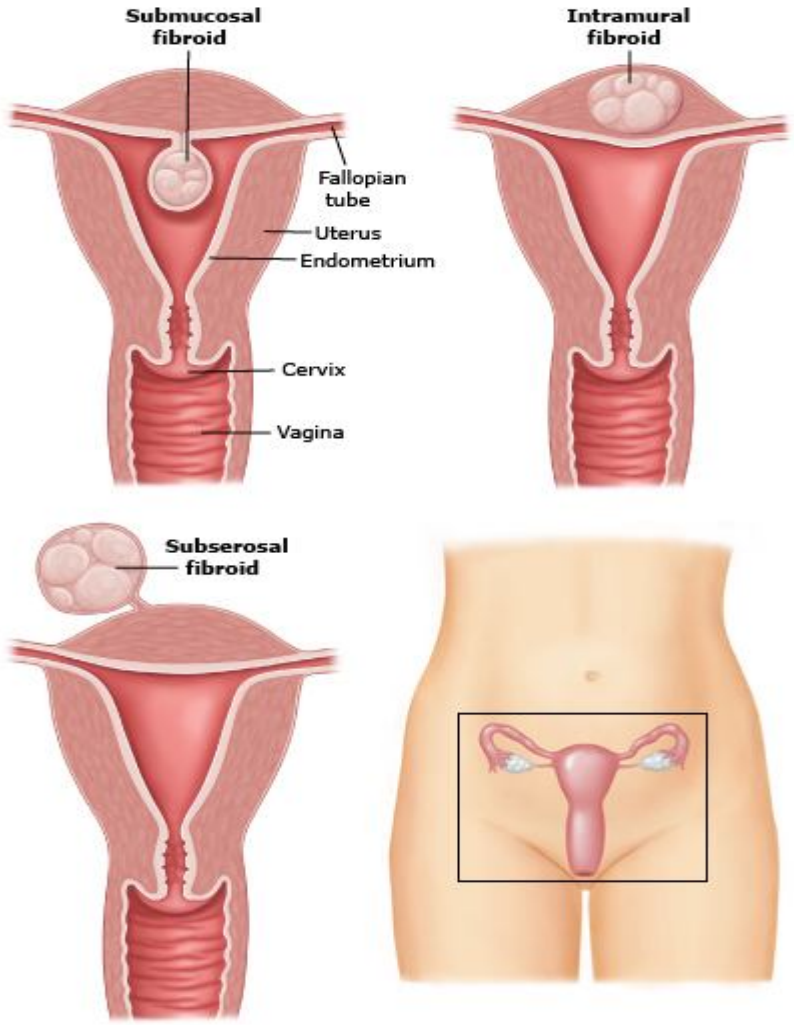
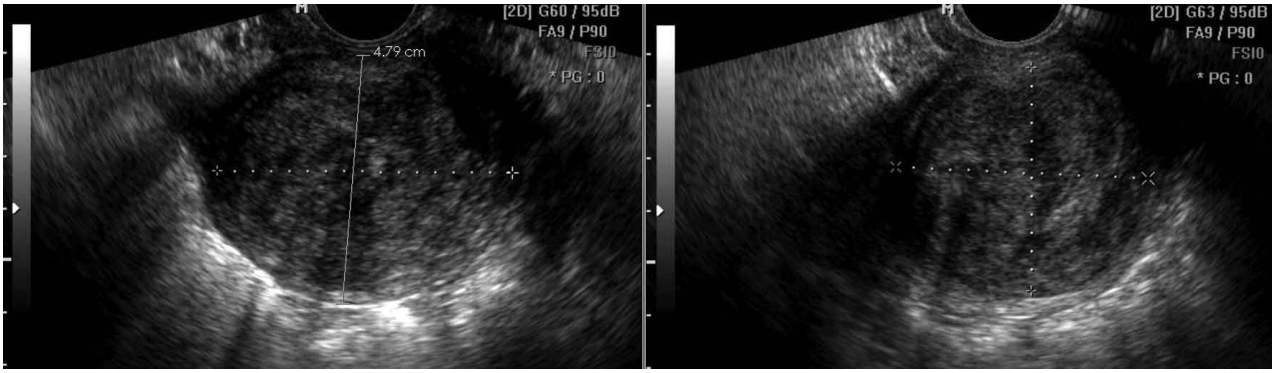
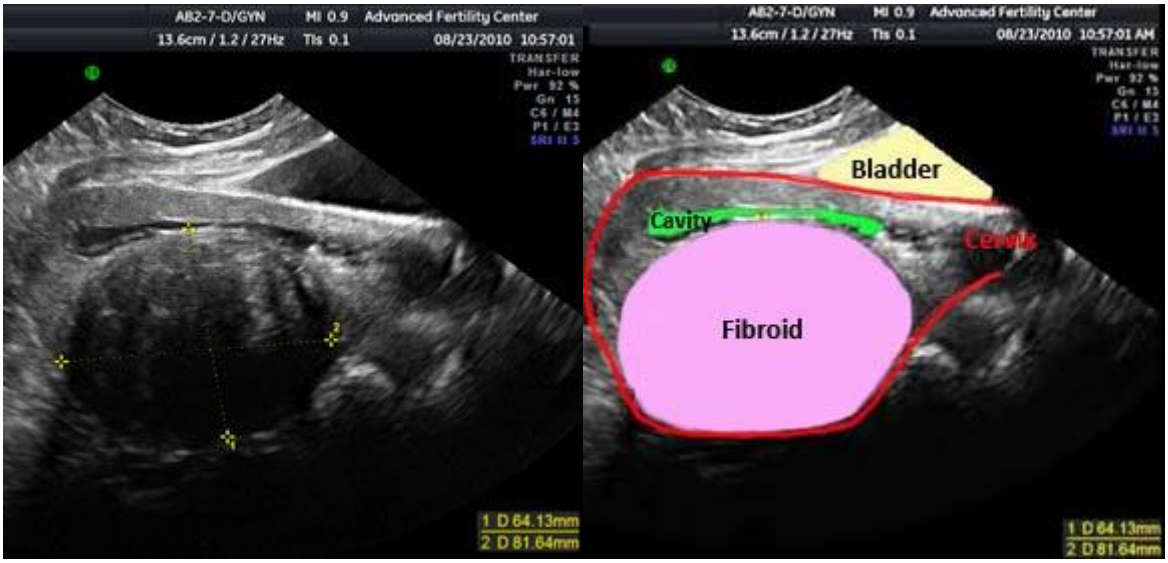


Diagram (2-8)showed **Fibroid locations in the uterus – (www.imagingconsult.com)**



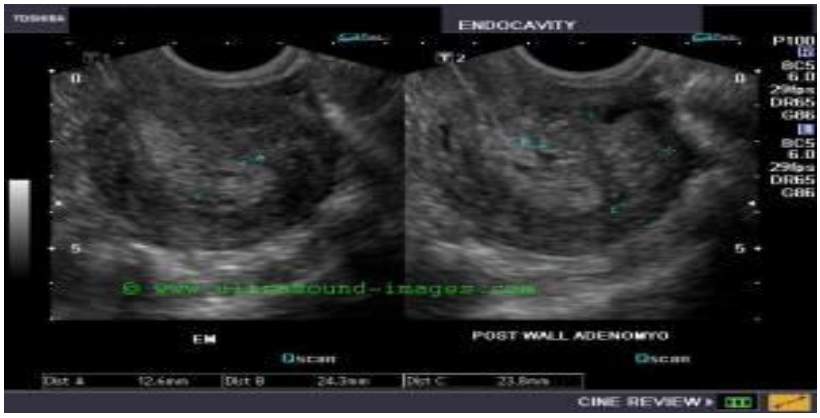
TVSUltrasoundImage (2-7)showed Fibroid - (www.ultrasound-image.com)



TVS Ultrasound Image (2-8) showed **Fibroid** - (www.ultrasound-image.com)

2.5.6 Adenomyosis:

Adenomyosis is defined as ectopic endometrial tissue within the myometrium. Adenomyosis can coexist with endometriosis however it is usually a separate disease. The term “internal endometriosis” is sometimes used to refer to adenomyosis. Adenomyosis may be either diffuse (infiltrative) or focal (known as adenomyoma). Diffuse adenomyosis manifests as an enlarged and globular uterus; focal adenomyosis manifests as a focal mass in the uterine wall, usually associated with uterine pain and tenderness. Adenomyosis is a benign disease that usually affects women in their reproductive years, and is most common in women 40 to 50 years of age (perimenopausal). Incidence is higher in multiparous women. The most common symptoms associated with adenomyosis are abnormal uterine bleeding (hypermenorrhea), dysmenorrhea, and pelvic pain referable to the uterus. Before the advent of EVS and MRI, adenomyosis was called the neglected diagnosis because preoperative diagnosis was only rarely made. Distinguishing focal adenomyosis and myoma may not be possible in some cases. Definitive diagnosis is by histological analysis of the uterus following hysterectomy. (Robbins C – 1999)



Doppler Ultrasound Image (2-9) showed Adenomyosis - (www.ultrasound-image.com

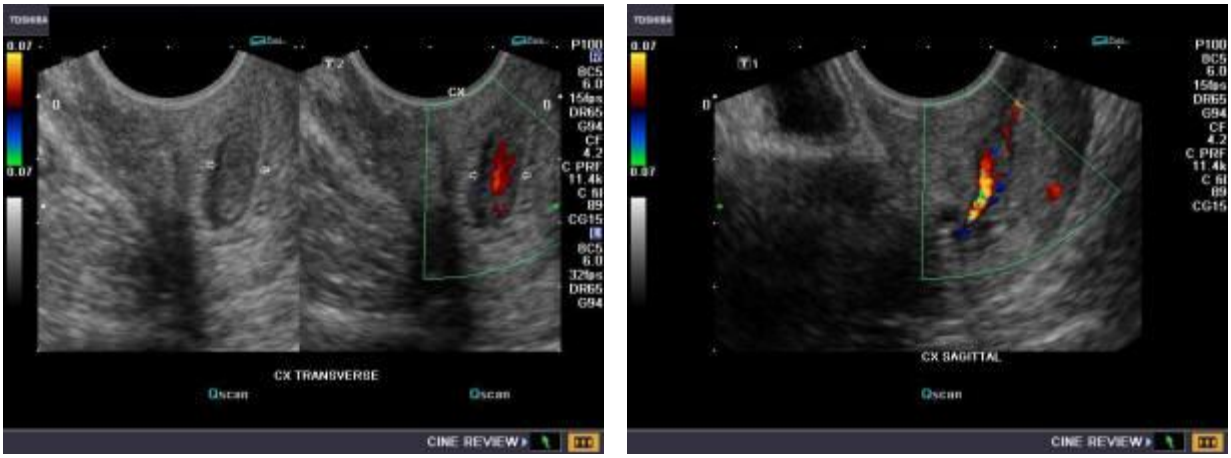
2.5.7 A Polyp :

Endometrial polyps are localized overgrowths of endometrial glands and stroma. These

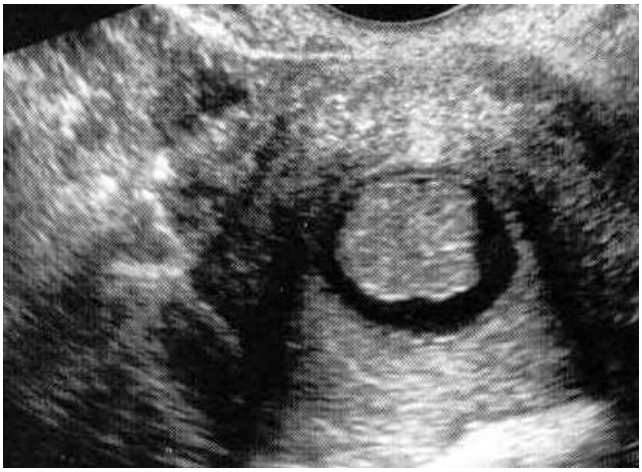
lesions may be either sessile (broad-based) or pedunculated. They are multiple in 20% of cases, and range in size from a few millimeters to several centimeters. In premenopausal women, polyps have very little premalignant potential however there is a 10 to 15 percent association with malignant disease in postmenopausal women. Endometrial polyps are often asymptomatic and detected incidentally during pelvic ultrasound. The most frequent symptom is irregular uterine bleeding, which may manifest as metrorrhagia, increased perimenopausal bleeding, or postmenopausal bleeding. Less commonly, polyps may be associated with mucous discharge. The diagnosis of endometrial polyps can be made with endovaginal sonography, dilation and curettage (D&C), and hysteroscopy Polyps may be removed by D&C or hysteroscopic excision. (Robbins C – 1999).

2.5.7 B **Ultrasound/Doppler**

With TAS, endometrial polyps are generally too small to be defined and typically produce non specific endometrial thickening. With EVS, polyps are generally discretely visualized and appear as focal echogenic masses with a uniform echo texture (slightly more echogenic than normal adjacent endometrium). On CD/PD evaluation, polyps typically demonstrate a single feeding vessel in the center of the lesion. Sonohysterography with the aid of CD provides more accurate EVS distinction between polyps, submucous myoma, clots, and synechia. The most frequent lesions to be distinguished are polyps and submucous myoma. Typical polyps have a single feeding vessel whereas submucous myomas typically have multiple feeding vessels that arise from the inner myometrium. (Maulik D, Zalud I – 2005)



TVS Ultrasound Image (2-10) pedunculated polyp of the cervix - (www.ultrasound-image.com)

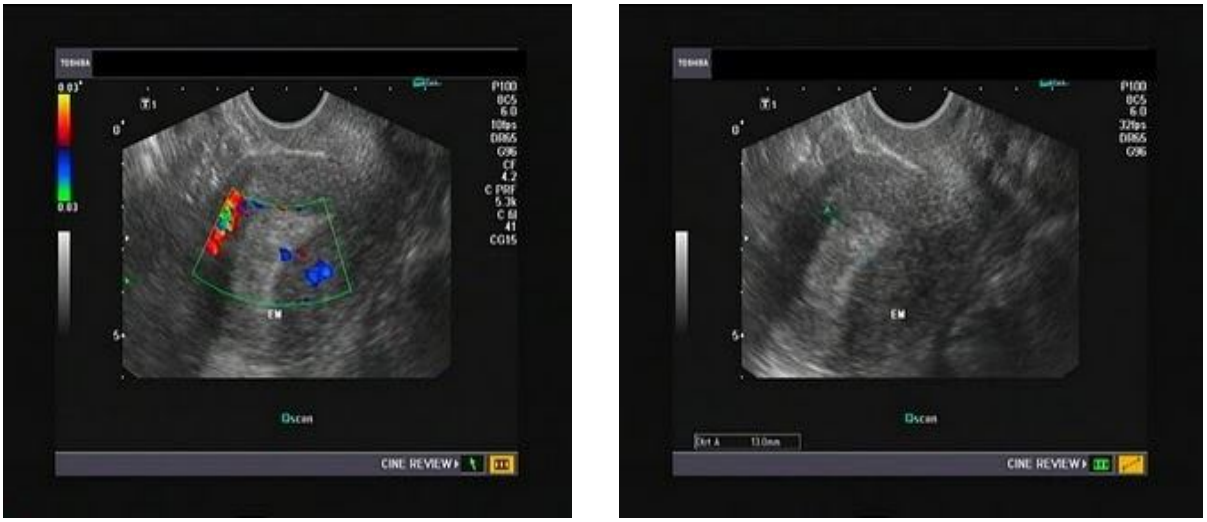


TVS Ultrasound Image (2-11) endometrial polyp outlined by fluid - (www.ultrasound-image.com)

2.5.8. Endometrial hyperplasia

Endometrial hyperplasia is defined as generalized overgrowth of the endometrium. There are several histological patterns with a spectrum of glandular proliferation with varying degrees of architectural disarray including simple hyperplasia, and complex adenomatous hyperplasia, with and without atypia risks include polycystic ovarian disease, tamoxifen therapy, and estrogen replacement therapy. Estrogen stimulation of the endometrium, without the controlling effects of a progestin or progesterone, is the underlying causes of endometrial hyperplasia, and eventually, endometrial cancer. The

risk of progression to endometrial cancer is reported to be 1% to 14% in untreated cases. This risk is greatest in postmenopausal women and in women with severe atypia. Endometrial hyperplasia is the most common cause of vaginal bleeding in both premenopausal and postmenopausal women. In women on estrogen replacement therapy, the addition of a progestational agent has dramatically reduced the risk of endometrial hyperplasia and carcinoma. Treatment of endometrial hyperplasia is usually medical, and depends on the patient's age, the underlying cause, and reproductive needs. On ultrasound, endometrial hyperplasia appears as generalized thickening of the endometrium with a smooth myometrial boundary and no evidence of myometrial invasion. It may be indistinguishable from endometrial polyps or carcinoma, even on EVS. Sonohysterography can provide more accurate distinction. Diagnosis is usually confirmed by endometrial sampling. (Mohan H – 1999).



Doppler Ultrasound Image (2-12) endometrial hyperplasia - (www.ultrasound-image.com)

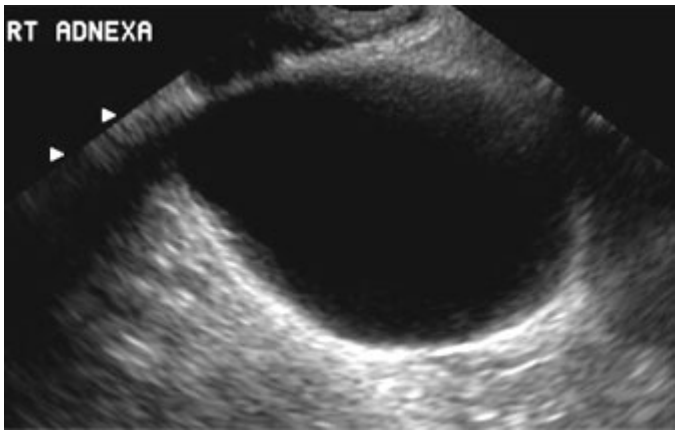
2.5.9 Ovarian Mass

Ovarian masses represent a wide variety of pathologies including functional cysts, endometriosis,

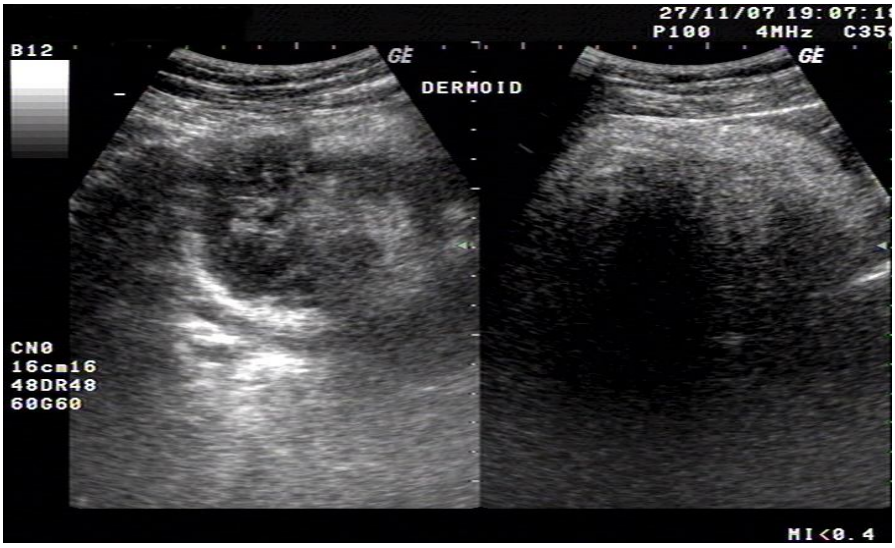
benign or malignant neoplasms, and those originating from adjacent pelvic organs. The term "tumor" does not mean benign or malignant. It simply means the mass in the ovary is not a functional, ovulatory cyst. "Tumor" implies that the mass or cyst is not in a normal finding.

The ovarian cysts are characterized by anechoic (black) fluid filling the cyst cavity and thin walls. Simple cysts are less than 40-50 mm in diameter. If an ovarian cyst has recently ruptured, one will see fluid in the pelvis. If there are echoes within the cyst, it may be from hemorrhage.

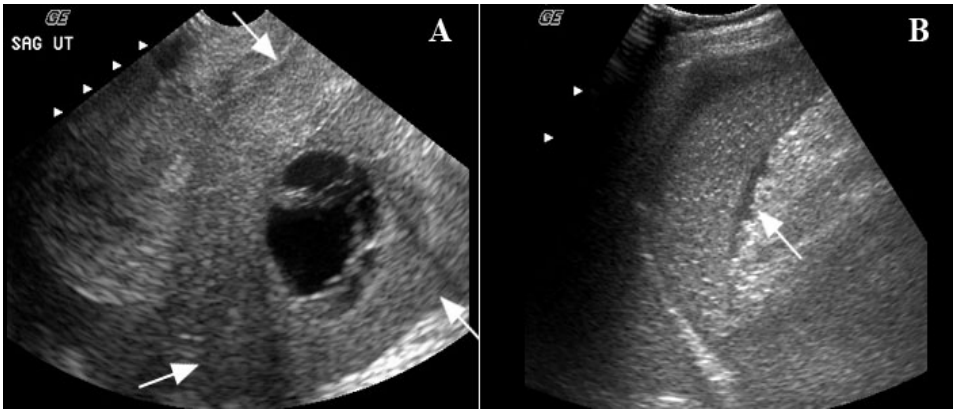
A complex cyst with hyperechoic regions may indicate a dermoid, and cysts with uniform hypoechoic texture can suggest endometriomas. Features suggestive of malignancy include that of a complex cyst (Figure 3) with thickened walls, septations, papillary solid components and flow detected on Doppler, It's also can associated with ancillary features of malignancy such as hydronephrosis, ascites, and pleural effusions. (www.Radiographics.com).



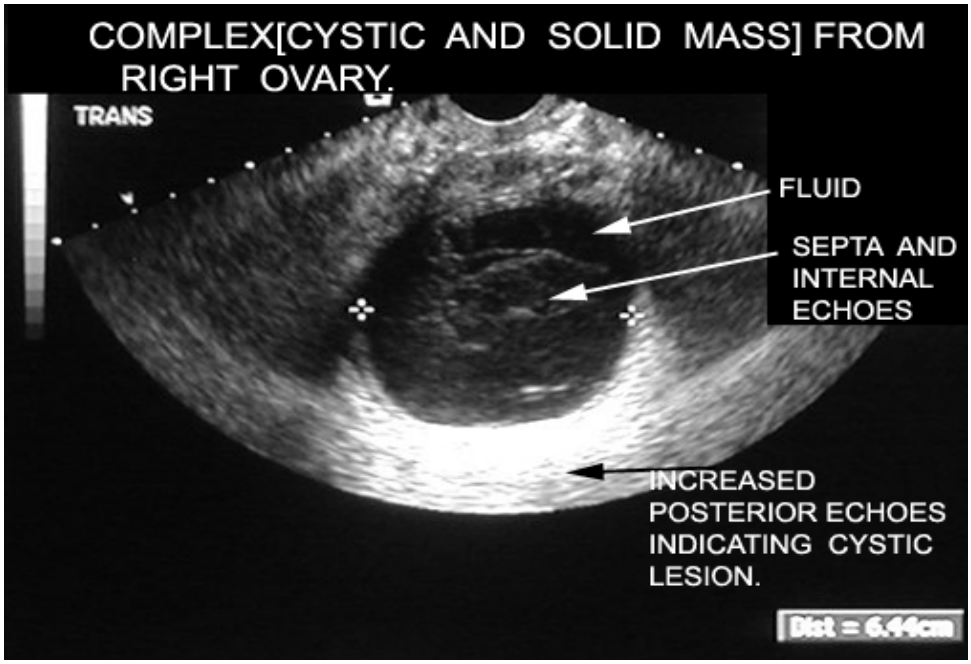
TAS Ultrasound Image (2-13)showed Simple ovarian cyst - (www.ultrasoundimagegallery.com)



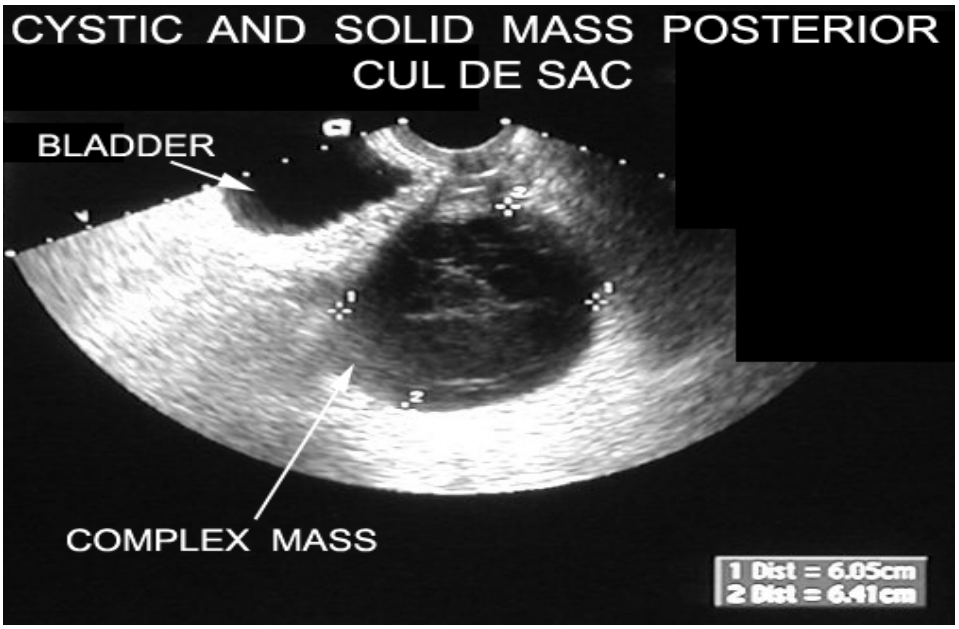
Doppler Ultrasound Image (2-14) Dermoid cyst - (www.ultrasoundimagegallery.com)



TVS Ultrasound Image (2-15)showed Ovarian Cancer - (www.ultrasoundimagegallery.com)



Doppler Ultrasound Image (2-16)showed Ovarian Cancer - (www.ultrasoundimagegallery.com)



TVS Ultrasound Image (2-17) showed Complex cystic and solid mass -

(www.ultrasoundimagegallery.com)

2.5.10 Polycystic ovarian syndrome:

PCOD is a complex endocrine disorder characterized by chronic an ovulation associated with elevated serum androgen levels (hyperandrogenemia) and unbalanced elevations of serum LH levels (PCOD is the most common cause of chronic anovulation). The clinical and sonographic manifestations of PCOD are variable depending on the degree of hormonal imbalance. Patients may present with amenorrhea, oligomenorrhea, or other menstrual irregularity; other symptoms include hirsutism, infertility, and obesity. Stein-Leventhal syndrome is the clinical manifestation of PCOD associated with obesity, hirsutism, and amenorrhea. Stein-Leventhal syndrome spans a wide array of clinical manifestations including anovulation and infertility in addition to the classic triad of obesity, hirsutism, and amenorrhea. Women with Stein-Leventhal syndrome represent only a small subset of all women with PCOD although the names are often used interchangeably. The subsequent androgen elevations may cause hirsutism and, because of the local effects of androgen on the ovarian follicle, premature regression of developing follicles. This results in the characteristic multifollicular (polycystic) ovary typically seen in women with PCOD. Women with PCOD are at risk for endometrial hyperplasia and endometrial carcinoma due to chronic unopposed estrogen stimulation. Hormonal findings of PCOD include a generalized increase in serum androgens (androstenedione. testosterone) as well as an elevation of serum LH in the presence of normal to low serum FSH levels, resulting in an increased LH/FSH ratio which in many cases approaches or exceeds 2.5:1.

Ultrasound/Doppler - Patients with PCOD typically have bilateral ovarian enlargement,

numerous immature follicles without evidence of dominance (cysts <15 mm), and stromal hypertrophy with increased echogenicity. “An increase in the amount and echogenicity of the ovarian stroma distinguishes PC ovaries from the multifollicular ovary characteristic of normal puberty and hypothalamic anovulation. Ovarian volume in the diagnosis of PCOD has lessened in importance because various groups have reported demonstrating normal ovarian volumes in approximately one-third of patients. There are two morphological patterns of polycystic ovaries including peripheral and generalized distribution of cysts. The peripheral pattern is referred to as the “necklace” or “string of pearls” pattern. The Doppler characteristics of the ovaries and uterine arteries have been studied by several investigators with mixed and inconclusive results. (Robbins C – 1999).

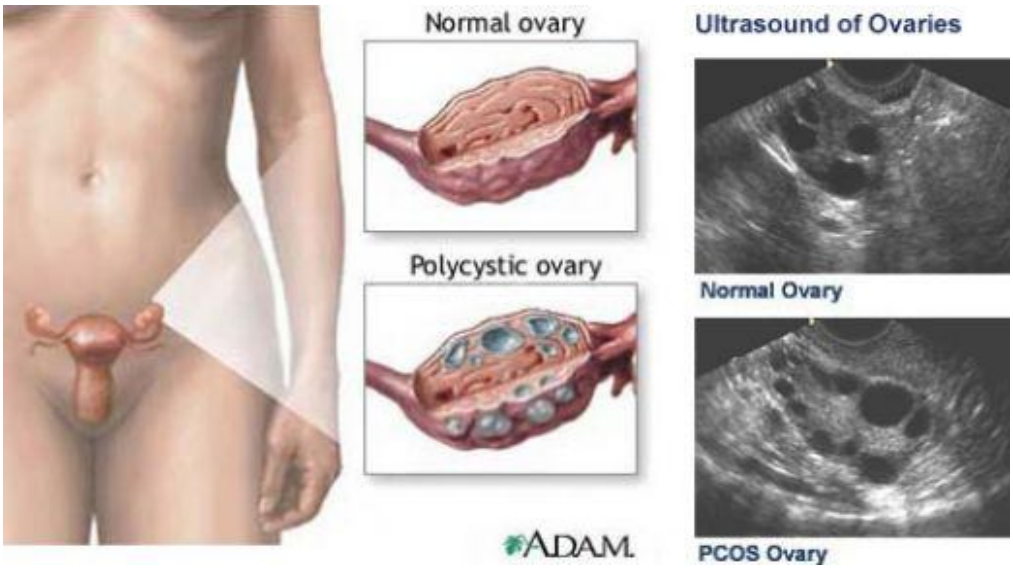


Diagram (2-9)showed polycystic ovarian syndrome - (www.ultrasoundimagegallery.com)

2.5.11 Trauma

Trauma to the lower genital tract should also be considered as a cause for an acute

presentation of abnormal bleeding. Postcoital laceration to the vagina can occur and in many situations a history may not be readily forthcoming. It may be use of a ring pessory. Vaginal trauma may be associated with significant hemorrhage, and occasionally will leave vesical or fistula. Rare it is such as arteriovenous malformation in the uterus have also been reported. . (Robbins C – 1999)

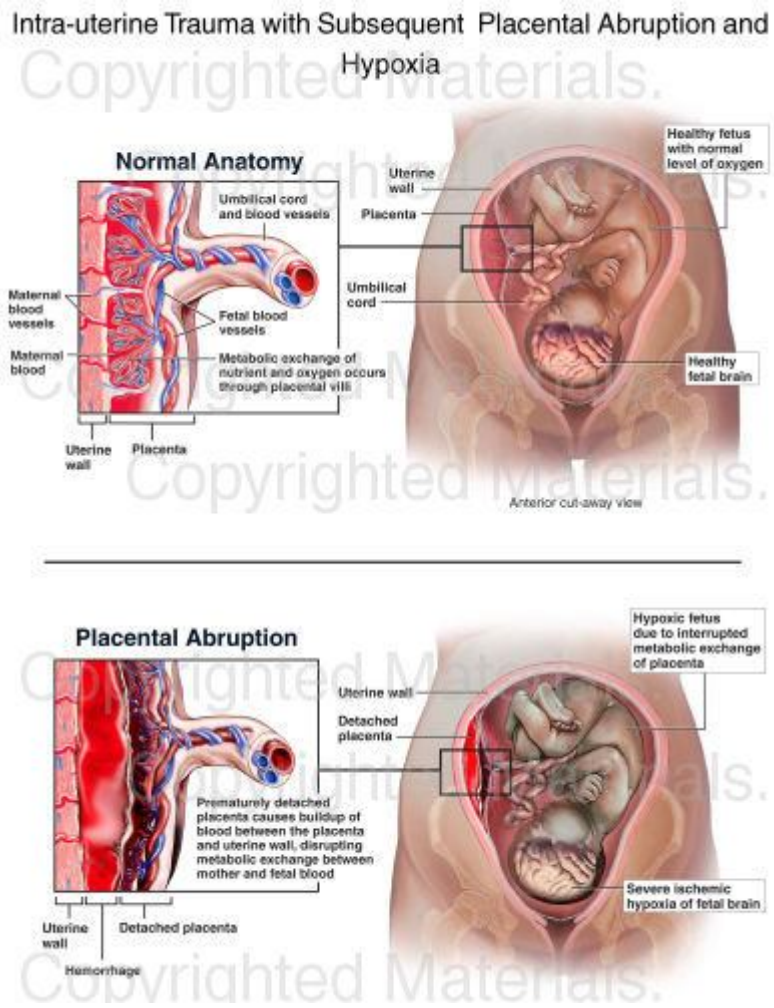


Diagram (2-10)showed Intra Uterine Trauma – (www.imagingconsult.com)

2.5.12 ***Neoplasm of genital tract:***

Vulval carcinoma account for approximately 5 per cent of genital tract cancer in the UK. It most commonly seen in older women with a media age of over sixty years. Little is

known about the etiology of vulval cancers, most invasive cancers [85%] are squamous, some 5 per cent are melanoma and adenocarcinoma in underlying porcine glands melanoma and paged disease any carry as especially poor prognosis (Robbins C – 1999).

The most common malignant disease affecting the uterine body is adenocarcinoma. Squamous carcinoma is rare, but when it occurs it develop in a glandular epithelium which has undergone squamous metaplasia .Sarcomas occurs much less frequently than adenocarcinoma and include leiomyosarcoma which can develop within the myometrium or within a leiomyo fibroma , and the rare sarcomas developing from endometrial stroma. The comments presentation symptom in patient suffering from endometrial carcinoma is abnormal vaginal bleeding. It is the most common postmenopausal and the bleeding can be scanty with irregular and sometimes quit long interval between episodes of bleeding. Other symptoms such as pain are uncommon until very late stage. In all patients with abnormal vaginal bleeding the possibility of eithera cervical or uterine carcinoma should only be discount after they have been formally excluded.

Ultrasound appearance is variable, depending on the stage at presentation. Generally no uterine enlargement at the time of diagnosis but changes in the endometrium and inner myometrium may be apparent. Endometrium thickening is always pathological but no morphological features to malignancy have been identified. Initially there is endometrium thickness and there is irregular of cavity interface. Small cystic area may be identified within the endometrium .early tamer cannot be detected by ultrasound imaging; cervical enlargement may be the first visible feature, the differential diagnosis being fibroid, lymphoma or sarcoma. Irregularity of the cervical outline is a common

feature that suggestive tumor spread in to the parametrium or invasion of the bladder. (Robbins C – 1999).

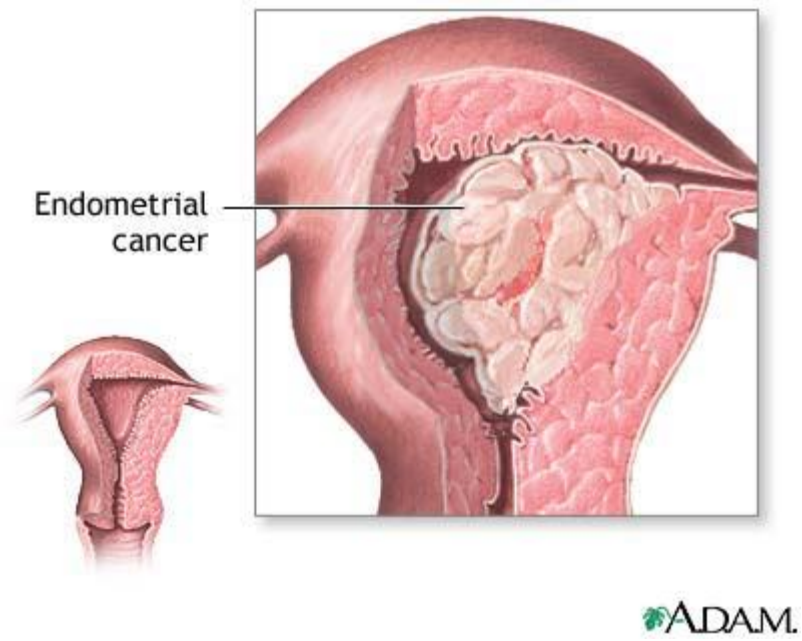
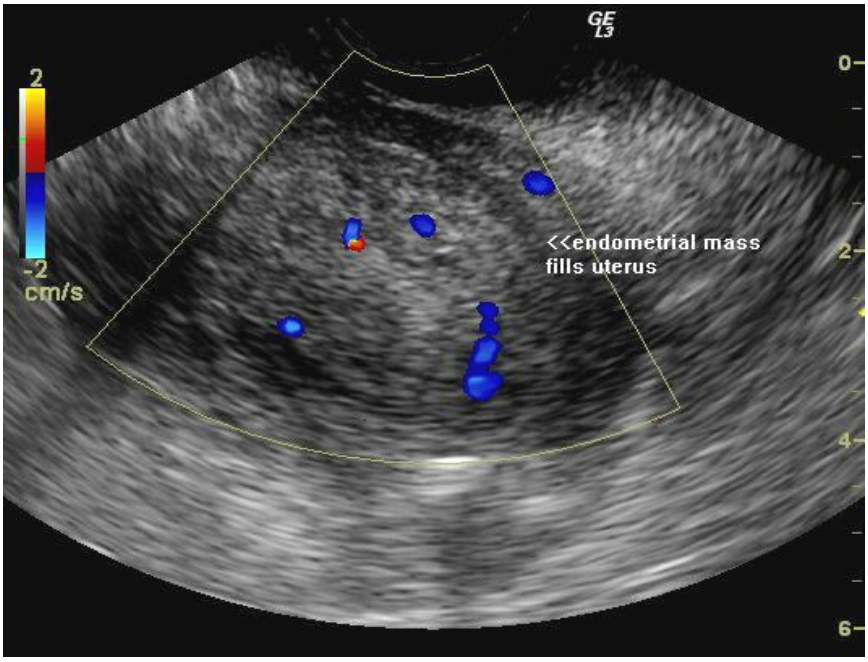


Diagram (2-11)showed Endometrial Cancer



Doppler Ultrasound Image (2-18) Endometrial Cancer (www.ultrasoundimagegallery.com)

Chapter 3

Methodology

Chapter three

Methodology

3.1 Type of the study:-

This is prospective study deals with the pregnant women complaining of abnormal vaginal bleeding that come for ultrasound department in different ages .

3.2 Population of the study:

Women with abnormal vaginal bleeding present to ultrasound department in Elsaudi Hospital in Omdruman in the period from June to November 2014.

3.3 Study sample:

The samples size consisted of 30 pregnant women were selected randomly.

Presented to ultrasound department indifferent ages.

(i) Inclusion criteria:

Woman with vaginal bleeding in the second and third triminster.

(ii) Exclusions criteria:

- Diabatic **.**
- Hypertion .

-First triminster bleeding

3.4 Material:

Gray scale Ultrasound machine Toshiba with 3 - 7.5 MHz machine made in china 2011 .

3.5 **Method**:

The method used is direct interviewing the patients when they came to ultrasound department, asking them their history, recent complain and others investigations i.e. HCG test. The patients undergoing ultrasound investigation were well prepared i.e. they must came with almost reasonably emty bladder, then the patient laid in supine position on the couch. All patients were examined transabdominally and transvaginal to confirm placenter

previa , then gel was applied in pelvis area and both longitudinal and transverse views of the patients uterus, its contents and adnexa were examined ,when we using transvaginlal probe in addition to gel we used gloves.

3.5 Duration of the study:

This study started from June up to Novemberber 2014.

3.6 Data collection:

1- The data was collected by master data sheets using the following variables age, parity, fetal activity,fetal weight , plcenter location .

2- ultrasound findings .

3.7 Data analysis:

Data were analyzed by using SPSS program version 16 and the results were presented in form of graphs and tables.

3.8 Ethical consideration : Tvs – considerd to pregnant privacy .

Chapter 4

Results and analysis

Chapters 4

Results and analysis

This study was carried out on 30 pregnant complaining of abnormal vaginal bleeding were examined with the following results according to the age, parity, fetal activity,fetal weight,placenta location and the ultrasound finding.

Table (4 -1) Effect of bleeding on fetal biometry

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Difference	30	1.2174	.59974	.12505

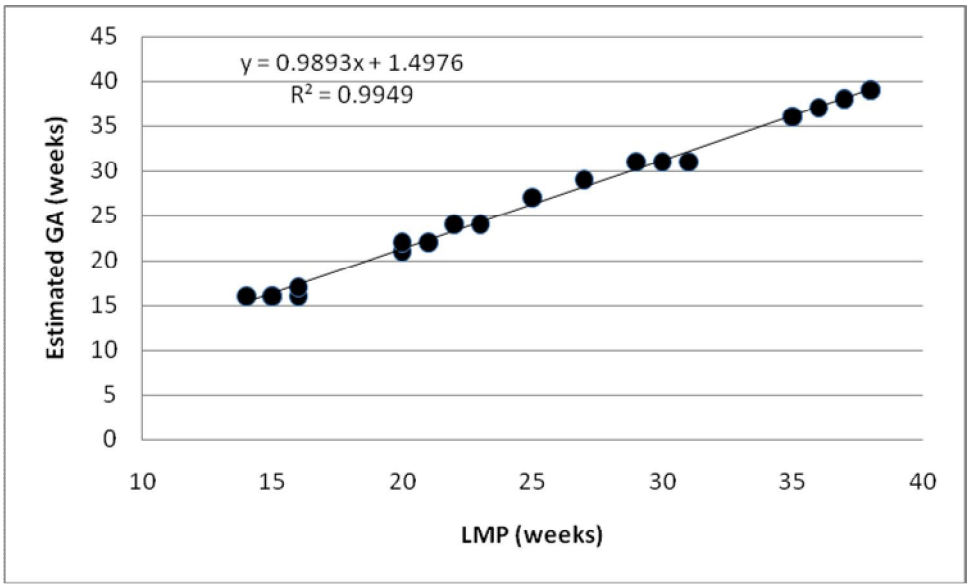


Figure (4 -1) **Effect of bleeding on fetal biometry**

Tabe(4-2) Socioeconomic status

Socioeconomic

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low	19	63.3	63.3	63.3
	MID	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

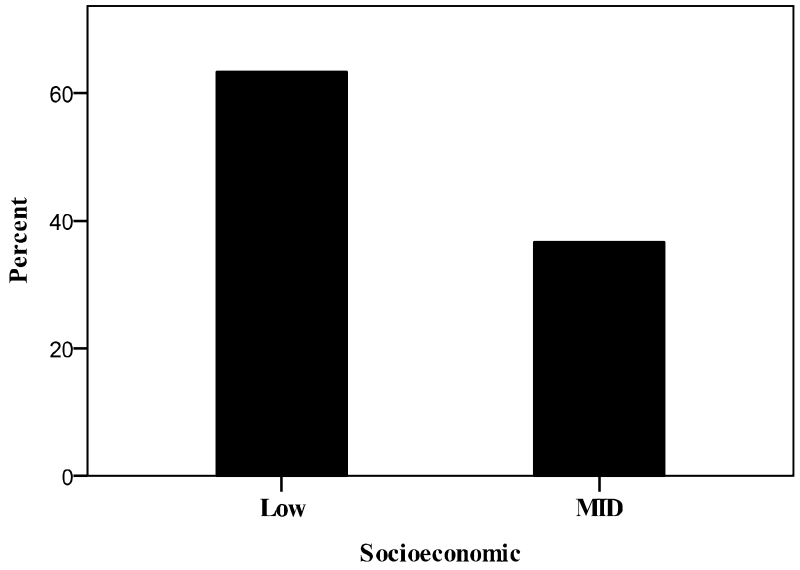


Figure (4 - 2) **Socioeconomic percentage**

Table (4-3) Parity distribution

Parity

	Frequency	Percent	Valid Percent	Cumulative Percent
Primigravida	4	13.3	13.3	13.3
Multi-gravida	25	83.3	83.3	96.7
Grand multi-gravida	1	3.3	3.3	100.0
Total	30	100.0	100.0	

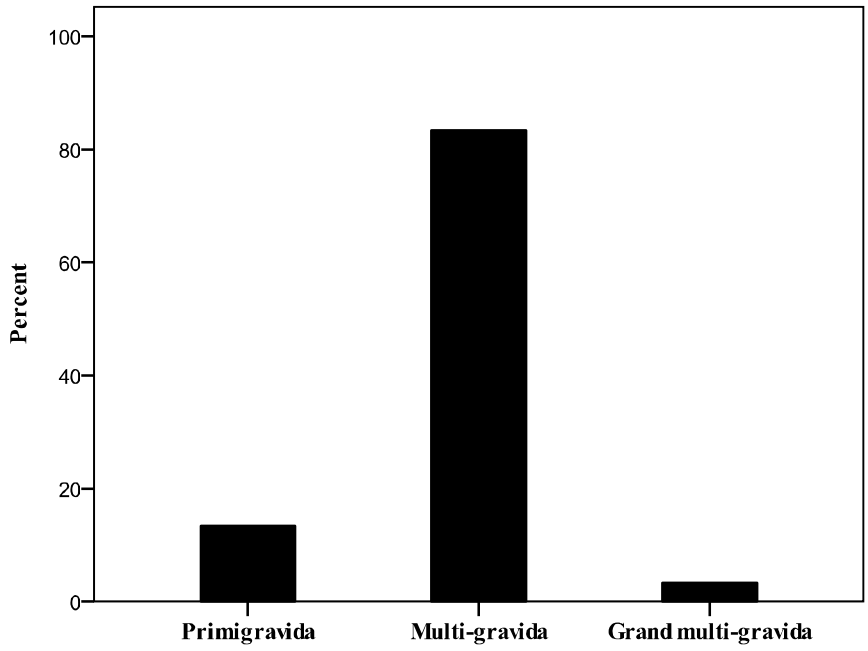


Figure (4-3) Parity percentage

Table(4-4) fetus Presentation

Presentation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cephalic	21	70.0	70.0	70.0
	Breech	8	26.7	26.7	96.7
	Transverse	1	3.3	3.3	100.0

Presentation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cephalic	21	70.0	70.0	70.0
	Breech	8	26.7	26.7	96.7
	Transverse	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

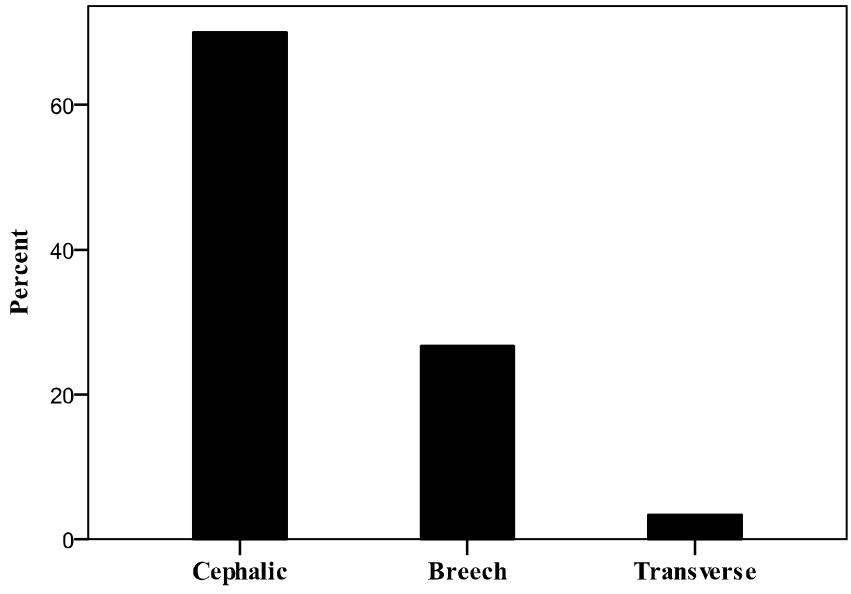
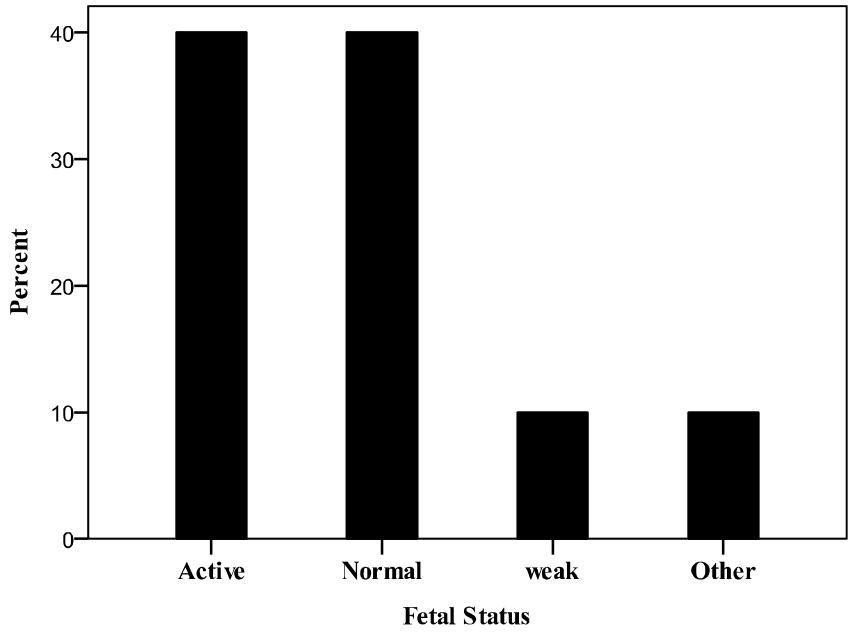


Figure (4 - 4) fetal presentation

Table (4-5) fetal status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Active	12	40.0	40.0	40.0
	Normal	12	40.0	40.0	80.0
	weak	3	10.0	10.0	90.0
	Other	3	10.0	10.0	100.0
	Total	30	100.0	100.0	



Figure(4 - 5) fetal status

Table (4-6) Trauma percentage

Trauma

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	23	76.7	76.7	76.7
	YES	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

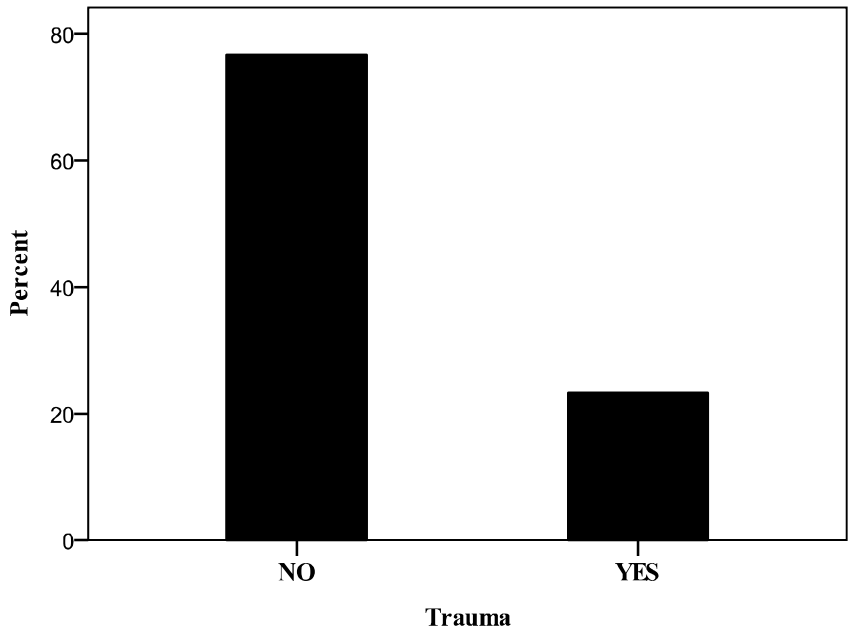


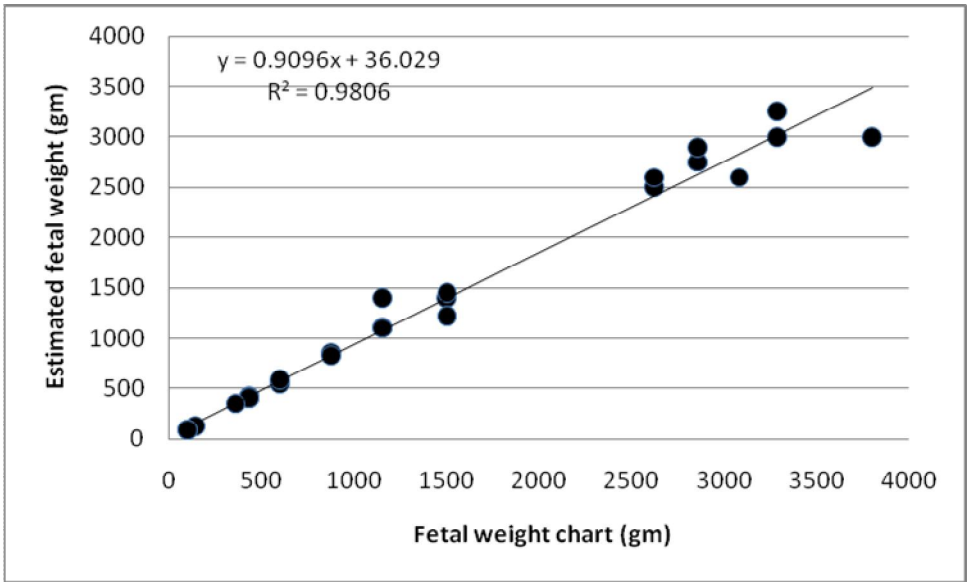
Figure (4 - 6) Trauma percentage

Table (4 -7) Parity * Fetal Status Crosstabulation

		Fetal Status				
		Active	Normal	weak	Other	Total
Parity	Primigravida	0	4	0	0	4
	Multi-gravida	11	8	3	3	25
	Grand multi-gravida	1	0	0	0	1
Total		12	12	3	3	30

Table (4 - 8) Parity * Abnormal Placenta Cross tabulation

		Abnormal Placenta		
		Previa	Abruption	Total
Parity	Primigravida	1	3	4
	Multi-gravida	14	11	25
	Grand multi-gravida	1	0	1
		16	14	30



Figure(4-7) scatter plot shows a direct linear realtionship between the estimated fetal weight and the fetal weight using chart.

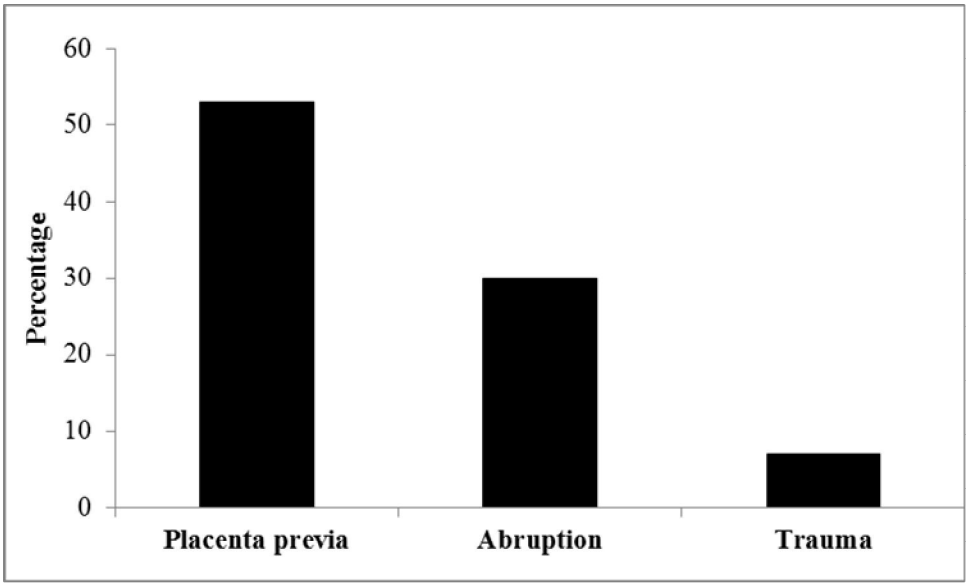


Figure (4 - 8) General causes of bleeding

Chapter 5

Discussion, Conclusion, Recommendations & Suggestion for future. Reference

CHAPTER5

5.1 Discussion:

This is a retrospective study has been conducted to identify the causes of vaginal bleeding during the second and third trimenster. 30 female with bleeding were enrolled in the study. Their age at the range in bettween (18-37) years old .

Regarding the parity group in our study population,25pregnant(83.3%) were multigravida 4 pregnant(13.3%) were primigravida, and only one(3.3%) was grandmultigravida table(4-3). Fetal status has been studied, it showed that 24 fetuses(80%) were active,and only 6 fetuses 20% showed week activity table(4—5). Furthermore fetal presentation was assessed, our findings showed that21(70%) of cases were cephalic presentation,8(26.6%) were breech presentation and only(3.3%) were transverse table (4 - 4)) .

In this study when we correlate between parity group and fetal activity; it showed that primigravida group 4(13%) has normal fetal activity, while multigravida group 19(63%) showed normal activity, while the rest 7 (20%) showed weak activity. In addition the parity group was correlated with placenta location; it showed that placenta previa and abruption 25 (83%) were most commonly seen in multigravida group table (4 -8). This result is constant with the previous studies which stated that the multigravida women are susceptible to have abnormal placenta location (Frederiksen et al., 1999).

Effect of bleeding on fetal biometry (FL, BPD,AC and HC) has been evaluated by comparing gestational age calculated from LMP with that obtained from mathematical formula established on ultrasound machine using fetal biometry. The finding of this study revealed that the difference between two methods of gestational age was found to be within the normal variation. (Figure (4-1)) were for one week using LMP the estimated one equal to0.99 week.

In evaluating fetal weight in order to assess the effect of vaginl bleeding on it, the result of this study showed that there is mild weight loss compared with the fetalweight chart .Were for each 1gm read from the chart estimated on was equal 0.91gm Figure(4-7), this result was in line with Karim finding which stated that ther was mild weight loss associated with second trimester hemorrhage(Karim et al., 1998).

Regarding to the main causes of vaginal bleeding during the second and third trimester, this study found that the placenta previa representwas the higher percentage of causes the vaginal bleeding, The second cause was the placenta abruption and less common was trauma Figure (4 - 8) . The result was in agreed with previous study which revealed that the placenta previa was the most common definite etiological factor behind the bleeding (Jouppila, 1979, Nielson et al., 1991).

5.2 Conclusion :

The mian objective of this study was to evaluate the role of ultrasound in detecting of the late pregnancy bleeding problem.

The sample of this study consist of 30 pregnant in second and third trimester in defferant ages came to department with vaginal bleeding .

The method of the data collection was done by data collection sheet.

aterial used was Toshiba machine power of 3-7.5MHZ made in China in 2011.

Study found thatbleeding during late pregnancy has no more effect on the following.

Fetal biometry (FL, BPD, ACandHC) did not affected by the bleeding.

The main causes of the bleeding was the abnormal location of the placenta(previa ,abruption and finally the trauma).

there was mild weight loss due to the bleeding. .

Bleeding has no effect on the activity of the fetus.

The location of the placenta centa was common seen in multigravida group .

The important of the study was to denote the main causes of the late pregnancy bleeding was placenta previa ,placenta abruption.

5.3 Recommendation

Ultrasound examination is very important to identify the causes of abnormal vaginal bleeding in order to prevent the complications .

The researcher has come out with the following recommendations.

* All health care centers and clinics must be provided by ultrasound units.

* Health information must be delivered in the rural area for pregnant women.

* Every pregnant woman must be examined by ultrasound in as routine to control the risk of vaginal bleeding.

*We suggest that further reaseach shoud be done to relate the vaginal bleeding with pelvic inflamatary dieeases (PID).

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Appendix

Appendix master table

NO	SOCIOE-CONOMIC	PARITY	presenentation	FETAL STATUS	PLACENTA PREVIA	PLACENTA ABRUPTION	TRAUMA	FL	BPD	AC	HC	FW/G	SD FW/G	LMP	GA
1	1	2	2	4		1	0	55	70	18	23	550	600	30	31
2	1	2	2	2	3		0	55	72	24	29	1400	1153	15	16
3	1	2	1	1		2	0	73	93	29	33	2500	2622	37	38
4	2	2	1	2		2	1	74	98	31	39	3250	3288	21	22
5	2	2	1	2		2	0	71	92	29	34	2750	2859	20	21
6	1	2	1	1		2	1	75	96	30	34	2600	3083	35	36
7	1	2	1	4		1	0	54	73	29	23	1110	1153	38	39
8	2	1	1	2		2	1	55	72	23	29	585	600	14	16
9	2	2	2	3	1		1	60	77.9	25	31	1400	1500	16	16
10	1	2	2	1	3		0	55	72	24	29	1100	1153	29	31
11	1	2	2	4		1	0	50.9	62.8	22	28	860	875	31	31
12	1	1	1	2	3		0	50	66	23	27	825	875	36	37
13	2	2	1	2		2	0	71	92	30	34	2750	2859	15	16
14	1	2	1	2	1		0	67	93	32	35	2900	2859	25	27
15	1	3	1	1	3		0	59	77	27	31	1450	1502	25	27
16	2	2	1	1	3		1	61	80	28	33	1220	1502	27	29
17	1	2	1	1	3		0	77	96	31	35	3000	3288	22	24
18	2	2	1	1	3		0	72	90	30	33	2600	2622	20	22
19	1	2	1	1	1		0	78	95	30	35	3000	3800	37	38
20	2	2	1	1	3		1	61	80	28	31	1220	1502	38	39
21	1	2	1	1	2		0	23	38	11	15	130	140	16	17
22	1	2	1	3		2	0	34	49	16.5	20	410	430	35	36
23	2	2	3	2	1		0	33	51	15.7	19.5	350	360	23	24
24	1	2	2	1	3		0	23	35	10	14	90	100		
25	2	2	2	1	3		0	23	35	10	14	90	100		
26	1	1	1	2		2	0	20	32	10	14	95	100		
27	1	2	1	2	2		0	31	55	15	19	420	430		
28	1	2	1	2		2	1	31	53	16	20	410	430		
29	1	1	2	2		2	0	22	33	10	14	92	100		
30	2	2	1	3		2	0	34	49	15	19	350	360		

Code of Socioeconomic status : low 1 M id 2 High 3.

Code of theParity : primgravida : 1 Muti-gravida 2 Grandmultiprod 3.

Code of Bleeding during this presentation: yes 1 No 2

Code of Trauma: Yes 1 No 2 .

Code ofPresentation : cephalic 1 breech 2 transverse 3 .

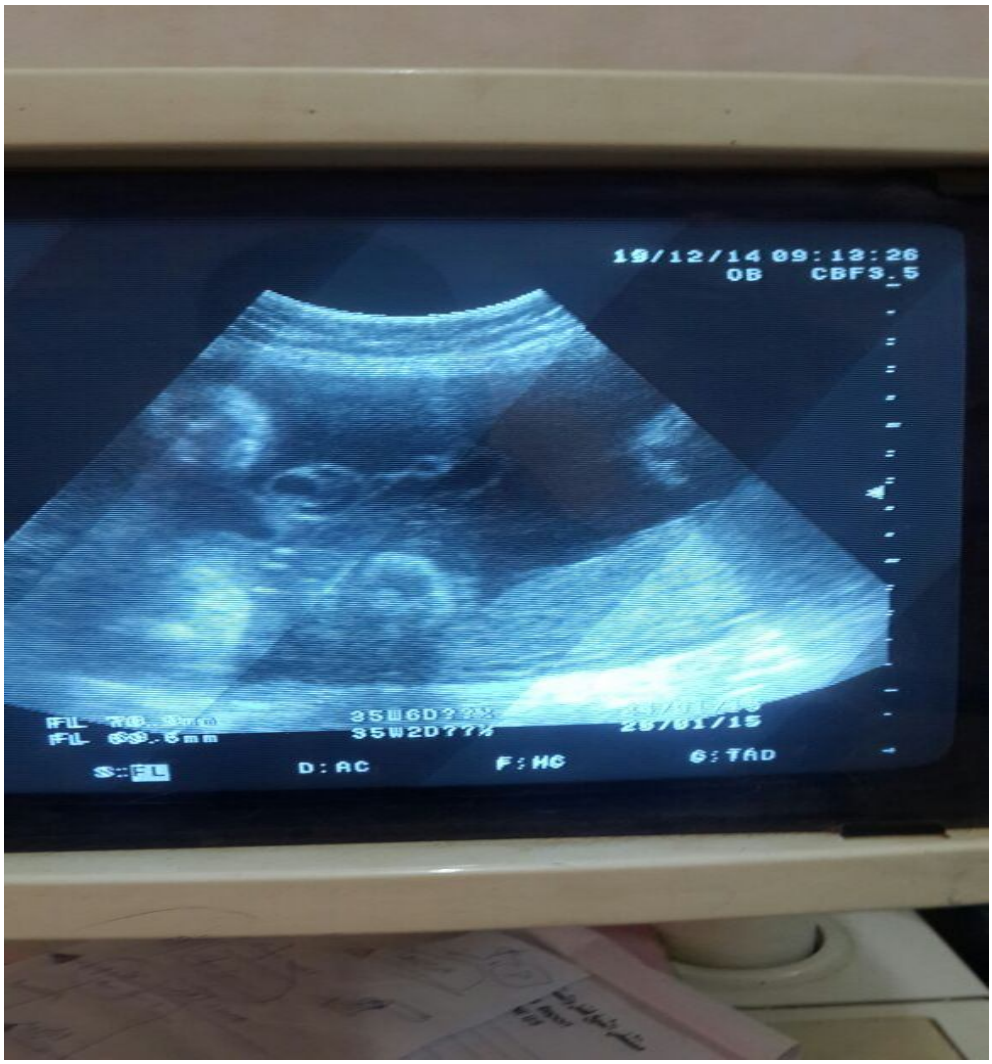
Code of Fetus status : Active 1 Normal 2 Week 3.

Code of the placenta : Anterior 1 posterior 2 Lateral fundal 3.

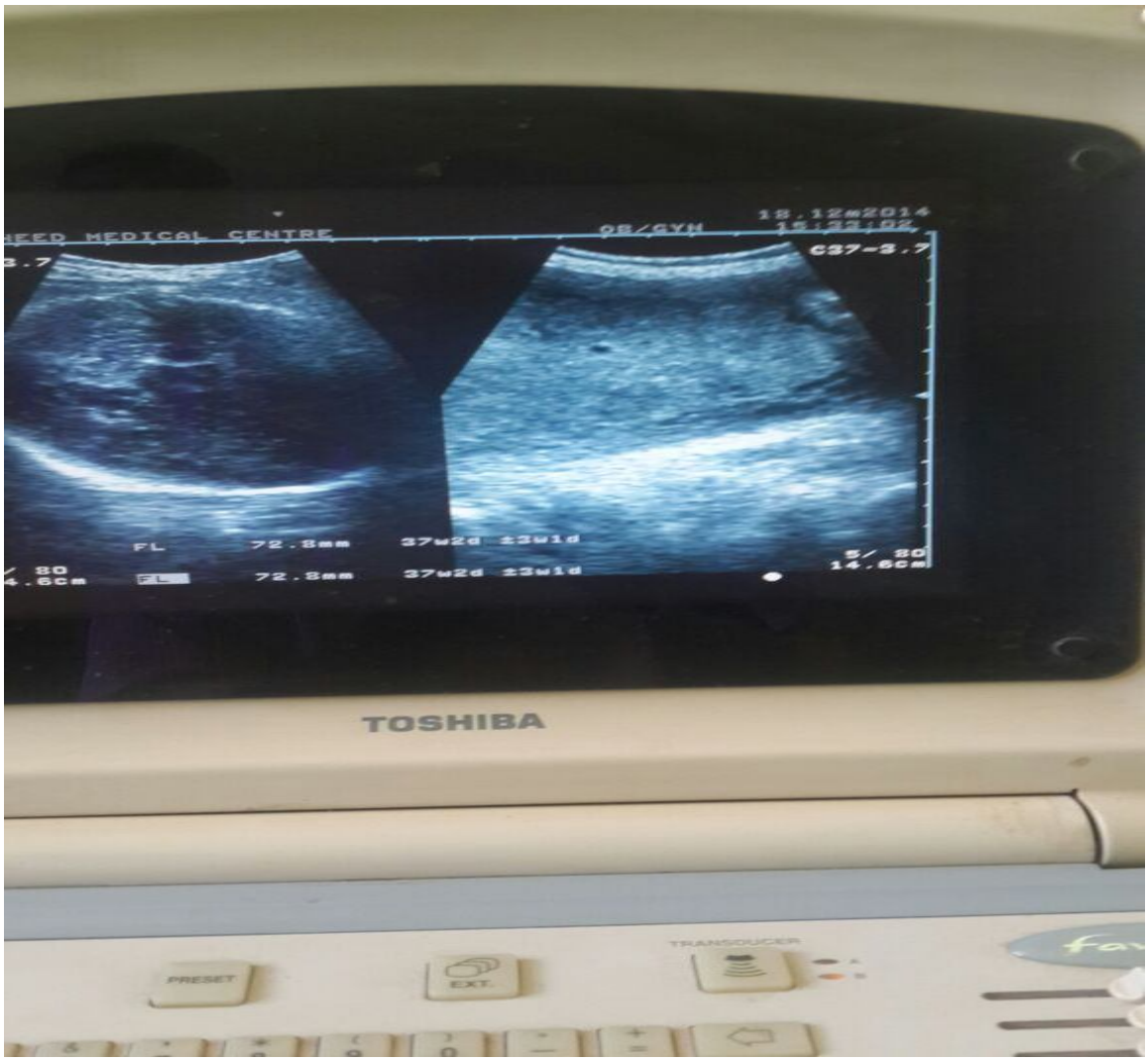
Previa: Complete 1 Parial 2 Marginal 3 Lline 4

Abroption : Complete 1 Partial 2

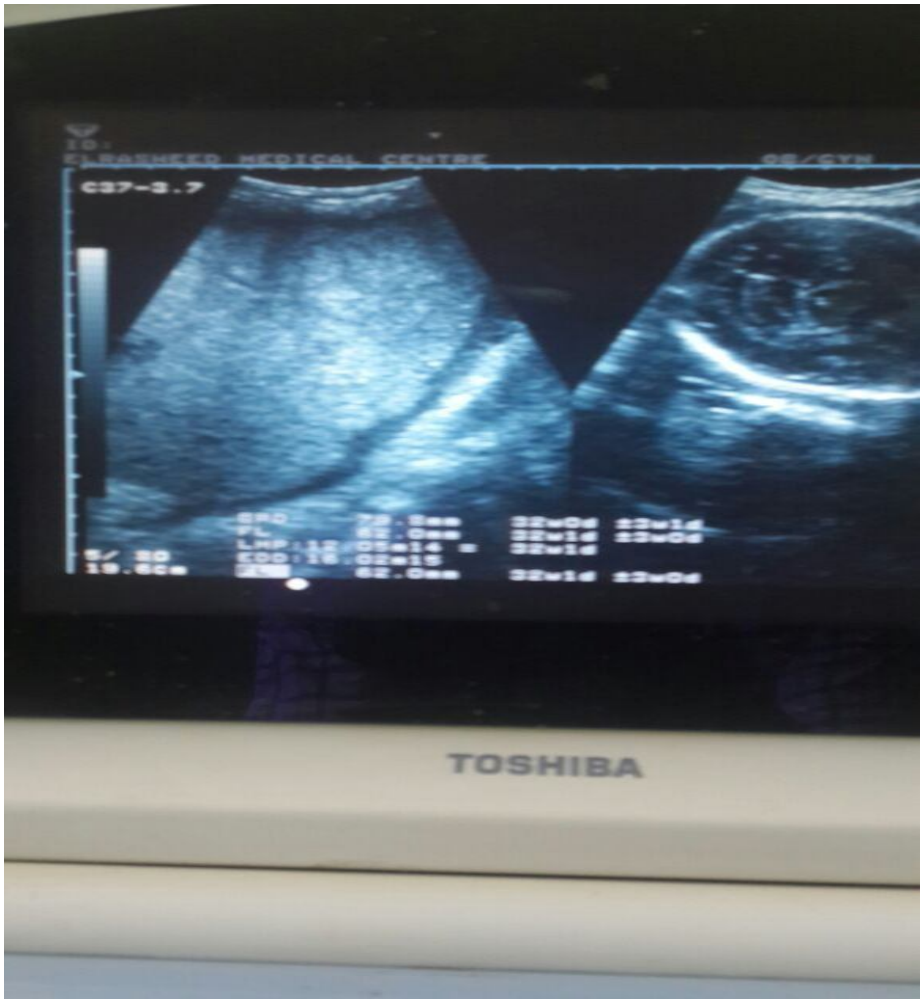
Appendix - Images Of The Research



32 years old pregnant woman 35 weeks + 6 days GA Diagnosed of marginal placenta previa .



31 years old pregnant woman 38 weeks GA Diagnosed of complete placenta previa .



30 years old pregnant woman 37 weeks GA Diagnosed of complete placenta previa .

Average fetal length and weight chart

Pregnancy week	Length (inches)	Weight (ounces)	Length (cm)	Mass (g)
8 weeks	0.63 inch	0.04 ounce	1.6 cm	1 gram
9 weeks	0.90 inch	0.07 ounce	2.3 cm	2 grams
10 weeks	1.22 inch	0.14 ounce	3.1 cm	4 grams
11 weeks	1.61 inch	0.25 ounce	4.1 cm	7 grams
12 weeks	2.13 inches	0.49 ounce	5.4 cm	14 grams
13 weeks	2.91 inches	0.81 ounce	7.4 cm	23 grams
14 weeks	3.42 inches	1.52 ounce	8.7 cm	43 grams
15 weeks	3.98 inches	2.47 ounces	10.1 cm	70 grams
16 weeks	4.57 inches	3.53 ounces	11.6 cm	100 grams
17 weeks	5.12 inches	4.94 ounces	13 cm	140 grams
18 weeks	5.59 inches	6.70 ounces	14.2 cm	190 grams
19 weeks	6.02 inches	8.47 ounces	15.3 cm	240 grams
20 weeks	6.46 inches	10.58 ounces	16.4 cm	300 grams
21 weeks	10.51 inches	12.70 ounces	26.7 cm	360 grams
22 weeks	10.94 inches	15.17 ounces	27.8 cm	430 grams
23 weeks	11.38 inches	1.10 pound	28.9 cm	501 grams
24 weeks	11.81 inches	1.32 pound	30 cm	600 grams
25 weeks	13.62 inches	1.46 pound	34.6 cm	660 grams

Pregnancy week	Length (inches)	Weight (ounces)	Length (cm)	Mass (g)
26 weeks	14.02 inches	1.68 pound	35.6 cm	760 grams
27 weeks	14.41 inches	1.93 pound	36.6 cm	875 grams
28 weeks	14.80 inches	2.22 pounds	37.6 cm	1005 grams
29 weeks	15.2 inches	2.54 pounds	38.6 cm	1153 grams
30 weeks	15.71 inches	2.91 pounds	39.9 cm	1319 grams
31 weeks	16.18 inches	3.31 pounds	41.1 cm	1502 grams
32 weeks	16.69 inches	3.75 pounds	42.4 cm	1702 grams
33 weeks	17.20 inches	4.23 pounds	43.7 cm	1918 grams
34 weeks	17.72 inches	4.73 pounds	45 cm	2146 grams
35 weeks	18.19 inches	5.25 pounds	46.2 cm	2383 grams
36 weeks	18.66 inches	5.78 pounds	47.4 cm	2622 grams
37 weeks	19.13 inches	6.30 pounds	48.6 cm	2859 grams
38 weeks	19.61 inches	6.80 pounds	49.8 cm	3083 grams
39 weeks	19.96 inches	7.25 pounds	50.7 cm	3288 grams
40 weeks	20.16 inches	7.63 pounds	51.2 cm	3462 grams
41 weeks	20.35 inches	7.93 pounds	51.7 cm	3597 grams
42 weeks	20.28 inches	8.12 pounds	51.5 cm	3685 grams
43 weeks	20.20 inches	8.19 pounds	51.3 cm	3717 grams

http://www.babycentre.co.uk/a1004000/average-fetal-length-and-weight-chart#ixzz3NN1DVW9j