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College of Graduate Studies

Detection Some of Abortion Causes using Ultrasonography

كشف بعض اسباب الاجهاض عن طريق الموجات فوق الصوتية

A thesis Submitted for partial fulfillment of requirements

of MSC degree in medical diagnostic ultrasound

:B y

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الايـة

قال تعالى:

{هُوَ الَّذِي يُصَوِّرُكُمْ فِي الأَرْحَامِ كَيْفَ يَشَاءُ لاَ إِلَـهَ إِلاَّ هُوَ الْعَزِيزُ الْحَكِيمُ }

صدق الله العظيم

(آل عمران:6)

Dedication

To all whom I love and respect, my parents who broughtme up and my family. To all those who supported ., participated and adviced me through this research

Acknowledgement

Gratefull thanks and grace to Allah for guiding and .helping me finishing this research

I would like also to express sincere thanks and gratitude to my supervisor Dr. **Asma Ibrahim Ahmed Alamin** for her keen supervision, guidance, valuable comments and support the idea of this research until .finishing

Abstract

This is adescriptive study conducted in Bashaer hospital Khartoum city(Sudan).from may to August 2016. The main aim to assess the causes and incidence of abortion using U/S.

A total of (50) patients were scanned using TRA ultrasound machine, all of them suffering from abortion. Study was reveled that the highest incidence of abortion was incomplete abortion (56%) followed by complete abortion (24%) and then missed and threatened abortion (10%) equally.

Data was collated using Data Collection Sheet and analyzed using SPSS Program.

All the patients were scanned by trans abdominal ultrasonography .The patients age group was found to be between(20 – 41 years). The study found (90%) of the study group had symptoms , and (10%)of the study group discovered to have missed abortion on routine antenatal scanning without any symptoms of abortion and this demonstrate the value of early antenatal ultrasound scan.

The main symptoms of the study group was found to be vaginal bleeding which score (86% (.

The study clearly confirm the event of abortion by the absent of cardiac activity and state of the gestational sac.

The study concluded that the majority of the patients had no history of recurrent abortion (88%) and (12%) had recurrent abortion. and denied any correlation between abortion and the kind of work in this study It found that housewife are commonly suffering from abortion(78%), this result associated with place and time . of research

The multipara women are the most who have abortion (52%) . also the study concluded that the ultrasonography is the most sensitive , specific , practical , cost effective and useful imaging technique for confirmation of abortion and classifying it's different . types

ملخص البحث

اجريت هذه الدراسة الوصفية في مستشفي بشائر بمدينة الخرطوم بالسودان في الفترة من مايو 2016 الي اغسطس 2016م.

الهدف الاساسي من هذه الدراسة هي معرفة دور الموجات فوق الصوتية في تشخيص اسباب ونسبة حدوث الاجهاض .

50 امرأة حامل تم فحصهن بالموجات فوق الصوتية في تلك الفترة، اوضحت الدراسة ارتفاع في الاجهاض خاصة غير المكتمل بنسبة (56%) ثم الاجهاض المكتمل بنسبة (24%) ثم بنسبة متساوية لكل من الاجهاض المهدد والمفقود بنسبة(10%).

تم فحص المريضات بالموجات فوق الصوتية البطنية وقد تراوحت اعمارهن ما بين(20 – 41 سنة)

وقد وجدت الدراسة ان (90%) من المريضات لديهم اعراض، ولم توجد اعراض لإجهاض مبكر في حوالي(10%) من هذه الحالات رغم اثبات الاجهاض بالموجات فوق الصوتية وهذا يوضح فائدة المتابعة الدورية للحمل المبكر

وجدت هذه الدراسة بأن اكثر الاعراض شيوعاً هو النزيف المهبلي اذ يشكل 86% من هذه الاعراض .

اثبتت الدراسة وضوح حالات الاجهاض بانعدام نبضات الجنين او تغير حالة الكيس الجنيني .

خلصت هذه الدراسة بأن غالبية المريضات ليس لديهن تاريخ مرضي لإجهاض مبكر بنسبة (88%) ،بينما (12%) لديهن اجهاض متكرر .

ونفت أي ارتباط بين الاجهاض وانواع العمل (توقع الباحث وجود صلة بين الاجهاض والنساء العاملات وهذا لم يثبت). هذه النتيجة مرتبطة بمكان وزمن البحث .

واضحت هذه الدراسة ان النساء ربات المنازل اكثر عرضة للإجهاض بنسبة 78%) كما اوضحت الدراسة ان النساء متعددات الولادة هن اكثر عرضة للإجهاض بنسبة (52%)

كما خلصت الدراسة بأن الموجات فوق الصوتية هي من اكثر الوسائل التشخصية دقة وسلامة وذات قيمة اقتصادية عالية في تشخيص الاجهاض وتحديد انواعه المختلفة.

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Abbreviations

U/S ultrasound

TRA trans abdominal scan

GS gestational sac

HCG human chorionic gonadotropin

MHZ megahertz

LMP last menstrual period

LH luteinizing hormone

SPSS Statistical Packaged for Social Studies

Chapter One
Introduction

Introduction :1.1

Early pregnancy disorders are one of the most common indications for referral to hospital emergency services and they account for approximately three-

.quarters of acute gynecological admissions

Abortion is common complication that occurs in 10 to 25 percent of pregnancies, the vast majority of abortion occur in the first trimester, especially before 8

(weeks(SnelL R, 2012

Abortion is any procedure that terminate pregnancy at certain gestational age or by any means that by removing the fetus or embryo before it can survive outside the uterus. The expulsion of the ovum occurring during the first three months of gestation, and occurring from any

(cause what so ever, is called abortion.(SnelL R, 20012

In the fourth ,fifth ,sixth ,and seventh months , i.e. , from the formation of the placenta to the period of viability - the occurrence is called immature delivery , or miscarriage , the delivery occurring from twenty-eight

. week to the thirty-eight week is called premature

Abortion may be due to pathological changes in the ovum, the uterus, or its adnexa one or both to the physical or nervous condition of the women, to disease either inherited or acquired (syphilis,tuberculosis,rheumatism). To shock, injury, or accident. It may be induced and criminally by the pregnant person herself, or by someone else, with the aid of drugs, or instrument, or both (SnelL R,

(2012

The abortion may be complete or partial. if complete , the danger is principally from shock and hemorrhage , if incomplete an any debris remain is danger of septicaemia, uraemia, endometritis, perimetritis,disease of tubes , ovaries , bladder , cervix , vaginal canal, and rectum , together with catarral .discharge from one or more of these part

Pregnancy can occur by sexual intercourse or assisted reproductive technology. It usually lasts around 40 weeks from the last menstrual period (LMP) and ends in .child birth

Pregnancy is typically divided into three trimesters, the first trimester is from week one through 12 and includes conception. conception is when the sperm fertilizes the egg , the fertilized egg then travels down the fallopian tube and attaches to the inside of the uterus ,

where it begins to form the fetus and placenta. The first trimester carries the highest risk of miscarriage, The second trimester is from week 13 through 28. around the middle of the second trimester , movement of the fetus may be felt , at 28 weeks , more than 90% of babies can survive outside of the uterus if provided high-quality medical care. The third trimester is from 29 weeks through 40 weeks(Sheema Osman, 2009).

The abortion is one of common problems that involve a good management in obstetrics, some types can be controlled regarding to their causes and possibility of treating them. Medical diagnostic ultrasound is considered to be an essential method in diagnosing the abortion events and its causes. Ultrasound has come to play an important role in the management of obstetric patients, (it can provide a window through which inside the uterus can be evaluated and look at the fetus. The information that u/s provide regarding pregnancy is extensive.(Royal College , 2003).

For example, when a mother presents with vaginal bleeding,
acommon obstetric complication, placental location can easily be determined. G.A can be determined and fetal growth can monitored. Also by U/S twin and triplets can be diagnosed early in pregnancy. Moreover u/s has improved patient care as it used as a guidance in amniocentesis instead of doing this blindly, in addition it

replace the fluoroscopy in intrauterine transfusion with less radiation to both the fetus and mother. Ultrasound may be used to confirm a pregnancy, if the gestational age is old enough for visualization of recognizable fetus and fetal heart beat. In that situation, a confirmatory HCG is not necessary. Generally considered safe, it should be used only when there is a good clinical reason. Diagnostic ultrasound has been used in obstetrics for near 30 year .Many physicians consider the scanning is recommended because many obstetric abnormalities cannot be detected by clinical examination such as:90% of developmental fetal abnormalities occur without any family history and very few of the mothers show any obvious risk factors, there may be significant fetal abnormalities even in a clinically normal pregnancy, neither clinical examination nor a family history is an entirely reliable way to detect the multiple pregnancy , a significant number of mothers with a low-lying placenta (placenta praevia) show no evidence until bleeding starts at the onset of labor and Up to 50% of mothers who claim to know their obstetric dates with certainty are in fact more than two weeks in error when gestational age is calculated with ultrasound . A discrepancy of two weeks can be critical for the survival of and infant who has to be delivered early because of some antenatal complication. (Royal College of Obstetricians .(and Gynaecologists, 2003

This study aim at understanding the causes and consequences of abortion among pregnant women.

1.2 Problems of the study:

Increased rate of abortion and its complications among pregnant women,so we need agood sure and reliable tool for early detection of it .

1.3.1 General objectives:

To assess the complications and causes of abortion using U/S, in Khartoum state.

1.3.2 specific objectives:

- To assess the incidence of abortion in the area of study .
- to list the different types of abortions .
- to show the role of diagnostic U/S in diagnosis of abortion .
- and find other causes of abortion rather than pathological causes.

4.1 Inclusion criteria:

The population of this study includes 50 patients among .pregnant women who are complaining of abortion

;Exclusion criteria 4.1

Pregnant women who are not complaining of .abortion

:Over view of study 5 .1

The study composed of five chapters, chapter one includes introduction about abortion and pregnancy also include the objectives, and the proplems of study. While Chapter two include a comprehensive scholarly literature reviews concerning the previous studies. Chapter three deals with the methodology, where it provides an outline of material and methods used to acquire the data in this study as well as the method of analysis approach. While the results were presented in chapter four, and finally Chapter five include discussion of results, conclusion and recommendation followed by .references and appendices

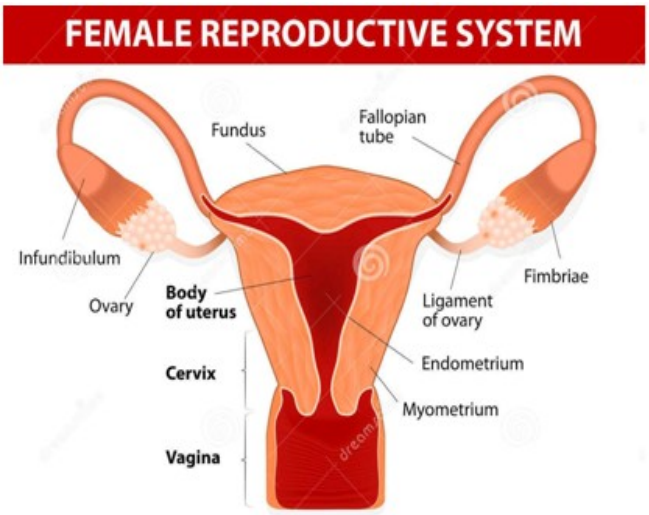
Chapter Two
Literature Review

:Anatomy of the female pelvis 2-1

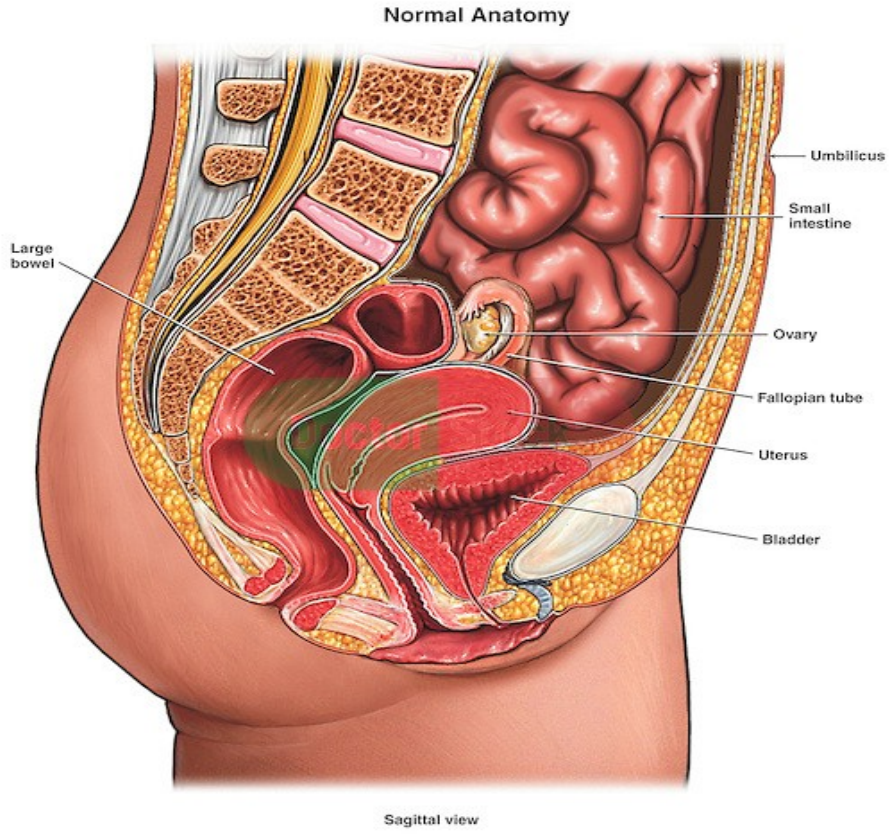
The understanding of the anatomy as it relates to the female pelvis is very important for the sonographer to build a foundation before learning pathophysiology. There are many pelvic landmarks, ligaments, and muscular structures within the pelvis that help the sonographer differentiate the normal reproductive organs from muscular and vascular .structures

Vagina 2.1.1

The vagina is a muscular tube composed of primarily smooth muscle with skeletal muscle fibers at the lower end. It measures about 10cm in length.The vagina lies anterior to the rectum and analcanal and posterior to the pubic symphysis, urinary baldder, and urethra. It is the pass way for the products of the menstrual cycle and is easily distensible (especially during child birth). The vagina has a mucous membrane lining its muscular walls to receive secretions from the vaginal wall and the mucous glands of the cervix and vestibular glands (during sexual .(excitement) (*Errol R, 2011*



.(**Figure (2.1): uterus and uterine tubes**(*Snell R, 2012*



Figure(2. 2):lateral view of internal female reproductive organs(*Snell .(.R,2012*

2Uterus .2.1

The uterus becomes the largest organ in the normal female pelvis when the urinary bladder is empty. It is a mobile, hollow, muscular pear-shape structure, partially covered by peritoneum. The normal menarchal uterus measures about 7.5 cm long, 5cm wide and 2.5cm thick. The uterus is composed of the externallayer or serous coat, the middle layer or .(musculararcoat, and the internalmucouslayer(*Elberhard ,2002*

The external layer, the peritoneum, surrounds the uterus except where the bladder layers against it at the cervical-vaginal connection. The middle, the myometrium, composes the majority of uterus. It is primarily smooth muslcle that is longitudinal and circular. The inner, the endometrium is a thin, smooth mucous. This membrane is contiguous with the lining of the vagina. The inner lining of the uterus varies in appearance and histologic structure, depending on the period of life in which it is studied. The uterus consist of the fundus or most upper portion, the body or central area, and the cervix, or the lower cylindric portion that joins the uterus to the vagina. At the latereal borders of fundus there are cornua, where the fallopian tubes are attached to the uterine cavity. The central cavity is a potential spacetallowing for the dynamic changes during the normal menstrual cycle and pregnancy. The

upper portion of the cervix is constricted by the internal os and the lower portion by the external os.The uterus is supported in its midline position by paired broad ligaments, round ligaments, and uterosacral ligaments, as well as other lesser ligaments.The broad ligaments area double fold of peritoneum and provide bilateral support for the uterus. They attach to the lateral walls of the pelvis, surrounding the fallopian tubes, round ligaments, parovarium, connective tissue, unstripedmuscular fiber, bloodvessels, and nerves. The upper edge of the broad ligament encloses the fallopian tube as it extends from the cornua of the uterus (*Elberhard,*

.(2002

The round ligaments occupy space between the layers of the broad ligament and occur in front of and below the fallopian tube. These two cords commence in each side of the superior aspect of the uterus and course upward and lateral through the inguinal canal to be insertedinto the labia majora. The uterosacral ligaments (cardinal ligament) originate laterallyatthe level of the internal os of the cerix and pass downward along the sides of the rectum extending to the third and fourth, bones of

.(the sacrum(*AsimKarjak,1986*

The body of the uterus is normally "bent" forward, or ante flexed, to make a slight angle with the cerix. The cervix makes a similar angle with the vagina, also called anteverted. In some females the uterus tips backward rather than forward, becoming "retroverted and/or retroflexed". The broad ligaments and round ligaments help somewhat to hold the uterus in position. In addition, there are condensation of connective tissue under the peritoneum in the region of the cervix of the uterus and fornix of the vagina. Those condensations are known as the lateral ligament,

cervical ligaments and cardinal ligaments. The ligaments passing on either side of the rectum are uterosacral ligaments. The clinical of "proalpase" of the uterus is found when these ligaments are stretched or abnormal(*Snell R, 2012*).

Endometrium 3 .2.1

The endometrium consists primarily of two layers: the functional layer (zonafunctionalis) and the deep basal layer (zonabasalis). The functional layer is a superficial layer of glands and stroma. The basal layer is a thin layer of blinds end of endometrial glands that regenerates new endometrium after menses. It is well known that the endometrium of uterus changes dynamically in response to cyclic hormonal flux(*Snel R, clinical anatomy 1995*).

Fallopian tubes 2.1.4

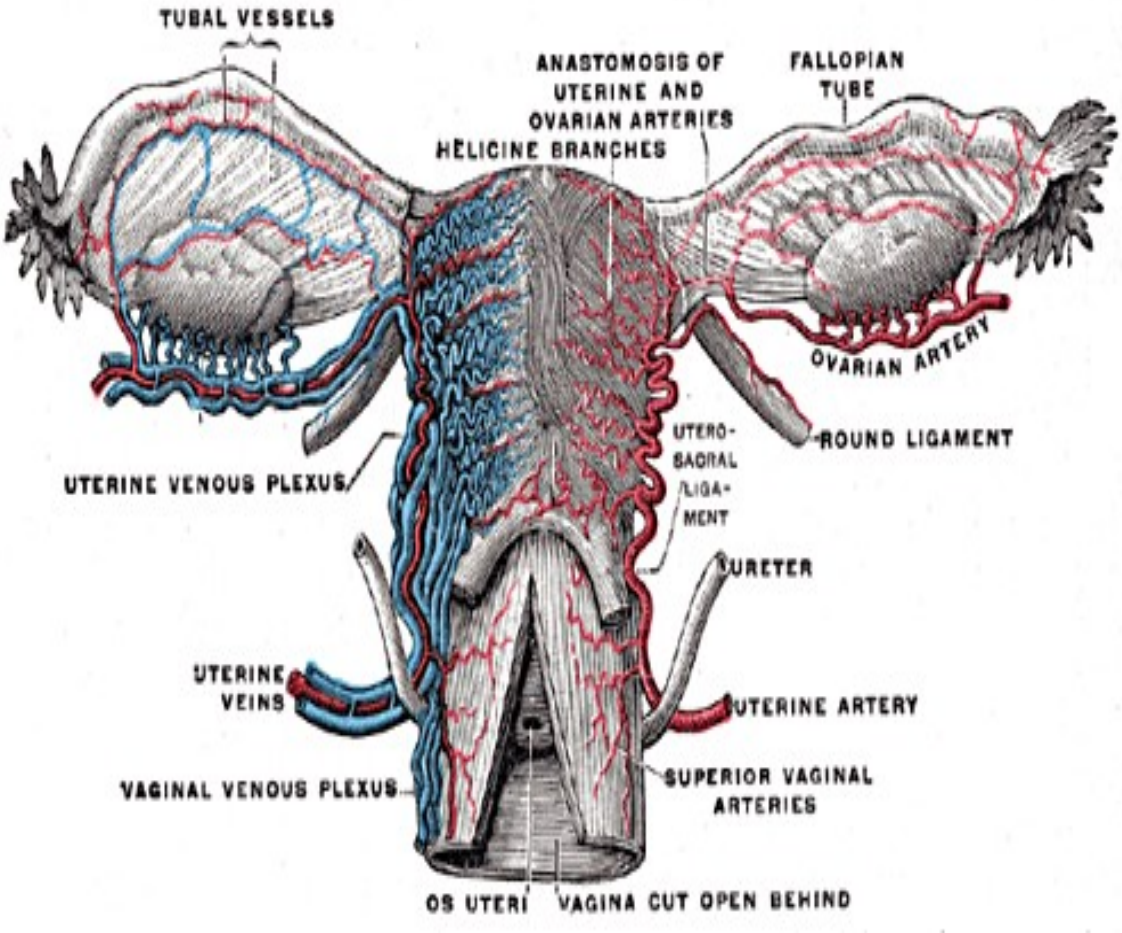
After evaluation of the uterus and cervix is complete, the adnexae are interrogated. It is important to assess the fallopian tube in its normal and pathologic states. The normal fallopian tubeis about 12 cm in length and 1 to 4cm in diameter. It is difficult to distinguish from the surrounding ligaments and vessels. It is contained in a special fold of the

broad ligaments called the mesosalpinx. The tubes lie above the utero-ovarian ligaments, the round ligaments and tubo-ovarian vessels(*AsimKarjak, 1986*).

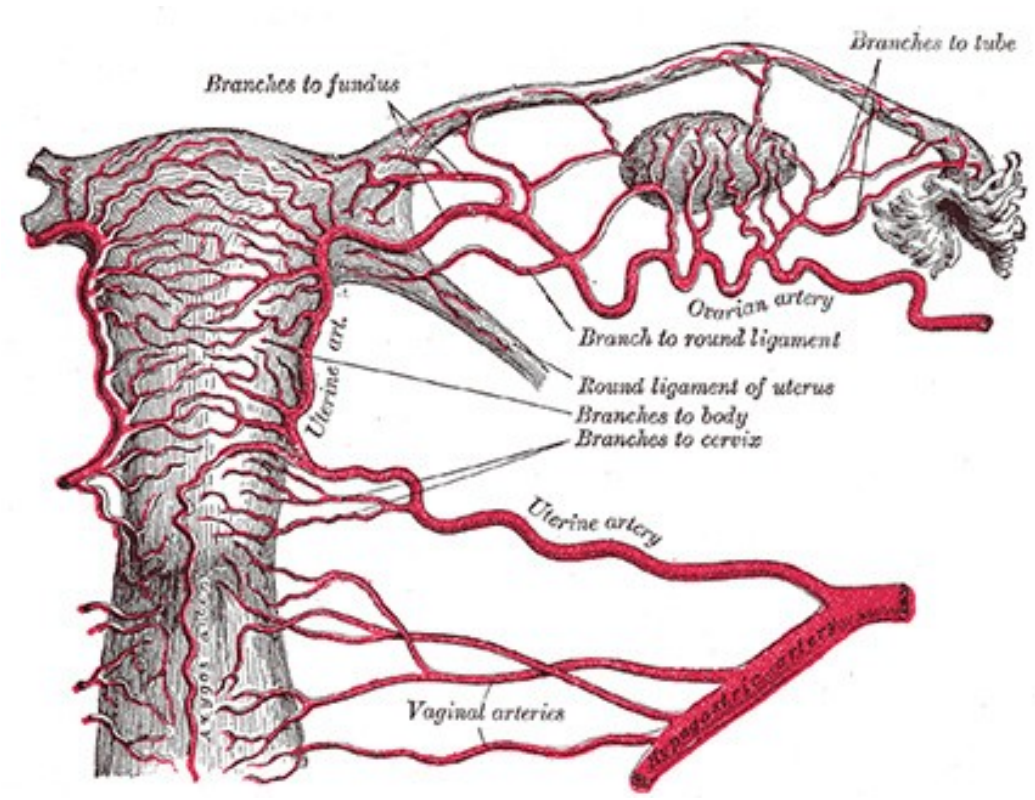
Doppler imaging may help distinguish vessels fromtubes. The fallopaian tube has three anatomic parts (the infundibulum distal), ampulla (mid), and isthmus (proximal).

ovaries 2.1.5

The ovariesaretalmond-shaped structures, each measuring about 3 cm long. They usually lie near the cornua of the uterus, along the side wall of the pelvis, suspended from the back of the broad ligament of the uterus in a fold of peritoneum called the mesovarium. The ovaries are usually medial to the external iliac vessels and anterior to the ureter. The blood supply to the ovary is from the ovarian artery. Early embryologic development shows the ovary to develop high on the posterior abdominal supply, ovarian us. The d to the e broad *Snell R,* .(*2012*



(***Figure (2.3)blood supply of uterus,ovaries*&vagina.(SnellR,2012**



.(Figure(2. 4) blood supply of uterus, ovaries & vagina.*(Snell R, 2012*

2.1.6Uterne position

Midline anterversion: Most common, degree of anteversionis bladder distention dependent, Right or left: Normal variant in absence of pelvic masses, Retroverted: Entire organ displaced posteriorly and Retroflexed:

.Body displaced with respect to cervix

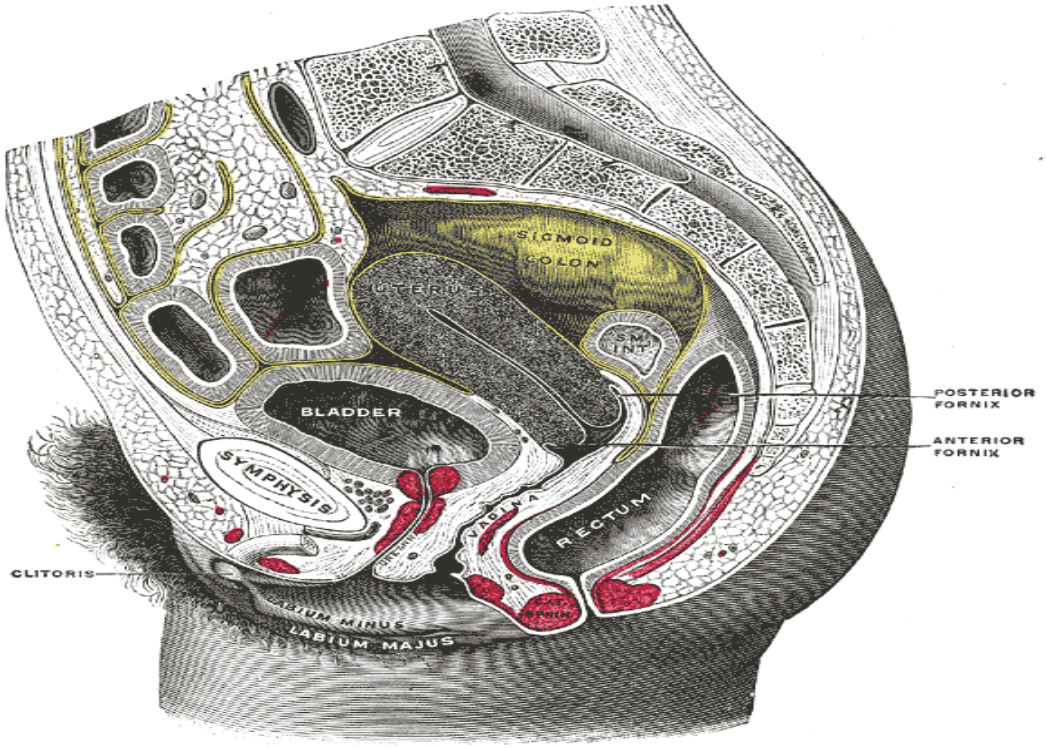


Figure (2.5): Sagittal section of the lower part of female turnk*(Snell*

.(R, 2012

:Reproductive Physiology 2.2

:The menstrual cycle 2.2.1

The menstrual cycle is a term used to describe the monthly cycle of physiological event which prepare the femal for pregnancy. The cycle ends in menstruation if pregnancy dose not occur. The duration of an average normal menstrual cycle is 28 days from the onset of menses to the next with rang of 21-35 days (*Sukkar,2000*).

:2.2.2The ovarian cycle

Each month a few primordial follicles start to grow in response to the vision level of pituitary follicle – stimulating hormone (FSH). Most will undergo Artesia, while usually only one follicle will continence development to be able to respond to LH and progress to ovulation .((*Sukkar, 2000*

Follicular development, the ovulatory process and luteal phase *(Sukkar, , 2000*

Follicular phase involve change in three components of primordial follicles: the oocyte, the granulose cell and the theca cell *(*layers*(.Sukkar,.2000*

The granulose cells proliferative to form several layers, with fluid spaces appearing between cells, the granulose cell responds to FSH by *(*synthesizing estrogen hormone*(Sukkar,.2000*

Enlarges and becomes surrounded by zone pellucid, monopoly saccharine *(*layer and some layer of granulose cells hormone*(. Sukkar,.2000*

Differentiate in to a well, vascularized theca external. The theca cells .respond to LH by synthesizing androgen

During the follicular phase, the rising level of oestrogen exerts a negative feedback on FSH secretion(*Sukkar,.2000*)

The ovulatory process usually occurs about 24-36 hours following the LH peak between 12th and 15thedays of 28 day cycle, this LH surge is produced only.

When one follicle has matured and is secreting large amounts of oestrogen(*Sukkar,.2000*)

The oestrogen triggers the LH secretion through a positive feedback mechanist LH cause ovulation by production of prostaglandins *(Sukkar,2000)*

After ovulation LH acts on the follicular cells, which differentiate in to luteal cells and the corpus luteum is formed (luteinization) of these two hormones increase, they inhabit the secretion of gonadortpins.

If no pregnancy takes place, the corpus lustrum reaches the end of its life and ostrigen and progesterone levels decline *(Sukkar,2000)*

2.2.3The uterine cycle

The most important target for oestrogen and progesterone in response the ovarian hormones both myometrial and endometrial tissues undergo important changes , in **The myomerim**Oestrogenincreases the uterine

blood flow ostrogen increase and progestronedecreasesmyometrial activity (*Sukkar,.2000*)

Endometrial change ,Within 48 hours after period of menstruation, the surface of the endometrim is covered by epithelial out growth from the remmants of glands change in the endometrium can usually be described under (*Sukkar,.2000*)

Three phases ,Proliferative phase, secretary phase and menstrual phase(*Sukkar,2000*)

Proliferative phase,This phase state from the end of menstruation and last until the time of ovulation, during the endometrium grouss from approximately 5mm to ++mm in height, a 10-fold increase (*Sukkar,2000*)

The secretary phase,This phase occupies the time from ovulation until mernstration during this phase progesterone is dominant hormons, further changes in the late luteal phase depend on wither implantation has taken place or not:

Implantation: If pregncy occurs, the ealy embryo secrets human chronic gonadotrophin(HCG), and the secretion of oestrogen and peogestrinl continue. Further changes in the enometium will mainly invole the stromal cells.

Non-implantation: in absence of implantation and chorioncegonadortophin support, the corpus lueum declines and ostrogen

and progesterone level fall. This result in redaction in endometrial tissue .height and more is coiling in spiral arteries with secondary stasis

Menstruation: inirial hemorrhage occur as a result of the breajdown of superficial arteries and capillaries this process continues until all the layer except the deep layer of the endometrum are shed menstrual flow stop in (5-7 days are to formation of thrombin platelet plugs *(Sukkar,2000*

:Placental physiology 2.3

The placenta has two principal functions: it acts as a transfer organ for metabolic products, and it produces or metabolizes and enzymes necessary for the maintenance of pregnancy. It thus acts as a lung. A gastrointestinal tract, a kidney, and complex of ductless glands for the .conceptus

The placenta derives most, if not all of its nourishment from matemal blood. The metabolic activity of the placenta may be measured by it oxygen consumption. Continued growth of the placenta is feasible only to a point, and its functional capacity and oxygen consumption decline in (laic pregnancy (*Errol ,.2011*

:Placental Hormons 3.1 .2

With the onset of pregnancy, the pattern of circulating hormones change abruptly from that of the normal menstrual cycle. complete sex steroid hormone (estrogen and progesterone) production by the placenta alone is

impossible because the necessary enzymes are lacking: however, the fetal and maternal adrenal cortices produce the precursors needed for placental

.synthesic of the hormones

.The is the basis for the concept and term maternal-fetal- placental unit

Estrogens are bound to serum albumin in the maternal circulation and are, therefore, metabolized slowly. Progesterone, on the other hand, is not bound and is metabolized rapidly. Thyroxine(T_4) is bound to alpha-gobulin and prealbumin, conrticosteroids are held in relatively inactive from in plasma by transaction. Thus the titer of hydroxycorticosteroids is high during pregnancy, although frank Cusging's syndrome is uncommon

((Errol ,.2011

:Estrogens 2.3.1.1

Estrogens are produced in ever-increasing amounts by the syncytiotrophoblast. The placenta cannot produce the required estrogen precursor but synthesize estrogens from those supplied by the mother and

*(*the fetus. The most potent estrogen, 17b-estradiol (*Errol, .2011*

:2.3.1.2Progetogens

17_aHydorxyprogesterone declines to very low levels after an initial (about2 week after the beginning of pregnancy) mid elevation.It in contrast, progesterone, which is produced by the placents.Inereases daily after the beginning of pregnancy to more than double the

prepregnanctvalur. Progesterone is metabolized about equally by the maternal and the fetal liver and fetal adrenal cortex. The final metabolites

.are 20_a- dihydroprogesterone and pregnanediol

Progesterone is the principal precursor of the glucocotricotds and mineralocrttcotds of the fetus. Progesteronetalso can be synthesized in the

(placenta from acetates or cholesterol (estrogens cannot) (*Erro,2011*

(Human Chorionc Gonadotropin (hCG 3 .3.1 .2

The placental hormone hCG is produced by the syntrophoblast. Its

concentration rises sharply after implantation of the fertilized ovum and reaches a peak value of 100.000mIU/ml about the eighth to tenth week Chorionic gonadotropin them falls sharply to a lower level by about the 120^{th} day and remains at this level to term. It disappears from the circulation at a know rate of approximately 50% per week. hCH is secreted directly onto the maternal blood.With virtually none reaching the

(fetal circulation (*Errol,2011*

hCH in luteotropic and. Like LH. Stimulates the production of

.progesterone

hydroxyprogesterone, and estrogens. The physiologic role of-17

(hCH.Particularlyin later pregnancy (*Errol,2011*

:Embryology 2.4

Early development 2.4.1

The sonographic diagnosis of any early intra uterine gestation requires the sonographer to be familiar with certain aspects of early reproductive physiology and anatomy that have sonographic and clinical significance.

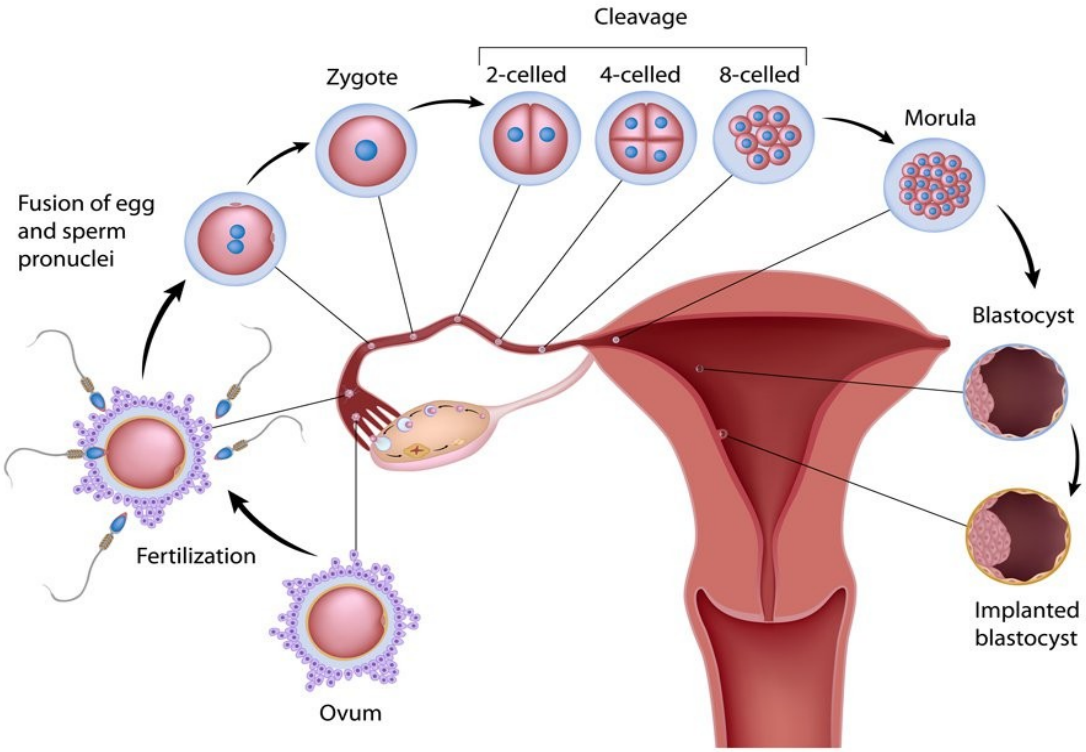
: 2.4.1.1Fertilization

Ovulation is the release of the mature, secondary oocyte or ovum from the dominant follicle triggered by the rise of serum estrogen and the release of luteinizing hormone (LH) from the pituitary gland. Ovulation occurs on approximately day 14 of the normalized 28 day menstrual cycle. With ovulation the wall of the follicle collapses and the antrum fills with blood and lymph to formthe corpus hemorrhagicum, which develops into the corpus luteum.

Fertilization or conception is the cellular union of the secondary oocyte released during ovulation with a single sperm cell. It generally occurs with 24 hours of ovulation (day 14 to 15) in the ampullar portion of the ipsilateral fallopian tube (*www.f medicne.com*). **Zygote, cleavage and morulaformation ,**The zygote represents the first product of conception. The zygote represents the fertilized seconcary oocyte. Half of the 46 chromosomes in the nucleus of the zygote arise from the secondary oocyte and half from the sperm. A normal oocyte and sperm consist of only 23 chromosomes (referred to as a haploid number).

A normal zygote has 46 chronosomes (referred to a diploid .number) of which determine the genetic sex of developing embryo

Cellular division of the zygote occurs by the process of cleavage. The dividing cell mass (2.4.8 and 16 cell stage) moves slowly towards the uterine cavity with the effortof tubal peristalsis and the ciliary action of the tubal mucosa. The 16-cell stage is referred to the morula and is the .(last stage before blastocyst formation (*Clemant ,21969*



*(**Figure (2.6): blastocyst formation** (Clemant , 1969*

The morula is transformed into the blastocyst which enters the uterine cavity approximately 5 days following conception. The blastocyst is the precursor to the gestational sac seen on ultrasound but it is too small to be sonographicallyvisulalized at this stage of development.

The preimplantation blastocyst has three components-an outer zone yet undifferentiated cells called trophoblast, an inner cell mass, and a fluid space or antrum called the blastocyst cavity or blastocele. The inner cell mass is destined to form the embryo whereas the trophoblastenvolves into the chorion from which forms the fetal component of placenta. The trophoblast severs as a source of nutrition for the rapidly developing blastocyst and also secretes hCG.

An adequate amount of hCH is essential at this stage to maintain the activity of the corpus luteum. The corpus luteum secretes estrogen and progesterone during the first trimester of pregnancy which is essential for normal uterine and decidual (endometrium) function.

The end of the blastocyst with the inner cell mass attaches to the endometriumto begin the process of implantation about 6 days following formation of the zygote (day 19 to 20 of the menstrual cycle).

The trophoblast starts invade the endometrium with digestive action. This invading mass of trophoblast is known as the syncytiotrophoblast. The blastocyst embeds completely in the functional

layer of the thickened endometrium by about day 24 LMP. A new layer of blastocyst being completely surrounded by endometrium which results from layer of endometrium form over the burrowed blastocyst. The covering endometrium is referred to a deciduascapsularis whereas the deeper zone of endometrium which is the site of the future placenta is called deciduasbasalis. There is a thin transparent membrane known as the zona pellucid which surrounds the conceptusinclusing the primitive

.(preimplantationblastocyst(*Willard , 1990*

The zona pellucid should normally disintegrate automatically at the time of implantation to allow the blastocyst to implant in the uterine cavity. If transit of the blastocyst has been delayed, implantation will occur in the fallopian tube (tubal pregnancy) or any where the blastocyst happens to be at the time of implantation. The invading syncytiotrophoblast proliferates rapidly and erodes endometrial blood vesselsto form pools of maternal blood within the syncytiotrophoblast known as lacunae. The numerouslacunaearoundthe blastocyst eventually communicatetogether to form a lacunar network near the basal layer of the endometrium which becomes theintervillousspacesofthefuture

.(placenta (*Hinney, 1998*

2.4.2Chorion and chorionic cavity

The wall of the rapidly developing blastocyst consists of three tissue layers that form a tissue called the chorion. In an exophytic fashion, the chorion gives rise to villi which completely covers the blastocyst. The chorion differentiates into two zones known as the smooth chorion (chorion leave) and the chorionfrondosum (villous chorion). The

chorionfrondosumproliferates in the region of the basal endometrium (decduabasalis) and eventually forms the placenta. The smooth chorion is formed by compression and disintegration of the villi beneath the deciduascapsularis. The chorionic cavity emerges by day 26 to 27 LMP and grows rapidly with the production of chorionic fluid from the inner

..(layer of cells lining the chorion(*Hinney,1998*

:Amnion and amniotic cavity 2.4.3

The amnion and amniotic cavity emerege at about 22-23 LMP (8 days following conception).Initially, the amniotic cavity is small and lines one side of embryo while the other side is lined with the yolk sac. With growth and folding of the embryo.The amnion and chorionfusetogether to form the amniochorionic membrane. This process is variable in duration

*.(*but fusion is usually complete by 20 weeks LMPmid term*(Reva 1997*

:Yolk SAC 2.4.4

The primary yolk sac forms by day 23 LMP. By day 27-28 LMP, the primary yolk sac starts to shrink and is replaced by a secondary yolk sac which is connected to the embryo via a yolk stalk which contains paired viteline arteries and veins (which supply the yolk sac) and the viteline or emphalomesenteric duct which is connected to the embryo's

.(mid-gut (future bowel)(Reval,1997

The human yolk sac plays a role in the transfer of nutrients to the embryo during the second and third weeks of embryonic development

while the uteroplacental circulation is being established. It is the center of primitive fetal blood formation until hemopoietic activity begins in the liver during the 6th embryonic week. The dorsal part of the yolk sac incorporated into the embryo as the primitive gut. The primordial germ cells appear in the wall of yolk sac in the third embryonic week and subsequently migrate to the developing gonads where they become the

(fetal germ cells (*Reval,1997*

It is postulated that errors in yolk sac development is responsible

.for abnormal embryogenesis in some cases as demonstrated in rat studies

:Embryo 2.4.5

The embryo is the early developing human prior to becoming a fetus. The fetus (term) is applied to the developing human at the end at the end of the embryonic period to the end of pregnancy. The embryonic period extends unitl 10th menstrual weeks. The embryo arises from the embryonic disk which is located at the edge of yolk sac between the yolk sac and the amniotic cavity. The trilaminar embryo conists of a layer each of ecotoderm, mesoderm and endoderm from which develops all future tissues in the embryo. During 5th week LMP, the embryo's heart forms as two paired tubes that fuse and pump blood by about day 36

.(LMP(*Reval,1997*

:Umbilical cord 2.4.6

The umbilical cord forms at the end of the 6th menstrual week as the amnion expands and envelops the connecting stalk, yolk sac and thetallantois. The normal cord is there for covered by amnion and contain two umbilical arteries, a single umbilical vein, and a moulding substance known as the Wharton's Jelly. Remnants of thetallantois and yolk stalk in the cord and are the potential source of cord cysts. Thetallantoisarisesasa small diverticulum of the yolk sac and associated withbladder development.Thetallantoisbecomes the urachus, which inturn becomes the median umbilical ligament persistence of the urachus may be associated with urachal abnormality including cysts. Thetallantois extends from the bladder to the proximal portion of the umbilical cord.

(The yolk stalk connects the primitive gut to the yolk sac (*Snell R,2012*

:Deciduas 2.4.7

Deciduas is the term applied to the endometrium during pregnancy decidual reaction is a term used by pathologist to describe the histological changes observed in the endometrium in pregnant patient. These changes are brought by the continued production of progesterone elaborated by the corpus luteum in response to the presence of HCG in the maternal

.circulation. Decidual reaction occurs regardless of implantation site

Dicidualized endometrium is obviously distinguished under the microscope form normal secretary endometrium seen in the non-pregnant patient however these histological differences are too subtle to be appeared with ultrasound technique. Decidual reaction is associated with hypertrophic changes in the endometrial cells and glands as well as an

increase in the uterine blood flow however these changes are too subtle to

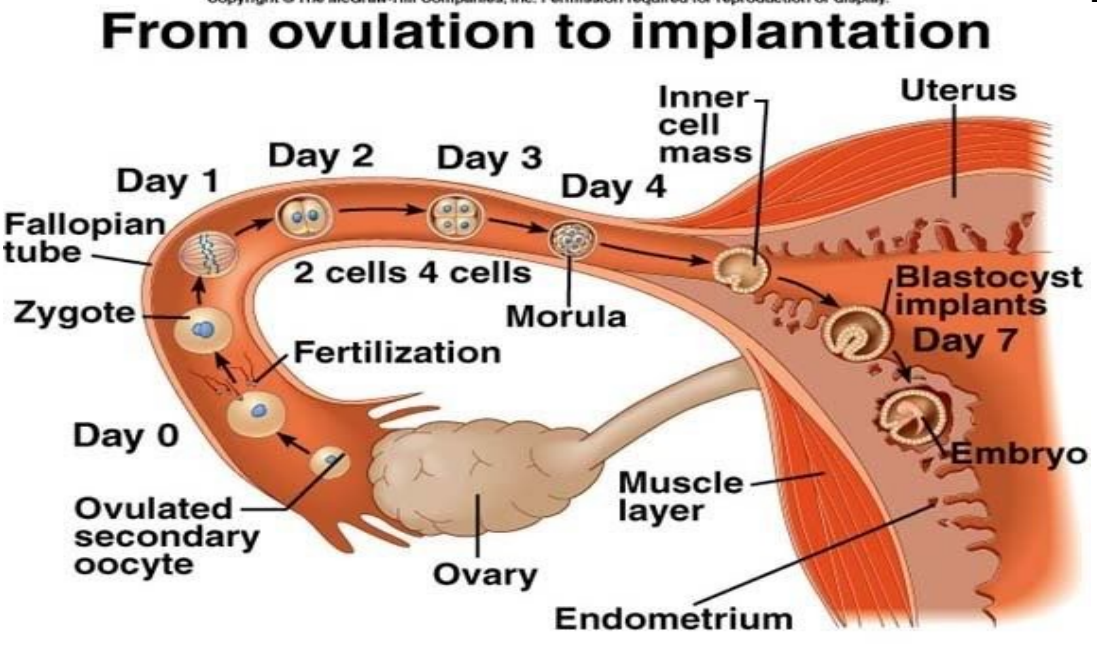
(be diagnostic of pregnancy (*SnellR,2012*

The deciduas is anatomically dividedintothreezones with reference to the implantation site and the deep and superficial poles of the burrowed sub endometrial blastocyst. The deepest pole of the blastocyst forms the chorionforndosum. The region of deciduas associated with the chorionfrondosum is referred to as the deciduasbasalis. Together the chorionfrondosum and the deciduasbasalis from the fetal and maternal

..components of the placenta

The new endometrium which regenerates over the superficial pole of the blastocyst is called the deciduas capsular is which associated with the smooth chorion. Prior to about the 8thwk LMP, the chorion is completely covered with a uniformly thick layer of chorionic villi. The villi beneath the deciduascapsularis are compressed and degenerate to form the smooth, a villous chorion. The remainder of deciduas not directly related the blastocyst is called deciduasvera or

(deciduasparietalis(SnellR,2012



Figure(2.7): Diagram illustrates normal conception (*Snel lR,2012*

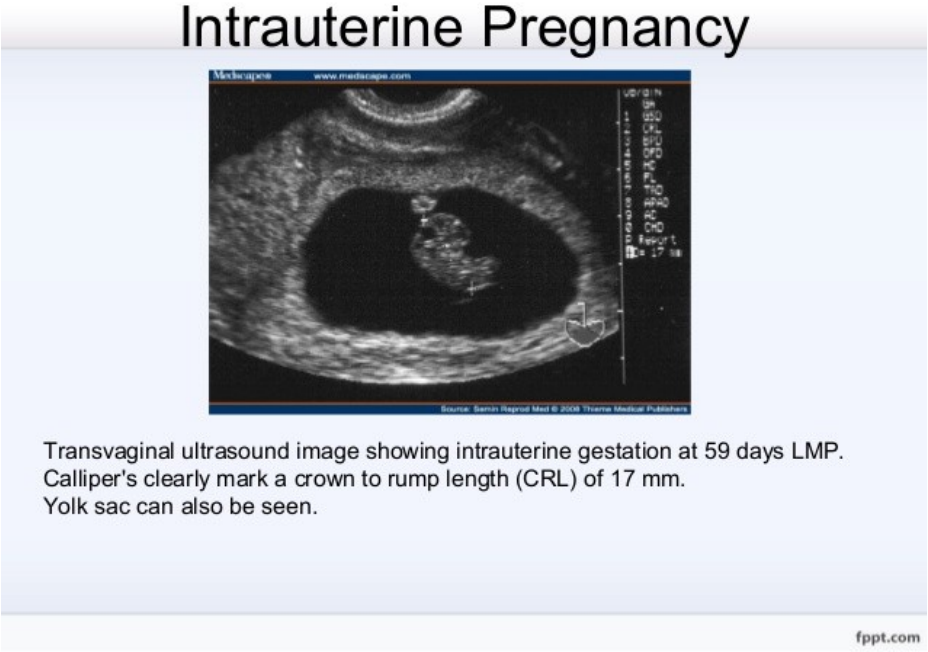
:2.4.8The viable intrauterine pregnancy

:Gestational sac 2.4.1

The first visible structure with the uterus is a gestational sac. During the 5 gestational weeks, it measures 2 to 3 mm in diameter as estimated by transvaginal ultrasound. The measurement should be obtained from the outer to inner part of the gestational sac. The gestational sac grows approximately 2mm in size per day.

Biometric and morphological characteristics of gestational sac and embryonic echo can be used as apredictive factor in diagnosis of abnormal early pregnancy. Decreased values of gestational sac diameter and/or its irregular shape can suggest upcoming incident and may lie used as a marker for chromosompathies for example, early spontaneous abortion as me of the complications in early pregnancy usually connected with triploidy and trisomy is followed by abnormal gestational sac

,2012



Figure(2.8): Intrauterine Pregnancy

By transabdominal approach abnormal gestational sac criteria include:Impossibility to detect double decidual sac when sac diameter is 10mm or greater, Impossibility to detect Yolk sac diameter when sac is 20mm or greater, an/or andImpossibility to detect an embryo with cardiac activity when sac diameter is 25 mm or greater.

By transvaginal approach abnormal gestational sac criteria include:Impossibility to detect Yolk sac when sac diameter is 5mm or greater, or impossibility to detect cardiac activity when sac diameter is 16 mm or greater, when growth rate fails to at least 0.7 mm/day, abnormal sac and early embryo failure should be considered and colour Doppler evaluation of the supposed gestational sac is important for obtaining additional information and differentiation between the pseudogestationalsac and interauterinegestatonal sac. Pseudogestational sac is characterized by either absent flow around it or very low velocity flow (<8 cm/s peak systolic velocity and moderate resistance to blood flow).

Normal or abnormal gestational sac is characterized by high velocity and low resistance pattern (R1<0.45). as mentioned, there is no difference in blood flow between normal and abnormal gestational sac.

Measurement of gestational sac volume by 3D u/s can be used for the estimation of gestational age in the early pregnancy. An abnormal measurement of gestational sac could potentially be used as a prognostic marker for pregnancy outcome *(Royal ,2003)*.

:Yolk Sac 2.4.8.2

Yolk sac is the first recognizable structure inside the gestational sac and should be obtained as a regularly extra-amniotic structure when gestational sac reaches 8-10mm. Normal biometric values of yolk sac diameter are 3-6mm.

The following changes assessed by 2D U/S are related to spontaneous abortion prediction: Absence of the yolk sac, too large-more than 6mm and too small-less than 3mm.

Irregular shape-mainly wrinkled with indented wall, degenerative changes- abundant calcifications with decreased translucency of the yolk sac number of yolk sacs-has to be equal to the number of the embryos. It is, nowadays supposed that yolk sac abnormalities are rather consequence that a cause of altered embryonic development.

The ultrasound appearance of the yolk sac has already been proposed as a prognostic parameter for the outcome of pregnancy. Kurjak and coworkers established biographic criteria for distinguishing between "normal" and "abnormal" yolk sac appearance. In their experience, yolk sac should betalways visible before the viable embryo, yolk sac measures

4-5 mm in diameter until 7-8 wks of gestation and reaches 6mm by the end of the 9th week. After that period yolk sac starts its regression and disappears at 12 weeks of gestation(SnellR,,*20112*)..

The sonographic detection of abnormal yolk sac morphology may predict abnormal fetal outcome. Attempts have been made to identify abnormal parameters.

Abnormal yolk sac size may be the first sonographic indicator of associated failure, the presence of an embryo without the visible yolk sac before the 10thgestational weeks is mostly an abnormal finding. According to authrs, the inner diameter of the yolk sac is always less than 5-6mm in a normal pregnancy before the 10th week of gestational age. Lyons established that for a mean gestational sac diameter of less than 10mm the yolk sac diameter should be less than 4mm. in 15 patients who had abnormally yolk sacs, six had an embryo, five aborted spontaneously and only one concept us survived. Out of nine others with embryo and large yolk sac, eight patients aborted and in one trisomy 21 were detected at the 24thgestationalweek*(Reval,1995*)..

The yolk sac can be too small, and this accepted as a marker of poor pregnancy Kcoine. Green and Hobbins analyzed a group of patients between 8 and 12 weeks: (gestational age, and found out that patients with a yolk sac diameter less than 2mm were moated with an adverse pregnancy outcome(.

Most often, the shape of yolk sac is changed when compressed by an enlarging embryo after the 10th gestational week. The normal spherical shape of the yolk sac could be distorted even earlier, requiring intensive follow-up within the next few weeks. The most difficult diagnostic puzzle is the double yolk sac. Each singleton pregnancy should have a single yolk sac. A double yolk sac. Each singleton pregnancy should have a single yolk sac. A double yolk sac is an extremely rare finding. The diagnostic puzzle includes the morphological differentiation early abdominal wall defect. It is unknown whether abnormalities of the yolk sac are related primarily to the yolk sac or secondary to embryonic mal development. According to the present data it seems that the yok sac plays an important role in maternofetal transportation in early pregnancy. Changes in size and shape could indicate or reflect the significant dysfunction of this system, and therefore could influence early embryonic development.

Currently, the major benefits of the sonographic evolution of the yolk sac:Differentiation of potentially viable and nonviable gestations and confirmation of the presence of an intra uterine pregnancy VS. adecidual cast, and indication of a possible fetal abnormality.

2.4.8.3 :Embryonic heart rate

The cutoff CRL for detecting cardiac activity by transabominal probe is 9mm and by transvaginal4mm. Heart rate progressively increases to 120 to 160 beats per minute after 6 to 7 weeks.

Embryonic heart rate demonstrates certain physiologic variability with in its normal range of frequencies that is 150-190 beats/minute for embryos bigger than 10mm at 8-12 weeks of gestation. An embryonic bradycardia. An embryonic heart rate less than 100 beats/minute7 week is recognized as embryonic bradycardia. An embryonic heart rate less than 70 beast/minute has been reported to result in a fetal demise in 100% patients.

Brady cardia or arrhythmia could be considered as predictors for heart action cessation. In these cases, an early hemodynamic heart failure was noticed with consequential (gestational enlargement, yolk sac enlargement morethan6mm) and initial generalized hydrops. This type of hemodynamic disturbances can occur in patients presenting with massive intrauterine hematomas prior to fetal demise.

Doublet reported that pregnancies, in which the embryos have a slow heart rate or before 7 weeks of gestation and which continues beyond the first trimester, have a high likelihood (90%) of congenital anomalies, than embryos with normal heart rates*(Reval,1995)*.

Reduced body movement of the embryo during first and second trimester is also considered possible predictors of early pregnancy

complications. Embryonic oligohydramnios occur if the gestational sac is .4mm less than CRL

:5Pathology .2

Spontaneous abortion 2.5.1

Spontaneous abortion is defined as expulsion from its mother of a featus before24 completed weeks of gestation or an embryo weighting .500gm or less

Incidence,The incidence of spontaneous abortion of a clinically recognized pregnancy is said to be about 15%.**Etiology,**The causes of spontaneous abortion are broadly divided into fetal, placental and material causes in approximately 25% of the cases the cause of abortion .remains unknown

:Fetal causes 2.5.1.1

Chromosomal abnormality: Fetal chromosomal abnormality is responsible for 50% of the first trimester abortions. This cause becomes less frequent in second trimester and the incidence falls from40%- at 15 weeks to 12% at 23 weeks. The chromosomes may be abnormal in *(*structure*(Mellise ,2008*

Abnormal chromosomal number: The normal human chromosomal number is 64-22 pairs of autosomes and X and Y sex chromosomes innormal males, a similar numbers of autosomes and 2X sex chromosomes innormal females. This results from equal contribution from each parent. It is the unequal contribution from the parents due to non disjunction of chromosomes, which results in a fetal chromosomal component which is either deficient or in excess of one or more .chromosomes

The variation in chromosomal number is responsible for abortion some individuals with these chromosomal abnormalities to survive with a .wide variety of congenital abnormalities

Trisomy: Presence of one extra chromosome (47) is called "trisomy", the individuals do survive with more than one extra chromosome. Trisomies due to extra autosomes commonly about or if survive, they are severely malformed. Autosomal trisomies commonly seen in the abortus are trisomy 2, 13, 15, 16, 18, 21 and 22. The surviving trisomies have special names due to associated malformation i.e. Down's syndrome (21), Edward's syndrome (18) and Patau's syndromes (13). Possession of extra sex chromosomes is less likely to cause abortion and most of them enjoy .normal mental and physical health

Monosomy: When one chromosome is less than normal (4), it is called monosomy. An autosomolmonosomy is lethal and all zygotes abort. Loss of a sex chromosome is lethal to the zygote if X is lost and Y remains. Loss of one X or of the Y with an X remaining is likely to result in abortion, although a small percentage of such embryos are born alive with

congenital malformation, when called turner syndrome. No individual survive with chromosomal number less than 45 (*Mellise ,2008*) survive with chromosomal number less than 45*(Mellise ,2008*

Triploidy/Tetraplaidy: the other chromosomal abnormalities seen in the abort uses are triploidy (69), which is presence of triple sets of haploid numbers. Tetraploidy (92) is presence of 4 sets of haploid number. The triploid zygote commonly aborts at 5 weeks and tetraploid at 3 weeks of embryonic life.

:Structural chromosomal abnormaities

The chromosomes can be abnormal in structure. It is more commonly involved in recurrent abortion.

:Developmental defects

A variety of developmental abnormalities have been observed in chromosomally normal abort uses. These include neural tube defect, cleft lip palate, cyclopia, polydactyly, amniotic bands, sirenomdia and caudal regression.

:Placental causes 2.5.1.2

Histological examination of the products of conception after spontaneous abortion reveals hemorrhage into the deciduasbasalis and necrotic changes in the tissue adjacent to the bleeding. The conceptus

becomes detached in part or completely. If there is an intact sac, it usually contains a small macerated fetus in the sac. In other cases hydropic degeneration of the placental villi is seen. This abnormal placentation may have some role in cause of spontaneous abortion*(Mellise, 2008).*

Maternal causes: Maternal causes of spontaneous abortion are more commonly related to the second trimester than first trimester abortions. They are more often associated with recurrent than isoloated spontaneous abortion*(Mellise ,-2008).*

Uterine anomalies:Uterine anomalies responsible for spontaneous abortion include bicornuate and subseptated uterus. Cervical incompetence is one of the most important causes of second trimester abortion*(Mellie, 2008)..*

InfectionThe infecting organisms are more commonly it cause of isolated spontaneous abortion than recurrent abortion.

Any acute pyrexial illness during pregnancy like malaria, typhoid fever, pyelonephritis and appendicitis can result in abortion, but the organisms commonly involved in the etiology of abortion include bacteria listereiamonocytogenes, campylobacter supp, mycoplasma hominis, ureaplasmaurealyticum, spirochaetestreponemapallidum, parasites toxoplasma gondii, viruses cytomegalovirus, Rubella, Herpes, Coxsackie virus*(Willard cate JR1990) (Mellise, 2008)..*

:2.5.1.3Other maternal causes

Chronic diseases,Chronic systemic diseases like hypothyroidism, diabtes mellitus, systemic lupus erythematosus, renal disease, and essential .hypertension aretall associated with spontaneous abortion

Ovarian cystectomy in pregnancy

During first trimester leads to abortion as the pregnancy is initially supported by corpus luteum. It is therefore customary to delay removal of .an ovarian cyst until after 16 weeks of pregnancy

Peritonitis,Peritonitis increases the likelihood of abortion, so an early .laparotomy for appendicitis during pregnancy is recommended

Social habits, chronic smoking and alcohol consumption increases the .risk of abortion

Unproved causes 2.5.1.4

In about 25% cases of spontaneous abortion, the etiology remains unproved. A number of factors have been considered as a possible cause, .*(*but supportive evidence is lacking *(Mellis, 2008*

:The factors include

Progesterone deficiency in first trimester has been blamed as a cause of obortion, but progesterone replacement fails to improve the outcome, Immunological cause though seems relevant but is more of a conceren in recurrent abortion than in isolated spontaneous abortions and atients and their relatives tend to attribute abortion to weight lifting, climbing stairs, recent fall, accident, blow or psychological shock it is unlikely that these factors are of much importance in causing abortion.

:2.5.1.5Predisposing factors

:Age/ Parity

The risk of spontaneous abortion increases significantly with increasing maternal age beyond 35 years this increases is attributed to the increased incidence of chronic maternal ailments and chromosomal abnormaities in the conceptus. The incidence of spontaneous abortion is also high in teenage pregnancy and multiparous patients.

:multiple pregnancy

The incidence of abortion is three times higher in multiple gestations when compared with singleton pregnancy. It is higher in monoczygotic than diszygotictwins. The abortion in multiple pregnancy is largely related to chromosomal and developmental abnormalities. Sometimes in twin gestation one embryo aborts and the other continues,

as the incidence of twin pregnancy detected by ultrasound during the first trimester is higher than the incidence of twin births.

Previous abortion:

The history of having an abortion in a previous pregnancy is associated with an increased risk of abortion in subsequent pregnancies.

Other factors:

Sex of the baby and season of the year have no influence on the incidence of abortion.

2.5.2 Types of spontaneous abortion:

Spontaneous abortion is subdivided into threatened, inevitable, incomplete, complete, missed and septic abortions.

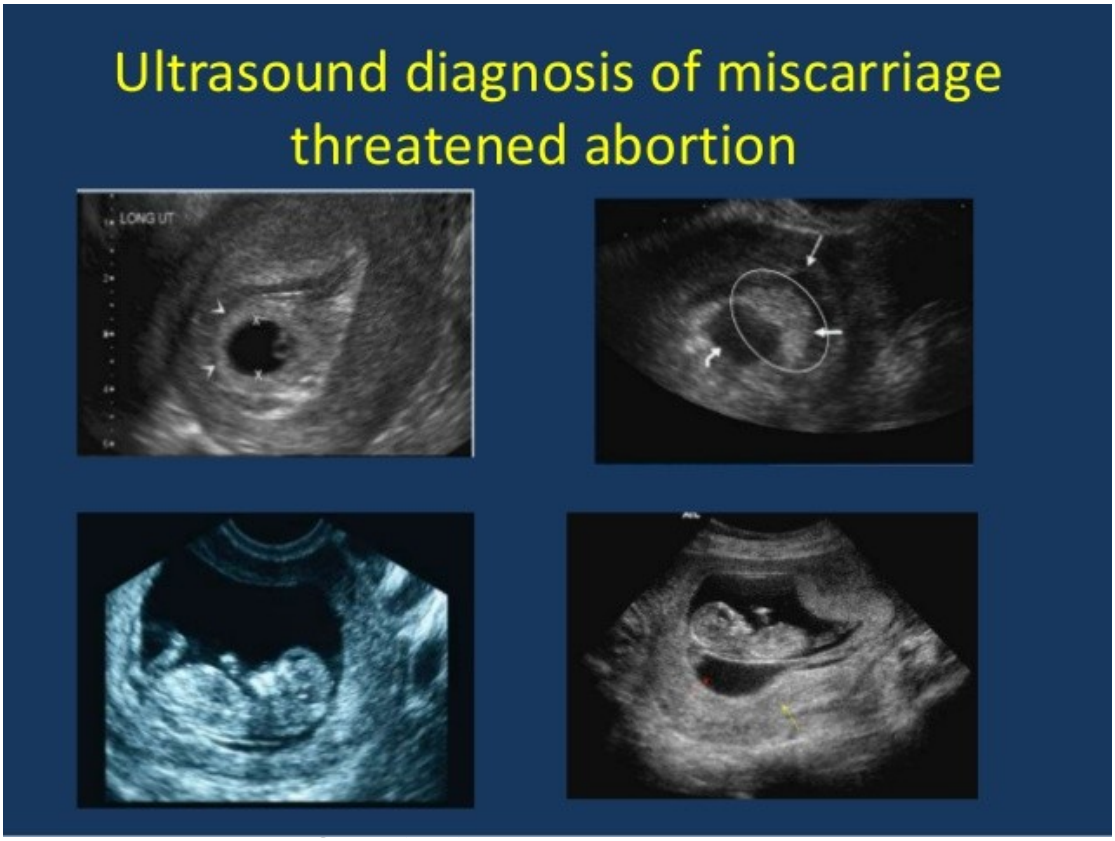
2.5.2.1 Threatened abortion:

2.5.2.1.1 Clinical presentation:

Threatened abortion is a clinical entity in which there is threat to abort, but the pregnancy can still continue. The patient presents with

vaginal bleeding. The bleeding is small in amount, bright red in colour which later on changes to brown. The bleeding is characteristically pain less, though in some cases patient may complain of backache*(Willard ,*

(1990



:Pathophysiology 2.5.2.1.2

The bleeding is perhaps placental in origin, which comes from placental disruption or as a result of vascular disturbances at the site of implantation, or because of union of deciduascapsularis and deciduasvera.

Bleeding can also be due to the loss of a second non viable twin pregnancy.

:Examination 2.5.2.1.3

Small amount of blood which is generally freshis seen coming through cervix on speculum examination. On bimanual examination uterus is soft non tender and of size which is appropriate for gestational age. The cervical os is closed. The patient must be assured that vaginal examination in case of bleeding in early pregnancy does not precipitate miscarriage.

:Ultrasound findings 2.5.2.1.4

In threatened abortion the baby is a live. Fetal life is decided by the presence or absence of fetal cardiac activity. The presence of fetal heart activity can reliable be identified by 7^{th} week of gestation. If a gestational sac is seen on a scan and there is no cardiac activity, the diagnosis rests between missed abortion and a pregnancy of earlier gestation than expected. The situation is generally clearified by managing patient, conservatively and repeating the scan after 1-2 weeks.

:Outcome 2.5.2.1.5

Threatened abortion may proceed in three ways i.e. continuation of pregnancy, missed abortion or inevitable abortion.

:Treatment 2.5.2.1.6

The patient with threatened abortion advised to restrict her activities and avoid intercourse, as the semen contains prostaglandins (which can precipitate uterine activity(*Willard , 1990*

:2.5.2.2Inevitable abortion

:Clinical presentation 2.5.2.2.1

Inevitable abortion means that the process of abortion has begun and can not be stopped associated with crampyabdominal pain. Blood less in this subtype of abortion and sometimes associated with passage of clots,The pain of inevitable abortion is rhythmical and resembles normal labour pains. It may be severe enough to require analgesia.

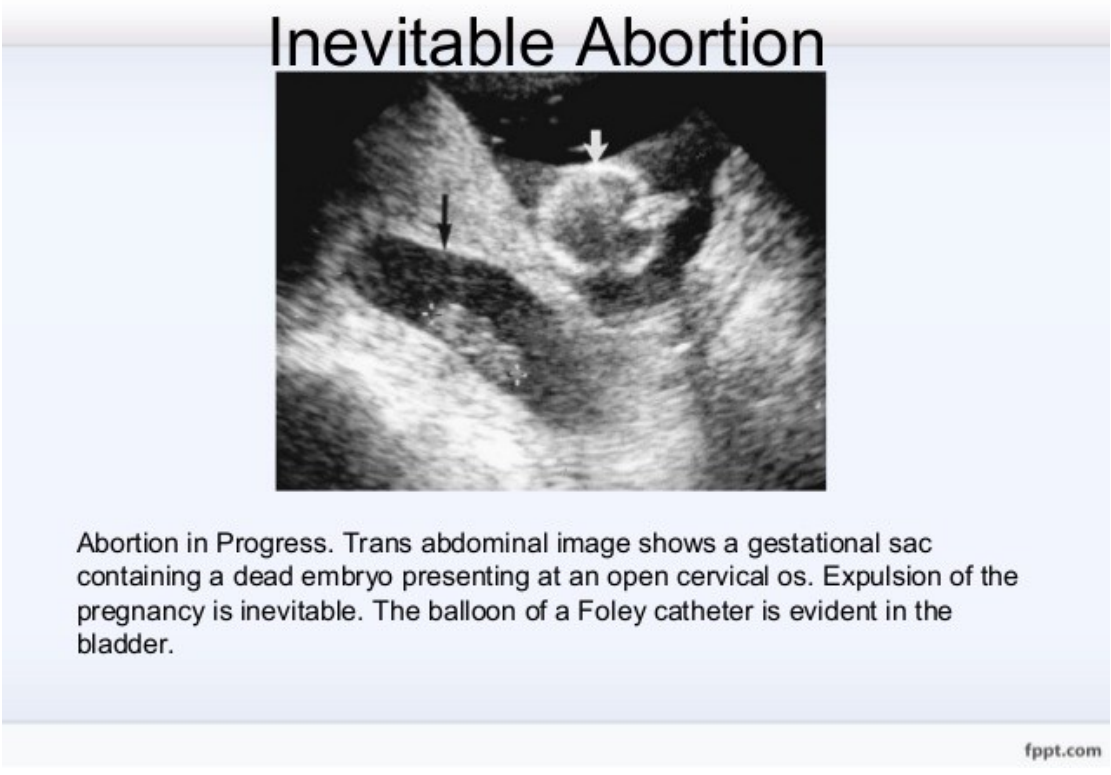


Figure (2-10): Inevitable Abortion

:2.5.2.2.2Pathophysiology

The hall mark of inevitable abortion is opened internal os, which differentiates if from threatened abortion. The pain is due to cervical dilatation secondary to uterine contractions. This results from prodtaglandin release, as placenta and membranes separate from the .uterine wall

:Examination 2.5.2.2.3

On speculum examination the vagina may be full of blood clots or active bleeding coming through the cervix may be observed. The bag of .membranes may be seen bulging through the dilated cervix

On bimanual examination the uterus is firm tender and may be smaller than gestational age. Internal cervical os is open through which .the products of conception can easily be palpated

:Ultrasound findings 2.5.2.2.4

The diagnosis of inevitable abortion is made purely on clinical grounds and it does not depend on ultrasound. The baby is generally dead

but may be a live particularly in mid trimester. The fetal life has no .bearing, on the outcome of inevitable abortion

:2.5.2.2.5outcome

Once the internal os is open, the products of conception will be .expelled completely or more commonly incompletely

:Treatment 2.5.2.2.6

The name of inevitable abortion is self explanatory, which means the pregnancy can not continue. The aim of management is to evacuate .the uterus

:incomplete abortion.2.5.2.3

:Clinical Presentation 5.2.3.1. 2

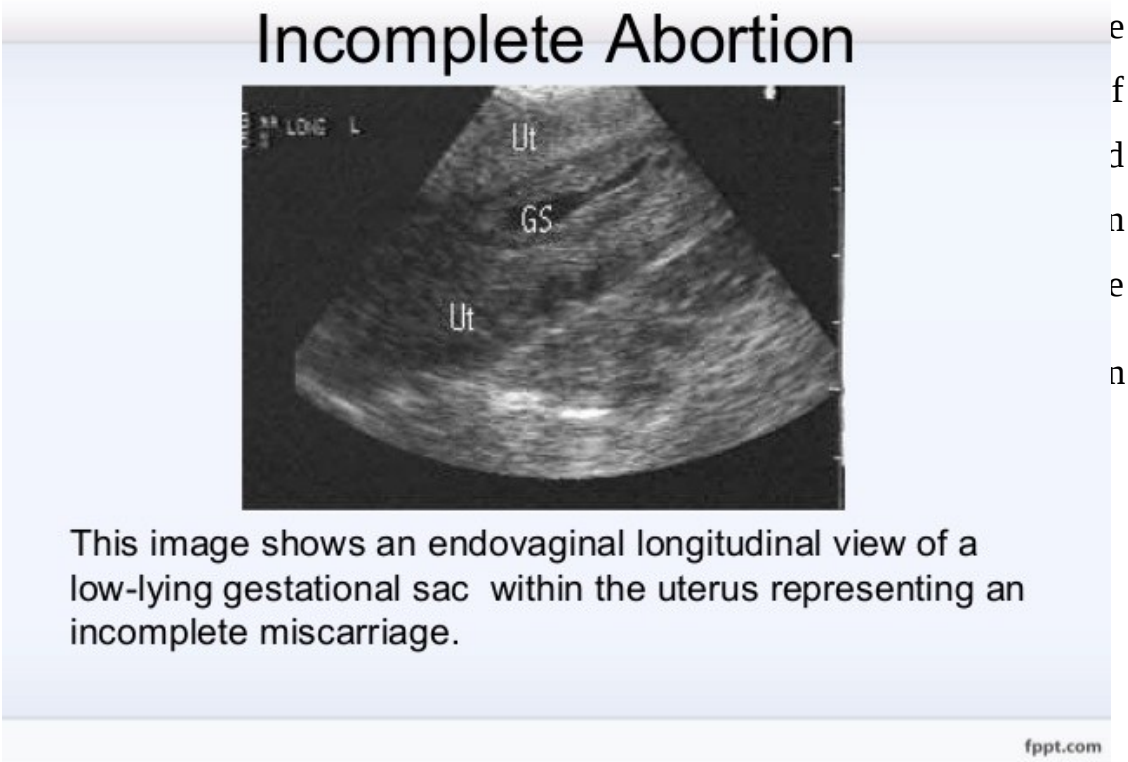


Figure (2-11): Incomplete Abortion

:Pathophysiology 2.5.2.3.2

The mechanism of pain of this subtype of abortion is same as described in inevitable abortion.

:Examination 2.5.2.3.3

On speculum examination the vagina is full of products of conception which are seen coming through the cervical os. On bimanual exam the uterus is firm tender and smaller tan duration of gestation. The products of conception in the vagina and those coming through cervix should be removed at this examination. Digital removal of these products relieves pains in most of these patients. In incomplete abortion the examining finger can feel the retained products of conception within the uterine cavity through dilated cervix.

:Ultrasound findings 2.5.2.3.4

On ultrasound examination the retained products appear in an irregular hyperechoic shadow distending the uterine cavity.

:Outcome 2.5.2.3.5

Incomplete abortion is already a lost pregnancy.

:Treatment 2.5.2.3.6

The average blood loss in case of incomplete abortion is generally heavy which requires urgent treatment. The evacuation of uterus in this type of abortion is done in emergency.

:Complete abortion 2.5.2.4

:Clinical presentation 2.5.2.4.1

When the pregnancy is expelled intact the abortion is said to be complete. The patient is generally pain free and bleeds only slightly if at all at the time of presentation. There is a history of vaginal bleeding, passage of blood clots, product's of conception and crampy lower abdomi of pregnancy.

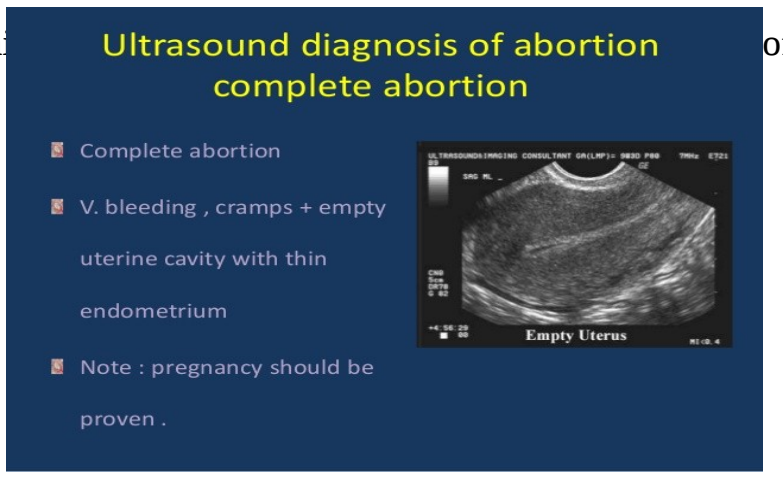


Figure (2-12): Complete Abortion

:Pathophysiology 2.5.2.4.2

Once the products of conception are expelled, the uterus is contracted and retracted which controls the blood loss from placental site.

.The pain gradually settles once the uterus is retracted

:Clinical examination 2.5.2.4.3

On speculum examination the vagina may be empty or may show some old blood clots; on bimanual examination the internal cervical os maybe open or closed depending upon the time interval between

(expulsion and examination.(Willard,1990

:Ultrasound findings 2.5.2.4.4

On the ultrasound examination the uterus is empty, though

.sometimes it may show small blood clots in the uterine cavity

:outcome 2.5.2.4.5

.The patient has already aborted completely

Treatment 2.5.2.4.6

.Complete abortion: is no treatment is needed

:missed abortion 2.5.2.5

:2.5.2.5.1Clinical presentation

Missed abortion is defined as intrauterine fetal demise before 24 weeks gestation and the uterus makes no attempt is expel it.The presenting complaints include. Regression of the pregnancy symptoms i.e. nausea, vomiting, urinary frequency and breast changes, vaginal bleeding. In missed abortion vaginal bleeding when present, occurs in small amount and is generally old altered blood of brown or black colour, vaginal bleeding is more common on a presenting, complaint in first trimester missed abortion, fundal height, failure of fundal height to grow or reduction in fundal height in proportion to the gestational age, fetal movements: failure of fetal movements to appear at expected duration of gestation on less of fetal movements and pain is not prominent feature of

Figure (2-13): Missed Abortion

:pathophysiology 2.5.2.5.2

In one variety of missed abortion the fetus never develops in the amniotic sac, when it is called anembryonic pregnancy or blighted ovum. This is commonly associated with fetal chromosomal abnormality (trisomy). In the other type of missed abortion, the fetus develops but subsequently dies. When a nonviable pregnancy becomes surrounded by blood clot in utero, it is termed as corneous mole. In such cases small amounts of bleeding have been occurring at regular intervals over a considered period

.of time forming layers of blood around the conceptus

:**Examination 2.5.2.5.3**

Per speculum vaginal examination may be absolutely normal or a small amount of dark blood is present in the vagina. On bimanual examination uterus is soft, non tender and of a size smaller than the

(duration of gestation(Willard,1990

:Ultrasound findings 2.5.2.5.4

The diagnosis of missed abortion is confirmed on ultrasonography if fetal cardiac activity is absent, provided the possibility of a viable pregnancy of a lesser gestational age has been ruled out.

:Outcome 2.5.2.5.5

A missed abortion may proceed to inevitable abortion in a variable length of time, which in turn may end in incomplete or complete abortion.

:Treatment 2.5.2.5.6

Once the diagnosis of missed abortion is made the patient should be counseled about further management; which may either be active or conservative.

:Septic abortion 2.5.2.6

The term septic abortion is applied to a condition when a patient acquires infection after any type of abortion. The risk of infection is highest after incomplete abortion particularly when it is induced and spontaneous abortions are less likely to be infected.

:Clinical presentation 2.5.2.6.1

Septic abortion presents into two ways.

Mild: When the infection is restricted to uterus and fallopian tubes, the patient presents with lower abdominal pain, mild vaginal bleeding, pyrexia and malaise.

Severe: In its severe form the patient develops septicemia, and present with high swinging temperature, abdominal pain and distention and foul smelling vaginal discharge.The patient may develop bacteraemicendotoxic shock which can result in maternal death.

:Pathophysiology 2.5.2.6.2

Septic abortion is more likely to occur when the intervention has been carried out unhygienically with improperly sterilized instruments. The retained products of conception act as a very good medium for bacterial growth. The most common infecting organisms are Escherichia coli, Bacteroidesspp, Streptococci (both anaerobicand less commonly aerobic) and Clostridium Wallachia.

Examination 2.5.2.6.3

In mild cases the patient has high temperature and rapid pulse. On speculum examination small amount of blood mixed with foul smelling discharge is present in the vagina. On abdomino pelvic examination, the lower abdomen may be rigid, uterus and adnexae are tender, cervical os is closed and cervical excitation (pain with cervical movement) may be present.

In severe cases, the patient is dehydrated, temperature and pulse is raised. The abdomen is distended and tender. The bowel sounds may be absent in case of peritonitis or when bowel is damaged. On speculum examination foul smelling vaginal discharge is present. On bimanual examination uterus and adnexae are tender and cervical excitation is present. In extreme form the patient will have signs of bacteraemicendotoxic .(shock(Willard,1990

Ultrasound findings 2.5.2.6.4

Retained products of conception are seen distending the uterine cavity. Gas shadows will sometimes be present in case of clostridial infection. When adnexae are involved pelvic abscess can easily be seen on .ultrasound. Ascites may be present in cases with bowel perforation

:Outcome 2.5.2.6.5

Sepsis restricted to pelvis may resolve completely if treated properly at an .early stage

:Treatment 2.5.2.6.6

In mild cases systemic antibiotic administration is the first line treatment. The patient with retained products of conception needevacuation of uterus under antibiotic cover. The systemic antibiotics should be given for .(12-24 hours before evacuation of the uterus.(Willard,1990

:Complications 2.5.2.6.7

Hemorrhag, sepsis, coagulopathy/renal failure, complications of treatment of abortion are uterine perforation and Ashcrman's syndrome, and late pregnancy complications: patients experiencing threatened abortion in first trimester are at a high risk of preterm labour and intrauterine growth retardation in later part of pregnancy and retained placenta at the time of delivery. Therefore a patient reporting bleeding in early pregnancy should be identified as a high risk and delivered in a hospital.

Ultrasound physics 2.6

The creation of an image from sound is done in three steps-

producing a sound wave receiving echoes, and interpreting those echoes.

producing a sound wave 6.1. 2

A sound wave is typically produced by piezoelectric transducer

encased in probe. strong electric pulses from the ultrasound machine make the transducer ring at the desired frequency. The frequency can be anywhere between 2and18 MHZ. The sound is focused either by the shape of the transducer , a lens in front of the transducer ,or complex set control pulses from the ultrasound scanner machine this focusing

produced an-arc-shaped sound wave from the face of the transducer the wave travels into the body and comes into focus at the desired depth.

Older technology transducer focus their beam with physical lenses

newer technology transducer use phased array techniques to enable the sonographic machine to change the direction and depth of focus. Almost all piezoelectric transducer are made of ceramic.

Materials on the face of transducer enable the sound to be transmitted efficiently into the body (usually seeming to be a rubbery coating a from impedance matching). In addition water-base3d gel is placed between the patients skin and the probe.

The sound wave is partially reflected from the layer between different tissues. Specifically, is reflected anywhere there are density changes in the body: e.g. blood cells in blood plasma, small structures in organs ,etc some of the reflection returns to the transducer.

Receiving the echoes and forming the image 2.6.2

The return sound wave to the transducer result in same process that

it took the sound the wave, expect in reverse .the return sound wave vibrate the transducer, the transducer turns the vibration into electrical pulses that travel to ultrasonic scanner where they are processed and transformed into digital image.

modes of ultrasound 2.6.3

Four sound modes of ultrasound are used in medical imaging they are: **A-mode,**A-mode is simplest type of ultrasound A- single transducer scans a line through the body with echoes pltted on screen on function of depth. Therapeutic ultrasound aimed at a specific toumr or calculus is also A- mode to allow for panpoint accurate focus of the destructive wave .energy

B-mode,In B-mode ultrasound a linear array of transducer simultaneously scans a plane through the body that can be viewed as a .tow dimensional image on screen

M- mod ,m-stands for motion. In M-mode a rapid sequence of B- mode scans whose images follow each other in sequence on screen enables doctors to see an measure range of motion as the organ boundaries that ..produce reflection move to the probe

Doppler mode,This mode makes use of the Doppler effect in measuring .and visualizing blood flow

:Diagnostic applications .2.6.4

In physics the term “ultrasound” applies to all acoustic energy with a .(frequency above human hearing (20.000hertz or 20 kilohertz

Typical diagnostic sonographic scanner operate in frequency range of2to18 mega hertz , hundreds of times greater than the limit of human hearing the choice of frequency is trade of between spatial resolution of the image and imaging depth lower frequency produce less resolution but

.(image deeper into the body(Sandra,2001

Sonoghrapic (ultrasonography) is widely used in medicine. It is possibol to perform both diagnosing procedures, using ultrasound to guide interventional procedures,(for intense biopsies or drainage of fluid collection).sonographers are medical professionals who perform scans diagnostic purposes sonographers typically use hand held probe (called transducer) the placed directly an on move over patient. A- Water based

.gel use a couple the ultrasound between transducer and patient

Sonogrphy is effective for imaging soft tissues of the body. Superficial structures such as muscle tendons, testes, breasts and the neonatal brain are imaged at higher frequency (7-18MHZ),which provides better axial and lateral resolution. Deeper structures such as liver and kidney are imaged at lower frequency 1-6MHZ with lower axial and lateral

.(resolution but great penetration.(Sandra,2001

:Medical sonography is used in,for example

2.6.5Therapeuticapplications

Therapeutic applications use ultrasound to bring heat or agitation into the body. Therefore much higher energies are used than in diagnostic Ultrasound. In many cases the range of frequencies used aretalso .very different. Ultrasound may be used to clean teeth in dental hygiene

Ultrasound sources may be used to generate regional heating and mechanical changes in biological tissue, e.g. in occupational therapy,physical therapy and cancer treatment. However the use of ultrasound in the treatment of musculoskeletal conditions has fallen out (of favor.(Willard,1990

Focused ultrasound may be used to generate highly localized heating to treat cysts and tumors (benign or malignant), This is known as Focused Ultrasound Surgery (FUS) or High Intensity Focused Ultrasound (JIIFU). These procedures generally use lower frequencies than medical diagnostic ultrasound (from 250 kHz to 2000 kHz), but significantly higher energies. NIFU treatment is often guided by MRI.Focused ultrasound may be used to break up kidney stones by lithotripsy. .Ultrasound may be used for cataract treatment by phacoemulsification

Additional physiological effects of low-intensity ultrasound have recently been discovered, e.g. its ability to stimulate bone-growth and its potential to disrupt the blood-brain barrier for drug delivery. ((Willard,1990

Previous Studies 2.7

A study done by Mohamed Ahmed Adlan in 2004,(A total of 194 patient were referred to ultrasound examination with the history of vaginal bleeding) in which 84 patients were diagnosed as threatended abortion making this diagnosis is very reassuring to the patients of the 84 patients 76 (90%) progressed normally in pregnancy while 8 patients(9.5%) had spontaneous abortion. A total of 42 patients were referred with clinical diagnosis of incomplete abortion other 5 patients as complete abortion ,The cases of complete abortion were examined bimanually and the cervix was found to be closed and the bleeding stopped. The cases of incomplete abortion were evacuated surgically and the finding confirmed the diagnosis. In this study 4 cases were referred with the clinical diagnosis of hydratedformmole 2 of these cases were diagnosed as complete and partial mole but the ultrasound examination was highly suggestive of molar pregnancy, and with missed abortion but in differential diagnosis. In the fourth case molar pregnancy was excluded by finding that it was twin pregnancy. Surgical management findings and histology confirmed that diagnosis in 3 cases. The patent that diagnosis as twin pregnancy was reassured and discharged.

Another study was done by Sheema Osman Gismalla Ibrahim in October 2009, to evaluate the role of ultrasound and the causes of early pregnancy failure. The result of this study, the highest incidence of spontaneous abortion is incomplete abortion about 50% followed by complete abortion 17.6%, missed abortion 13.2%, and threatened abortion 8.8%. Remains types of early pregnancy failure are blighted

ovum 4.4% ectopic pregnancy 4.4%, molar pregnancy at least incidence 1.5% vaginal bleeding is the most symptoms related with early pregnancy failure which contributed 76.5% followed by pelated pain 13.2% vomiting 8.8% and abdominal pain 1.5%. passive smoking and alcohol consumption contribute 44.1%, and 2.9% respectively. Hypertension was higher caused of rarly pregnancy failure 44.1%, following by uncontrolled diabetes mellitus 39.7%, and allergic 25%. The incidence of visible GS was 32.4%, and invisible GS 67.7%, in addition to that the shape of visible GS normal 17.6%, abnormal 14.7%, the most common type of early pregnancy failure is in incomplete abortion and the least common type is molar pregnancy. The study showed that ultrasound is

.easy and accurate in diagnosis of early pregnancy failure

Shell Fean Wong evaluated the role of trans-vaginal sonography in the detection of retained products of conception after first trimester spontaneous abortion, the result of this study, a total of 113 women were recruited, and 14 were excluded for various reasons. Among 52 women with a clinically incomplete abortion, only 50% had retained produets of conception. The used of trans-vaginal sonography. On the other hand 30% of women with clinical diagnosis of complete abortion had relained products of conception. The sensitivity and specificity of cervical status for detecting of complete abortion had relined products of conceptionwere 65%, and 56% respectively, whereas the overall sensitivity and specificity of trans-vaginal sonographic examination (bilayer endometrial thickness 8mm or less) were 100% and 80%

.respectively

Another study was done by Beter M. Doubile, to determine retrospectively the outcome of pregnancies in which the embryo has slow heart rate6.0-7.0 weeks gestation and normal heart rate at follow up ultrasonogrphy by 8.0 weeks gestation. The result of this study, the rate of first trimester demise were 60.6%, for pregnancies with slow heart rate at 6.0-7.0 weeks (188 of 310), 17.4% for those with borderline heart rate (103 of 593), and 9.1% for those with normal heart rates (186 of 2034) there were 59 pregnancies with a slow heart at 6.0-7.0 weeks and a normal heart rate at follow up US by 8.0 weeks, 15 results in first trimester demise. This rate of demise was significantly higher than that of 7.2% (28 of 309) in pregnancies with a normal heart rate at 6.0-7.0 weeks and a normal heart rate by 8.0 weeks ($p<.001$, fisher exact test) pregnancies with a borderline heart rate early in pregnancies followed by a normal heart rate had a demise rate of 7.6%, which is similar to those with normal heart rateearly in pregnancy followed by normal heart rate at

. follow up

A study done by BitBceh 2005, to determine during pregnancies is associated with late fetal death (spontaneous abortion and stillbirth). The result was there is 1.102 fetal deaths. High levels of consumption were associated with an inerased risk of fetal death Relative to non consumers of coffee, the adjacent hazard rate for fetal death associated with coffee consumption of 5-3 and 4-7 and 8 cups of coffee per day were (95%) confidence interval (CI):0.89, 1.19). (95%) CI): 1.08, 1.63) and 1.59 (95% CI 1.19-213) respectively. Reversecausation due to unrecognized fetal demise may explain the association between coffee intake and risk of fetal death prior to 20 complete weeks gestation but not the association with fetal loss following 20 complete weeks gestation. Consumption of

coffee during pregnancies was associated with a higher risk of fetal death, especially losses occurring after 20 complete weeks of gestation.

Also another study was done by Denizo et al, ti evaluate the role of slow embryonic heart rate in embryos before 7 weeks gestation as a marker in screening for chromosomal abnormalities. The methods of this study, 57 embryos before7 weeks gestation with slow heart rate were compare with 1156 embryos of same gestational period with normal heart rates. An embryo that shows an increased risk of chromosomal abnormalities in the screening blood lest underwent invasive analysis for abnormal karyotype detection. The result of this study, the rates of first trimester death were 15.8% for those with normal heart rates (29 of 1156) Because of the increased risk of chromosomal abnormalities, amniocentesis was performed on 6 with slow embryonic heart rates and 61 with normal embryonic heart rates. after karyotype analysis, there were 2 fetuses with trisomy 21 in each group, which represented significantly higher percentage of embryo with trisomy 21 in the slow heart rates group compared with the normal heart rates group($P<0.05$) the conclusion showed when aslowembryonicheart rates is detected before 7 weeks gestation, there is a higher likelihood of chromosomal abnormalities.

Chapter Three
Methodology

Chapter Three

Material and Method

.This is adestructive study

:material 3.1

Ultrasound machine 3.1.1

Mindray DP-20/ Digital ultrasonic Diagnostic imagining system operator's Manula With convex probe TAS 3,5-5 MHZ

Shenzhen mendary BIO/ Medical Electronic Co, Ltd.

(China (the Issue date is 2012

.Selection of ultrasound equipment

The selection of the right ultrasound equipment is probably the most difficult decision that one has to

.make when starting with new imaging techniques

Mechanical and electronic convex transducers are available in a range of frequencies, some being end-firing and others offset to allow imaging of

lateral structures. The mechanical systems at present appear to have superior resolution to electronic probes, though the former are less reliable. Orientation is easier with end-fire than with off-set probes though lateral structures in the pelvis may be seen more easily with the later. Probes where the convex, which is normally on-line, can be steered, to either side have the benefits of easy orientation as well as superior imaging of laterally displaced organs and are the

.most flexible and satisfactory

The choice of probe frequency is dependent on the fact that higherfrequencies give greater resolution in the near field, but their depth range is limited. For example, a 7.5 MHz probe gives high resolution images within a range up to 5 cm, whereas a 5 MHz transducer images structures between 3 cm and 10 cm but with reduced resolution. With a 5 MHz probe, if a structure to be imaged lies within 3 cm, one can still obtain good images by with drawing the transducer slightly to increase the distance between the probe and the imaged structure. (In general 5 MHz is preferable,

especially in early pregnancy scanning where dup (insertion).

3.1.2 Patients:

pregnant women in their first trimester, 50 complain of variable symptoms with suspicion of abortion, age (20-41years) :

3.1.3 Inclusion criteria

The population of this study includes 50 patients among pregnant women who are complaining of abortion

.

3.1.4 Exclusion criteria;

Pregnant women who are not complaining of abortion.

3.2 Methods:

Technique: data collection, patientspreparation and scanning technique.

patients preparation:

All the patients were examined with U/S using the abdominal route, we prepared the woman prior to exam they will must come with a full bladder,that takes about 32 to 40 ounces of clear fluid, 1 hour before the exam and finished within 15 to 20 minutes time period. this has three effects : first, it pushes the uterus out of the pelvis, this removing it from the shadow caused by the symphysis pubis ,second, it provides as acoustic window through which the pelvic organs can be visualized , third it displaces the bowel scattering the ultrasound beam.

scanning technique:

All patients were examined in supine position, many sections were performed (longitudinal and transverse).Put the coupling gel on the transducer surface and put it lust above the symphesis pubic

and perform longitudinal and transverse sections of internal genital organs.

3.2.1 Data collection:

The data was collected by using 50 samples of patients presenting to obstetrics and gynecology casually in Bashairteachinghospita1in Khartoum state.

The patients differ in age , occupation, but show similar complain of vaginal bleeding and pelvic pain, hapits,history of diseases and u/s finding

3.2.2 Statistic consideration :

Analysis of data using simple statistic method

3.2.3 Facilities available:

Mindray DP-20 With convex probe TAS 3,5-5 MHZ

3.2.4. Source of data collection:

From the ultrasound request written by the physician about the history of the patient and clinical presentation and patients data sheet designed for the purpose of this study.

Chapter Four

Results

Results

Table 4.1 : Shows statistical parameters according to Age and weight

Weight	Age	
66.65	29.68	Mean
8.78	5.92	STD
49	20	Minimum
80	41	Maximum

Figure 4. 2: Shows statistical parameters for all patients according to Age and weight

. **Figure 4. 3:Shows Types of Abortion**

. **Figure 4. 4: Shows Types of Abortion**

Figure 4. 5: Shows distribution of Clinical presentation

. Table 4. 6: Shows Vaginal bleedingdistribution

Percentage	No of Patient	**Vaginal bleeding**
86%	45	Present
14%	5	Absent

. Figure 4. 7: Shows Vaginal bleeding distribution

. Figure 4. 8: Shows u/sFindings

Figure 4. 9:show Finding from all patients

.Figure 4.10: Shows distribution of Parity

.Figure 4 .11: Shows distribution of Parity

Figure 4. 12: Shows distribution of visible embryo in GS

Figure 4. 13: Shows distribution of shape of GS for fetuses

Figure 4.14: Shows distribution of Cardiac Activity of fetuses.

Figure 4. 15: Shows distribution of CRL for fetuses.

.Figure 4.1 6 Shows distribution of Habits

.Figure 4. 17: shows distribution of Habits

.Table 4. 18 shows distribution of Occupation

%	frequency	Occupation
78	39	House wife
14	7	Teacher
2	1	Student
2	1	Sister
2	1	Tea Maker
2	1	Cooker

. Figure 4.19: shows distribution of Occupation

.Table 4.20 : shows uls findings in GS

NO	Gestation Sac	
5	A pear	Threatened abortion
5	A pear	Missed abortion
12	Not appear	Complete
28	apear	INcomplete

Figure 4.21 shows uLs finding in GS

Chapter Five

Discussion, Conclusion and recommendation

Discussion 5.1

this is study includes 50 cases of pregnant ladies attended to antenatal ultrasound clinic at area of study in Khartoum state – Sudan]Bashaer teaching hospital[, during period extended from May 2016 – August 2016. All patients were investigated by 3.5 MHZ transducer regarding of their symptoms of early pregnancy failure. Regarding the maternal age , the study found that the age group between] 20-41 year[, age group]26-30 [is 34% ,]20-25 [is 26% ,]31-35 [, is 22% and percentage of the group]36-41[is 18%(table4.1).

The study is revealed that the highest incidence of abortion is incomplete abortion]56%[followed by complete abortion]24%[and then at equal percentage the missed and threatened abortion] 10%[(figure4.3).

The incomplete abortion was more common in age from]26-30 year [34%.

Housewives are commonly suffering from early pregnancy failure]78%[, were employers 22% , a fact there were slight link between abortion and the type of work of this study(figure4.19).

The multipara woman are the most who have abortion]52%[, followed by grand multipara]36% ([and then Nulipara]12%[. (figure 4.10

Habits in abortion as drugs injection] especially anti-hypertensive drug, anti asthmatic, antithyroid disorder and antibiotic [found in]20% [in this study found relationship between the drugs ingestion and past history of abortion, and no score found for radiation exposure(figure4.16).same]. result achieved by]Sheema Osman 2009

Regarding the clinical presentation of the study group, symptomatic patients]90% [and a .] symptomatic patients]10%

The most common clinical presentation was vaginal bleeding]86% [, and other clinical symptoms]14% [like lower abdominal pain, passage of products. Some patients complains of three symptoms and some of them complains of .(two symptoms(figure4.7

Regarding The recurrence of abortion, the majority of the study patients had no history on recurrent abortion]88% [, and]12%[had recurrent .abortion

In associated diseases Diabetes mellitus are the highest cause of early pregnancy]6% [company with the other factor followed by Hypertention]4%

[, infection]4% [, asthma]4% [and then anemia]
] 2%

Regarding the gestational Sac, the study found that]20% [of the samples have gestational sac with embryo and]80% [not appear embryo . Study found that the shape of the GS, was distorted in] 87% [of cases and not exist in]13% [, there were fluid collection or retained products in incomplete abortion or empty uterus, with normal uterus size .(in complete abortion(figure4.12

The CRL is ubnormal in]10% [and not exist(figure .(4.15

Regarding the cardiac activity in the embryo,]10% [of cases the cardiac activity was detected, and only]10% [the cardiac activity was not .(detected(figure4.14

Regarding the major finding is enlarged uterus] .(56% [in cases and others are]44%[(figure4.21

The common laboratory test requested for woman .] in this study is HCG scoring]100%

Conclusion 5.2

This study showed that the most common type of abortion was incomplete abortion, among

pregnant woman in]Bashair hospital [was]56% [of all recognized pregnancies.

Most common in age group]20 – 30 years old [in 34%.

This incidence of abortion was high in non-worker woman than in employer woman. history of Diabetes mellitus most associated disease with abortion. Vaginal bleeding is the most presenting symptom in abortion.

The study showed that the ultrasound was an easy and accurate and non- Invasive method and of great value in detect the different types of abortion, by knowing the details of the gestational sac and it's different content, which affect the management.

Accurate assessment of early pregnancy was essential component of medical abortion services. The patients history and physical examination are not sufficient to establish the diagnosis of early pregnancy reliably.

Recommendations 5.3

Organized intensive maternal care and awareness should be applied in Sudan hospital.

Ultrasonography should be a routine component of antenatal care clinics.

Provision of ultrasound devices in hospitals and rural health centers , and train technicians for help in early detection of abortion.

Further researches in the same topic were recommended , in which increased patient number.

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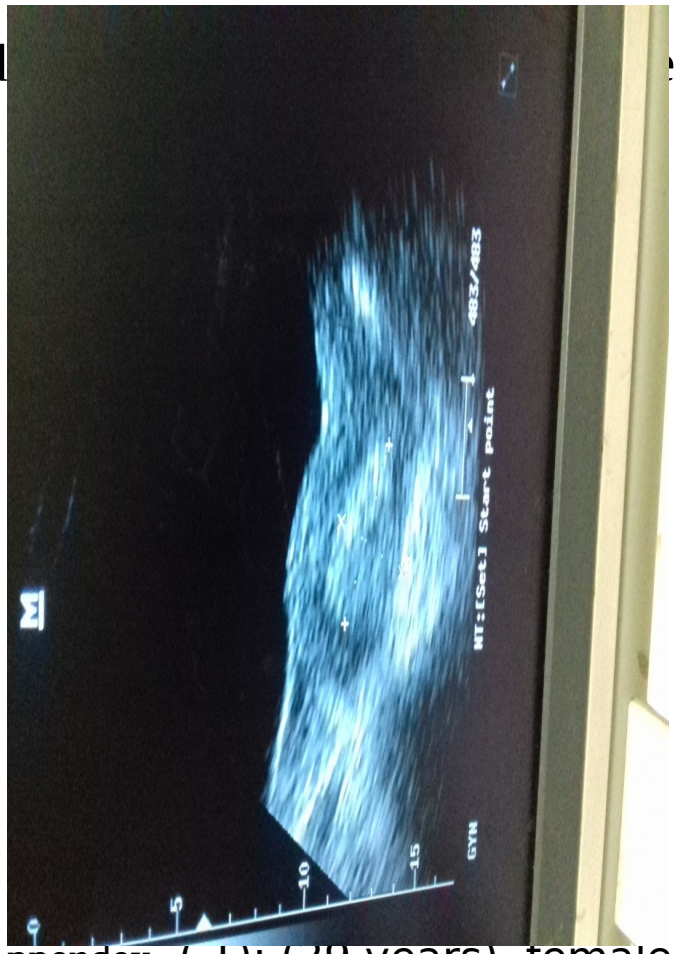
Appendices

Append sample of

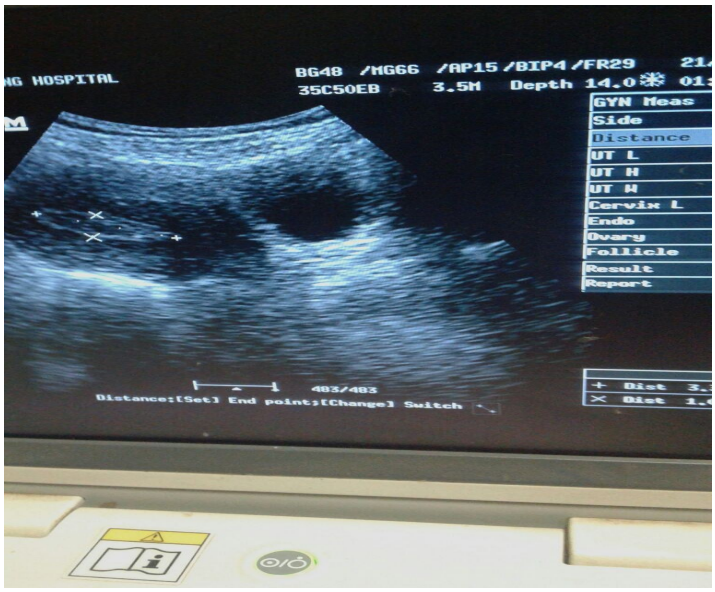
.the study



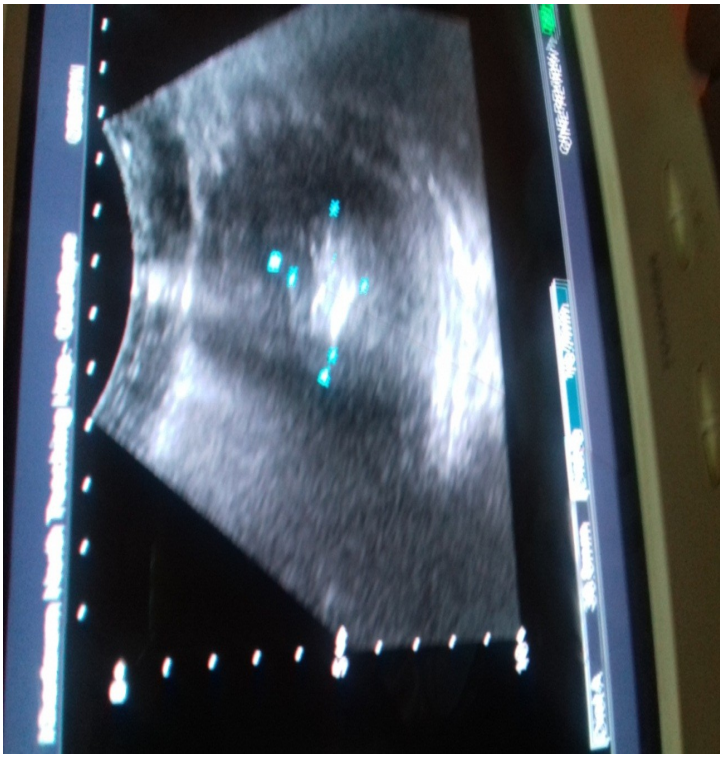
Appendex (1): (29 years), female with vaginal bleeding and expel of clots, longitudinal scan showing incomplete abortion (TAS).

Appendix(2,3): (27 years), female presented with history of Amenorrhea for three month and vaginal bleeding with positive urine for pregnancy test, the Image show product of conception, so diagnosed incomplete abortion longitudinal and transverse

.scan



Appendix(4.5): (25 years) female with vaginal bleeding, longitudinal and transverse scan showing product of conception, so diagnosed as incomplete .abortion



Appendix(6): (35 years) female with vaginal bleeding, the Image show Bulky uterus with echogenic retained products so diagnosed as .incomplete abortion

B676 /M056 /AP1
35C50EB 3.5H
ERCHING HOSPITAL
B690 /M056 /AP14 /BIP4
35C50EB 3.5H Depth
ACHING HOSPITAL

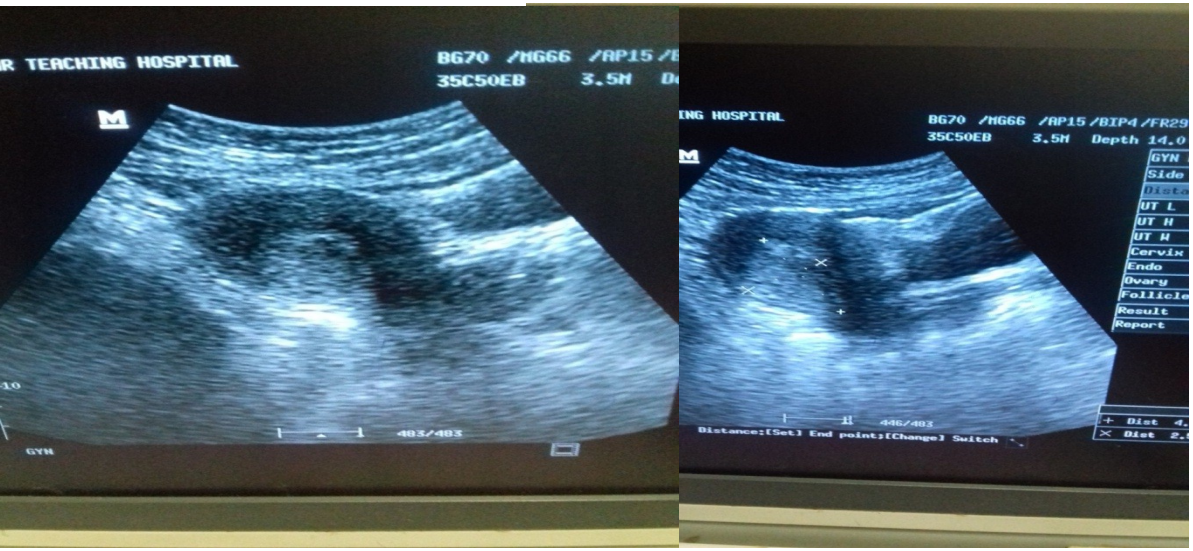
Appendix(7,8): (22 years) female with amenorrhea . (longitudinal scan showing missed abortion (TAS

Appendix (9,10) : (25 years) female presented with vaginal bleeding, the Image showing normal A/V uterus with empty and thickness endometrium.

.so diagnosed as complete abortion

Appendix(11) : (28 years), female presented with vaginal bleeding, longitudinal scan showing A/V uterus with viable fetus with heart beat and close

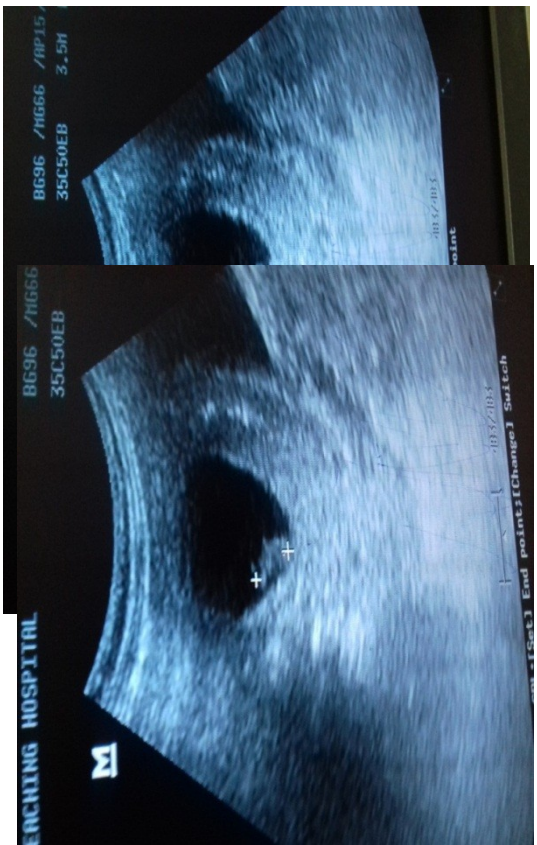
.cervix so diagnosed as threatened abortion


R TEACHING HOSPITAL
BG70 /MG66 /AP15 /E
35C50EB 3.5M D
M
403/403
GYN

ING HOSPITAL
BG70 /MG66 /AP15 /BIP4 /FR29
35C50EB 3.5M Depth 14.0
M
GYN
Side
Dista
UT L
UT H
UT W
Cervix
Endo
Ovary
Follicle
Result
Report
446/483
Distance:[Set] End point;[Change] Switch
+ Dist 4.
× Dist 2.

Appendix(12,13): (23 years), female presented with vaginal bleeding, and lower abdominal pain, longitudinal scan showing incomplete abortion .((TAS

Appendix(14): (25 years), female presented with vaginal bleeding, and lower abdominal pain, longitudinal scan showing bulky A/V uterus with retained product of conception and diagnosed as .(incomplete abortion (TAS



Appendix(15,16): (41 years), female with amenorrhea longitudinal scan showing missed abortion (TAS).

(APPENDIX(II

بسم لله الرحمن الرحيم

Sudan University of Science & Technology

College of post Graduate Studies

Data Collection Sheet

Detection of abortion causes using ultra sonography

1. Patient name:.....

2. Age:

3. Presenting complain:

lower abdominal pain Vaginal bleeding

Morning sicken Amenorrhea

others

4. Ultrasound findings:

- gestational sac: Appear Not appear

- Shape of GS: Normal Distorted

- CRL: Normal Abnormal

- Visible embryo in GS: Appear Not-appear

- Cardiac activity:: Normal Abnormal

Others:

.....

5. Types of probes:

Trans-abdominal trans-vaginal

.6 Laboratory tests:

HB HCG
TWB

.7 Occupation:

Employers Housewife

.8 Habits:

Exposure to radiation Drugs ingestion
Nothing Alcohol consumption Smoking

.9 Parity:

Multipara Nulipara
Grandmultipara

.10 Past history of:

Others Cesarean section Abortion
Trauma

.11 Associated diseases:

Myoma Infection DM HTN
Others

.12

Conclusion.....