Sudan University of Science and Technology

College of graduate studies

Study o f causes of vaginal bleeding in Second and Third Trimester using ultrasound

دراسة أسباب النزف المهبلي فى الطور الثاني والثالث من الحمل باستخدام الموجات فوق الصوتية

thesis submitted in partial fulfillment for the requirements of M.Sc A Degree in Medical Diagnostic Ultrasound

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الآيـة

قال تعالى :

(خَلَقَكُم مِّــن نَّفْــسٍ وَاحِــدَةٍ ثُــمَّ جَعَــلَ مِنْهَــا زَوْجَهَــا وَأَنزَلَ لَكُــم مِّــنْ الأَنْعَــامِ ثَمَانِيَــةَ أَزْوَاجٍ يَخْلُقُكُــمْ فِــي بُطُــونِ أُمَّهَــاتِكُمْ خَلْقًــا مِــن بَعْــدِ خَلْــقٍ فِــي ظُلُمَــاتٍ ثَلاثٍ ذَلِكُمُ اللَّهُ رَبُّكُــمْ لَــهُ الْمُلْــكُ لا إِلَــهَ إِلاَّ هُــوَ فَــأَنَّى تُصْرَفُونَ (6)) . الزمر

صدق الله العظيم

Dedication

I dedicate this work to solo of my father, my mother, my wife my suns my daughters my sisters, my brothers, my teachers and my friends.

sitting in mine and courage me to do the best in my life. Always you are

Best regards for all.

Acknowledgment

I thank God for enabling me to complete this thesis. I sincerely thank Dr.Alsafi Ahmed, the supervisor of this thesis for his continuous help, supervision and guidance.

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Very much thanks to all the staff in the Omdurman maternity Hospital, Ultrasound Department, personally to sinologist; Abbass Osman the director of the department for his permission help provided by him and co-operation to achieve my work.

Abstract

This research is conducted so as to know the importance of ultrasonography in the control , follow up and the diagnosis of the different types causes of vaginal bleeding in second and third trimester .

This study about vaginal bleeding in second and third trimester ,the data were collected from Omdurman maternity hospital , carried about 50 patient, conducted from August up to December 2014 using ultrasound machine (Toshiba power version 600) ,the probe is phased –array 3.5 MHz Transabdomenal, and data collection sheet .The patient prepared by full bladder and scanned with supine position ,the statistical methods used SPSS version 19 by which the data has been tabulated , represented.

The study reveal that the incidence of vaginal bleeding in 2th and 3th trimester is common in patient of age group 30---40 =48% ,second trimester 60% ,multigravida 90% and the causes ,liquor volume oligo 26% , placenta hematoma 18%

The conclusion of this study ,the vaginal bleeding associated with the liquor volume (oligo) is strong risk factor of the fetus viability ,the most patient comes with supra pubic pain

In the discussion we found that there is relationship between age , parity ,viability and liquor volume (oligo).

ملخص البحث

أجريت هذه الدراسة لمعرفة أهمية الموجات الصوتية في تشخيص الأسباب المفضية الي النزف المهبلي في الطور الثاني و الثالث.

جمعت بيانات هذه الدراسة في مستشفي الولادة بأمدرمان قسم القاينة بعدد خمسين مريض في الفترة من اغسطس الي ديسمبر باستخدام جهاز الموجات فوق الصوتية (توشيبا دنش 600) واستخدام مسبار محدب بطني 3.5 ميغا هيريز واستمارة استبيان جمع المعلومات, المرضي بملء المثانة ثم مسح المرضي بتقنية الوضع المنبطح وتم تحليل البيانات بواسطة نظام (s pss version19).

وتوصلت هذه الدراسة الي ان معظم المرضي اللاتي يعانين من النزف المهبلي تتراوح اعمارهم مابين 30 -40 سنة ويمثلن 48% وذلك في الطور الثاني من الحمل الذي يمثل 60% وان 90% منهن متتعدة الولادة .

وان اهم اسباب النزف المهبلي بقص السائل الامنيوني ويمثل 26% ونزف المشيمة ويمثل 18% .

خلصت هذه الدراسة إلي العلاقة بين النزف المهبلي وعمر المريض وعمر الجنين وعدد الولادات بالإضافة لنتيجة الموجات الصوتية ايجابية ، وكذلك إلي العلاقة بين النزف المهبلي والسائل الأمينيوني والعمر وعدد الولادات وآثرها علي الجنين والأم أو الاثنين معاً

توصي هذه الدراسة بأهمية الموجات فوق الصوتية في تشخيص النزف المهبلي عند الحوامل والمتابعة الدورية حتى تقلل من المخاطر الناتجة عن النزف المهبلي بنسبة للام والجنين معاً .

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
AUB	Abnormal Uterine Bleeding
Ca	Cancer
V.B	Vaginal Bleeding
M.C	Menstrual Cycle
APH	Ante Partum Hemorrhage

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Chapter 1

1.1 introduction.

Vaginal bleeding is a common event at all stage of pregnancy . the source is virtually all way maternal rather than fetal, vaginal bleeding during early pregnancy is most frequency duto abortion , ectopic pregnancy and hydatidiform ,it is postulated that vaginal bleeding can occur at any time of implantation of the blasto cyst this has been referred to as implantation bleeding may be mistaken for a menstrual period by the patient bleeding to in accurate dating of the pregnancy .

Vaginal bleeding during advanced pregnancy , second and third trimester is referred to as ante partum hemorrhage or (APH) may be result from disruption of blood vessels in the decidual (i.e. pregnancy endometrium) or from discrete cervical or vaginal lesion.

The two techniques general used in the first trimester one transabdominal (TAS) and transvaginal sonography (EVS). The main advantage EVA is better resolution with advances the diagnosis of early intrauterine pregnancy be about one week over TAS ,the main advantage of the TAS is better penetration and a large field –of-view due to increasing size of the uterus and its gestational content, TAS is the main technique to evaluate second and third trimester pregnancy.

The causes of vaginal bleeding during the second and third trimester include micarrge (before the 20^{th} week) or intrauterine fetal death, cervical cancer , incompetence cervix , uterine mass or ovarian mass ,in late of pregnancy placenta previa and placenta abruption ,preterm labor, uncommon causes include cervical infection or neoplasm , a rare emergency situation presenting as bleeding and sever pain in late pregnancy can occur in patient who have had caesarean section and uterine surgery.

Vaginal bleeding of pregnancy women 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)

This study was done to look for risk factor for vaginal bleeding in the second and third trimester particularly , miscarrge (fetal death), cervical incompetence , retro placenta hematoma , placenta previa and placenta abruption .Identification of risk factor as previous caesarean section , multi parity, mal presentation expectant management and adequate availability of blood may help in better out come by reducing the feto-maternal complications.

The aim of this study to assess the finding ultrasound of vaginal bleeding in second and third trimester, however if the bleeding is sever and there are sing of fetal distress, urgent delivery is required .

There are many studies looking about vaginal bleeding in second and third trimester the summary of them Vaginal bleeding in the second or third trimester can be associated with increased risks to the mother and fetus, or both, depending on the severity, number of episodes, and cause of bleeding, as determined by US.

1.2Problem of the study:

An Incidence of vaginal bleeding in second and third trimester is high among patient in the Omdurman maternity Hospital.

1.3 General objective of the study:-

The general objective of this study was to investigate the causes of vaginal bleeding in second and third trimester order to find out any sonographical markers.

1.4 Specific objective

To correlate the incidence of the vaginal bleeding with the risk factor of maternal and fetal or both

Assess the relationship between positive finding ultrasound and negative finding ultrasound.

To diagnosis the abnormalities of placation.

To characterize the uterine mass (fibroid) or ovarian mass (cyst) in pregnancy patient.

1.5 Overview of the study

This study consisted of five chapters

Chapter one: contains introduction and objective (general and specific)

Chapter two: contain literature revive in two parts, part one anatomy, physiology, pathology, and previous study.

Chapter three: contain the material and methods

Chapter four: contain the results presentation.

Chapter five: contain the discussion, conclusion and recommendation.

Chapter 2

Literature review

2.1 Anatomy Internal Genital Organs

2.1 .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)

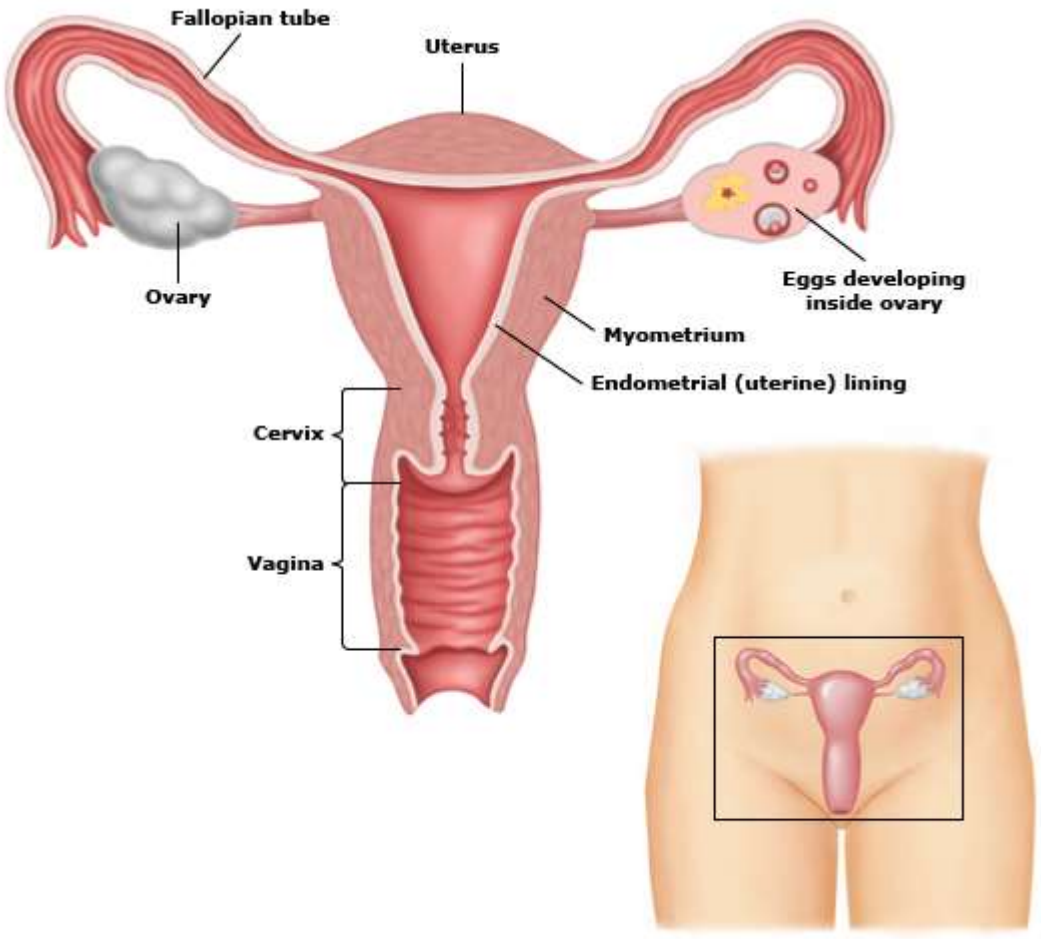

Figure (1) Reproductive System- (www.womaen.w

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)

2.1.1.1 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)

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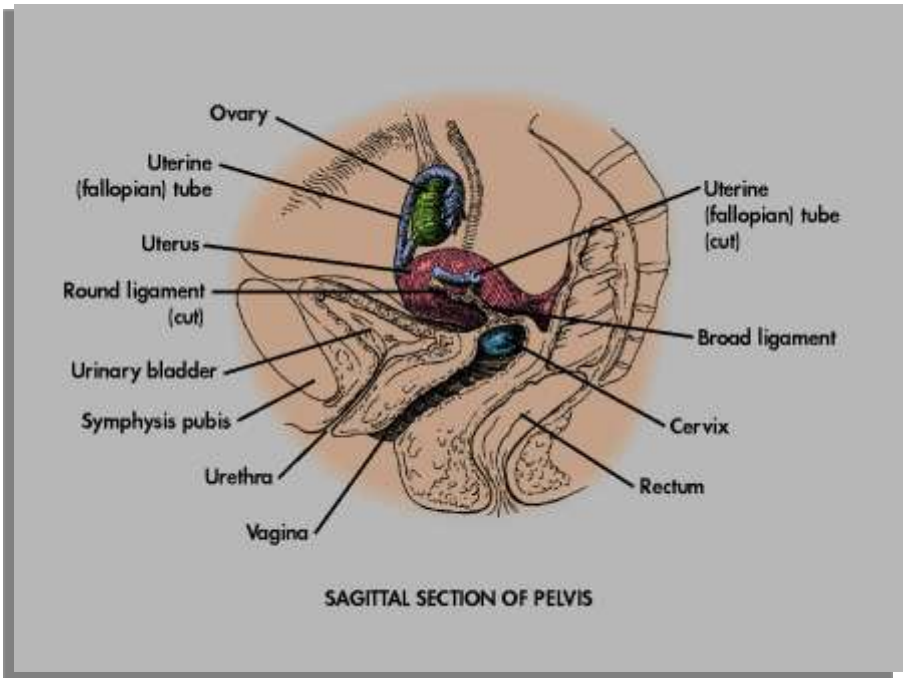


Figure (2) Sagital section of pelvis – (www.imagingconsult.com)

2.1.1.2 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.

2.1.1.3 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.

2.1.2 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)

2.1.2.1 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).

2.1.2.2 The support of the uterus:

The uterus is held in a position of anteflexion and anteversion by its weight, by the round ligaments, which hold the fundus 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)

2.1.2.3 Vascular Connection:

I- Arterial:

Uterine and ovarian arteries.

II- Venous:

Pampiniform plexuses in board ligament.

Uterine and ovarian veins.

Vaginal plexus and vertebral plexuses.

2.1.2.4 Lymphatic drainage:

I- Cervix:

Paraervical plexus.

External iliac and internal iliac (hypogastric) nodes.

Obturator 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)

2.1.3 Fallopian Tubes:

2.1.3.1 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

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).

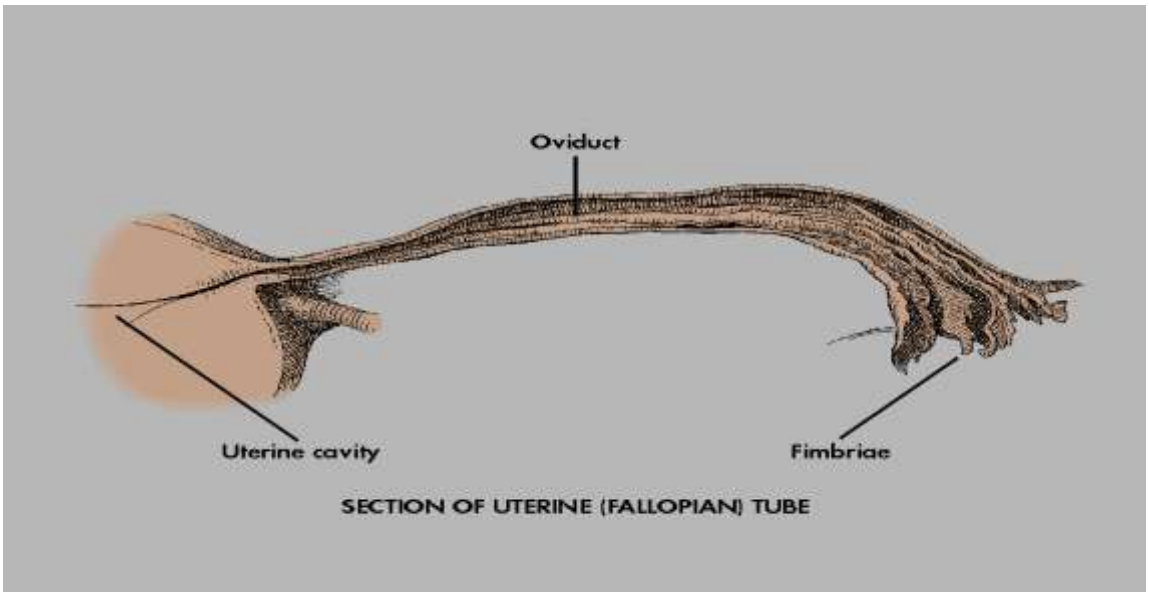


Figure (3) Fallopian Tube – (www.diagnosticmaging.com

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).

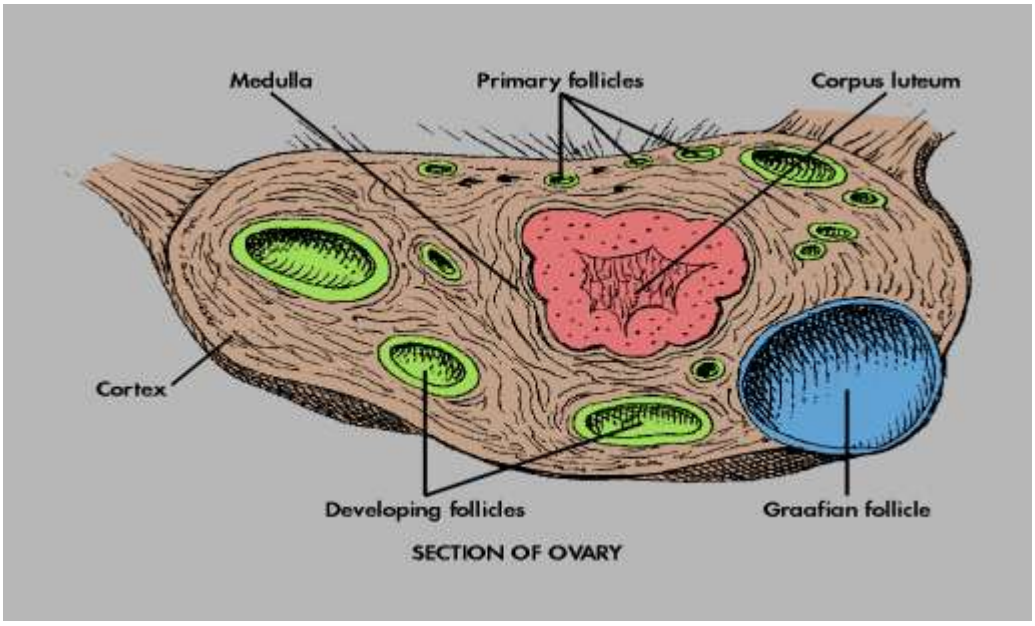


Figure (4) Cross section ovary – (www.diagnosticimaging.com)

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 16ranulose 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 20eciduas 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- 2

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).

Table (1) (**Error! Hyperlink reference not valid.**

Type	Symptoms	Signs
Threatened	Bleeding	Cervical os is closed Fetal Heart present, with normal intrauterine growth
Inevitable	Bleeding + Pain	Cervical os open
Incomplete	Bleeding + Pain	Cervical os open, some fetal parts may have been passed.
Missed	No symptoms	The os is closed and the uterus is small for dates
Complete	Passage of embryonic/ fetal parts , the pain and bleeding have subsided	Cervical os is closed and the uterus empty.

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.

- 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)

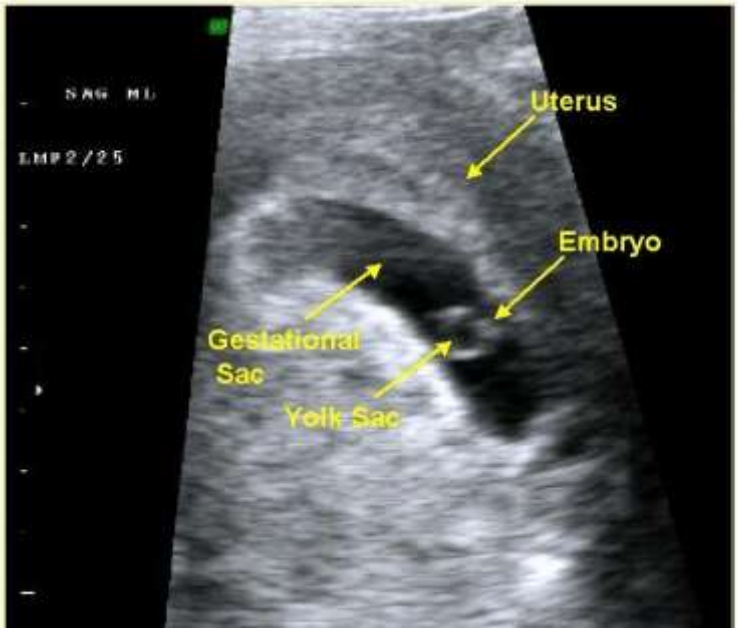


Figure (5) Missed Miscarriage – (www.ultrasound-image.com)

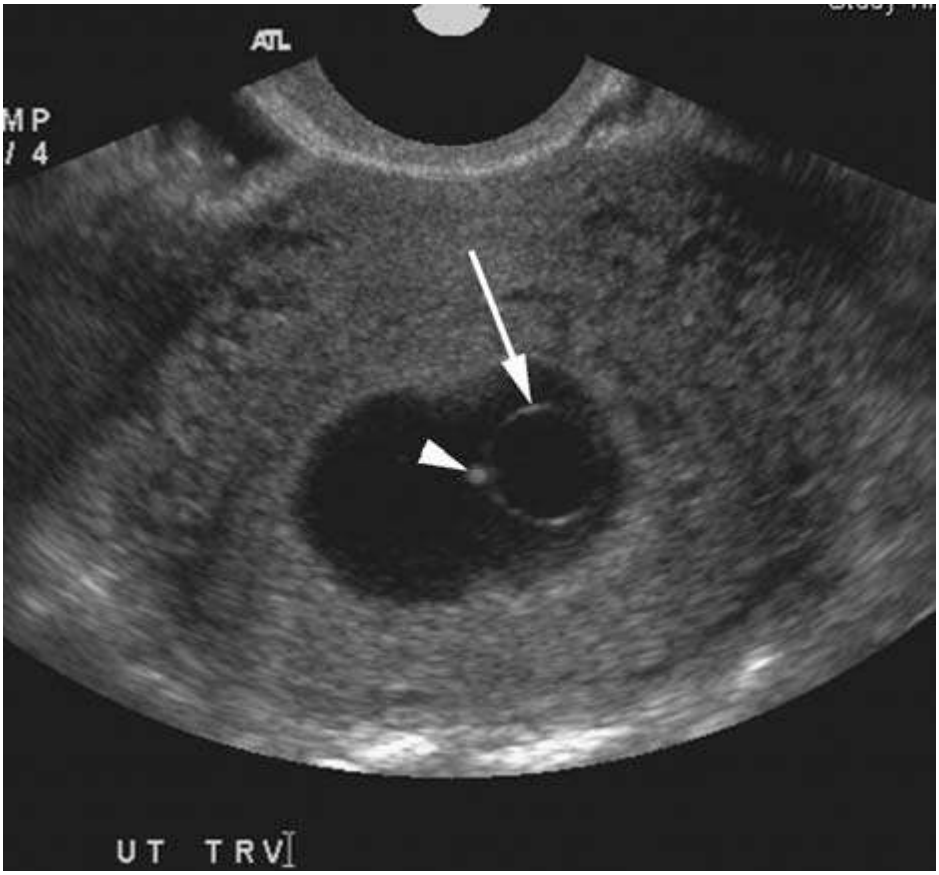


Figure (6) Incomplete Miscarriage – (www.ultrasoundimage.com)

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)

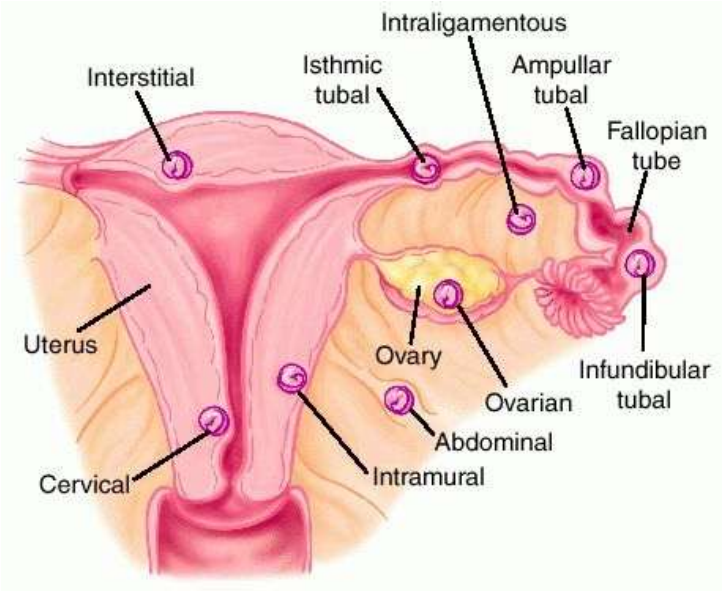


Figure (7) Ectopic Pregnancy Location- (www.imagingconsult.com)

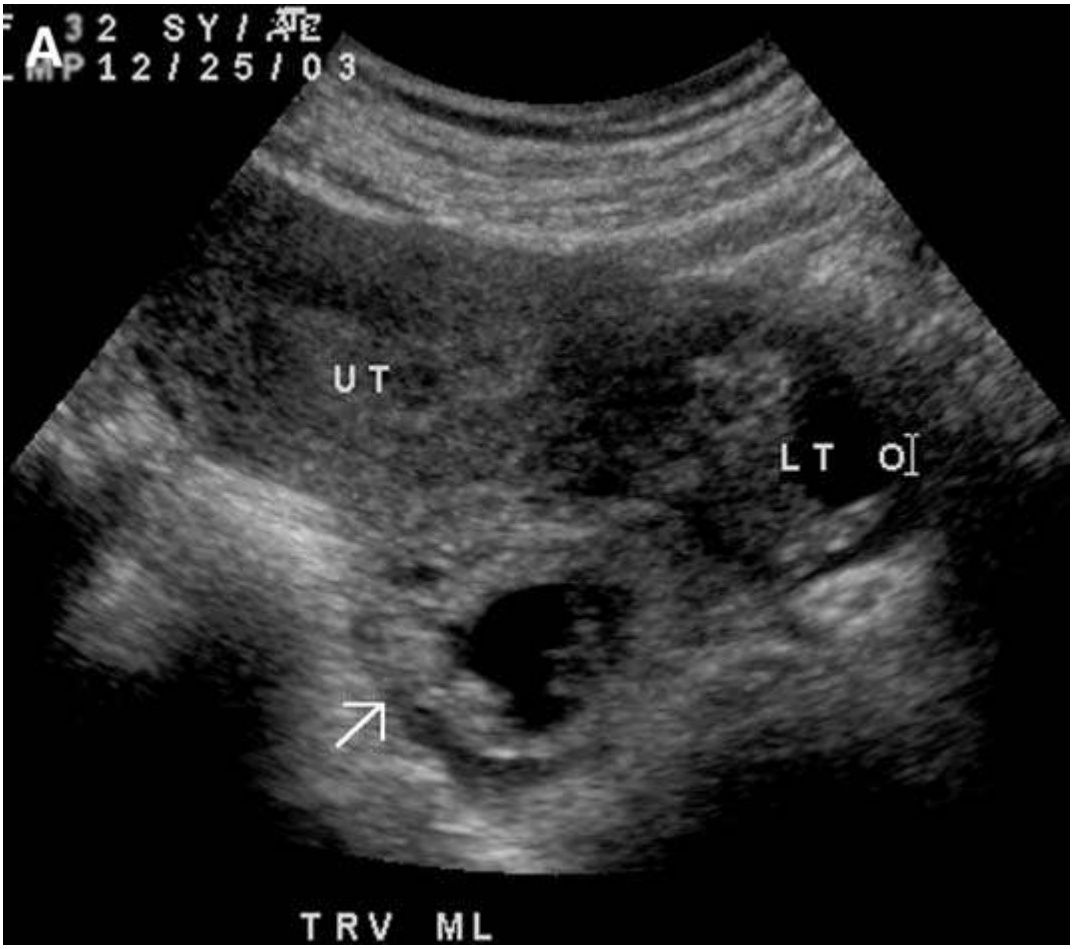


Figure (8) Ectopic Pregnancy – (www.ultrasoundimagegallery.com)

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. Larger, irregular sonolucent areas may also be seen and represent areas of hemorrhage or maternal lakes in the surrounding 29 eciduas. The role of Doppler, which almost always demonstrates high velocities and low resistance to flow in the uterine arterial circulation, is limited and will be of clinical interest only in the diagnosis and clinical follow-up of gestational trophoblastic neoplasia (invasive mole and gestational choriocarcinoma). The sonographic diagnosis of partial HM should be suspected if a fetus is seen in association with a placenta that appears abnormally thickened and contains numerous small cysts, a finding referred to as the "swiss cheese appearance" of the placenta. The fetus is usually severely anomalous and manifests abnormalities of triploidy, most notably severe symmetrical growth restriction or retardation, bilateral cerebral ventriculomegaly (hydrocephalus), heart anomalies, micrognathia, and abnormalities of the hands, e.g. syndactly. Theca lutein cysts can vary in size (2-10 cm) and typically appear as multiple cysts producing either a "soap bubble" or a "spoke wheel" appearance of the ovaries. Rarely, in association with a normal singleton, twin, or higher order multiple pregnancy, TLCs may arise in the presence of normal levels of circulating hCG, a condition referred to as hypereactio luteinalis. (Simpson L Lynn – 2004).

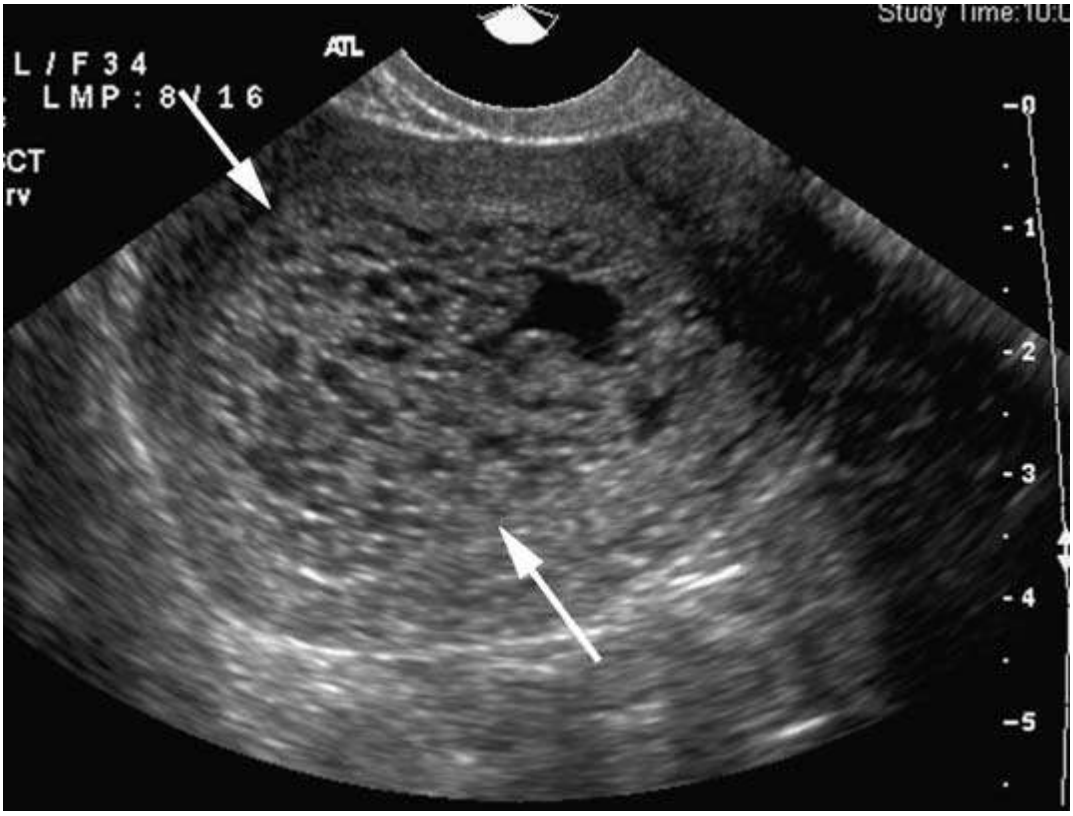


Figure (9) Molar Pregnancy – (www.ultrasound-image.com)

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).

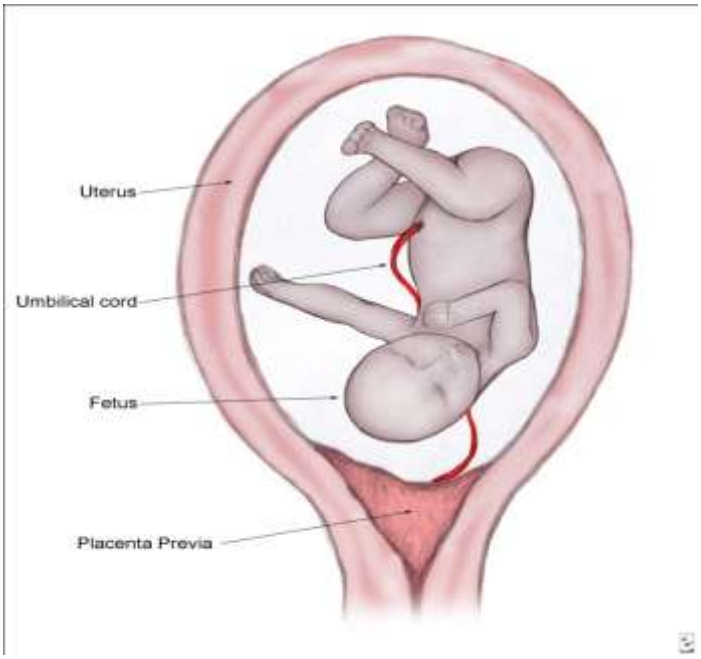


Figure (10) Complete Placenta Previa – (www.ultrasoundimagegallery.com)

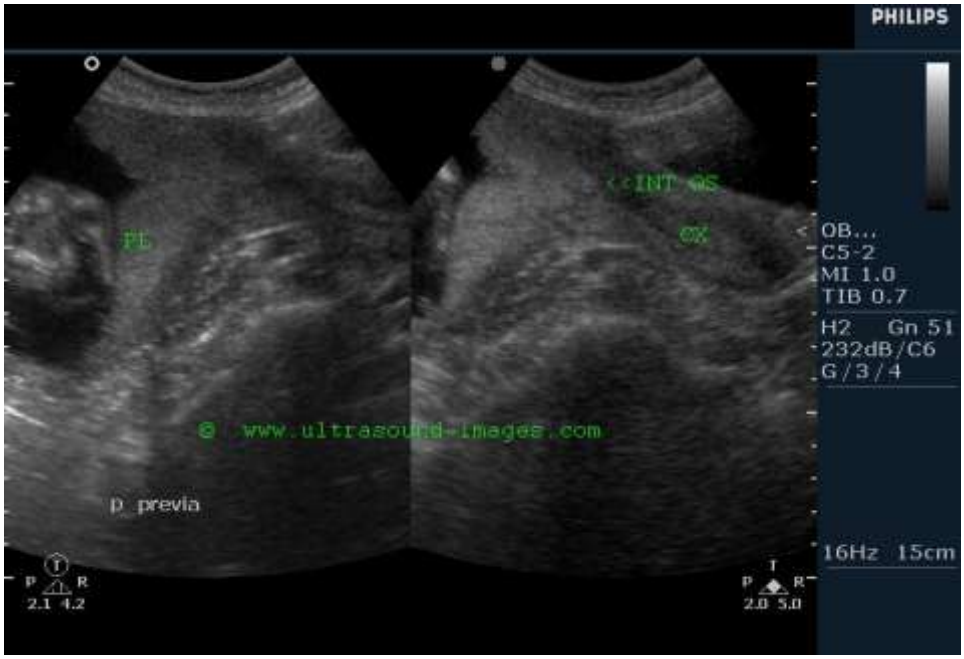


Figure (11) Complete Placenta Previa – (www.ultrasound-image.com)

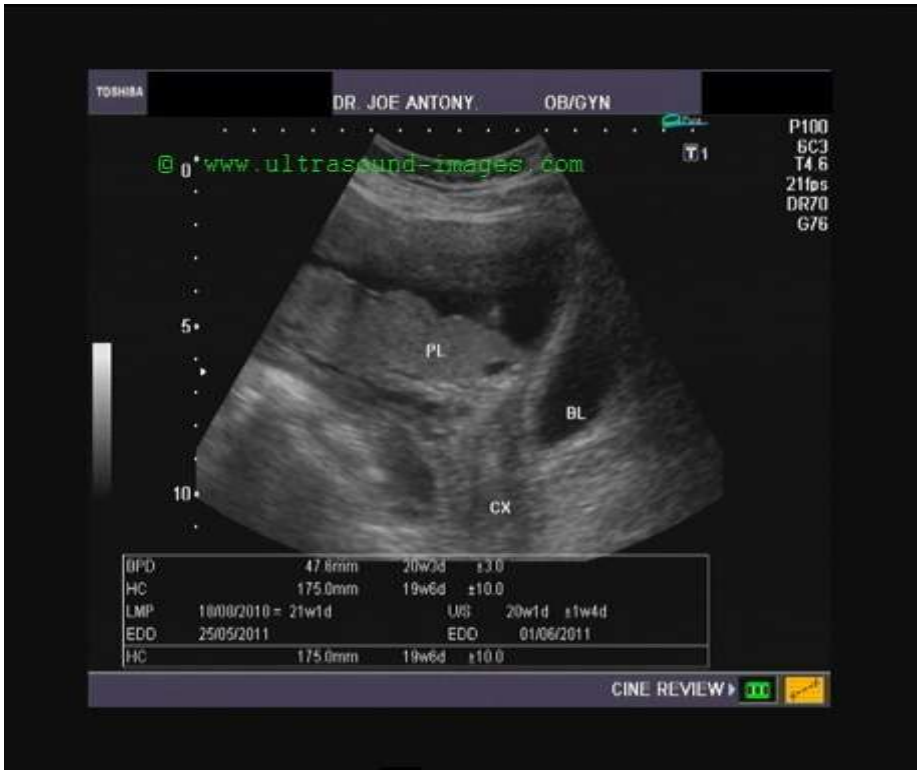


Figure (12) Incomplete Placenta Previa – (www.ultrasound-image.com)

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 33bruption 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).

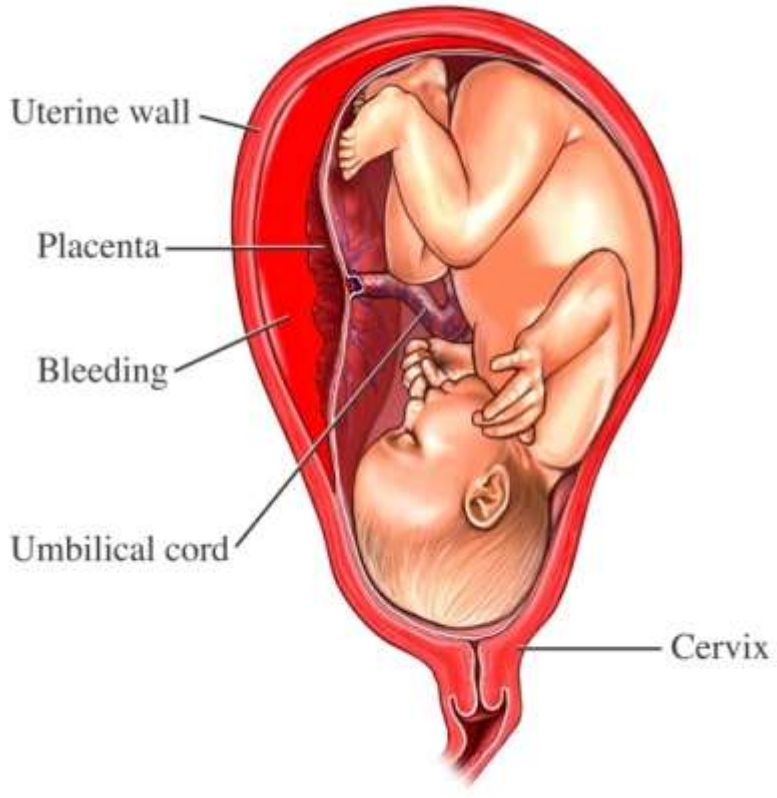


Figure (13) **Abruption placenta –** (www.ultrasoundimagegallery.com)

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).

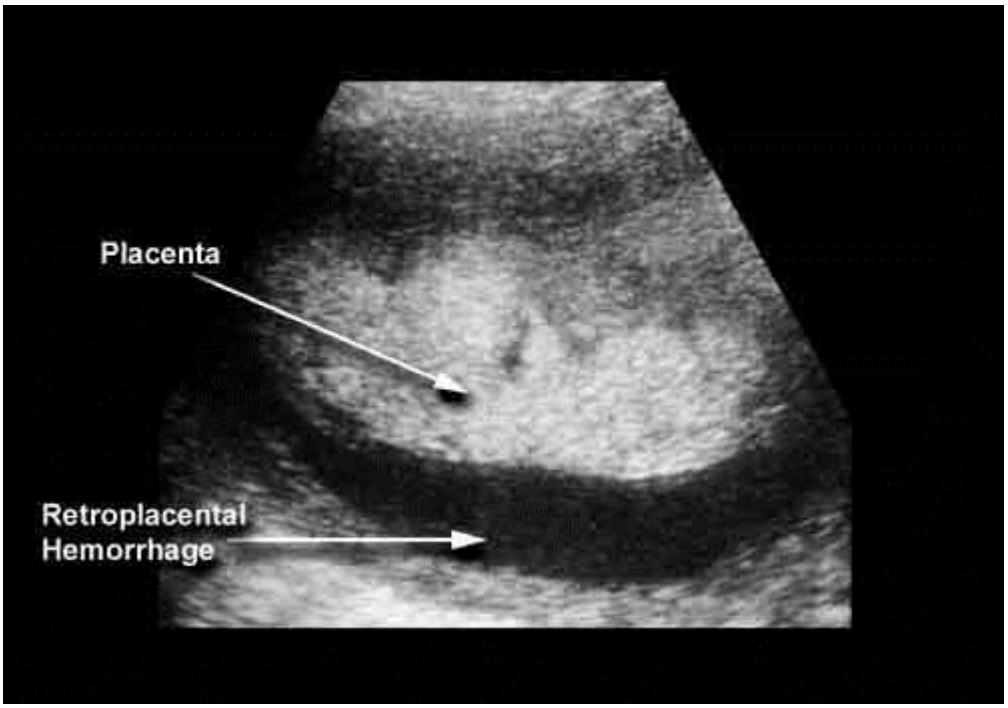


Figure (14) **Abruption placenta – (www.diagnosticimaging.com)**

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. Therefore DUB 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).

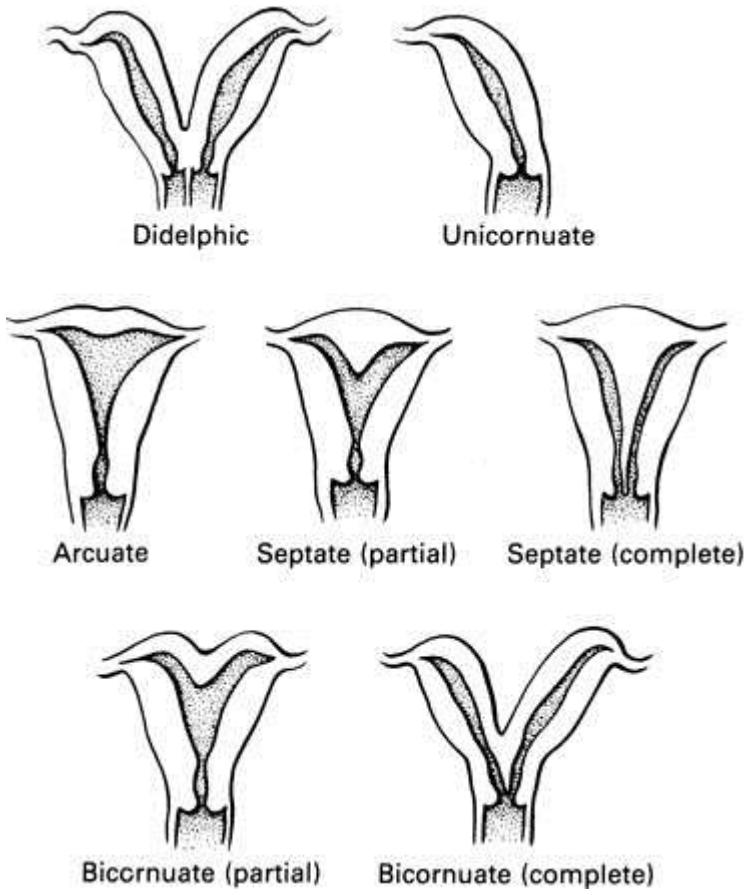


Figure (15) Uterine Anomalies – (www.imagingconsult.com)

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. 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)

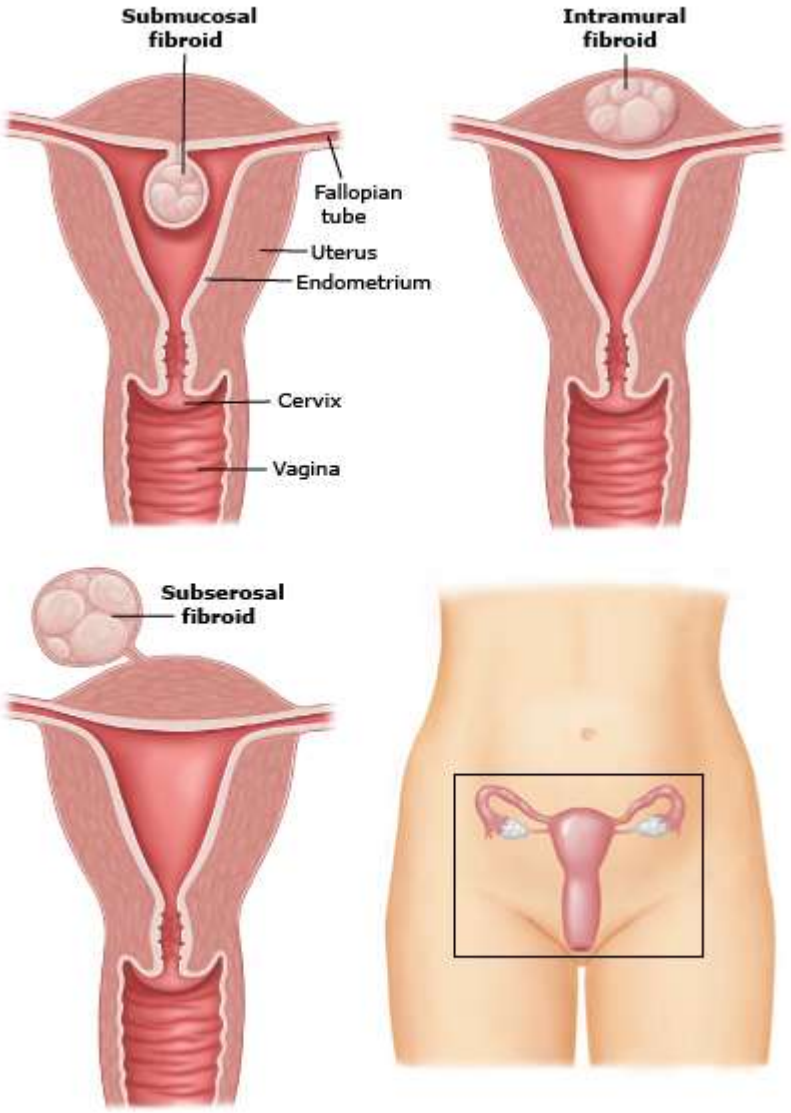


Figure (16) **Fibroid locations in the uterus – (www.imagingconsult.com)**

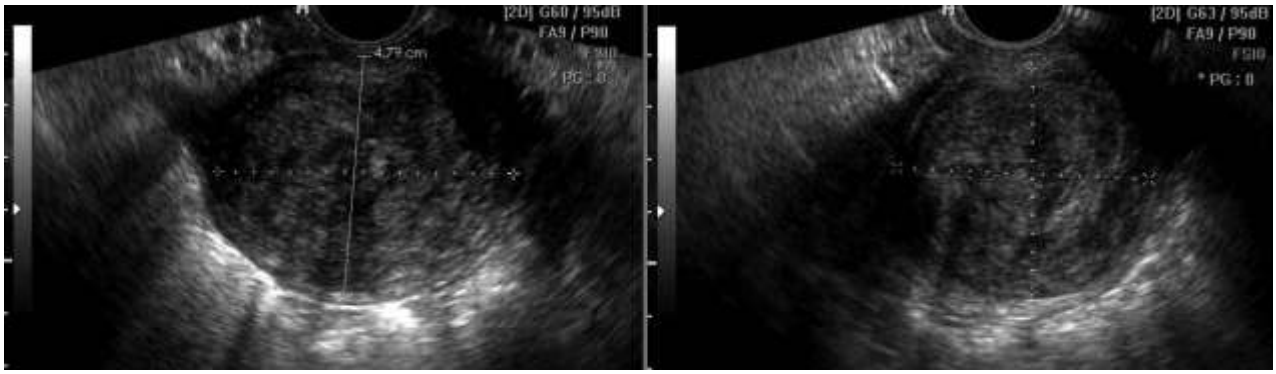


Figure (17) Fibroid - (www.ultrasound-image.com)

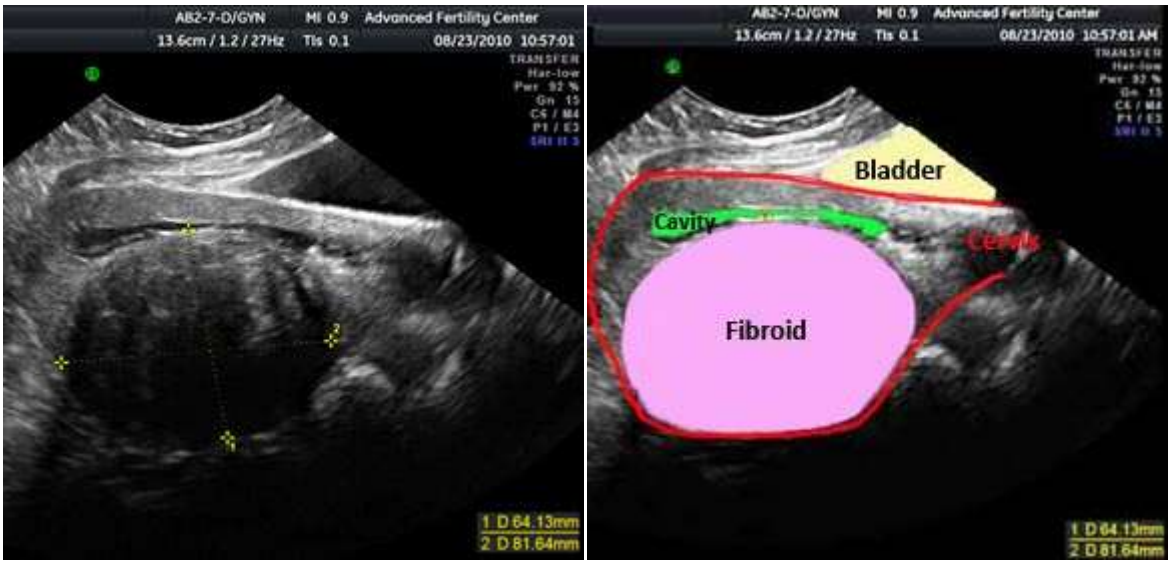


Figure (18) **Fibroid** - (www.ultrasound-image.com)

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).

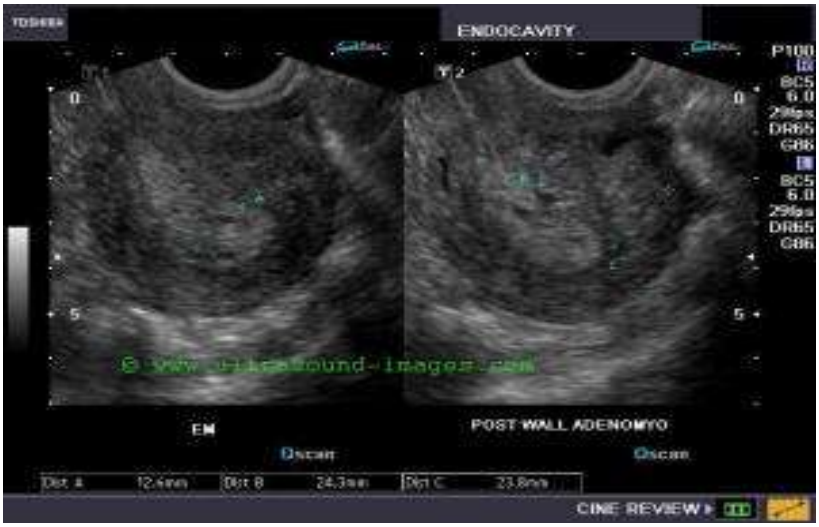


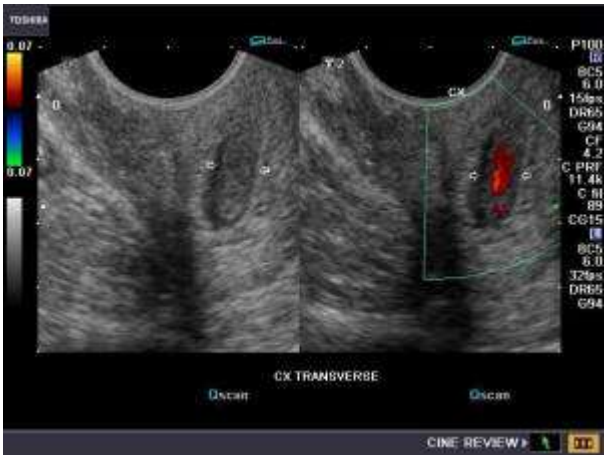
Figure (19) **Adenomyosis** – (www.ultrasound-image.com)

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)



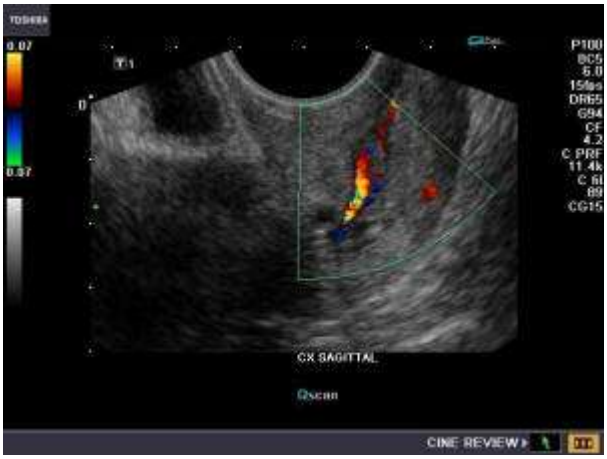


Figure (20) pedunculated polyp of the cervix – (www.ultrasound-image.com)

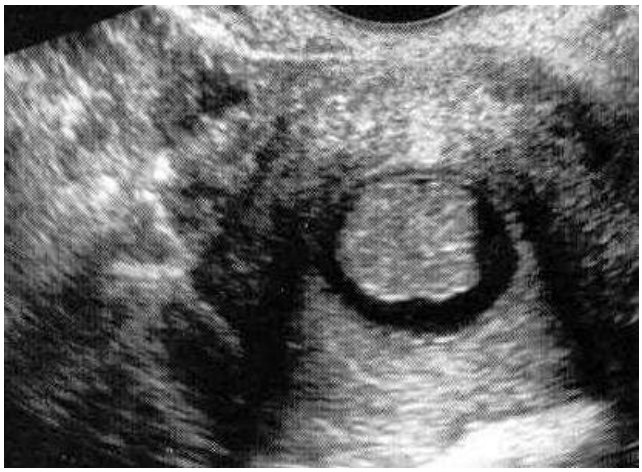


Figure (21) endometrial polyp outlined by fluid – (www.ultrasound-image.com)

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).

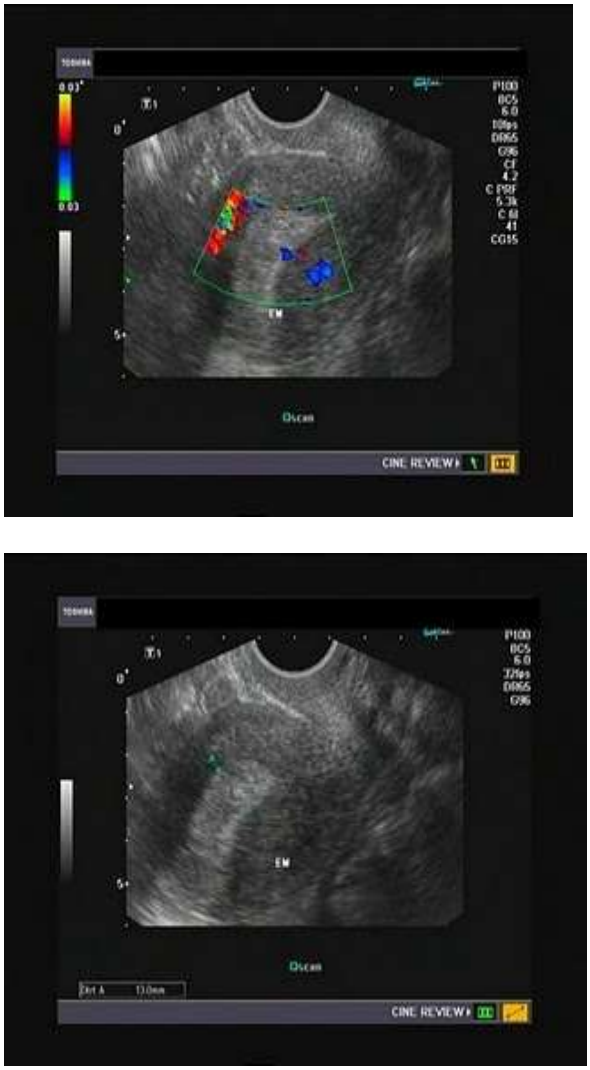


Figure (22) endometrial hyperplasia - (www.ultrasound-image.com)

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).

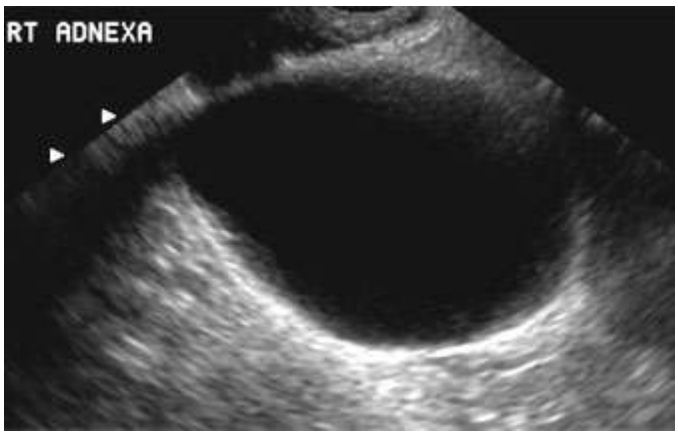


Figure (23) Simple ovarian cyst - (www.ultrasoundimagegallery.com)

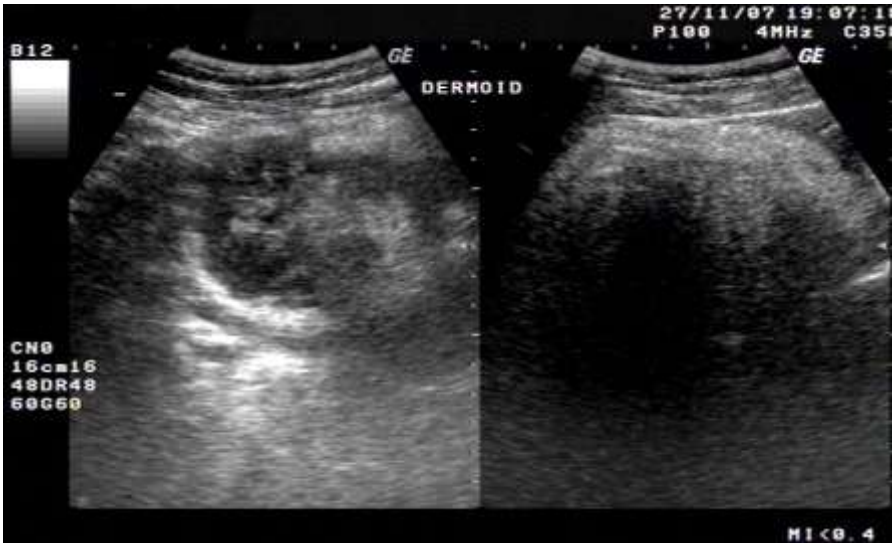


Figure (24) Dermoid cyst - (www.ultrasoundimagegallery.com)

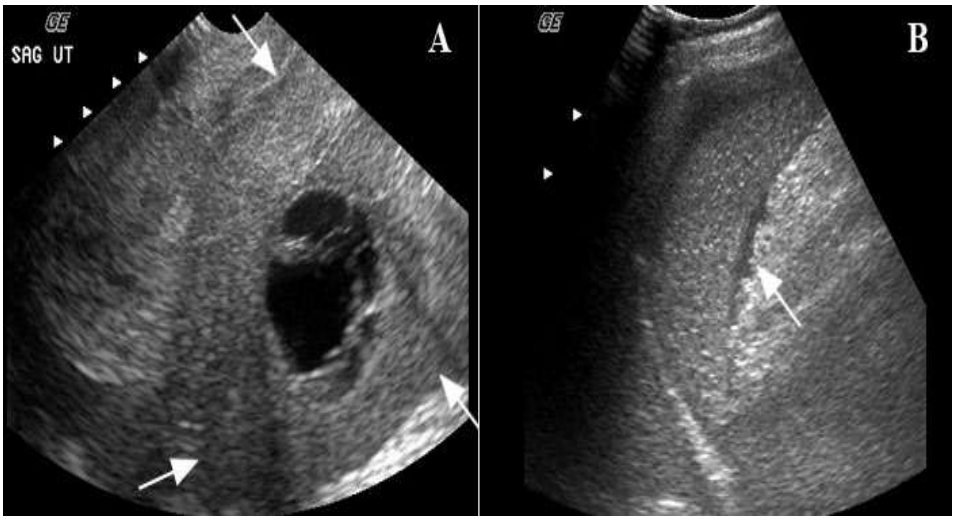


Figure (25) Ovarian Cancer - (www.ultrasoundimagegallery.com)

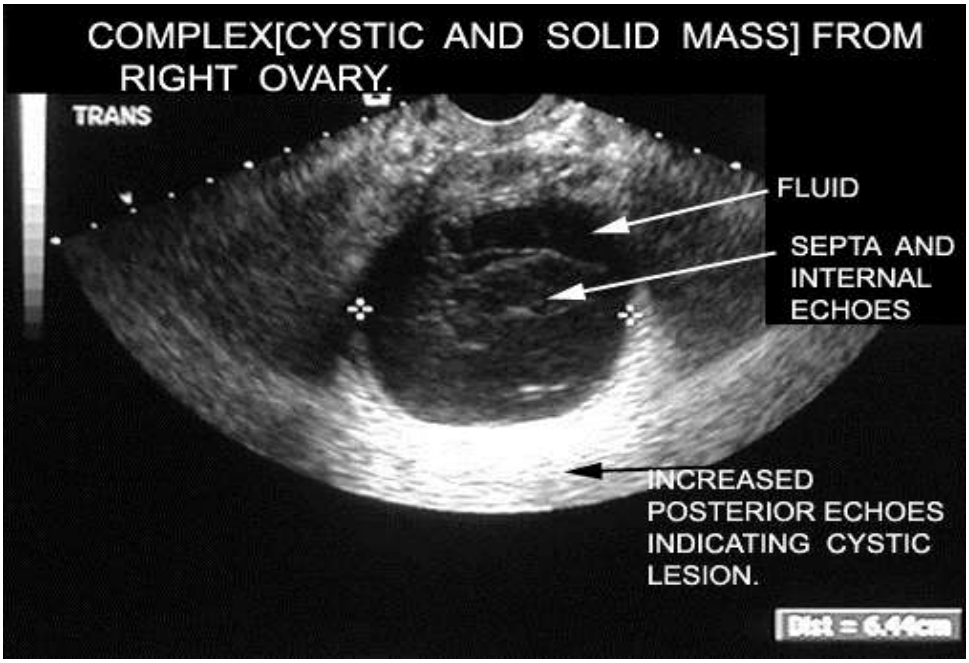


Figure (26) Ovarian Cancer - (www.ultrasoundimagegallery.com)

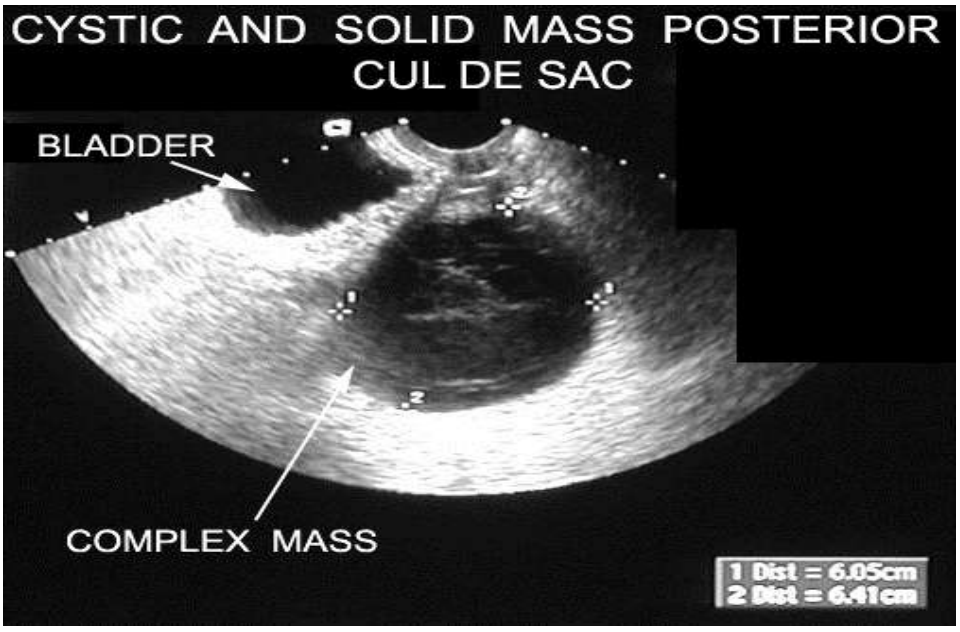


Figure (27) Complex cystic and solid mass - (www.ultrasoundimagegallery.com)

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).

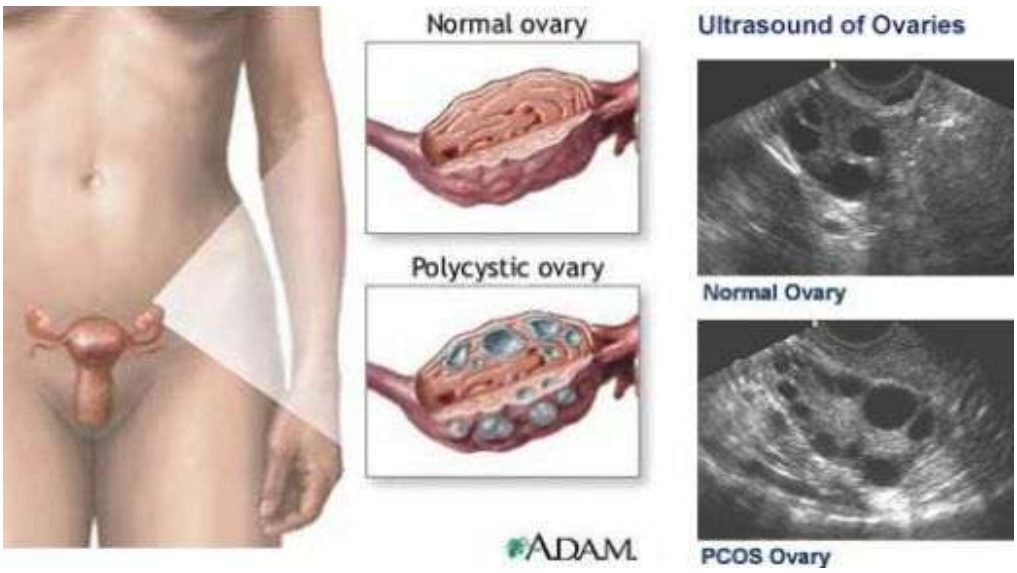


Figure (28) polycystic ovarian syndrome – (www.ultrasoundimagegallery.com)

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).

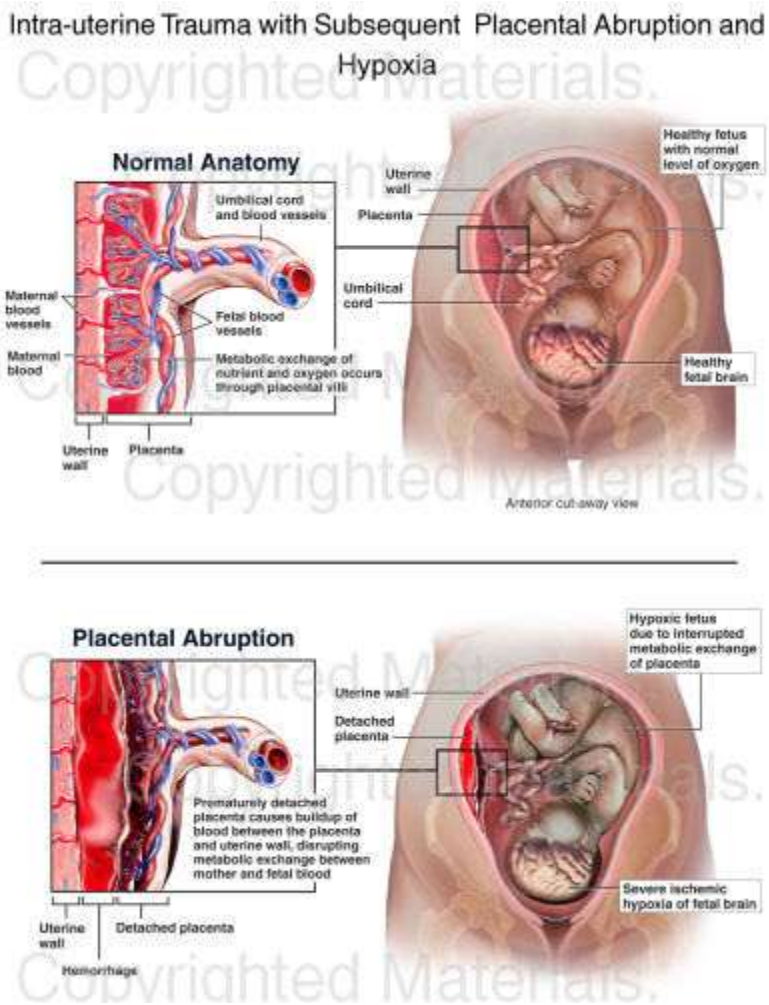


Figure (29) Intra Uterine Trauma – (www.imagingconsult.com)

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 either a 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).

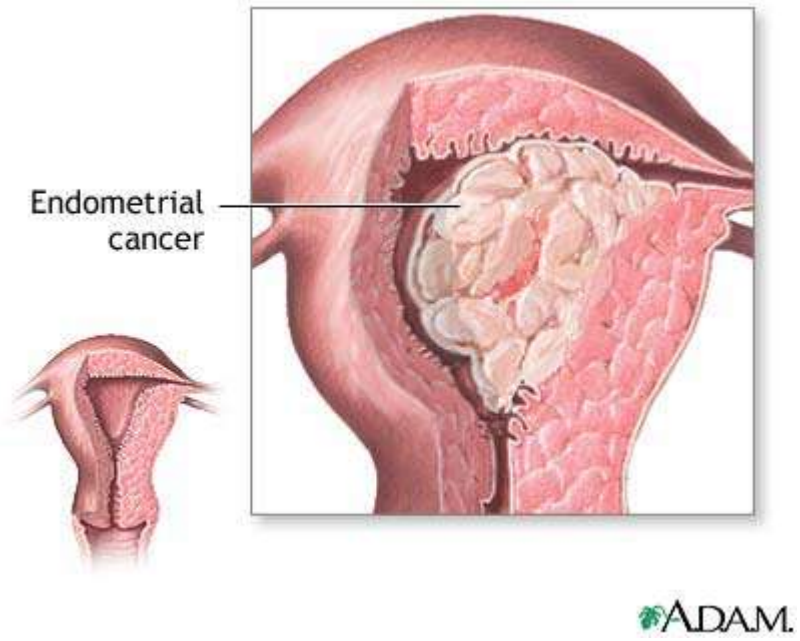


Figure (30) Endometrial Cancer

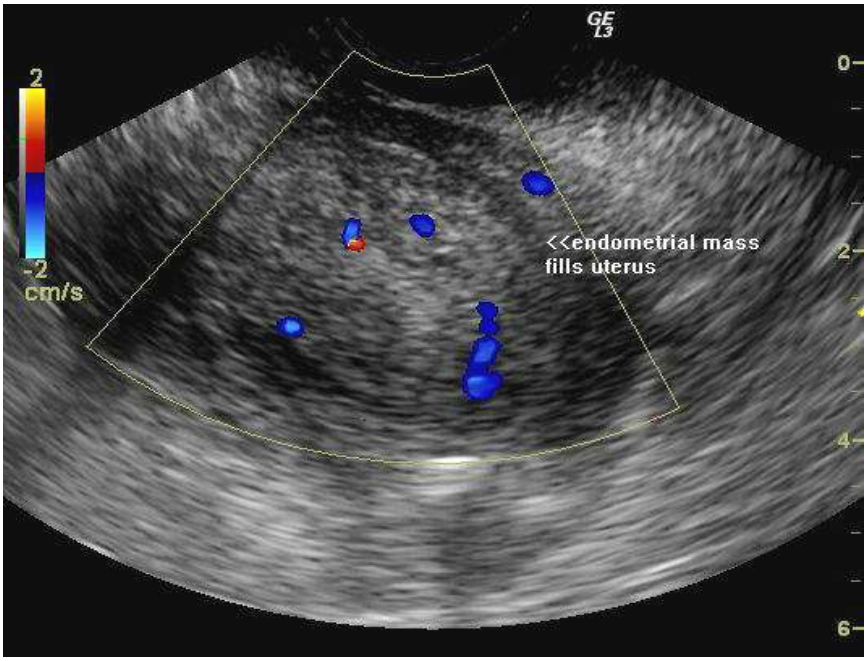


Figure (31) Endometrial Cancer (www.ultrasoundimagegallery.com)

2.5.13 Systemic disorder:

Endocrine disorder may manifest themselves as abnormality of menstruation. The following conditions may be associated with menstrual dysfunction. Hyper-or hypothyroidism, diabetes mellitus, adrenal disease, prolactin disorders. These disorders most likely interfere with the normal feedback mechanism that regulates the secretion of gonadotrophin-relasing hormone (GnRH) from the hypothalamus, gonadotropin from the pituitary and sex steroids from the ovary. In addition to iron deficiency anemia, bleeding disorders, liver disease, renal disease or medication. (Robbins C – 1999).

2-6 Previous study.

Various reports have addressed the clinical significance of second- and third-trimester vaginal bleeding. In a recent clinical study, a single episode of light vaginal bleeding in the mid second trimester did not significantly alter pregnancy outcome, but an episode of heavy bleeding had a favorable outcome in 67% of nonprevia cases and 35% of previa cases. (Towers CV, et al ,2008)

Another study demonstrated no increase in the risk of preterm birth or preterm membrane rupture from a single bleeding episode. Multiple bleeding episodes, however, increased the risk of preterm complications . (Yang J, et al , 2004).

Late-pregnancy bleeding can be associated with significant maternal and fetal risks , including uteroplacental insufficiency, preterm birth, and severe maternal hemorrhage. (Mc Cormack RA, et al , 2008).

In another study, unexplained bleeding with a negative US examination after 20 weeks was correlated with risk of preterm delivery, neonatal intensive care, and reduced birth weight. (Sakornbat E, et al , 2007).

The main risk factors for placenta previa include age over 30, multiparity, prior Caesarean sections, and prior abortions. (Faiz AS, et al , 2003).

In Sudan also there are many studies carried on the issue , the must causes of abnormal vaginal bleeding were related to pregnancy problems which constitute 58% . (Abubaker Adam, et al ,2007).

Another study ,most causes of abnormal vaginal bleeding was related to pregnant and its complication constitute 91%. (Motaz basher ,et al ,2009).

2.7 **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).

Chapter three

Methodology

Material and Methods

3-1- Materials & tools

An ultrasound machine (Toshiba power version 600 with two probe –convex 3.5 MHz & transvaginal 7.5 MHz and sonoscope A6 with probe 3.5 MHz ,ultrasound imaging system with a B mode capabilities is used .The transducer is a phased-array 3.5 MHZ and ultrasound gel is applied to the transducer to prevent any attenuation or artifact, and thermal paper printer was used. The data collection sheet is used to collect the data and to number the patient.

3-2-Method

in second and third trimester present to ultrasound department in the Omdurman Maternity Hospital, Omdurman city in the period from August to December 2014.

2.2 Study sample:

The samples size consisted of fifty patient (n – 50) were selected to be sample unite randomly in this study.

3-3- Inclusion criteria:

Any patient attending the hospital in that period mentioned complaining of vaginal bleeding in second and third trimester .

3-4Exclusions criteria

No exclusion criteria, any patient comes with vaginal bleeding in second and third trimester.

A Written permission is issued and taken from the hospital director also anyone in the study signed and agreement to by one of the study objects after had been told about what should be done for here.

To collect the suitable data for the study personal information from any patient is written in the data collection sheet as well as the result. This include the following : general information, clinical information and ultrasound finding -- see the appendix.

3-5- Ultrasound technique

The examination begins with the patient in supine position , scans are perform in the sagittal and transverse planes from anterior approach using the bladder as acoustic window, trans abdominal TAS as wells trans vaginal scans EVS with empty bladder . This is usually in the 3.5 MHz a convex probe is used and acoustic gel is applied.

3-6- Statistics

Finally these data was tabulated , described represented and analyzed using SPSS version19, putting in mind that the P values 0,05 using the chi square test to know the significance , correlation coefficient between tow suitable variable. The results of this analysis put in a scientific forms and facts from which the medical decision and recommendation is created in the discussion chapter

3.7 Data storage:

The data was stored on:-

-Personal computer.

-Patients data collection

Chapters 4

Results and analysis .

Table 4-1 shows the distribution of the age group in the surveyed patient

AGE GROUP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 20 YEARS	4	8.0	8.0	8.0
	20-29 YEARS	22	44.0	44.0	52.0
	30- 40	24	48.0	48.0	100.0
	Total	50	100.0	100.0	

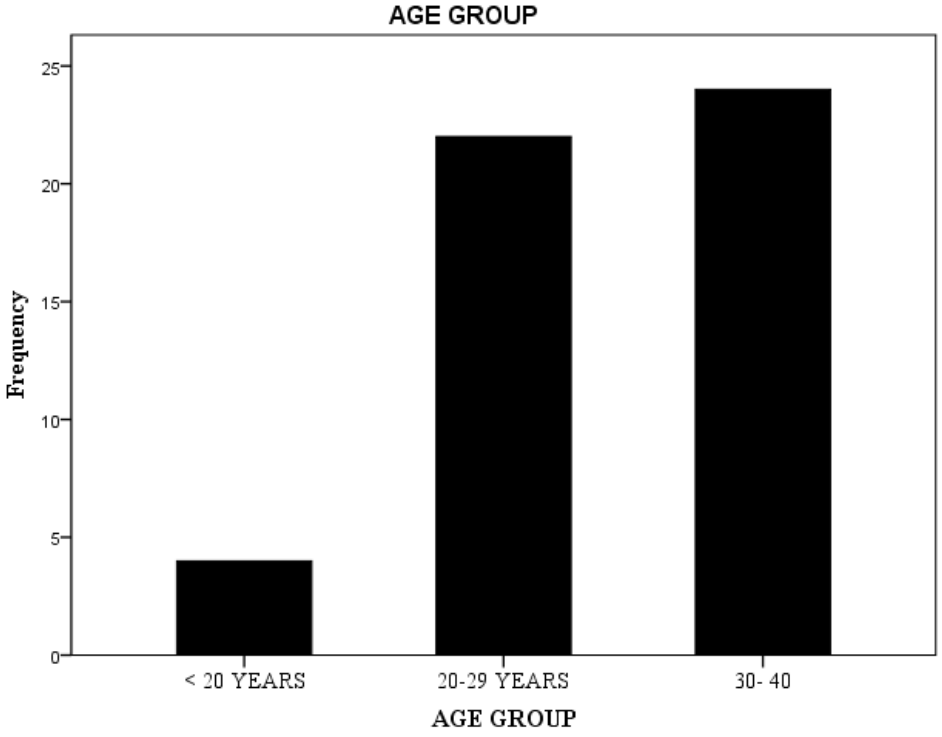


Figure (4-1) shows the distribution of age]

Table 4-2 shows the distribution of the gestational age group in the surveyed patient

GESTATIONAL AGE GROUP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SECOND TRIMESTER	30	60.0	60.0	60.0
	THIRD TRIMESTER	20	40.0	40.0	100.0
	Total	50	100.0	100.0	

-

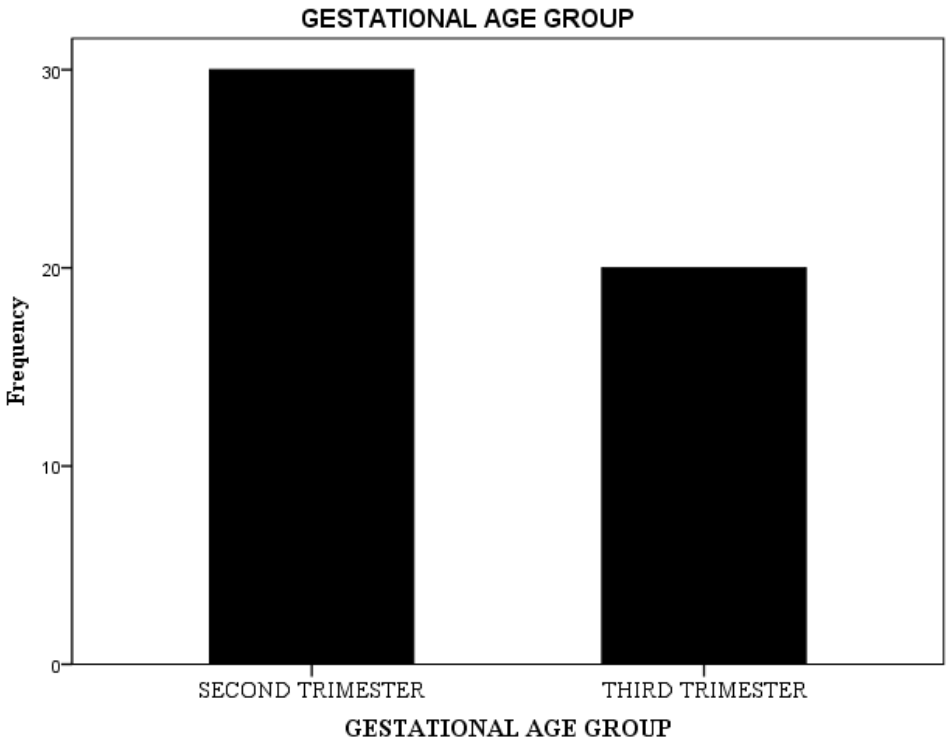


figure (4-2) shows the distribution of gestational age group

Table 4-3 represent the distribution of the parity in the surveyed patient

PARITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PRIMIGRAVIDA	5	10.0	10.0	10.0
	MULTIGRAVIDA	45	90.0	90.0	100.0
	Total	50	100.0	100.0	

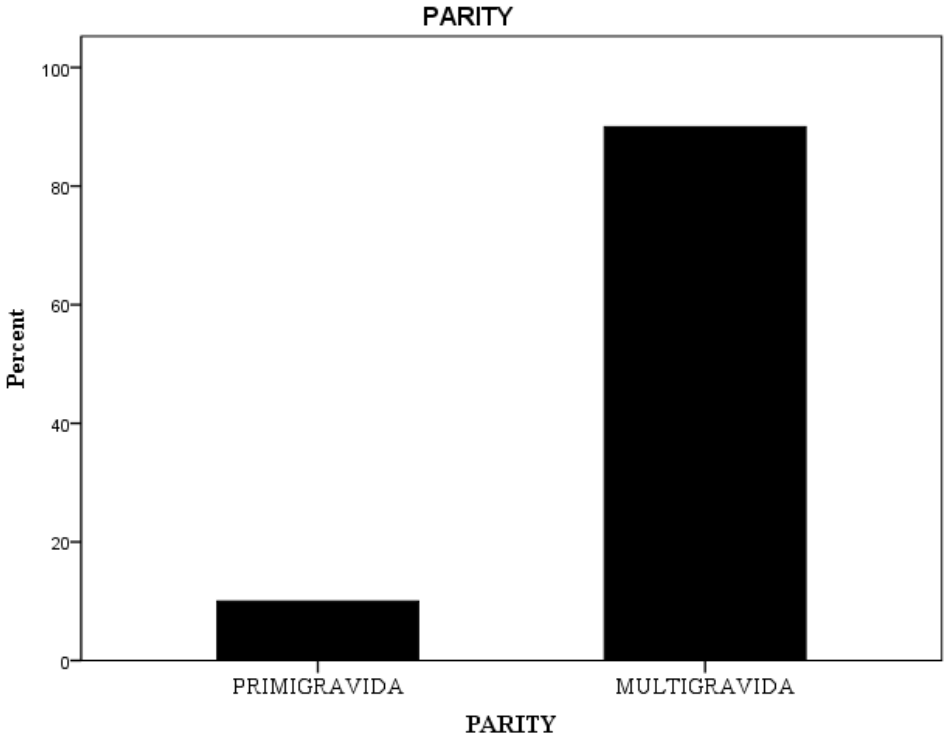


Figure (4-3) represent the distribution of the parity

Table 4-4 represent the distribution of painful vaginal bleeding

PAINFULL VAGINAL BLEEDING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	23	46.0	46.0	46.0
	NO	27	54.0	54.0	100.0
	Total	50	100.0	100.0	

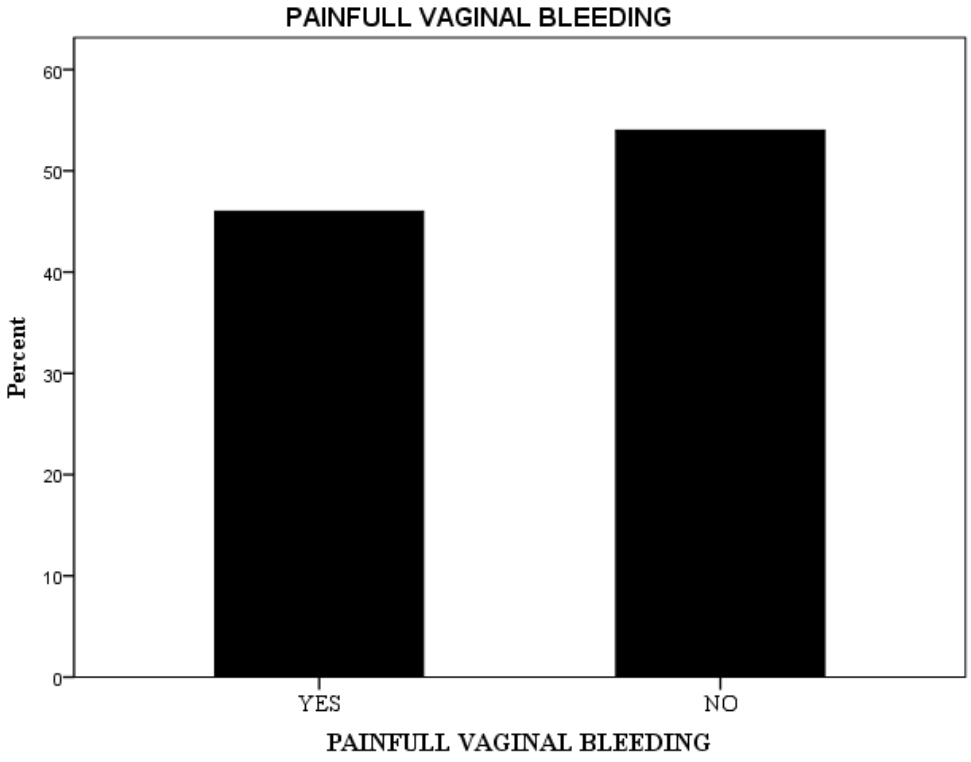


Figure (4-4) shows the distribution of pain full vaginal bleed

Table (4-5) shows the frequency distribution of vaginal bleeding in 2th and 3th trimester according to supra pubic pain

Table 4-5 Supra Pubic Pain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	35	70.0	70.0	70.0
	NO	15	30.0	30.0	100.0
	Total	50	100.0	100.0	

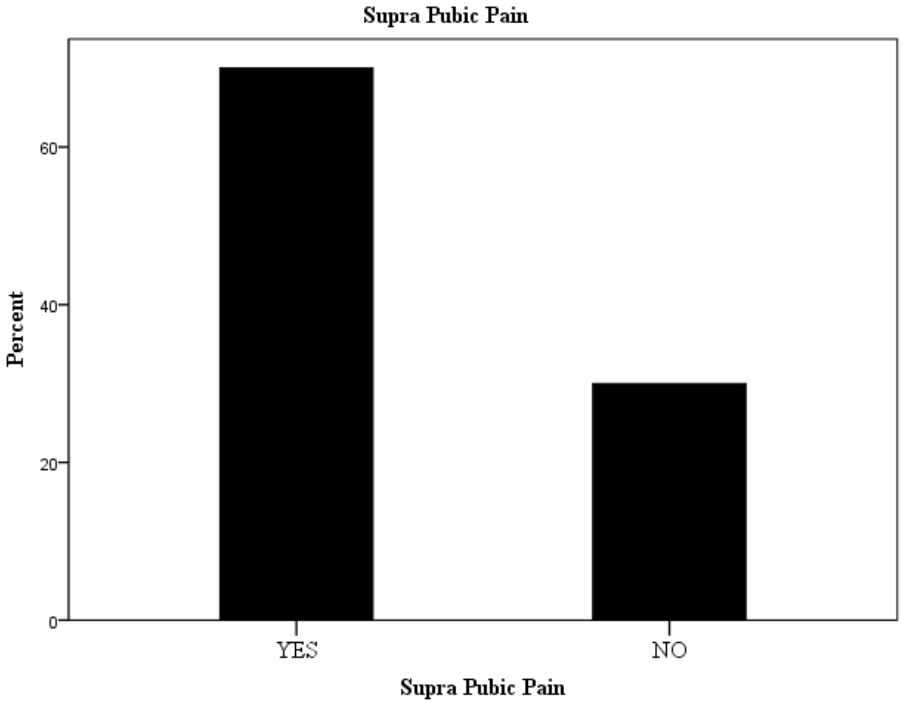


Figure 4-5 suprapubic pain

Table 4-6 shows the distribution of palpable pelvic mass.

Palpable PELVIC MASS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	19	38.0	38.0	38.0
	NO	31	62.0	62.0	100.0
	Total	50	100.0	100.0	

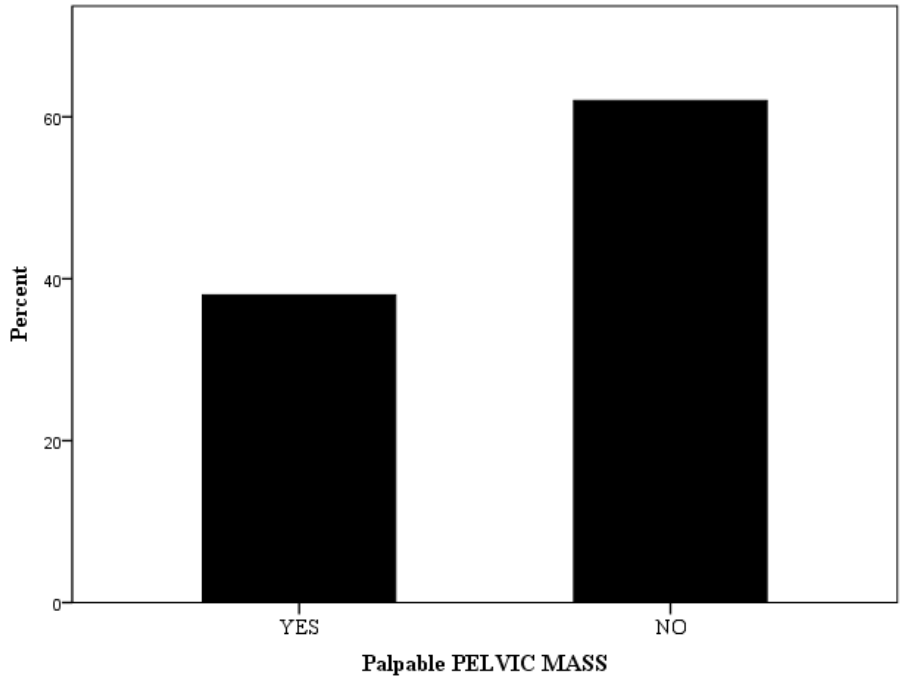


Figure (4-6) palpable pelvic mass

Table 4-7 represent the distribution of liquor drain

Liquor drain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	15	30.0	30.0	30.0
	NO	35	70.0	70.0	100.0
	Total	50	100.0	100.0	

Figure (4-7) shows distribution of liquor drain

Table 4-8 represent the distribution of abdomen status

ABDOMEN STATUS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SOFT	39	78.0	78.0	78.0
	RIGID	11	22.0	22.0	100.0
	Total	50	100.0	100.0	

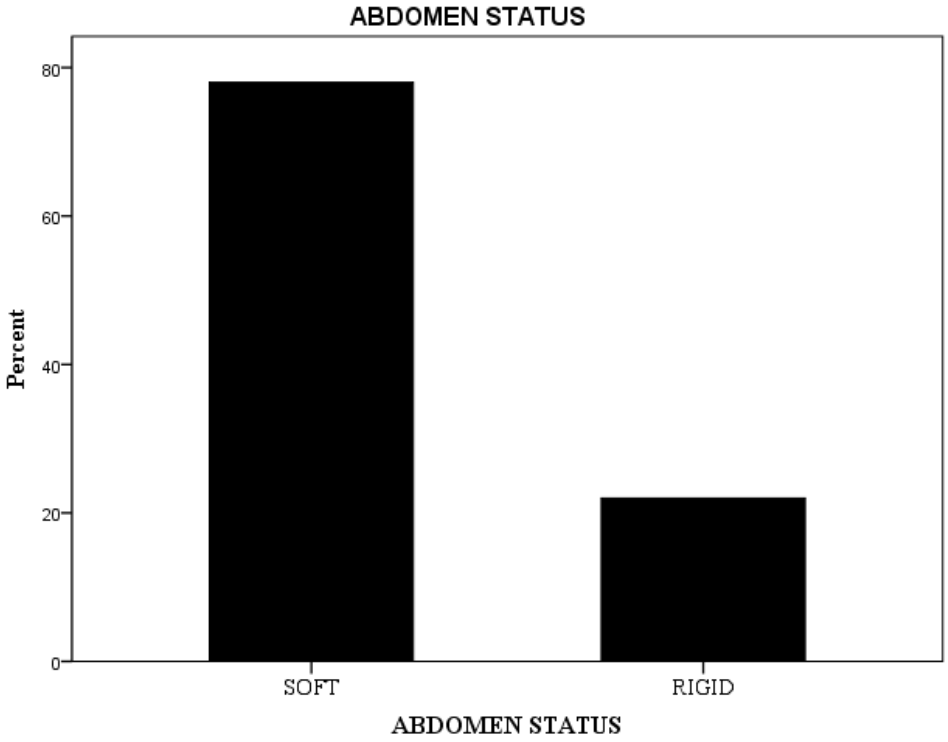


Figure (4-8) represent distribution of abdomen status.

Table 4-9 shows the distribution of diabtes mellitus .

DIABETES MELLITUS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	8	16.0	16.0	16.0
	NO	42	84.0	84.0	100.0
	Total	50	100.0	100.0	

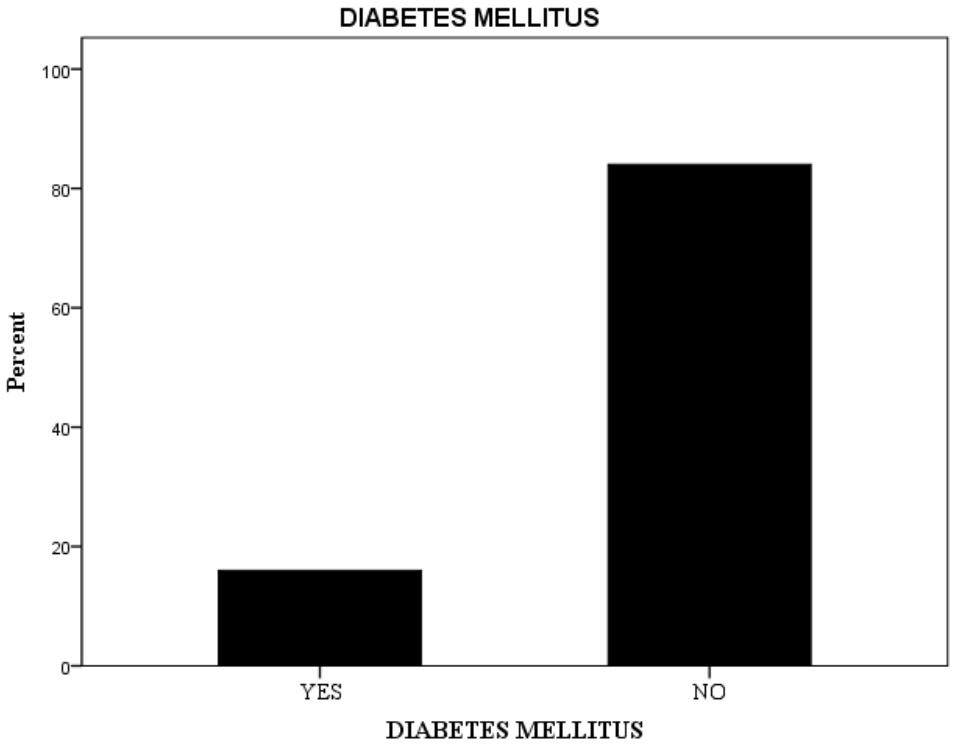


Figure (4-9) shows the distribution of diabetes mellitus

Table 4-10 shows the distribution of hypertension of the surveyed patient.

HYPERTENSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	4	8.0	8.0	8.0
	NO	46	92.0	92.0	100.0
	Total	50	100.0	100.0	

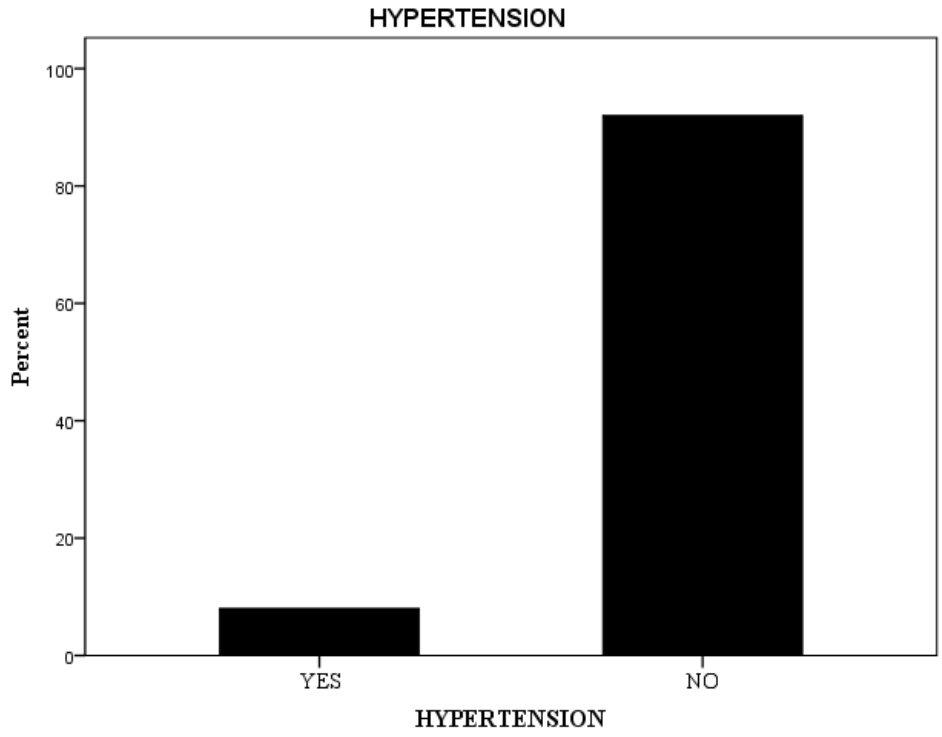


Figure (4-10) shows the distribution of the hypertension.

Table 4-11 represents the distribution of the history of caesarian section of the surveyed patient .

PREVIOUS H OF C/S

	Frequency	Percent	Valid Percent	Cumulative Percent
NO	41	82.0	82.0	100.0
Total	50	100.0	100.0	

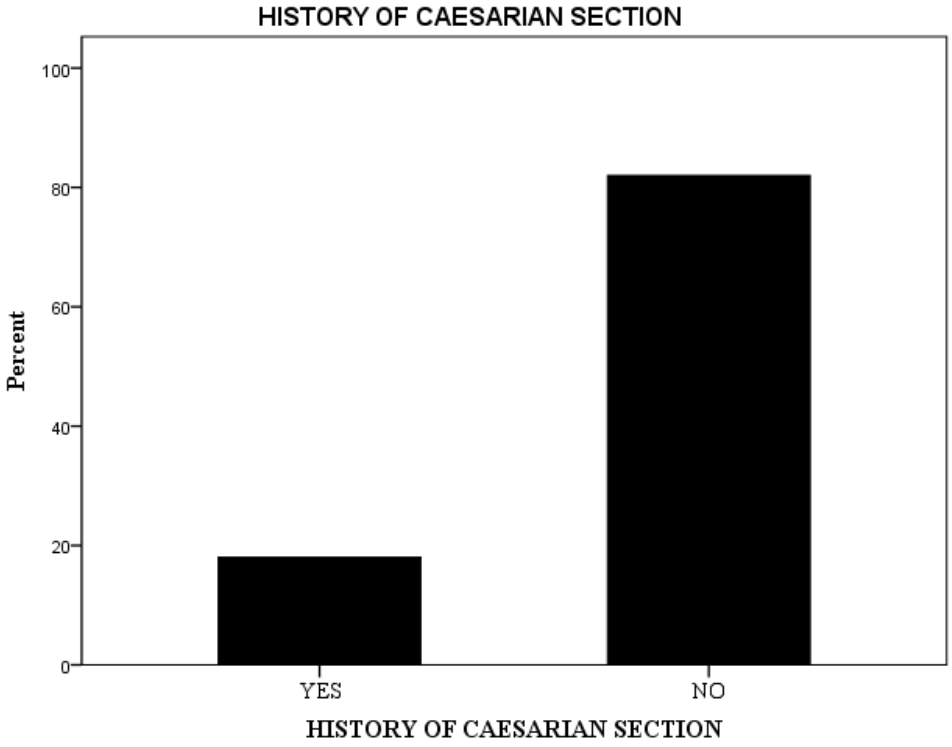


Figure (4-11) shows the distribution of the history of caesarean section

Table 4-12 shows the distribution of previous abortion of the surveyed patient .

PREVIOUS ABORTION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	10	20.0	20.0	20.0
	NO	40	80.0	80.0	100.0
	Total	50	100.0	100.0	

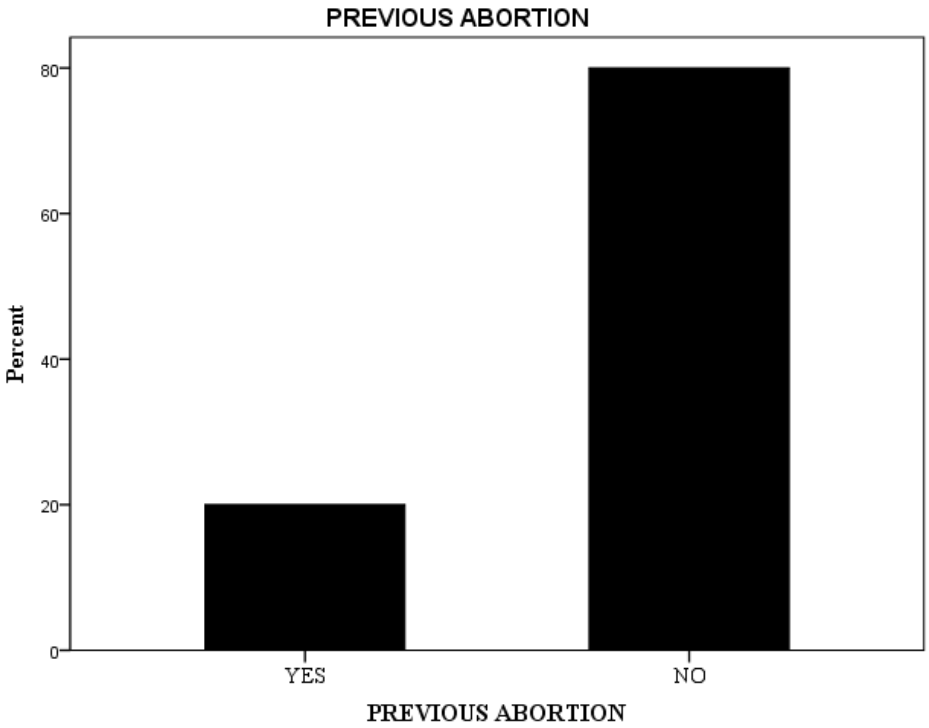


Figure (4-12) shows the distribution of the previous abortion

Table 4-13 represents the distribution of fetus number of the surveyed patient .

FETUS NUMBER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SINGLE	46	92.0	92.0	92.0
	TWINS	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

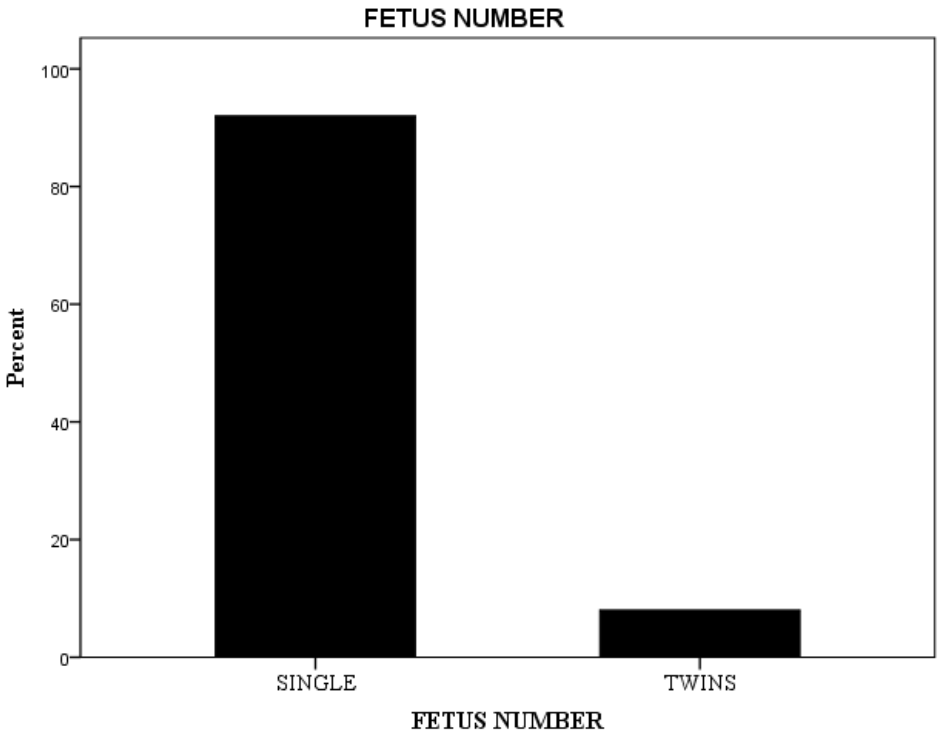


Figure (4-13) shows the distribution of the fetus number

Table 4-14 represents the distribution of fetus viability of the surveyed patient .

FETUS VIABILITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VIABLE	38	76.0	76.0	76.0
	NONVIABLE	12	24.0	24.0	100.0
	Total	50	100.0	100.0	

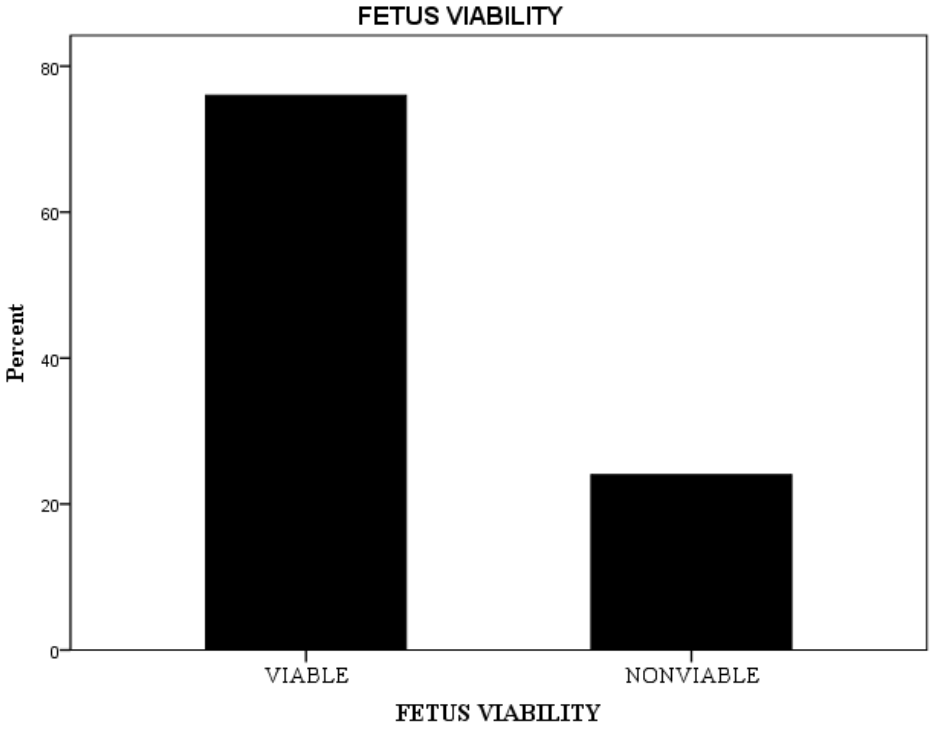


Figure (4-14) shows the distribution of the fetus viability

Table 4-15 shows the distribution of the placenta location of the surveyed patient.

PLACENTA LOCATION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NORMAL	44	88.0	88.0	88.0
	Previa	6	12.0	12.0	100.0
	Total	50	100.0	100.0	

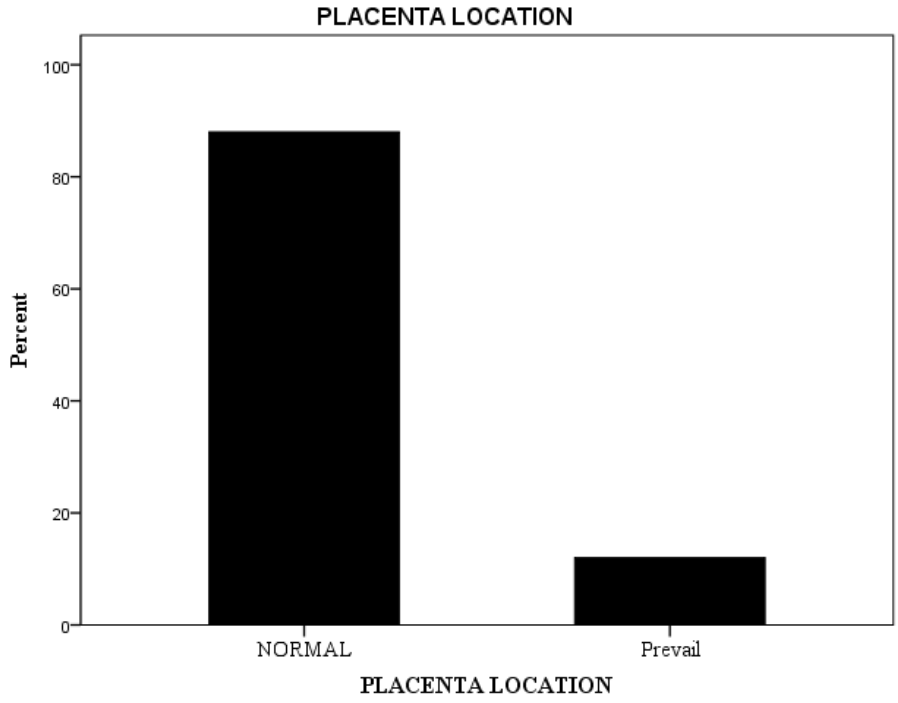


Figure (4-15) shows the distribution of the placenta location.

Table 4-17 shows the distribution of the liquor valume of the surveyed patient .

LIQUIR VALUME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	AVERAGE	36	72.0	72.0	72.0
	POLY	1	2.0	2.0	74.0
	OLIGO	13	26.0	26.0	100.0
	Total	50	100.0	100.0	

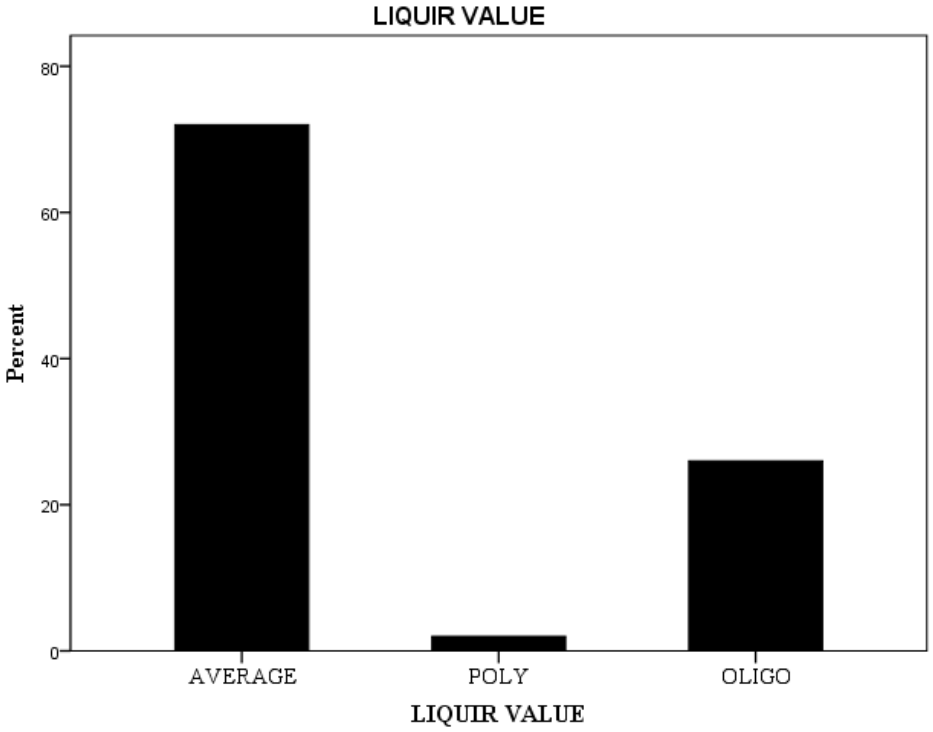


Figure (4-17) shows the distribution of the liquor volume.

Figure (4-18) shows the distribution of the cervical incompetent.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	2	4.0	4.0	4.0
	NO	48	96.0	96.0	100.0
	Total	50	100.0	100.0	

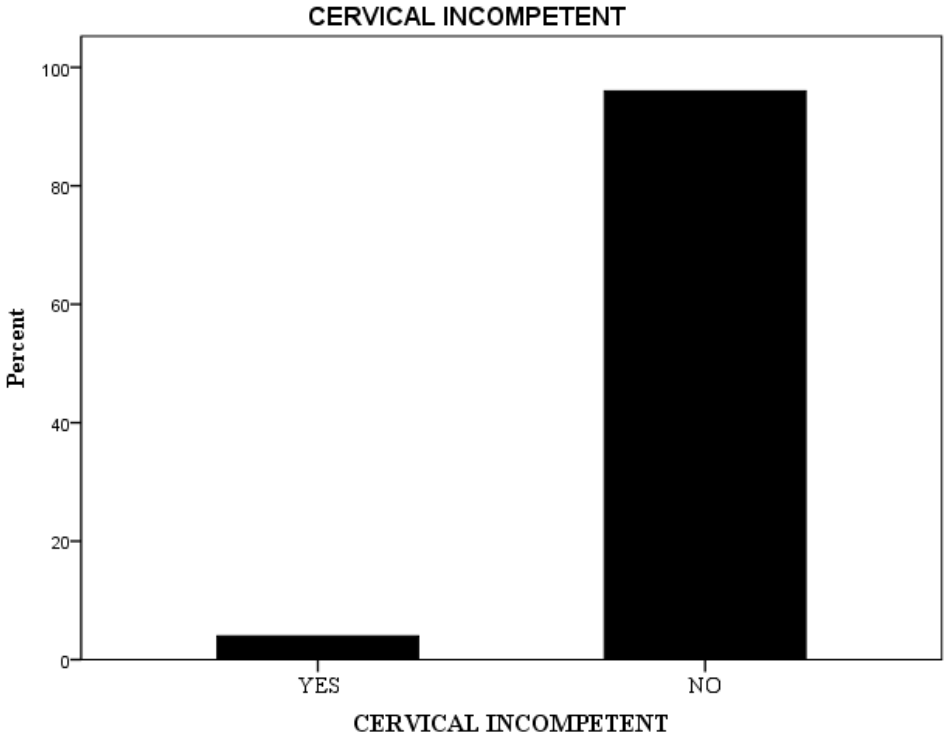


Figure (4-18) shows the distribution of the cervical incompetent

Table 4-19 shows the distribution of the fetal anomalies .

FETAL ANOMALIES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	2	4.0	4.0	4.0
	NO	48	96.0	96.0	100.0
	Total	50	100.0	100.0	

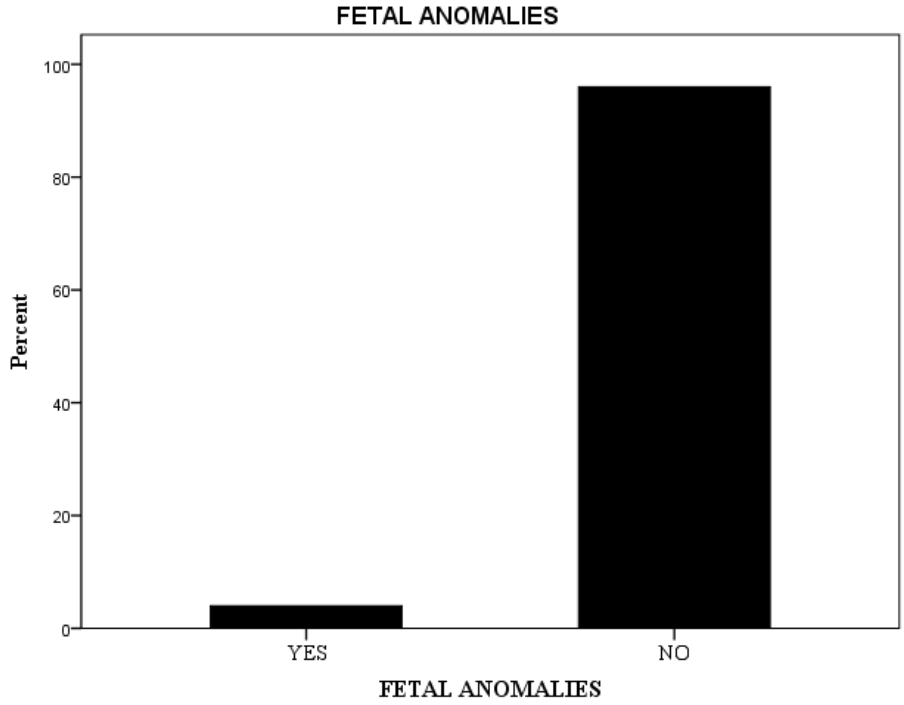


Figure (4-19) shows the distribution of the fetal anomalies

Table 4-20 shows the distribution of uterine mass of the surveyed patient .

UTERINE MASS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	8	16.0	16.0	16.0
	NO	42	84.0	84.0	100.0
	Total	50	100.0	100.0	

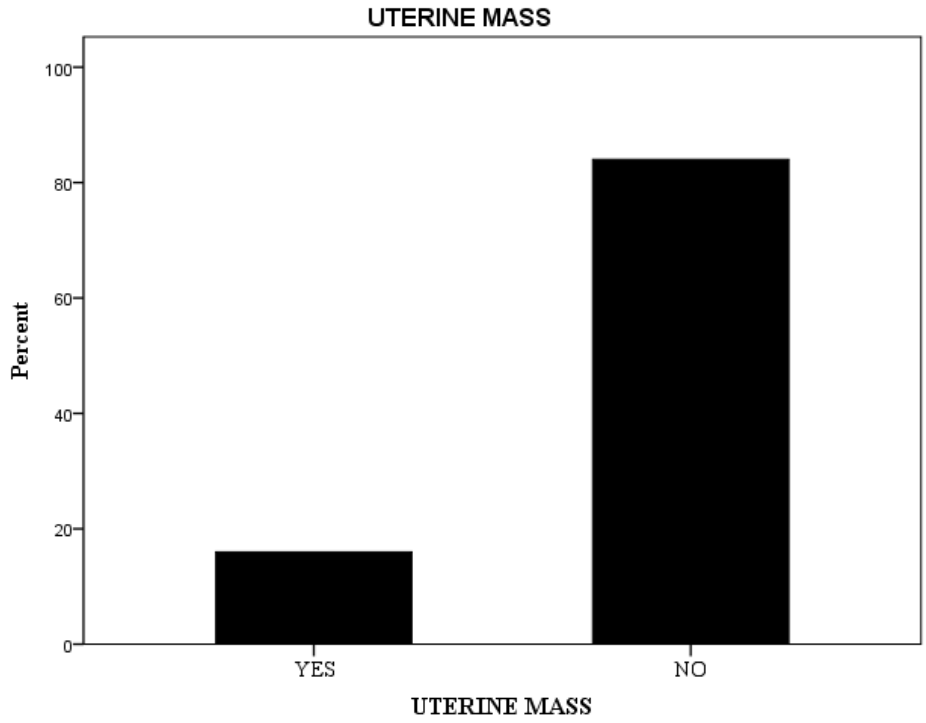


Figure (4-20) shows the distribution of the uterine mass.

Table 4-21 shows the distribution of the ovarian mass in the surveyed patient .

OVARIAN MASS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	4	8.0	8.0	8.0
	NO	46	92.0	92.0	100.0
	Total	50	100.0	100.0	

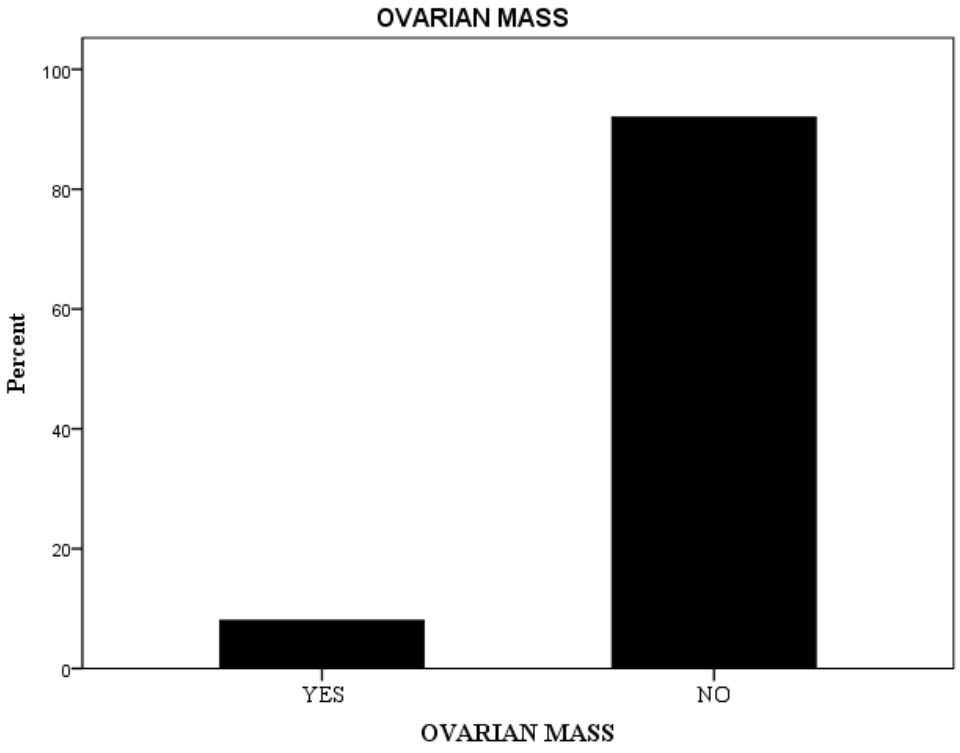
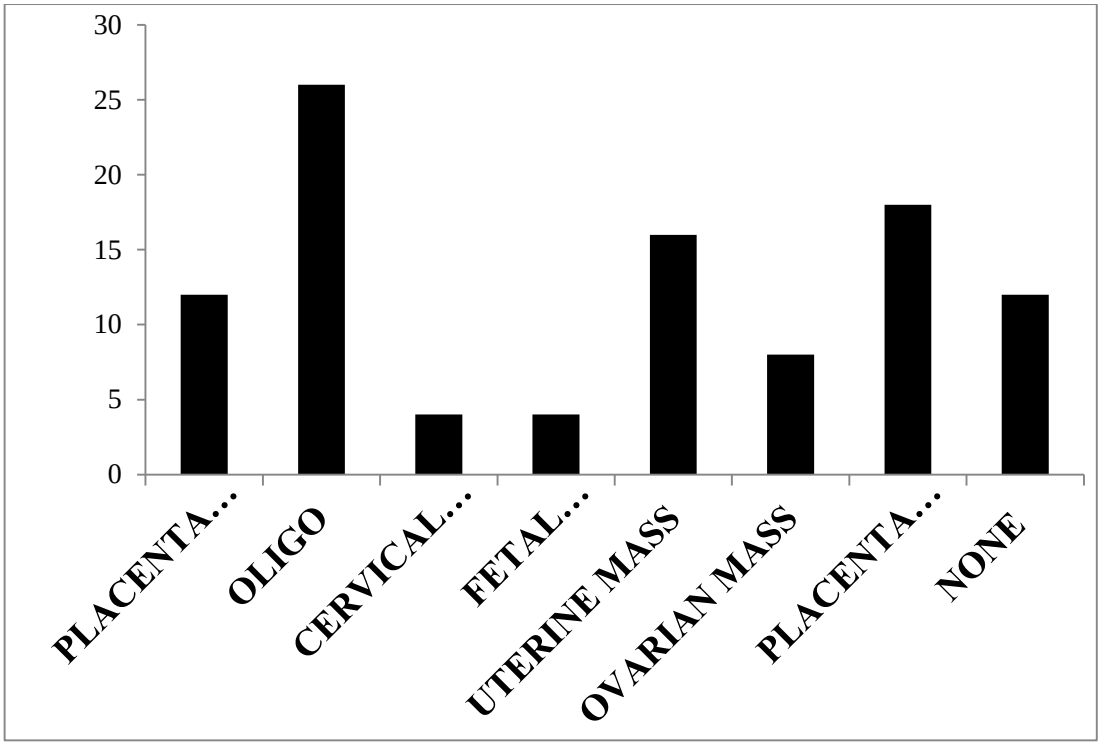


Figure (4-21) shows the distribution of the ovarian mass

General causes of bleeding

Figure



(4-22) shows the distribution of the finding ultrasound.

Table 4-23 shows values of the cross tabulation for the relationship between liquor volume and the gestational age group.

LIQUIR VALUME * GESTATIONAL AGE GROUP Crosstabulation

Count

		GESTATIONAL AGE GROUP		
		SECOND TRIMESTER	THIRD TRIMESTER	Total
LIQUIR VALUE	AVERAGE	21	15	36
	POLY	1	0	1
	OLIGO	8	5	13
	Total	30	20	50

Table 4- 24 shows values of the cross tabulation for the relationship between liquor volume and age groups.

LIQUIR VALUE * AGE GROUP Cross tabulation

Count

		AGE GROUP			
		< 20 YEARS	20-29 YEARS	30- 40	Total
LIQUIR VALUE	AVERAGE	4	18	14	36
	POLY	0	0	1	1
	OLIGO	0	4	9	13
	Total	4	22	24	50

Table 4-25 shows the values of the cross tabulation for the relationship between fetus viability and the liquor volume .

FETUS VIABILITY * LIQUIR VALUME Cross tabulation

		LIQUIR VALUME			
		AVERAGE	POLY	OLIGO	Total
FETUS VIABILITY	VIABLE	30	1	7	38
	NONVIABLE	6	0	6	12
Total		36	1	13	50

Table 4-26 represent values of the cross tabulation for the relationship between parity and placenta hematoma .

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PARITY * PLACENTA HEMATOMA Crosstabulation

		PLACENTA HEMATOMA		
		YES	NO	Total
PARITY	PRIMIGRAVIDA	0	5	5
	MULTIGRAVIDA	9	36	45
	Total	9	41	50

Chapter 5

5.1 Discussion

This study has been done in maternity hospital , Omdurman city , from Augustus to disember 2014 , from the study population in a random way a total of fifty patient (n=50) were selected to be the sample units in this study ,was defined in three age groups ,the table number (4-1) in chapter four indicates that the patient in this study aged from 30-40 years reveals that it is 48%=24 patient of them , 44% =22 patient in age group (29-20) years, than 8% =4 patient in age group less than 20 years, as represented in the figure (4-1) .Table(4-2) shows the gestational age groups of the surveyed patient in the second trimester 60% =30 patient, while 40% =20 patient in the third trimester , as depicted in the figure (4-2) . The table number (4-3) shows the distribution of parity among the studies patient , and it indicates that only 10% =5 patient primigravida , while the majority 90% =45 patient multigravida, as depicted in figure (4-3) .All the patient are selected should have vaginal bleeding pain as divided into painful and painless ,table (4-4) shows that 46% =23 patient of them are with painful vaginal bleeding rather than 54% =27 patient with painless, as shows also in figure (4-4) . Table(4-5) represent the distribution of supra pubic pain of the surveyed patient in the study , and it reveals that 70% of them are supra pubic pain , while only 30% are not , as shows also in figures (4-5) . Table (4-6) represent the distribution of liquor drain in the surveyed patient in the study , it reveals 30% of them with liquor drain , while 70% are not liquor drain , as depicted in figure (4-6).

In brief in the total of the studied patient (n=50) the causes (positive finding ultrasound) of vaginal bleeding in second and third trimester is as follow : placenta hematoma was 9 out of

50 which is 18% ,liquor volume (oligo) was 13=26% ,(poly) was 1=2% , cervical incompetent was 2 =4% ,fetal anomalies was 2=4 , uterine mass (fibroid) was 8=16% , ovarian mass (cyst) was 4=8% , and non causes (negative finding scans) was 5=10% , as shows in figure(4-24). Table (4-24) shows the relationship between liquor volume and gestational age that indicate liquor volume at average volume 21from 36 patient in second trimester, and 15 from 36 at third trimester in oligo volume 8 from 13in second trimester and 5 from 13 in third trimester. Table (4-25) shows the relationship between liquor volume & age group indicate that at average 4 from 36 in <20 years , 18 from 36 in 20-29 years and 14from 36 in age group 30-40 years , in oligo volume 4 from 13 patient in age group 20-29 , while 9 from 13 in age group 30 -40 ,there is relationship when increase age of patient with vaginal bleeding & liquor drain ,increase risk factor of oligo volume .

Table 4-26 shows the relationship between fetus viability and the liquor volume ,indicate that viable fetus at average volume 30 from 30 patient , in oligo 7 from 30 patient, non viable fetus at average 6 from 12 patient , in oligo 6 from 12, there is relationship, when increase the liquor volume oligo decrease the viability specially in second trimester when advanced maternal age ,the relationship between oligo associated with vaginal bleeding ,age and trimester is very strong factor of the viability of the fetus and maternal. Table (4-27) shows the association between parity and placenta hematoma ,and indicate that in primigravida recoded any cases of placenta hematoma, while 9 from 45 patient with placenta hematoma , most the cases of placenta hematoma associated with pain full and in second trimester, when placenta hematoma prognosis and heavy that increase the risk factor of feto-maternal and may be to be placenta abruption in late pregnancy.

This study agree with many studies nationality, looking about vaginal bleeding in second and third trimester, the summary of them Vaginal bleeding in the second or third trimester can be

associated with increased risks to the mother and fetus, or both, depending on the severity, number of episodes, and cause of bleeding, as determined by US.

Although this study documented by: Vaginal bleeding of pregnancy women is one of the major causes that increase the maternal mortality rate which jumped to 1000 deaths per100000 women in the last years, prior was 500 deaths in every 100000 women (Sudan Medical Journal, 2008).

5.2 Conclusion

This study has been done in Omdurman maternity hospital, Omdurman city , from the Augustus to the disemper 2014, from the study population in a random way a total of fifty patient (n=50) were selected to be the sample unit in this study, the age from 16 years and more, no exclusion criterion any patient comes with vaginal bleeding. The goal of the study is to evaluate the vaginal bleeding in the 2th and 3th trimester using ultrasonography.

The results conclude there are many causes of vaginal bleeding , the most important are liquor volume (oligo) , uterine mass (fibroid), placenta hematoma , and placenta previa in late pregnancy.

*The liquor volume (oligo) a associated with vaginal bleeding is strong risk factor of the fetus viability.

*Most the patient comes with supra pubic pain .

*Placenta hematoma in second trimester with a associated with painful and heavy bleeding it may be causes threatened abortion ,or to be placenta abruption in late pregnancy mean that risk factor of the maternal and fetus .

*Ultrasound scanning is very important modality to detect and evaluated any vaginal bleeding and it early diagnosed.

5.3 Recommendation.

After reading the result, analysis and the fruitful discussion we can send messages to the all people in medical field as follows :

*Ultrasounography could be useful as routine , check up , follow up to help diagnosis, treatment and control the risk of vaginal bleeding .

*The easy and safe way to diagnoses fibroid as well as uterine mass in ultrasound, and placenta hematoma as well as placenta abruption.

*Doppler ultrasound is important for more accurate result.

The researcher has come out with the following recommendations.

* 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.

* Doppler ultra sound is important for more accurate result.

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Appendices

Sudan university of technology post graduate of ultrasound

Data collection sheat

Vaginal bleeding of 2 nd and 3 rd trimester

Patient age ☐ year ☐ date of scan/ …….

GA/week ☐ day ☐ gravid

Painless vaginal bleeding yes ☐ no ☐

Painful vaginal bleeding yes ☐ no ☐

Supra pupicpain yes ☐ no ☐

Palpable pelvic mass yes ☐ no ☐

Derange of liquor yes ☐ no ☐

Abdomen soft ☐ rigid

DM yes ☐ no ☐

HTN yes ☐ no ☐

Pervious H OF c/s yes ☐ no ☐

Pervious abortion yes ☐ no ☐

U/S finding

Fetus single ☐ twins ☐

Viable ☐ non viable ☐

Placenta upper ☐ low lying ☐ praevia ☐

Placenta hematoma yes ☐ no ☐

Liquor value average poly ☐ olig ☐

Cervical in competent yes ☐ no ☐

Fetal anomelies : ……

Uterine mass : ……..

Ovarian mass :……

Other :…….

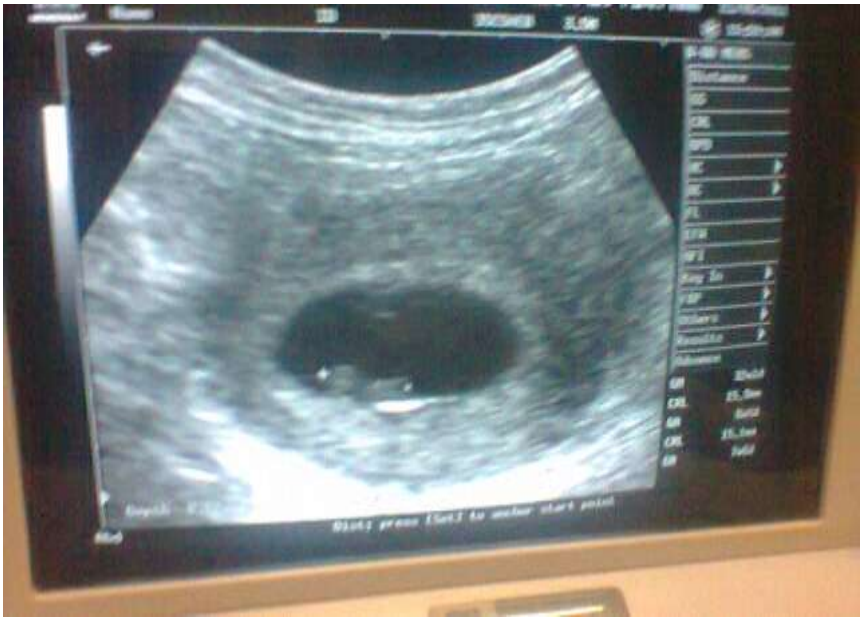

Figure (1) Missed Abortion

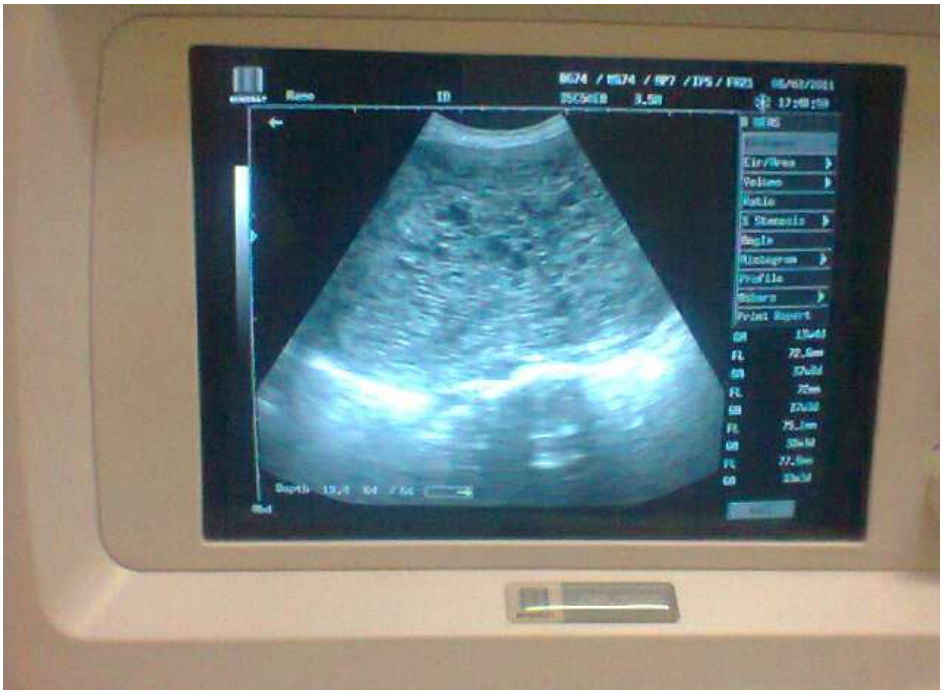

Figure (2) Molar Pregnancy

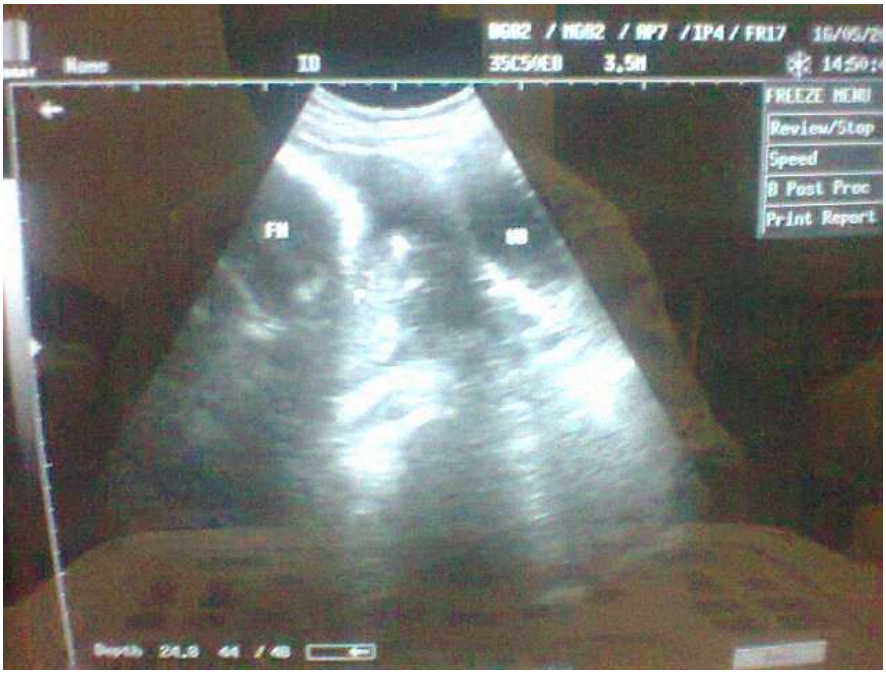

Figure (3) Placenta Previa

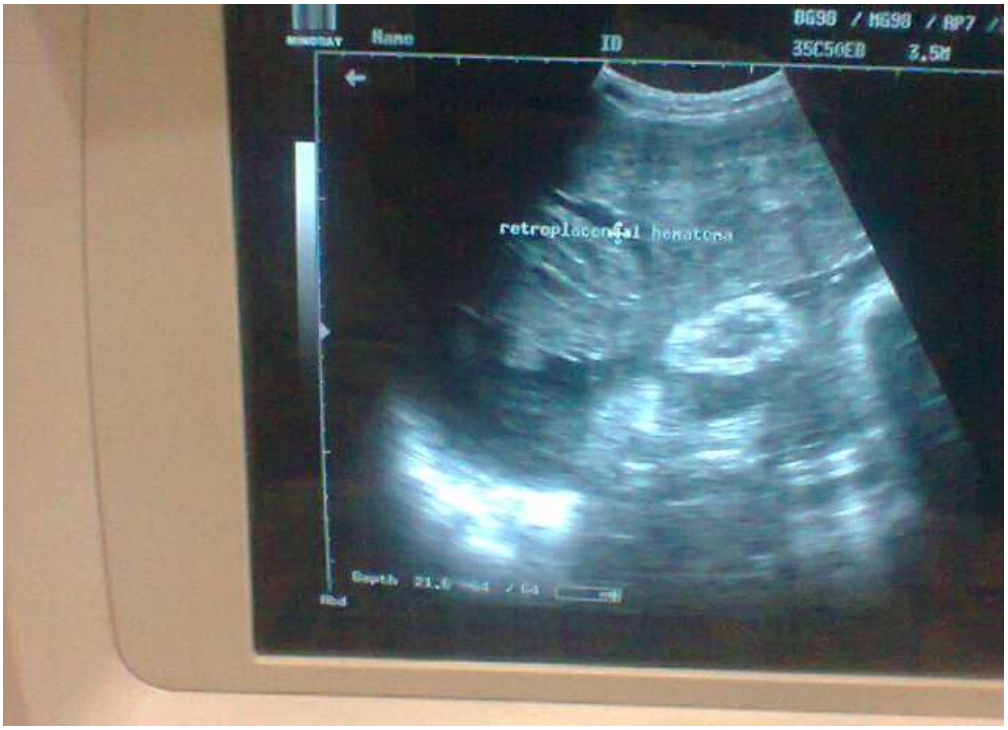

Figure (4) Abruption placenta

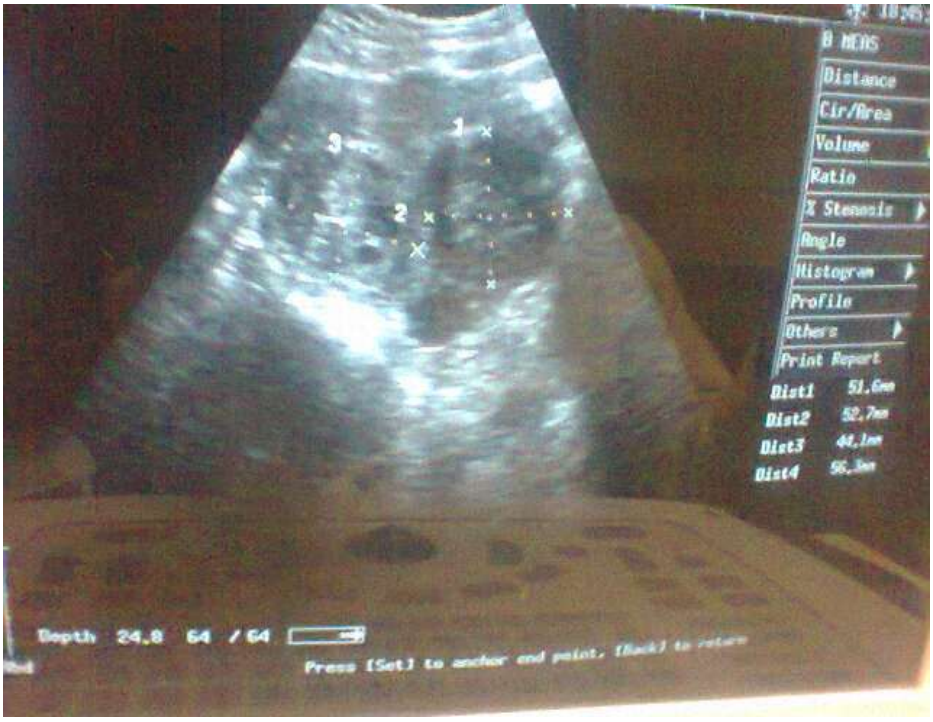

Figure (5) Multiple Fibroids

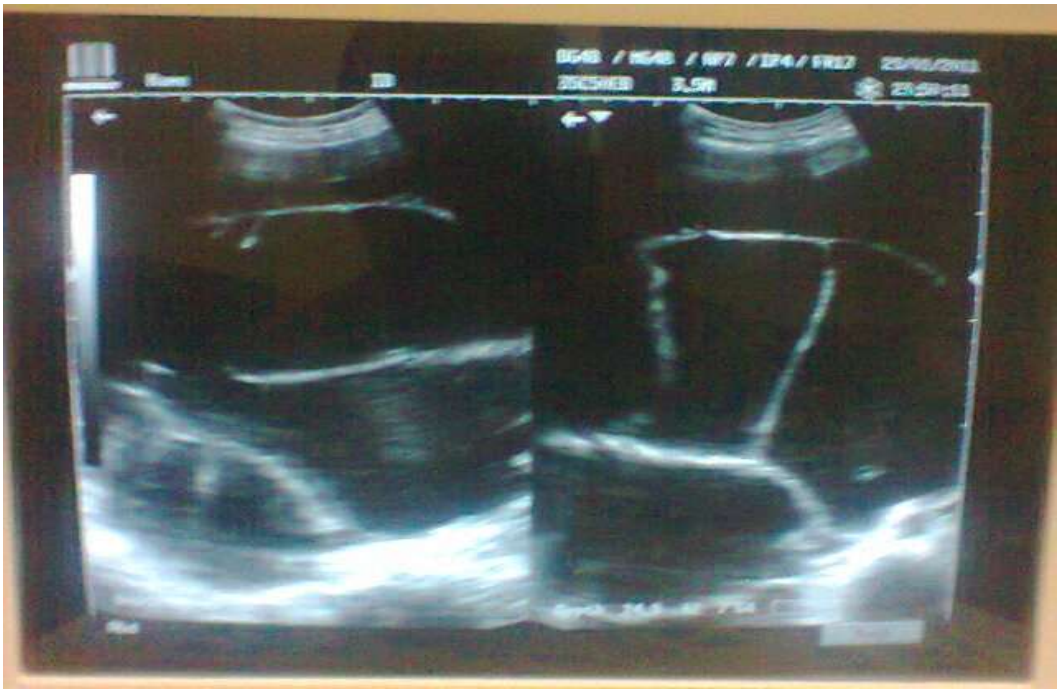

Figure (6) Complicated RT Ovarian Cyst