" SONOGRAPHIC EVALUATION OF FIRST TRIMESTER BLEEDING AND IT'S OUTCOME"

BY

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2011

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I solemnly declare that this dissertation titled **"SONOGRAPHIC EVALUATION OF FIRST TRIMESTER BLEEDING AND ITS OUTCOME "** has been prepared by me under the direct supervision and guidance of **Dr.P.B.JAJU,** professor , department of **OBSTETRICS AND GYNAECOLOGY**, BLDE university, Bijapur and is submitted in partial fulfillment of its regulations for the award of the degree of **" MASTER OF SURGERY IN OBSTETRICS AND GYNAECOLOGY ".** This work has not been submitted by me for award of any other degree or diploma by any other university.

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LIST OF ABBREVIATIONS USED

1. Abd: Abdomen
2. Abn: Abnormal
3. Ad.Mass: Adnexal Mass
4. Amen: Amenorrhoea
5. Anom: Anomalous
6. A-P: Antero-posterior
7. Ar: Areas
8. Bldg: Bleeding
9. BO: Blighted ovum
10. CC: Check Curettage
11. Cd: Clinical diagnosis
12. Com.A: Complete Abortion
13. CRL: Crown Rump Length
14. Cx: Cervix
15. Clin: Clinical
16. Cu-T: Copper-T
17. Del: Delivery
18. Diag: Diagnosis
19. Dil: Dilated
20. Disch: Discharged
21. Distor: Distorted
22. Dld-P: Delayed periods
23. D & F: Discharged and Follow up
24. Durn: Duration
25. Ech: Echogenic
26. Ect: Ectopic
27. Enl: Enlarged
28. Ect. Pg.: Ectopic Pregnancy

29. EGA: Estimated gestational age
30. Ext.os 1F: External OS 1 Finger
31. Fd: Final diagnosis
32. Fx. : Fornix
33. Fx Fs: Fornix Fullness
34. G.S: Gestational Sac
35. Hom: Homogenous
36. Hosp: Hospital
37. HP: Histopathologic
38. Inc.A: Incomplete Abortion
39. Inev.A: Inevitable Abortion
40. Int. os: internal os
41. Irrg.Sac: Irregular Sac
42. L : Left
43. LMP: Last menstrual period
44. M.A: Missed Abortion
45. Mol.Pg: molar pregnancy
46. N.Del: Normal Delivery
47. R: Right
48. Sub.Ser.F:Subserous Fibroid
49. S.E: Suction Evacuation
50. Thr.A: Threatened Abortion
51. Ud: ultrasound Diagnosis
52. Uni : Uniform
53. VM: Vesicular mole
54. Y.S: Yolk Sac
55. Ut: Uterus
56. Fp:fetal pole
57. USG: Ultrasonography

ABSTRACT:

Background :

First trimester vaginal bleeding is a common condition, occurring in approximately 16 – 20 % of pregnant women.

The important causes of first trimester bleeding include inevitable abortion, missed abortion, incomplete abortion, complete abortion, molar pregnancy, ectopic pregnancy, implantation bleeding, subchorionic bleeding and threatened abortion. Some of the above mentioned conditions are absolute indications for termination of pregnancy which can be missed by clinical diagnosis alone. Ultrasonography aids in diagnosing these conditions accurately.

Objective:

To evaluate the causes and complications of first trimester bleeding and to identify high risk pregnancy which warrants termination of pregnancy .

Method:

It is a randomized prospective study conducted in 128 pregnant women $\leq$ 12 weeks of Gestation with bleeding PV attending DEPT. of OBG of Shri. B.M.Patil medical college BLDE university, Bijapur.

After taking in to consideration the inclusion and exclusion criteria, all 128 patients were included into the study and subjected to ultrasound examination.

Results:

In our study of 128 cases, 40 cases were threatened abortion, 20 cases were complete abortion, 15 cases were missed abortion, 15 cases were inomplete abortion, 14 cases were inevitable abortion, 3 cases were blighted ovun, 8 cases were ectopic pregnancy and 6 cases were molar pregnancy. In these 128 cases, 93 ended in pregnancy failure. In 40 cases of threatened abortion, 21 cases had full term normal delivery, 7 cases had pre term delivery, 2 cases had spontanious abortion, 3 cases underwent mtp with tubectomy and 7 cases lost follow up .

The diagnosis by ultrasound wad done in all cases except in 2 cases, one is molar pregnancy which was diagnosed by HPR. Other one was ectopic pregnancy, diagnosed during laparotomy. The diagnostic accuracy of ultrasound in this study is 98.5%.

Conclusion:

Ultrasound is safe, non invasive and accurate method of diagnosis in first trimester bleeding and its outcome.

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INTRODUCTION

The First Trimester of Pregnancy is a dynamic period that spans ovulation, fertilization, implantation and organogenesis. Complications occurring during this period pose a diagnostic challenge to the obstetrician.

Vaginal bleeding occurring during first trimester is a symptom, which frequently heralds an abnormality interrupting the normal development of foetus in early pregnancy.

Vaginal bleeding during the first trimester has been estimated to occur in about 16-20% of all pregnant women, while the frequency of spontaneous abortion has been traditionally estimated as 10-20%. The clinical approach though helpful is of limited value. Despite the latest technological and laboratory diagnosis the desired goal of early recognition is not achieved. [1]

However since the addition of ultrasound in the diagnostic armamentarium, a precise discrimination of normal from abnormal pregnancy has been possible. It also provides an opportunity to sort out the type of pregnancy complication and provides for early institutional treatment. [2]

Prior to the era of ultrasound, diagnosing the cause of first trimester bleeding traditionally had been based on the history or positive pregnancy test.

The differential diagnosis of first trimester bleeding relied heavily on the results of a pelvic examination. If the cervix was closed and the size of the uterus corresponded to the period of amenorrhoea, the diagnosis of threatened abortion was made. If the cervix was Open, the size of the uterus corresponding to the period of amenorrhoea and no tissue

was passed the diagnosis was referred as inevitable abortion. It was diagnosed as an incomplete or complete abortion depending on the amount of expulsion of products of conception.

The differentiation depends on the best guess of the obstetrician. A grossly enlarged uterus with passage of vesicles suggests the diagnosis of hydatidiform mole and detection of a tender adnexal mass raised the suspicion of ectopic pregnancy. Unfortunately the diagnosis on such observation is not always precise, further this clinical approach is neither specific in indicating the cause of bleeding nor does it aid in decision making.

At this juncture, the dilemma in the management of early trimester bleeding is solved by the use of pulse echo ultrasound examination which offers a reliable means of obtaining a clear picture of the pathology as technology has increased to such an extent that it is now possible to detect as early as five weeks. [3] Heavy bleeding is a bad prognostic sign. [4]

With the aid of pulse echo ultrasound, a spectrum of causes for first trimester bleeding ranging from threatened abortion, missed abortion, inevitable abortion, incomplete abortion, gestational trophoblastic disease ,ectopic pregnancy and adnexal pathology like tubo-ovarian mass and torsion of ovarian cyst can be diagnosed. [2,3]

The differentiation of one from the other is so important since we are dealing with different entities with differing management for e.g. in threatened abortion, management is conservative. In vesicular mole, where in the management is operative. [4]

The diagnosis of multiple pregnancy in early gestation and low lying placenta which migrate upwards are virtually impossible by clinical methods. [5]

With sonographic guidance unnecessary delay in termination of abnormal pregnancies such as missed abortion and blighted ovum could be avoided . Equally important is its adjuvant role in early detection of tubal ectopic gestations in the unruptured state and institution of tubal conservative surgeries. [3,6]

While unnecessary curettage can be avoided in complete abortion and delayed periods, with a reduction in patient morbidity and mortality.

In the era of foetal medicine Donald's Vision of sonographic diagnosis of "handicaps even before the child passes through the valley of the shadow of birth are yet to be fulfilled".

Hence this non invasive, safe, rapid and extremely accurate investigation was evaluated.

AIMS AND OBJECTIVES OF THE STUDY

1. To evaluate the causes and complications of first trimester bleeding

2. To identify high risk pregnancies which warrant termination of pregnancy

HISTORY OF ULTRASOUND

The use of ultrasound in medicine is widespread, though ultrasound was scientifically described 15 years before the discovery of X-ray. The use and applications of diagnostic ultrasound have not enjoyed the rapid acceptance as compared to x-ray techniques. Instead the advancement of diagnostic ultrasound have been closely dependent on the advance of electronic technology. In 1880 Pierre Curie discovered the Piezo electric effect when he found that mechanical stress applied to quartz crystals created a minute electric potential across the crystal. If electrical current passes across the crystal it produces a mechanical change in the size of the crystal and produce high frequency sound (Ultrasound), and this technique is used for production of ultrasound. Galten in 1883 was the first to produce ultrasound using high frequency sound.

Langevin, commissioned by the French Government during World War I, produced and experimented with high frequency sound beams using quartz crystals. He used it to detect underwater objects. These techniques were first applied after the sinking of Titanic in 1912 and became the forerunner of SONAR (Sound navigation and ranging). Dussik began the first medical trial of ultrasound technology. He attempted to visualize the cerebral ventricles. Though he did not succeed in his effort because of the attenuation of the sound by the skull bone. Howry and Wilde pioneered the development of two dimensional imaging and Leksell and Elder of Scandinovia discovered and refined the techniques of echo Encephalography and Echocardiography respectively.

Application of ultrasound in obstetrics and gynaecology as well as its development of contact scanning (using a coupling oil gel) are all due to the work of Donald of Scotland.

Full bladder technique, which again was simple but ingenious concept of Prof.Ian Donald was introduced in 1963.

BASIC PHYSICS OF ULTRASOUND

Ultrasound is defined as a sound with a frequency above the audible range. A sound like X-ray is a phenomenon for the transfer of energy. Unlike X-rays, however, Which can travel through a vacuum, sound must have matter through which to pass, sound waves are actually vibrations, and the matter present vibrates to transmit the sound waves and produce sound.

The frequency of sound wave is deteremined by the number of oscillations per second made by the vibrating source. The unit of frequency is hertz (Hz). Hz is equal to an vibration (cycle) per second. The normal human hearing range is from 15 Hz - 20000 Hz (20khz).

Ultrasound is therefore defined as Mechanical vibration with a frequency above 20 kHz. For medical diagnostic application, the frequency in the 1-10 megahertz (MHz) i.e. 1-10 million Hz is commonly employed to obtain the required resolution.

SPEED OF SOUND:

The speed of sound in a given medium depends on its physical properties as shown in **Fig a**, e.g. elasticity and density of the medium. By knowing the speed of a given medium (e.g. body tissue) we can calculate the distance of the object by using the time it takes for sound to travel to the object and an echo to return back.

Ultrasound is used to image the soft tissue regions of the body. The average speed of sound in soft tissue is about 1540m/Sec. Most clinical instruments are set up or calibrated assuming that sound propagates through the body at this speed .

PRODUCTION OF ULTRASOUND:

Production of ultrasound requires a transducer. This is achieved by the inverse piezo-electric effect. The natural Crystal possessing piezo-electric effect is quartz, which is now replaced by synthetic crystals for convenience like lead zirconate, titanate or lead metabionate. These are cut as crystals along certain given axes. The frequency with which the crystal vibrates expressed in mega hertz, depends upon the material, its thickness and dimensions. A housing incorporating a slab of piezoelectric material is called a transducer.

Diagnostically useful information is obtained in an ultrasound examination because of partial reflection and scattering of sound beams of tissue interfaces with different acoustic impedances. The reflected echoes will strike the transducer and produce electrical signals which are amplified and processed into a format suitable for display.

PULSED VERSUS CONTINUOUS WAVE BEAMS:

In diagnostic ultrasound high frequency sound waves are transmitted into the body by an ultrasound transducer and echoes from tissue interface are detected and displayed. When ultrasound transducer is driven continuously we refer to continuous waves (C.W) which are used in Doppler Ultrasound. The transducer vibrates for only a few cycles each time it is activated. This produces an ultrasound pulse, that propagates through the tissues in a

well defined beam. After Transducer transmitting a pulse to the tissues, echo signals detected by the transducer are amplified and processed into a format suitable for display.

ULTRASONIC TRANSDUCERS:

An ultrasound transducer is the link between an ultrasound imaging instrument and the patient being examined. It is both the source and detector of ultrasound signals and is of major factor in the overall performance of an instrument. The term transducer in general, refers to any device that converts energy from one form to another.

Numerous types of transducers exist including single element units whose beams are scanned by moving the transducer over the region of interest and multiple element arrays whose sound beams are scanned by electronic manipulation of signals applied to and received from the transducer system. An array transducer assembly consists of a group of piezo-electric elements each of which can be excited individually and whose echo signals can be detected and amplified separately.

LINEAR ARRAY TRANSDUCER:

Gives a wide coverage of area scanned the rectangular area beneath the transducer and hence, is good for scanning the abdomen for obstetric indications and medical disorders. Presence of bones, such as ribs and pubic symphysis will limit the acoustic imaging by linear probe.

SECTOR SCANNING:

The advantage with a sector scanning is that a point contact is made with the patient, and this small acoustic window facilitates divergence of the sound waves and images the objects in depth. Hence intercostals scanning (Echocardiography) and pelvic scanning are best done with sector scanning.

RESOLUTION:

Resolution is the capability of a system to demonstrate two points of Information (acoustic boundary) that lie parallel or perpendicular to the beam. Resolution is expressed in millimeter(mm). If the system has the capability to resolve 5 mm, then two boundaries 5 mm apart are detected as two echoes in the image. If two points are closer than 5 mm, only one echo results. Axial resolution is the resolution along the path of the sound beam and lateral resolution refers to the ability of the system to resolve two acoustic boundaries that are perpendicular to the axis of the sound beam.

IMAGES DISPLAY MODES

An ultrasound beam directed into the body, results in an echo at an acoustic interface and produces a small electrical pulse. This electrical signals is amplified and passed on to an oscilloscope or some other device for visual display. Image display modes can be limited to four basic modes, A-mode, B-mode, M-mode and B-scan.

A-MODE DISPLAY:(Amplitude modulation)

After being amplified the returning echoes are displayed on an Oscilloscope screen. An oscilloscope is a device that displays the amplitude of an electric signal on the vertical axis while the moving base-time line Sweeps across the screen. The speed of sweep of

the base-time line is calibrated to correspond to the speed of the sound in tissue. (1540 m/Sec.).

So these uni-dimensional vertical deflection of echoes can be used to measure the depth of the objects and their dimensions accurately.

B- Mode Display: Brightness (intensity) modulation.

In B-mode display echoes appear as dots along the invisible time base. The strength of the echoes determines the brightness of dots on the oscilloscope screen.

M-Mode or Motion Mode: (Also known as cardiac mode)

Is used to correlate the position and time for objects in motion. Echoes are displayed as dots along the Horizontal time base line and their strength is indicated by the brightness rather than by amplitude. This mode is useful in tracking moving structures such as heart and great vessels.

B Scan:

B-Scan combines a B-mode type of display on an axial moving time base1ine, B-Scan is produced by using the B-mode type of display and sweeping the transducer across the area of interest, producing a tomographic effect. This procedure is extremely useful in producing outline of organs and mass and also the consistency and density variations within the organs. Recently it has become practical to produce images that record the quality (texture) of echoes as shades of gray. The “GRAY-SCALE” systems borrow heavily from television technology to accumulate and display the information. the quality of the echo is imaged in signal consisting of shades of gray.

REAL TIME ULTRASONOGRAPHY:

Each of the above mentioned technique are static and images must be built over a period of seconds. They do not respond to changes in the position by the structure being visualized. In real time system, the B-mode two dimensional images can be formed rapidly and position of an organ at any instant in time displayed virtually instantaneously and sequential presentation of these images on a display system will permit the organ movement to be viewed in real time. Real time scanners are smaller, freely mobile, easy to use and readily permit evaluation of motions. Real time machines can be equipped with two types of transducers, linear array and sector.

BIOEFFECTS OF ULTRASOUND

The intensity of ultrasound is measured in W/cms2. In diagnostic ultrasound the intensity transmitted through tissues is in the range of few mw/Cm2 and the frequency used is in the range of 1-10 Mega Hertz. In the acoustic conditions of diagnostic ultrasound with low instrumental output and short exposure time, there have been no confirmed significant biological effects in mammalian tissues. Hence ultrasound appears safe at any gestational age of pregnancy.

The experimental studies on animals with high intensity (100 mw/cm 2 - 5.5 W/cm2) and continuous exposure have revealed the following bio-effects:

1. Macromolecular degradation
2. Cellular effects of ultrasound
3. Genetic damage
4. Sister chromatid exchanges (SCE)

MACROMOLECULAR DEGRADATION:

The principal molecules of any cell, namely proteins and DNA, can absorb ultrasound energy and can be degraded. But in vivo exposure of DNA molecules with low intensity, intermittent ultrasound is unlikely to cause mutagenic effect because, “In vivo” human DNA is packaged and protected by proteins and would not be expected to react in the same fashion as purified DNA.

CELLULAR EFFECTS OF ULTRASOUND:

High level of ultrasound exposure could induce ill effects in cell structure, such as cell membrane changes and increased protein synthesis and DNA synthesis and cellular transformation. But these damaging levels of intensity & frequency are not reached during clinical exposure.

GENETIC DAMAGE:

Mutation and recombination of genetic materials have been found in association with ultrasound exposure of yeast & bacteria, and sufficient study has not accumulated in higher animals.

SISTER CHROMATID EXCHANGE (SCE):

Studies of SCE frequencies after ultrasound exposure have produced the most controversy because results are conflicting. SCE are believed to represent physical interchange of DNA segments between the two chromatids comprising a single chromosome.

Epidemiological studies do not indicate hazard associated with perinatal ultrasound imaging. In the Mean time with unknown risk and benefits to the procedure, a conservative approach to the imaging should be used. It appears that ultrasound is safe enough to be used in any pregnant women at any gestational ages as often as the clinical indications are present with informed consent. Minimum 4 times USG can be done in pregnancy as it is safe, non invasive and does not harm the fetus.

SONAGRAPHIC APPEARANCE OF THE NORMAL FIRST TRIMESTER.

EMBRYONIC SONOGRAPHIC APPEARANCE:

Demonstration of a fundal cavity interface echo is an important finding since it excludes the diagnosis of an Intrauterine pregnancy.

GESTATIONAL SAC:

Mac Vicar and Donald were the first to describe gestational Sac in early pregnancy. The earliest that an implanted gestational sac has been identified within the endometrial cavity is at 5 weeks, of menstrual age within days of the expected menstrual period. This is within few days of completion of implantation. Only the extra embryonic coelom or chorionic sac is visible. The amniotic cavity is just beginning to form and enlarge.

The sac reported in the literature have been about 8 mm in diameter sonographically having enlarged rapidly the preceding 7 days. The sac at this point has no internal echoes, since the yolk sac and neural plate are below the resolving power of the equipment. But the sac has a characteristic highly echogenic border that represents the decidual reaction. By 6 weeks the gestational sac occupies approximately 1/3rd of the uterine volume but it is still devoid of internal echoes. It can be identified as a small ring (White ring) shaped on both transverse and longitudinal scans. Failure to locate a sac by 40th day practically excludes an intrauterine pregnancy. The level of nidation can also be observed by the end of 6 weeks. In favorable circumstances this should be in the upper segment and on transverse scans appear eccentric.[6,7,8]

However in very obese patients or in patients with a retroverted uterus it may not be possible to visualize the gestational sac until 7-8 weeks amenorrhoea. This difficulty can be overcome by using transvaginal sonography.

ULTRASONOGRAPHIC PATTERN & SHAPE OF GESTATIONAL SAC

Tissues of the developing products of conception and tissues surrounding it have different acoustic impedance. Since the gestational sac is strongly reflective, it is visualized within the uterus as a brightly luminous and completely closed ring of equal thickness throughout, the ring echo is apparently generated by chorion.

DIAMETERS OF GESTATIONAL SAC:

The first reports on determining the mean diameter were published by **HELLMAN et al in 1969.** Gestational sac can be used to assess gestational age before sonographic identification of an embryo. The gestational sac grows at a constant rate of menstrual age. Mean diameter increase by approximately 1 - 1.5mm/day for the first 50 to 60 days of pregnancy. Gestational sac should be demonstrated sonographically when serum HCG exceeds approximately 1800 mIU/ml. Gestational sac volume are more accurate measure of gestational sac size.[7]

MEASUREMENT OF GESTATIONAL SAC VOLUME:

Full bladder is ensured and longitudinal axis of the uterus is located. The gestational sac will be visualized towards the uterine fundus. The maximum longitudinal axis length is measured in centimeters from the frozen image using the onscreen calipers. The maximum A-P diameter is also measured on this section. The maximum transverse diameter is also measured and the gestational sac volume is calculated.

Use of gestational sac volume measurement:

- ★ Confirmation of intrauterine pregnancy
- ★ Prediction of gestational age before the fetal pole visible
- ★ Diagnosis of blighted ovum.

MEASUREMENT OF CROWN-RUMP LENGTH (CRL):

Robinson et al succeeded in measuring the fetal length at six and half weeks of gestation. CRL measurements may be difficult to perform. The ability to correctly date a pregnancy by this method depends solely on the operator obtaining a time in flexed longitudinal section of the fetus with the end points of the crown and rump clearly defined owing to fetal movements there can be no standardized technique for obtaining a CRL. [8,9]

The transducer on the abdomen is placed to obtain a longitudinal section of the uterus and gestational sac, long axis of fetus measurements are taken from the top of the head to the base[2].

DOUBLE DECIDUAL SAC:

This double echogenic ring appearance is produced by decidua capsularis and decidua parietalis. The sonographic image of gestational sac must be distinguished from that of intrauterine blood collection and decidual casts which do not evidence the bright echogenic rim nor is associated with the double ring appearance double decidual sac is a useful feature on ultrasound in distinguishing between an early intra uterine pregnancy and pseudo gestational sac.[7]

FOETAL POLE:

By the 7th week of amenorrhoea it is usually possible to identify the foetal pole within the gestational sac with certainty and even to measure its CRL.[8]

Earliest demonstration of fetal pole is by 42 days between 6-7 weeks only in 50% and 7-8 weeks in 82.6% of normal pregnancies. No fetal pole detected by 8 completed weeks of last normal menstrual period is diagnostic of Blighted ovum by this time about one half of the uterus is filled by the amniotic sac. One may also visualize at 8 weeks of tiny cystic structure adjacent to the fetus that represents the yolk sac. This may be seen until approximately 11 weeks, after which it disappear.

FOETAL CARDIAC ACTIVITY:

Fetal cardiac activity is recorded as soon as the fetal pole is well recognized by 9 weeks in all subjects with a normal pregnancy. Absence of fetal cardiac activity in a well defined fetal pole denotes Missed abortion. One can also see gross fetal body motions, which may be accentuated as the anterior abdominal wall is tapped smartly sending a shock wave through the gestational sac, bouncing the fetus off the bottom. One can see a flailing activity as the fetus settles again to the bottom. Earlier the fetal cardiac activity visible on usg, better the prognosis.[10,11]

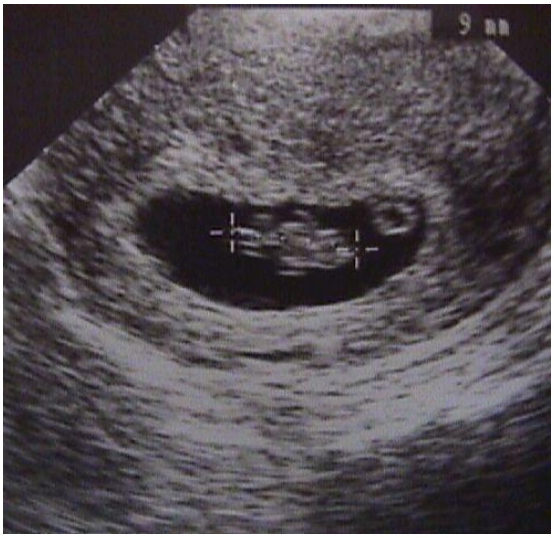


Fig b: Early Pregnancy Scan

By the 10th week the amniotic sac begins to fill the whole uterus. The fetal pole continues to enlarge and elongate reaching 5.5 - 6 cms at 12 week menstrual age. The fetal head is approximately same size of the fetal body and can be identified at approximately 12 weeks menstrual age. At 12 weeks the BPD can be identified and measured.

Developmental milestones seen by **USG** in **first trimester of pregnancy** are summarized as follows:

Gestational Sac	5-6 weeks
Fetal pole	6-7 weeks
Cardiac activity	7-8 weeks
Somatic activity	8-9 weeks
Placenta	9-10 weeks
BPD	12 weeks

AN IMPLANTATION BLEED (CALLEN): Appears as a gestational sac but should not be mistaken for a second gestational sac.

MULTIPLE GESTATION:

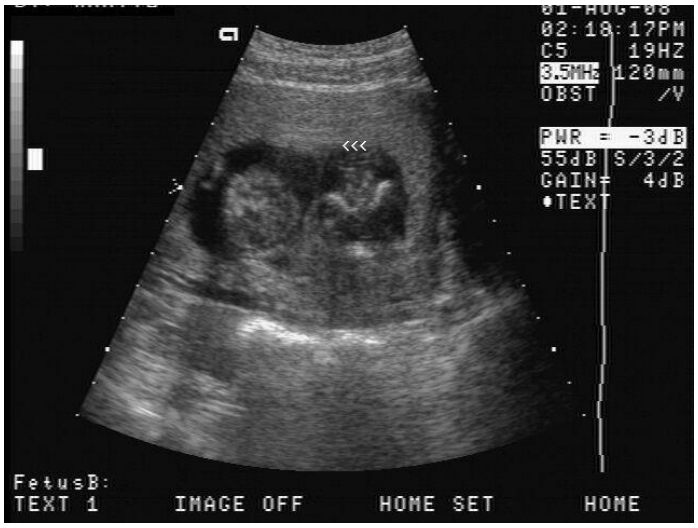


Fig c: Multiple Gestation

Twins, triplets, quadruplets and quintuplets have all been recognized sonographically in the first trimester as shown in **Fig c**.

Three patterns are seen

* Second Sac.

* Crescent of fluid outlining the intact sac.

* Septal division of the amniotic cavity with one compartment empty.

PLACENTA & MEMBRANES:

The placental thickening is usually seen by the 8th week of menstrual age. The sonogrophic appearance of the placenta is that of a uniformly echogenic thickening of the gestational sac. The placenta maintains this crescentric shape and its relatively uniform echogenicity throughout the first trimester.

CHORIO AMNIOTIC SEPARATION:

In a small percentage of cases, the amniotic and chorionic membranes fail to fuse over their entire surface at 16 weeks or separate following initial opposition. This finding is felt to be of no clinical significance.

CHORIO AMNIOTIC ELEVATION:

One may see a similar appearance if both the chorionic and amniotic membranes are elevated by fluid or blood in the endometrial cavity. In about 60% of first trimester pregnancy between the 5^{th} & 8th weeks of menstrual age, a relatively echo free triangular structures is seen adjacent to a normal gestational sac and foetus.[3]

CAUSES OF BLEEDING IN FIRST TRIMESTER OF PREGNANCY

Bleeding from the uterus in the early pregnancy from the uterus in the early pregnancy often suggests an abnormality of the gestation, though at times a normally developing pregnancy can be associated with some bleeding. Thorough work up of a case of bleeding in first trimester is very important. It is essential to promptly differentiate the threatened abortion from other potentially dangerous complication like hydatidiform mole and ectopic pregnancy.[1,5]

The important causes of first trimester bleeding are as follows.

1. Blighted ovum.
2. Abortions-Threatened, inevitable, incomplete, complete and missed.
3. Vesicular Mole.
4. Ectopic pregnancy.
5. Implantation bleeding.

BLIGHTED OVUM

This term is used to describe the fertilized ovum whose development becomes arrested in early pregnancy before the end of first trimester. It differs from missed abortion largely in degree but particularly by the absence of fetal parts as shown in **Fig d**.

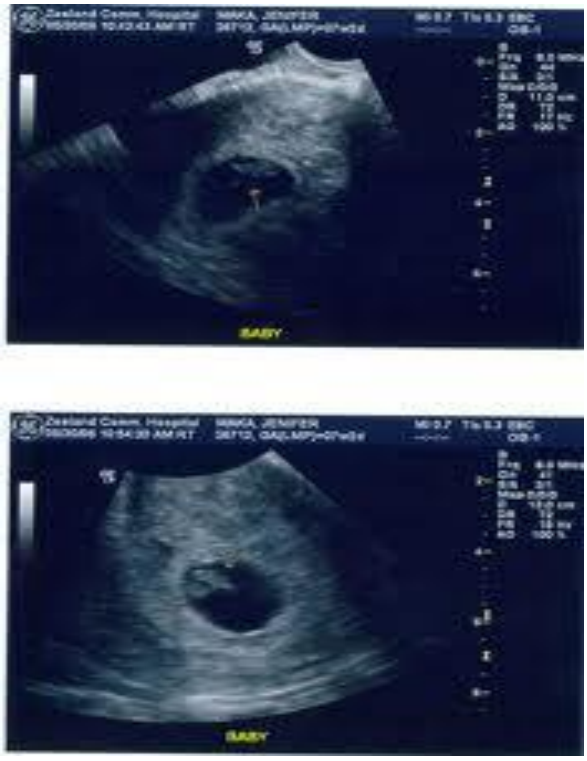


Fig d: Blighted Ovum

The phenomenon of blighted ovum has been recognized for more than 40 years. But the confirmation of diagnosis was only possible with histological examination of expelled products in "presence of empty sac without any demonstrable foetus". With the advent of SONAR it is possible to diagnose blighted ovum, while still it is inutero. This anembroyonic gestation is the most frequent cause of Spontaneous abortion. "It is after all natures method of rejecting the failed pregnancy".[5]

Ultrasonic criteria for diagnosis of blighted ovum Ian Donald was the first person to describe ultrasonographic picture of blighted ovum which was later confirmed by many author.

1. LOSS OF DEFINITION OF THE GESTATIONAL SAC:

This includes poor definition or actual fragmentation of the gestational sac within the first few weeks of pregnancy. A break in the contour of the sac with preservation of the remainder of the ring is also significant.

2. ABSENCE OF FOETAL ECHOES:

In a normal pregnancy from eight weeks amenorrhoea onwards or in a gestational sac with a volume of 2.5 ml or more, foetal echoes should be seen within the gestational sac. Absence suggests a blighted ovum.

3. SMALL FOR DATES GESTATIONAL SAC:

A sac which is much smaller than the period of amenorrhoea is suspect and should be examined a week later.

4. FAILURE OF GROWTH:

In the early weeks of normal pregnancy growth is rapid and failure of growth over a period of 1 -2 weeks is very significant. If a sac of less than 2 ml volume or 3 cms diameter is seen at first examination, the failure of this gestational sac to increase by at least 75% over a period of one week is suspect. Occasionally shrinkage of gestational sac may be seen on second examination.

5. LOW POSITION OF THE SAC:

A low position of the sac may not itself be diagnostic of blighted ovum but when it is combined with an open cervix may indicate that abortion is impending.

6. FAILURE TO LOCATE THE FOETAL POLE:

Failure to locate the foetal pole when the sac is more than 15 mm diameter is associated with blighted ovum in 50% of the cases and after 30 mm in 100%.

ABORTIONS

The term abortion denotes the termination of pregnancy after the implantation of the trophoblast in the endometrium but before the foetus has attained viability whether it may be spontaneous or induced. Traditionally the foetus is considered viable once it has attained 28 weeks of gestation and or weighs over 1000 gms. In some western countries this has undergone modifications where foetus can be salvaged after 20 weeks of gestation or if it weighs more than 500 gms.

WHO - defines abortion as 'the expulsion of a fetus or an embryo weighing 500 gms or less (approximately 20-22 weeks of gestation) or otherwise products of gestation of any weight & specifically designated (E.g. hydatidiform mole) irrespective of gestational age and whether or not there is evidence of life".

The clinical features of abortion are pain abdomen due to uterine contractions, haemorrhage as a result of separation of ovum, dilatation of cervix due to uterine contractions and expulsion of part or entire ovum.

Generally patient gives history of amenorrhoea followed by more or less severe pain in the lower abdomen and back accompanied by vaginal bleeding. Haemorrhage continues for variable periods. Pain may be severe, but is never so great as in cases of ruptured ectopic gestation.

Clinically when the cervix is closed the diagnosis of threatened abortion is made, if the cervix is open without passage of any products, the condition is referred to as an inevitable abortion and if the products are passed through the cervix it becomes incomplete or complete abortion.

A grossly enlarged uterus with passage of vesicles suggests the diagnosis of a hydatidiform mole and the detection of a tender adnexal mass raises the suspicion of ectopic pregnancy.

Several causative factors have been implicated in the aetiology of abortion and more than one may operate at a time. In practice, without special investigations it is not possible to ascribe a cause with any certainity in the majority of cases.

The principal causes in the first trimester includes congenital malformations of the fetus and chromosomal abnormalities (60% of cases). Hormonal disturbances like corpus luteal defect (CLD), maternal infections (TORCH group of infections) and immunological disturbances also play a major causative role. Ionizing radiation, drugs, chemicals and emotional shock are other factors to blame. However in more than one third of cases no cause could be elicited.[12,13]

THREATENED ABORTION:

It is a condition where no definite cause is identified for uterine bleeding in a normally developing pregnancy. Explanation put forth for bleeding during first trimester (especially in threatened abortion with normally developing pregnancy) is the concept of physiological bleeding of pregnancy. Approximately 20% of all women experience threatened abortion as shown in **Fig e**..[14,15,16]

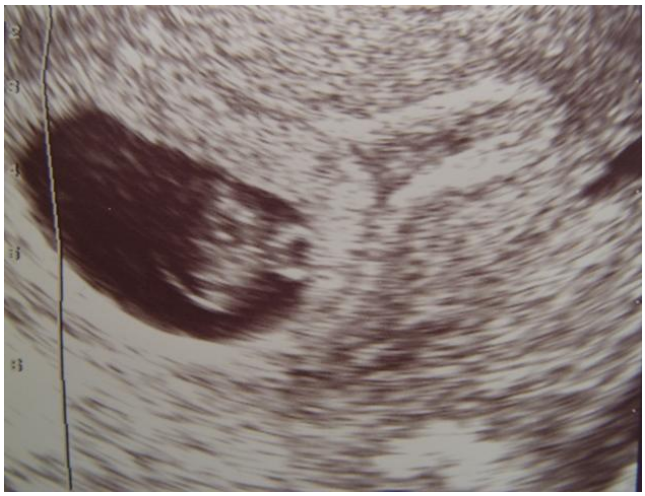


Fig e: Threatened Abortion

Causes of bleeding are:

* Erosion of endometrial blood vessels at the implantation site

* Stretching of the decidua capsularis with a physiological necrosis and necrobiosis.

* Transient dip in the progesterone secretion at the time of leuteoplacental shift.

Minor placental abruption which has tendency to be self limiting. Ultrasound plays a major role in evaluating women with threatened abortion because it can frequently distinguish living from non-living gestations. Various sonographic criteria have been put forward with regard to the reliability for predicting the outcome of threatened abortion.[15]

Each gestational sac was judged to be either normal or abnormal based on seven specific sonographic features, which are called as major and minor criteria. The criteria that demonstrated 100% specificity for predicting an abnormal outcome were termed major criteria. Those that demonstrated less than 100% specificity were termed minor criterias.

1. Major criteria was a large sac more than 25 mm sac diameter that lacked an embryo

2. The second major criteria was a grossly distorted sac shape.

Five minor criteria are used to identify abnormal gestations. Four are related to the appearance of the choriodecidual reaction.

- Thin choriodecidual reaction.
- Weak choriodecidual reaction (<than 2 mm in thickness)
- Weak choriodecidual amplitude
- Irregular contour (for sacs greater than 10 mm)
- Fifth minor criteria being abnormal position.

Each of the criteria was highly specific (95-99%) being and had positive predictive value of (94-98%). Most women who carry a living embryo do not have an apparent cause for their vaginal bleeding. Occasionally however, there is sonographic evidence of placental abruption. Recent evidence suggests that this may be a more common cause of threatened abortion during the first trimester. When the sonographic examination demonstrates gestational sac, but an embryo is lacking, it is more difficult to assess gestational viability, If the gestational sac appears normal (between 5-7 menstrual weeks) early normal pregnancy is likely. The prognosis is not as favorable as with a living embryo. These patients should be followed with serial ultrasound examinations to ascertain whether or not a living embryo develops. Lack of growth or decrease in size confirms non viable pregnancy. [17]

The final sonographic appearance in patients with threatened abortion is an empty uterus without gestational sac. This finding may be observed during the first 5 weeks of normal pregnancy. However if a pregnant women comes with vaginal bleeding, this appearance should suggest a recent abortion, ectopic pregnancy. In this situation, clinical and laboratory correlation with repeat ultrasound is essential for distinguishing the various diagnostic possibilities. Serial HCG determinations are useful because in normal pregnancy HCG level increases exponentially during the first 8 weeks. In comparison, patients with a recent abortion demonstrate a steady decline in HCG levels, while patients with an ectopic pregnancy usually demonstrate a plateau or subnormal rise in quantitative levels. [18]

If the initial ultrasound examination demonstrates a healthy gestational sac, a measurable crown rump length with a definite foetal heart motion, normal fetus to sac ratio and a normal placental implantation, the prognosis for achieving a term pregnancy is very good.

Treatment of threatened abortion logically includes bed rest & mild sedation, use of hormonal preparation is not advocated unless there is unequivocal indication. E.g. Progestational drugs in luteal function defects.

Even though threatened abortion may be a successful pregnancy, the pregnancy carries greater risk than normal for premature labour, IUGR, IUD and APH. If CRL is smaller than expected from their menstrual age, it is called early foetal growth delay.[19]

Retrospective studies demonstrated an increased incidence of learning disabilities, mental retardation and epilepsy in children with patients who had maternal bleeding in pregnancy.[19]

Subchorionic haemorrage in first trimester is associated with poor pregnancy outcome. (20,21)

INEVITABLE ABORTION

This term denotes that the ovum has practically separated from the uterine wall and is therefore dead and bound to be expelled, In such cases the pain is more severe, bleeding more profuse and the cervix is dilated. The term inevitable abortion implies that the changes are irreversible and that any attempt to continue pregnancy is useless.

At times the sac will be seen in the lower uterine segment and cervical dilatation may be demonstrable on scan. (2,3)

INCOMPLETE ABORTION:

When the entire products of conception are not expelled instead, a part of it is left inside the uterine cavity it is called incomplete abortion as shown in **Fig f**.

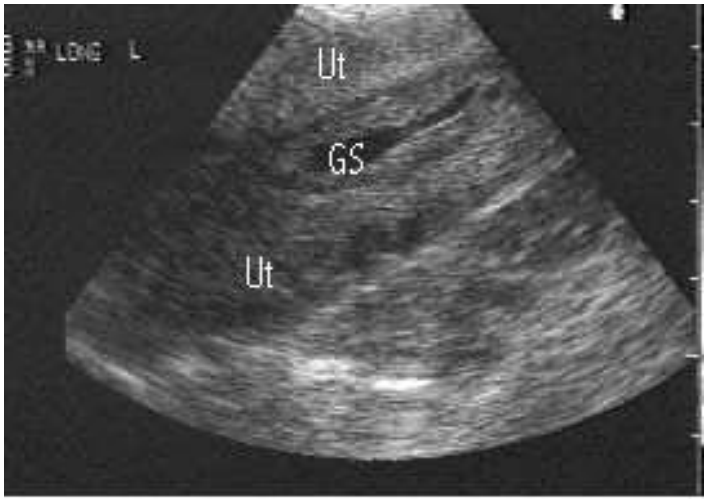


Fig f: Incomplete Abortion

If a part of the product is expelled and a part is retained in the Uterus bleeding ensures sooner or later, to produce the main sign of incomplete abortion. Bleeding is often profuse and may occasionally massive to the point of producing profound hypovolemia. if the placenta is Partly attached and partly separated the splint like action of the attached portion of the placenta interferes myometrial contraction.

Ultrasound is extremely helpful in the diagnosis of incomplete abortion. Retained products of conception are always seen along the line of uterine cavity. Although organized blood clot may occasionally produce echoes suggestive of retained placental tissue. [2,3]

COMPLETE ABORTION:

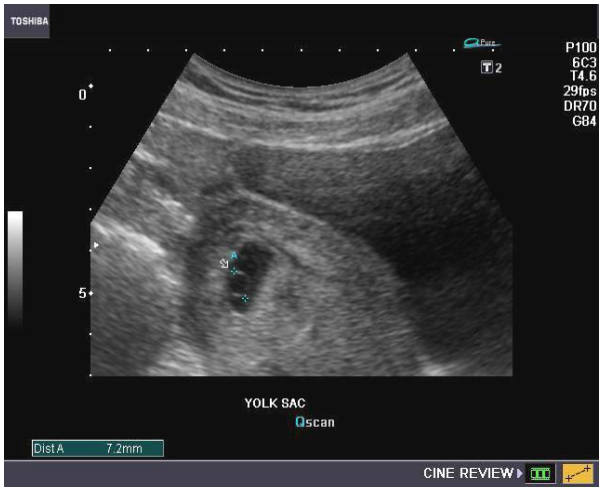
Abortion is said to be complete, when all the products have been expelled from the uterine cavity and clinically bleeding and pain should have been abated. The uterus is empty and is accordingly smaller in size than the period of amenorrhoea would suggest and the cervical canal may be closed as it contracts very rapidly after complete expulsion of the uterine contents.

Ultrasonography shows, thin regular line of echoes along the middle uterus in incomplete abortion. Alternatively, if no echoes are visible within the uterus can be reliably assumed that there is no retained products of conception.[2,3]

MISSED ABORTION:

Retention of products in the uterus for 4 weeks or longer after the death of the foetus is termed Missed abortion as shown in **Fig g**.

Fig g: Missed Abortion



In the beginning the patient has the signs and symptoms of normal pregnancy. This is followed by slight vaginal bleeding which may soon clear up temporarily and

amenorrhoea continues. There is however no continued enlargement of the breast, no enlargement of the abdomen and the Symptoms of pregnancy gradually subside. Bimanual examination will reveal that the uterus though enlarged never corresponds to the period of amenorrhoea, and is smaller. The cervical softening does not persists, and the uterus itself does not have the soft feel of the normal pregnancy, Pregnancy test in the early stages of missed abortion may be positive for variable period due to presence of viable trophoblast even though the foetus is dead. Products are usually expelled spontaneously after 4-6 weeks of fetal death. [22]

The haemorrhage that has occurred in the uterus may form a clot around the dead ovum and changes takes place subsequently in and around the ovum. In the early stages the clotted blood mole (**Bren's Mole**). Later when the blood clot becomes organized the whole uterine contents may be changed into a dark red or brownish shaggy mass known as **Carneous Mole.**

The sonographic diagnosis can be made much earlier and with more certainty. Because of early diagnosis delay in treatment and its attendant complications can be avoided. The basis requirement for an ultrasonic diagnosis of missed abortion is that, there is no evidence of fetal life such as heart or fetal movement at a time when there should be such signs of life. Ultrasonographic findings vary depending upon the gestational age at which the diagnosis is made. Other sonographic findings seen with a missed abortion depend on the time interval between the embryonic demise and sonographic examination. [22]

The presence of fetus with a crown rump length of 10 mm or more without foetal heart motion is diagnostic of a missed abortion. [22] The uterine size is usually smaller than

expected of menstrual date. In addition, the amniotic fluid volume may be diminished. In larger fetus (10-13 weeks size) the skull appear collapsed. If an early fetus has been dead some time the fetus and placenta may not be distinguishable.

In this case, a scan will demonstrate an ill defined collection of echoes within the uterine cavity. At time the fetus may not be distinguishable at all and differentiation from molar pregnancy or degenerated myoma may be difficult or impossible.

GESTATIONAL TROPOBLASTIC DISEASE (GTD):

Hydatidiform Mole was described by Hippocrates but it was not until 1827 that Boisin realized that it was derived from chorion. Marchand first described its origin from trophoblast in 1985. The available evidence suggests quite strongly that a hydatidiform Mole arises as a consequence of production of a defective ovum.

The term gestational trophoblastic diseases includes.

1. Hydatidiform Mole
2. Invasive Mole
3. Chorio carcinoma.

They are characterized by secretion of large quantity of human chorionic gonadotrophin (HCG) which is unique tumor markers. It is known that human chorionic gonadotrophin is composed of alpha and beta subunits and that of alpha subunit is homologous with other glycoprotein hormones like TSH, FSH and LH. The beta sub-unit do differ but have considerable homology in aminoacid sequence. Beta HCG assay is used in the diagnosis and follow up of trophoblastic disease.

VESICULAR MOLE

COMPLETE MOLE:

Complete mole is an abnormal conceptus without an embryo or foetus, amniotic membrane or cord is characterized by loss of villous vascularity, leading to hydrophic degeneration and pronounced cytotrophoblastic and syncytiotrophoblastic hyperplasia and dysplasia.

Cytogenetically complete mole contain a diploid complement of exclusively paternally derived chromosomes. The 46 XX karyo-type comes about through the fertilization of an empty egg by a haploid sperm (23X) that duplicates itself to give a 46, XX compliment. The occasional rare complete Mole with 46, XY Karyotype arises by fertilization of an empty egg by two spermatozoa (dispermy) one containing 23 X and other 23 Y chromosomal set. Moles with 46, YY complement are never seen because at least one chromosome is required for cell survival.

PARTIAL MOLE:

It is an abnormal conceptus with persistent embryonic or foetal elements and placenta with a mosaic or normal appearance of villous with areas of focal villous swelling and trophoblastic hyperplasia. Chromosomal analysis of partial Mole reveals triploid karyotype i.e., they posses 69 chromosomes instead of normal 46. This can occur as a result of fertilization of ovum by a sperm carrying the total paternal load of 46 XY (Meosis-1 failure) or by dispermy i.e. fertilization of ovum by two independent sperms. Dysgenic triploidy can occur occasionally but they are usually non molar. This

distribution between partial and complete mole is more than academic as the complete mole has the potential of developing choriocarcinoma.

INVASIVE MOLE:

It is an hydatidiform mole that has invaded the Myometium.

CLINICAL FEATURES:

The symptom in molar pregnancy appears by 6 - 12 weeks of gestation. The symptoms are uterine bleeding, brownish discharge, undue enlargement of uterus although it may be normal in size for and at times small for dates. The passage of vesicles per vaginum is diagnostic of molar pregnancy. Choriocarcinoma if develops after molar gestation cause widespread metastasis and is rapidly fatal, unless treated with appropriate chemotherapy.

Before the availability of ultrasound, measurement of HCG in urine or blood was used as an adjuvant to clinical assessment. Ultrasound makes us a ready diagnosis in majority of cases. In difficult cases however combined use of Beta HCG estimation and ultrasound clears the doubt.

ULTRASOUND FINDINGS IN MOLAR GESTATION:

Ultrasonic findings vary depending on whether there is a partial mole or complete mole as shown in **Fig h**. In any case special care should be taken to evaluate the ovaries for the presence of theca leutin cysts, which are present in about 0nethird of molar pregnancies. Presence of theca leutin cysts increases the likelihood that patient has molar pregnancy. It also increases the chances of patient requiring chemotherapy for cure. [5]

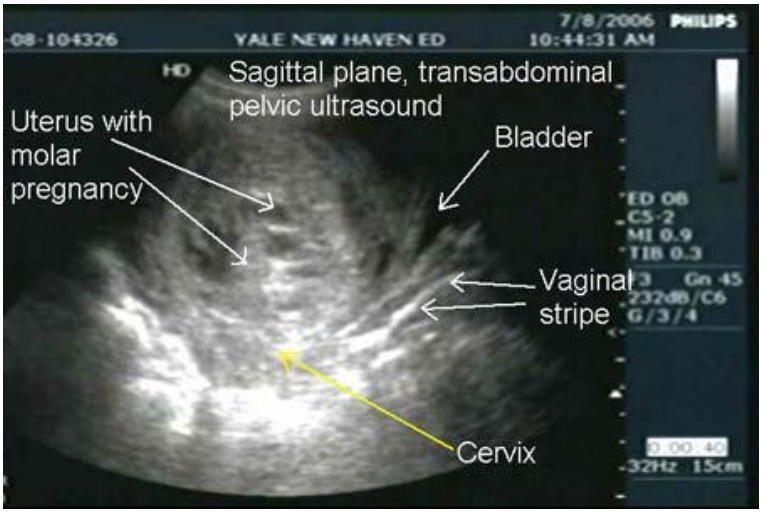


Fig h: Molar Pregnancy

Ultrasound is the most reliable and rapid method of diagnosing hydatidiform Mole. The classic ultrasonic appearance of molar pregnancy is that of a snow storm or snow flake appearance at high gain setting. At low sensitivity the fine speckled echo pattern disappears. The posterior uterine wall however remains clearly visible because of the sonoluscent nature of the fluid filled molar vesicles, which vary in size from 0.5 to 5 mm in diameters. If the vesicles are small the image will resemble a homogeneous "SNOW STORM" pattern within the uterus, Ultrasonic features will not be so distinctive if there is bleeding or collection of blood clots in the uterine cavity.

There are no distinguishing features if the mole is an invasive mole or if choriocarcinoma develops from preceding molar gestation. It is not generally possible to differentiate a complete mole from a partial mole on the basis of scan. Vesicle size in partial mole is usually small producing the more uniform "SNOW STORM APPEARANCE". [23]

The findings on sonography while usually distinctive may occasionally be produced by other conditions. A missed abortion with hydrophic changes may be indistinguishable from molar pregnancy. A leiomyoma. that has undergone degeneration may also produce similar ultrasonic findings. In myoma presence of some dense areas and lack of tiny cystic structures, together with the presence of characteristic whorle like appearance of myomas, should aid in the diagnosis. In addition posterior wall enhancement seem in moles is not observed. Certain ovarian tumors like disgerminoma, fibromas may at times be confused with hydatidiform mole. [5,23]

Donald and **Brown** (1961) were the first to diagnose mole by ultrasound. The classical ultrasonographic features described above are found only in two third of patients, quantitative beta HCG may help in diagnosis of difficult cases .

Once a diagnosis of molar gestation is made, immediate evacuation of the uterus in a least traumatic manner is indicated. Suction evacuation is the procedure of choice. Very rarely hysterectomy may be needed. However the most important aspect in molar gestation is follow up of patients after evacuation, as they have high potential for developing choriocarcinoma. Along with clinical assessment serial Beta HCG estimation is the most reliable method of early detection of the development of **post molar trophoblastic disease** (**PMTD**). With early detection and adequate chemotherapy a cure can be assured for more than 95% of cases with choriocarcinoma. [5,23]

ECTOPIC PREGNANCY

The term “ectopic pregnancy” refers to a gestation in which the fertilized ovum implants on any tissue other than the mucous membrane lining the uterine cavity. The majority (95%) are located in the fallopian tube. Less common sites are cervical canal, (cervical pregnancy), interstitial portion of the tube (interstitial pregnancy), ovary and abdominal cavity. The incidence of ectopic pregnancy is variable, average is 1 per 125 deliveries. There is a trend towards increase in incidence.

Patients with ectopic pregnancy presents with symptoms of pain abdomen, fainting attacks and vaginal bleeding. Not all women gives history of amenorrhoea. Examination of the patients reveals findings depending on whether the patient is seen before or after rupture of ectopic gestation. Abdominal examination may reveal varying tenderness and guarding. Pelvic examination may reveal tender adenexal mass with cervical movements being tender. Blood may be aspirated on culdocentesis if the gestation is ruptured. There are many factors which makes the women to be at high for an ectopic pregnancy. The risk factors are, pregnancy following tubal surgery, ovulation induction, tubal sterilization failure and contraceptive failure due to IUCDs. Previous history of pelvic infection is an important factor.

ULTRASONIC FEATURES OF ECTOPIC PREGNANCY:

Use of ultrasound is not a very satisfactory way of diagnosing ectopic pregnancy. The definitive diagnosis is by demonstration of gestational sac and fetal cardiac motion besides a slightly enlarged empty uterus which contains a pseudo sac as shown in **Fig i**. This is possible in 5 - 10% of cases only .The greatest value of ultrasound in suspected ectopic pregnancy is in Ruling out” an intrauterine pregnancy. The risk of co-existent

intrauterine and extrauterine pregnancy has been quoted as 1 in 30,000. Hence visulaisation of intrauterine pregnancy on ultrasound makes the likelihood of ectopic pregnancy very low but still possible. [2,24]

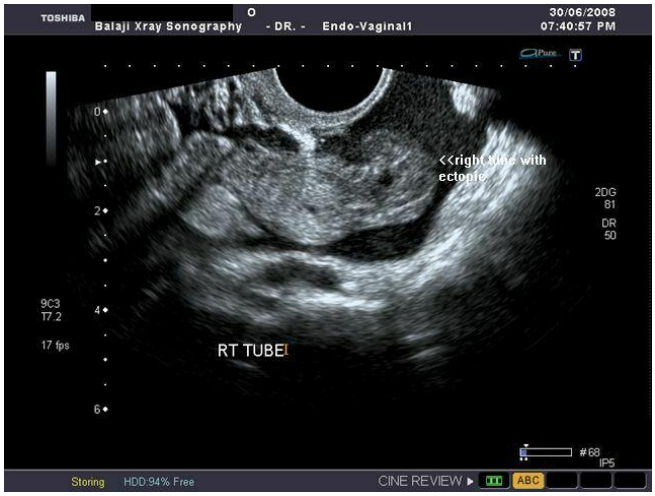


Fig i: Ectopic Pregnancy

In early gestation it is important to distinguish between pseudo gestational sac found in ectopic pregnancy from early gestation. Early gestation is usually located eccentrically with characteristic " Double ring" appearance produced by decidua capsularis and ducidua parietalis. Pseudo sac is centrally situated which lacks double sac appearance. On follow up examination (in a stable patients) a normal intrauterine pregnancy shows appreciable growth in 3-5 days.

Demonstration of large amount of fluid in the pouch of Douglas is also suspicious of ectopic pregnancy although same image may be found in ruptured corpus lutuem, leaking ovarian cyst, and in other intraabdominal haemorrhage.

Diagnostic accuracy can be markedly improved by combined use of serial quantitative beta HCG and real time ultrasonography. [24] The gestational sac should be identifiable

when the HCG level is approximately 6500 mIU/ml, which is usually 5-6 weeks from the last menstrual period. The absence of gestational sac when the HCG is over 6500 mIU / ml had a sensitivity of 100% and a specificity of 96%.

The doubling time (DT) for beta HCG in normal gestation ranged from 1.2 -3.2 days with a mean of 2.2 days. A doubling time (less than 66% increase of beta HCG in 48 hours) suggests an abnormal intrauterine pregnancy or ectopic gestation. [25,26]

Laparoscopy is an useful diagnostic tool which can confirm the diagnosis of unruptured ectopic pregnancy.Once the diagnosis of tubal ectopic pregnancy is made, management of patient includes supportive therapy of fluid, blood transfusion and immediate laparotomy & total salphingectomy of involved tube.

If preservation is the main concern, options are:

1. Surgical treatment: Salphingostomy through laparoscopy or laparotomy

2 Surgically administered Medical treatment (SAM) - administration of an abortificant into or around the ectopic pregnancy using endoscopic, radiological or sonographical techniques.

3. Medical treatment i.e. systemic administration of a cytotoxic agent.

4. Expectant Management i.e. observation and monitoring until the ectopic pregnancy resolves.

5.The diagnosis of cervical and interstitial pregnancy by ultrasound is difficult.

IMPLANTATION BLEEDING:

In many cases of first trimester bleeding, pathologic condition responsible for symptoms cannot be identified. Possible alternatives for the phenomenon are the occurrence of implantation bleeding, or separation of edge of the chorion frondosum. Extra chorionic bleeding occurs when there is separation of the placenta from the decidua. [3]

Other local causes of bleeding like cervical erosion, chronic cervicitis, carcinoma cervix, ulcerated polyp were to be excluded.

REVIEW OF LITERATURE

Tuladhar AS, Tuladhar AG et.al (2009), in a prospective study " Role of ultrasound in early pregnancy in differentiating normal and abnormal pregnancies" included 304 patients with early pregnancy evaluated by USG. Of these 203(66.8%) were normal pregnancies, 32(10%) were missed abortions, 29(6.3%) were incomplete abortions, 14(4.6%) were complete abortions, 12(4%) were blighted ovums, 11(3.6%) were without sonographic evidence of pregnancy, 7(2.3%) were ectopic pregnancies and 6(1.9%) were molar pregnancies. Hence USG in early pregnancy gives a reliable and accurate differentiation between viable normal pregnancy and an abnormal or pathological pregnancy. [6]

Moschos E, Twickler DM (2008), used endometrial thickness determined by USG and other parameters including maternal age, EGA by LMP and serum Beta- HCG in predicting normal intrauterine pregnancy and pregnancy of unknown location in the setting of vaginal bleeding in the first trimester. They found that as endometrial thickness increased, the likelihood of normal pregnancy increased. For each millimeter increase in endometrial thickness, the odds increased by 27% likelihood of a normal intrauterine pregnancy. No normal pregnancy has an endometrial thickness < 8 mm. As other parameters mentioned above increased, the likelihood of normal intrauterine pregnancy decreased. [27]

Gezginc K, Goktolga U, Ergun A(2007) , in a review article "First Trimester Bleeding And Pain" mention that early pregnancy bleedings are observed in 20% pregnancies and vaginal bleeding is most common gynecology emergency. Doctors should take rapid

history and apply laboratory tests and ultrasonography is mainstay of investigation. 30% these patients develop miscarriage, 10-15% ectopic pregnancy and 0.25% hydatadiform mole. 50% of pregnancy related complications are more common in this period compared to other trimesters. Ultrasonography is one of the most important method in evaluation of early complications of pregnancy. [28]

Paspulati RM, Shweta B, Sheriff N(2004), in their article "Sonographic Evaluation Of First Trimester Bleeding" mention that vaginal bleeding occurs in 20-25% of first trimester pregnancies. The important causes of first trimester bleeding are inevitable abortion, ectopic pregnancy and gestational trophoblastic diseases. As the clinical assessment alone is unreliable, ultrasound evaluation is a established diagnostic tool in these patients. [29]

Jurkovic D, Ross JA, Nicolaides KH(1998) , conducted a study on 221 patients with abdominal pain and vaginal bleeding with USG detected missed abortion including visible and non visible embryo (blighted ovum). In women who had spontaneous miscarriage, it was considered to be incomplete if there was persistent vaginal bleeding and evidence of retained products of conception on USG. Otherwise miscarriage was considered complete. The mean diameter of gestational sac and mean gestational age were both found to be significantly lower in the complete miscarriage group as compared to incomplete miscarriage group. Hence USG is widely used in evaluating missed abortions. [22]

Ralph S, Freedman, Guillermo TL et. al.(1996), in their article "Gestational Trophoblastic Disease" mention that the most common presenting symptom of a

hydatitiform mole is vaginal bleeding and is usually detected by ultrasound. Hence in women with previous history of hydatidiform mole and in those above 40 years age, use of ultrasound in first trimester pregnancy can help in early detection of hydatidiform mole and initiate definitive treatment. [23]

Daya, Salim(1993), Conducted studies which show that gestational age can be accurately calculated by measuring crown–rump length by up to 3 scans in the first trimester which will allow assessment of fetal growth which is useful understanding the problem of recurrent pregnancy loss. [30]

Isabel S, Campbell S, Grudzinskas JG(1987), Conducted ultrasonic examination to assess the complication during first trimester of pregnancy in 624 patients who presented vaginal bleeding with or without abdominal pain. In 466 women ultrasound examination correctly identified the underlining cause of vaginal bleeding. 60(12.5%) patients had ectopic pregnancy. In 179 patients the pregnancy was either electively terminated or went for inevitable, complete, incomplete or missed abortions because of various conditions like low lying placenta, an embryonic pregnancy, crumpled fetus with no fetal heart sounds, hydatidiform mole etc. in 227 cases normal progress was there beyond 20 weeks. Since ultrasound examination can reliably distinguish between most pregnancies with normal outcome and complication of early pregnancy, it should be considered the primary investigation for any women presenting with threatened miscarriage. [31]

.MATERIALS AND METHODS

SOURCE OF DATA:

All pregnant women ≤12 weeks of pregnancy with bleeding PV attending Dept of OBG of Shri. B. M. Patil Medical College, Hospital And Research Centre, Bijapur.

It is a prospective randomized case control study commencing from October 2008 to October 2010.

SAMPLE SIZE:

At 95% confidence limit with 30% allowable error and incidence of 20% of first trimester bleeding, the calculated sample size is 128 using statistical formula $\mathbf{n = 4\,pq / L^2}$

Statistical analysis:

1. Diagrammatic representation.
2. Mean +/_ standard deviation
3. Suitable statistical tests like x^2 or Z test etc.

Research hypothesis:

Ultrasound examination is safe, non invasive, easily available, cost effective and can be used as a preliminary investigation in diagnosing first trimester bleeding.

SELECTION CRITERIA:

INCLUSION CRITERIA:

All patients ≤12 weeks of pregnancy with bleeding PV attending Dept of OBG of Shri. B. M. Patil Medical College, Hospital And Research Centre, Bijapur.

EXCLUSION CRITERIA:

- Pregnancy ≥13 weeks of GA
- Delayed periods (pregnancy not confirmed by UPT test)
- Local cervical lesions
- Bleeding diathesis

METHOD OF COLLECTION OF DATA :

After taking into consideration the inclusion and exclusion criteria, patients were included into the study.

METHODS OF STUDY:

A detailed history of patients was taken. The risk factor for which the patient will be included in the study was noted. A thorough clinical examination including per-abdomen, per-speculum and vaginal examination was carried out to detect the size of uterus, condition of cervix and adnexal mass or tenderness and provisional clinical diagnosis was made. BP, pulse, presence of pallor / edema / icterus were also noted.

In all cases routine, relevant investigations like hemoglobin, blood grouping and Rh typing, VDRL, RVD, HbsAg, urine analysis were done. Gravindex test was done only if it was necessary.

All the patients were subjected to real time sonographic examination. All the data were recorded in a Proforma specifically made for this purpose and coding was done.

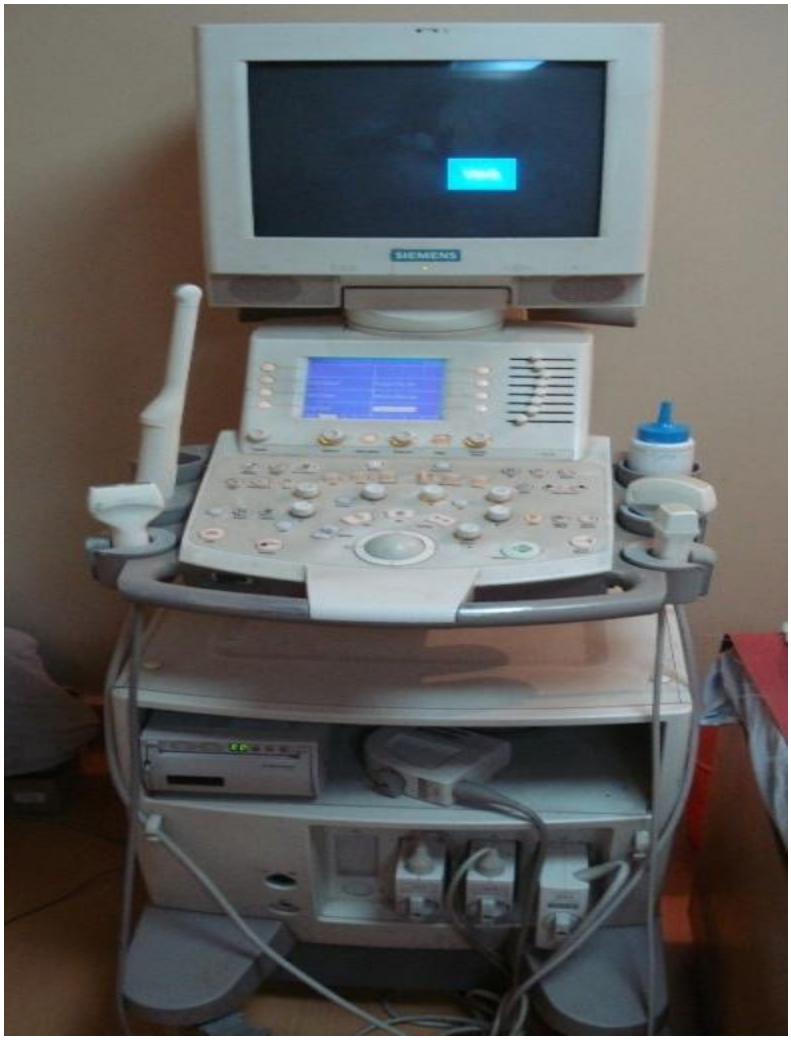
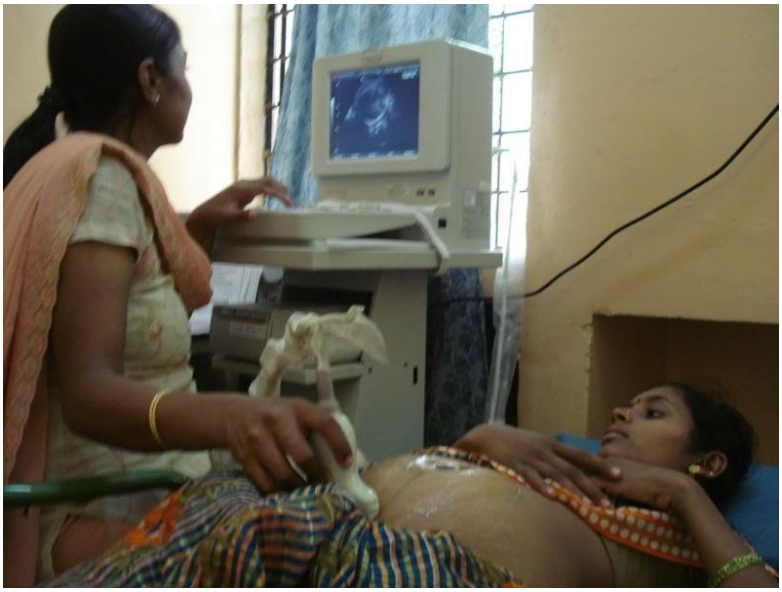


Fig j: Ultrasound Machine



The patient was examined with trans abdominal ultrasound with full bladder, with the patient in a supine position, a 3.5 mHz probe was placed in the suprapubic region and transverse and longitudinal view was obtained. Image was obtained in the midline and in both adnexa by sweeping laterally . The test was be repeated if there was improper visualization or Transvaginal ultrasound examination was done.

The following factors were studied by ultrasound scan.

1 Gestational sac, its size and shape

2 Presence or absence of fetal pole

3 CRL when fetal pole was present

4 Cardiac pulsations

5 Fetal movement

6 Fluids in the cul-de-sac

7 Any adnexal mass

Those who were reported as threatened abortion were followed up and those with pregnancy failure were managed accordingly.

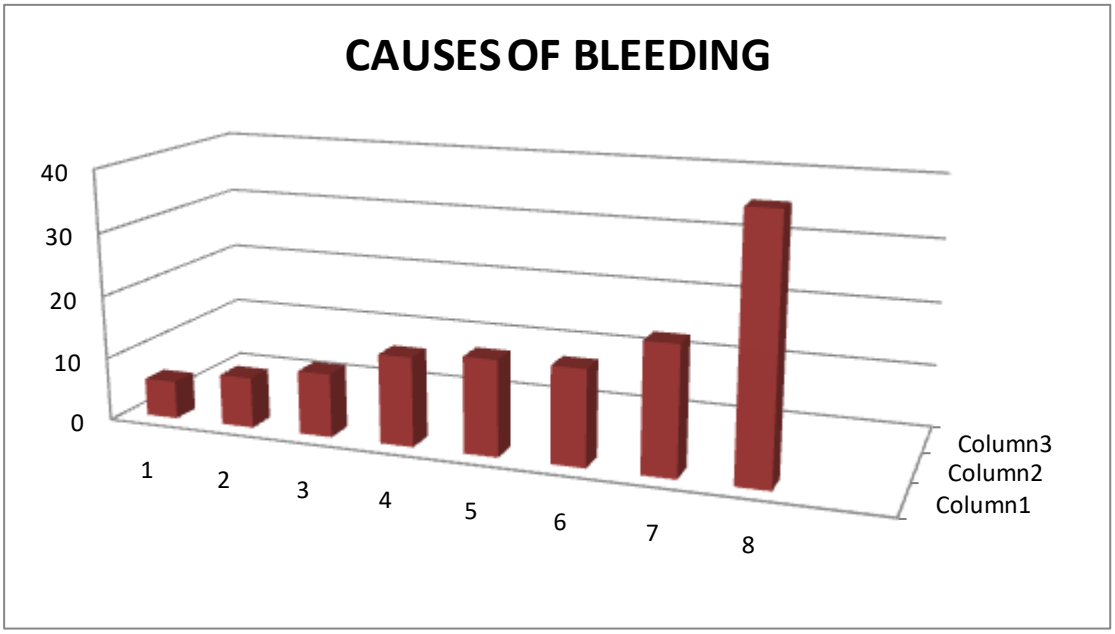
OBSERVATIONS

TABLE NO 1.

Out of the cases studied the following are the causes of bleeding in first trimester.

s.no	Causes of bleeding	No. of cases	Percentage
1	Threatened abortion	40	31.25
2	Complete abortion	20	15.62
3	Missed abortion	15	11.71
4	Incomplete abortion	15	11.71
5	Inevitable abortion	14	10.93
6	Blighted ovum	10	7.81
7	Ectopic pregnancy	8	6.25
8	Molar pregnancy	6	4.68

Out of 128 cases, there were 40 cases of threatened abortion giving a percentage of 31.25%. complete abortion was found in 15.62%. missed and incomplete abortion were found in 11.71% Inevitable abortion was found in 10.93% of the cases, blighted ovum in 7.81%, ectopic pregnancy in 6.25%, molar pregnancy in 4.68% of the cases.



1. Molar pregnancy -6
2. Ectopic pregnancy -8
3. Blighted ovum -10
4. Inevitable abortion -14
5. Incomplete abortion -15
6. Missed abortion -15
7. Complete abortion -20
8. Threatened abortion -40

TABLE NO 2.

AGE WISE DISTRIBUTION OF CASES

Age group	No. of cases	percentage
<20 years	10	7.82
21-25 years	50	39.06
26-30 years	48	37.5
>30 years	20	15.62
Total	128	100.00

Age wise distribution of patients shows 10(7.82%) <20 years of age group. 50(39.06%) were in 21-25 years age group, 48(37.5%) were between 26-30 years and 20(15.62%) were beyond 30 years of age group. The maximum incidence 39.06% was between 21-25 years is because of maximum number of pregnancies during this age group.

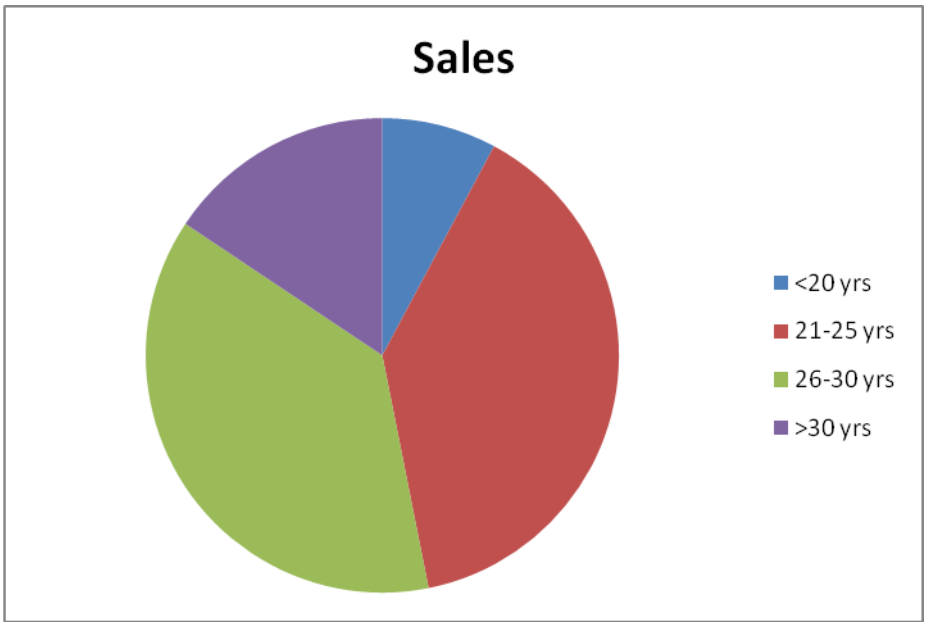


TABLE NO. 3

DISTRIBUTION OF PATIENTS ACCORDING TO GRAVIDITY

Gravida	No. of cases	Percentage
Primigravida	40	31.25
Gravida 2 & 3	70	54.69
Gravida 4 & above	18	14.06
Total	128	100.00

In the present study there were maximum number of gravid 2 and 3 i.e 70(54.69%) cases, there were 40 cases of primigravida giving a percentage of 31.25 and 18 cases were gravida 4 and above giving a percentage of 14.06.

TABLE NO. 4

DISTRIBUTION OF PATIENTS ACCORDING TO THE DURATION OF PREGNANCY

Duration of pregnancy	No. of cases	Percentage
Up to 8 weeks	50	39.06
8-10 weeks	48	37.51
More than 10 weeks	30	23.43
Total	128	100.00

In this study, there were maximum cases with history of pregnancy upto 8 weeks i.e 50 giving a percentage of 39.06. there were 48 cases with history of pregnancy from 8-10 weeks giving incidence of 37.5% and there were 30 cases with history of pregnancy more than 10 weeks giving the percentage of 23.43.

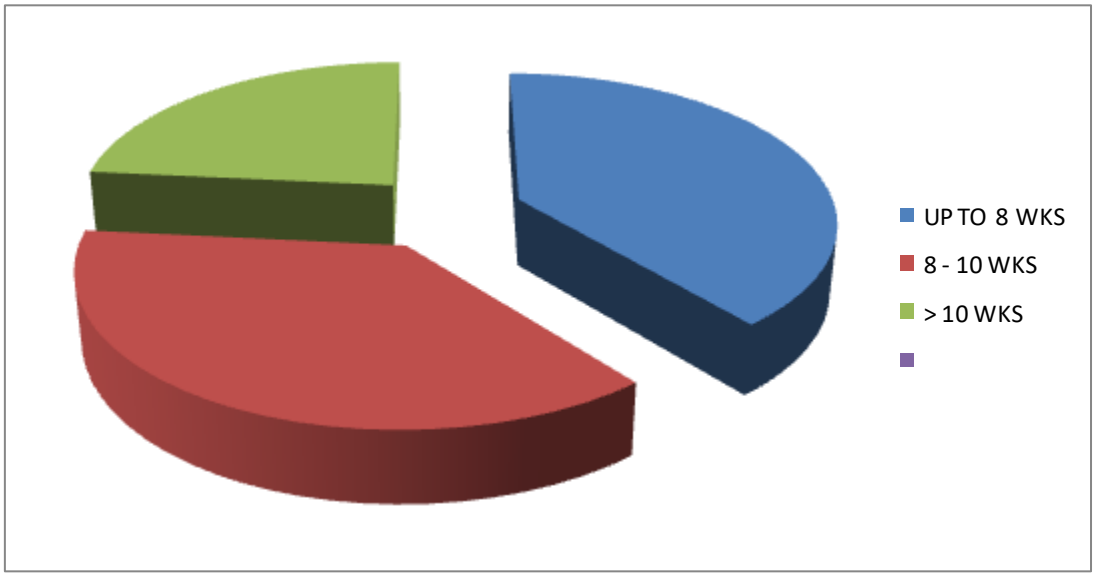


TABLE NO. 5

DURATION OF BLEEDING AND OUTCOME OF PREGNANCY

Duration of bleeding	Favorable outcome	Unfavorable outcome
< 2 days(88 cases)	18	70
2-4 days(30 cases)	3	27
>4 days(10 cases)	---	10

In the above table, outcome of pregnancy depending upon the duration of bleeding is analysed. Out of 88 cases, 18 had favorable outcome and 70 had unfavorable outcome. Out of 30 cases with 2-4 days of bleeding 3 case had favorable outcome and 27 cases had unfavorable, out of 10 cases with bleeding of more than 4 days duration, no case had favorable outcome.

TABLE NO. 6

MANAGEMENT OF PREGNANCY FOLLOWING ULTRASOUND DIAGNOSIS

Management	No. of cases	Percentage
Antenatal check up and repeat scan	33	27.27
Dilatation and currettage	54	44.62
Dilatation & Suction evacuation	6	4.96
Spontaneous complete abortion.	02	1.65
Discharge and Follow-up	15	12.41
Laparatomy for Ectopic gestation	8	6.61
MTP with Tubectomy	3	2.48

Out of 128 cases, 33 cases were followed up with regular antenatal check up in 40 cases of threatened abortion and 7 cases were lost for follow up. In 54 cases, dilation & currettage was done. Dilation and suction evacuation was done in 6 cases. In 5 cases of threatened abortion, 2 had spontaneous complete abortion and 3 underwent MTP with tubectomy, 8 cases of ectopic pregnancies underwent laprotomy.

TABLE NO. 7

SHOWS THE PERCENTAGE OF SYMPTOMS AND SIGNS OF PATIENTS

Symptoms & signs	No. of cases	Percentage
Vaginal bleeding	100	29.5
Abdominal pain	90	26.6
Amenorrhoea	128	37.8
Syncope	2	0.8%
Tenderness in the fornix	8	2.36
Mass in the fornix	6	1.77

Discrepancy in the figures is due to multiple symptoms in individual patient. Vaginal bleeding occurred in 29.5%, abdominal pain and amenorrhoea was observed in 26.6% and 37.8%. Other signs like syncope,tenderness in fornix and mass in the fornix was present in 0.8% , 2.36% and 2.77% of women.

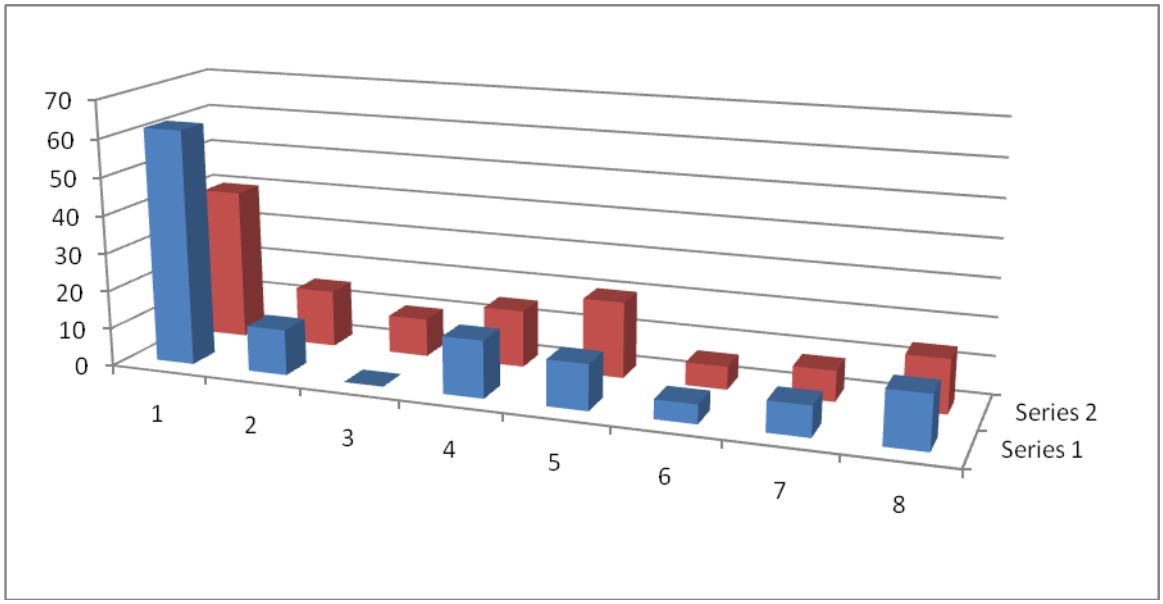
TABLE NO. 8

COMPARISON OF CLINICAL DIAGNOSIS & ULTRSOUND DIAGNOSIS

Category	Clinical diagnosis	Ultrasound diagnosis	Clinical fallacy
Threatened abortion	65	40	25(31.25%)
Missed abortion	12	17	5(12.5%)
Blighted ovum	0	10	10(7.81%)
Incomplete abortion	15	15	-
Complete abortion	12	20	8(15.625%)
Molar pregnancy	3	5	3(3.91%)
Ectopic pregnancy	7	7	-
Inevitable abortion	14	14	-

Discrepancy in total number is due to the occurrence of 2 symptoms in same patients.The diagnosis of threatened abortion was made in 65 cases but ultrasound confirmed it only in 40 cases, giving a fallacious diagnosis in 25 cases i.e., 31.25%. This is because all women coming with history of bleeding with size of the uterus corresponding to the period of gestation were diagnosed as threatened abortion. Clinically there was fallacious diagnosis of cases of missed abortion. None of the 10 cases of blighted ovum could be diagnosed clinically. Clinically there were 3 cases of molar pregnancy but, ultrasound confirmed in 5 cases and one case of molar pregnancy was misdiagnosed as missed abortion by ultrasound but, confirmed by HPR report. clinically and ultrsonographically only 7 cases of ectopic pregnancy were diagnosed, BUT ONE case of ectopic pregnancy was misdiagnosed as missed abortion, which was confirmed during laparotomy.

COMPARISION OF CLINICAL DIAGNOSIS AND ULTRASOUND DIAGNOSIS



Clinically proved **Ultrasound diagnosis**

S.no	Category
1	Threatened abortion
2	Missed abortion
3	Blighted ovum
4	Incomplete abortion
5	Complete abortion
6	Molar pregnancy
7	Ectopic pregnancy
8	Inevitable abortion

ROLE OF ULTRASOUND IN ACCURATE DIAGNOSIS OF FIRST TRIMESTER BLEEDING:

Ultrasound helped in accurately diagnosing the pregnancy complications. It was useful in making correct diagnosis in all cases.

THREATENED ABORTION:

Ultrasound contributed immensely to the diagnosis and prognosis of threatened abortion. The positive demonstration of cardiac motion in the early foetal pole, was the single most important indicator of favorable outcome of the pregnancy. The outcome in the ultrasonically diagnosed 40 cases of threatened abortion is given below.

TABLE NO. 9

OUT COME OF PREGNANCY IN THREATENED ABORTION

Pregnancy outcome	No. of cases	Percentage
Term delivery	21	63.64
Preterm delivery	7	21.21
Spontaneous abortion	2	6.06
MTP & tubectomy	3	9.09
Total	**33**	

Among 33 patients of threatened abortion, 28 patients continued their pregnancy beyond 28 weeks, had regular antenatal check up and repeat scan after 15 days and at term. Among these 21 patients delivered at term and 7 had preterm delivery. 4 cases had emergency LSCS for obstetric indications. 3 patients opted for MTP and tubal sterilization. 7 cases were lost for followup in 40 cases of threatened abortion.

This gives a term delivery rate of 63.64%. This figure could have been higher if 3 cases had not gone for MTP. There were 2 cases of spontaneous abortion 1 aborted immediately after ultrasound diagnosis and 1 mid trimester abortion.

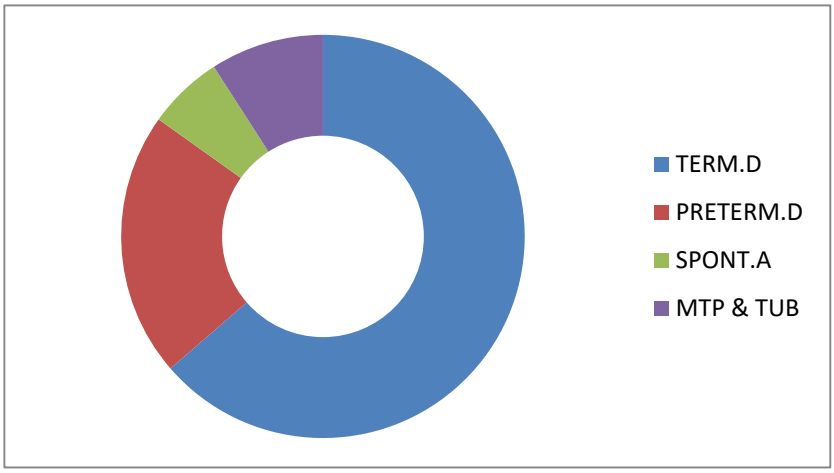


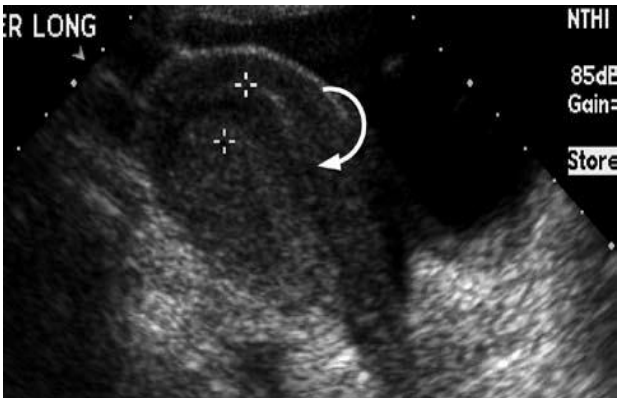
TABLE NO. 10

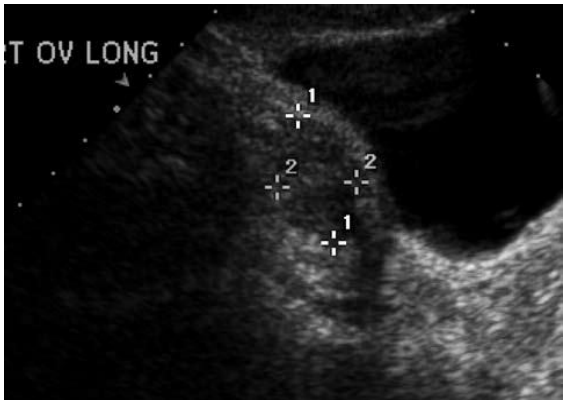
ANALYSIS OF PREGNANCY FAILURE

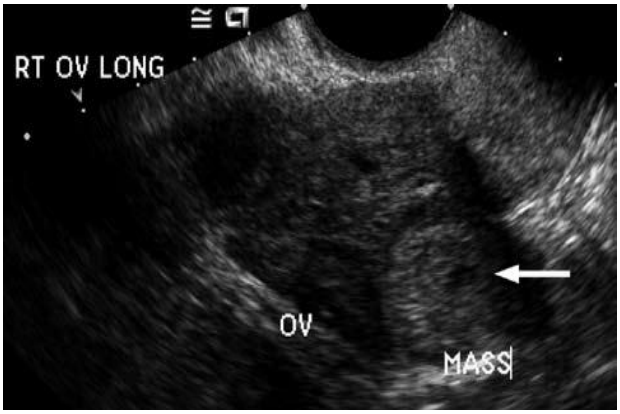
Type of pregnancy failure	No. of cases	Percentage
Blighted ovum	10	9.75
Missed abortion	15	16.13
Incomplete abortion	15	16.13
Complete abortion	20	21.55
Molar pregnancy	6	6.45
Ectopic pregnancy	8	8.60
Threatened abortion	2	2.55
Inevitable abortion	14	15.55
MTP & tubectomy	3	3.23
Total	93	

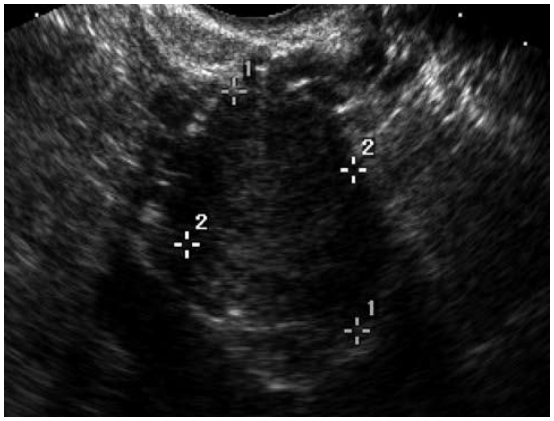
On analysis among the patients with diagnosis of pregnancy failure by ultrasound there were 10 cases of blighted ovum, 15 cases of missed abortion, 15 cases of incomplete abortion, 6 cases of molar pregnancy, 14 cases of inevitable abortion, 8 cases of ectopic pregnancy, In 5 cases of threatened abortion, 2 had spontaneous complete abortion and 3 underwent MTP with tubectomy. All cases were managed accordingly. In the present study pregnancy failure was found in 93 patients. 7 cases were lost for followup, 21 cases had fulterm delivary and 7 cases had pretern delivary.

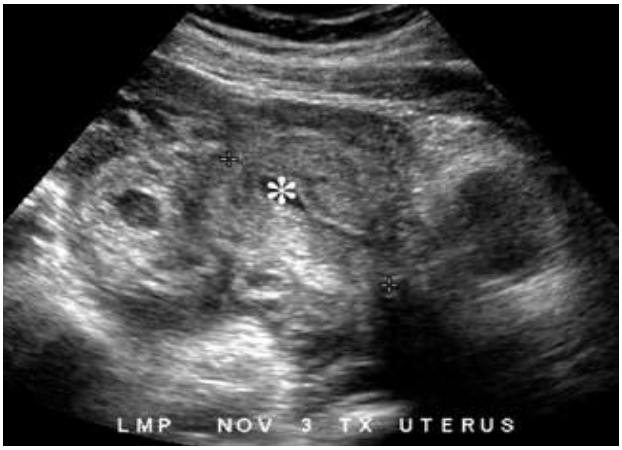
ECTOPIC PREGNANCY

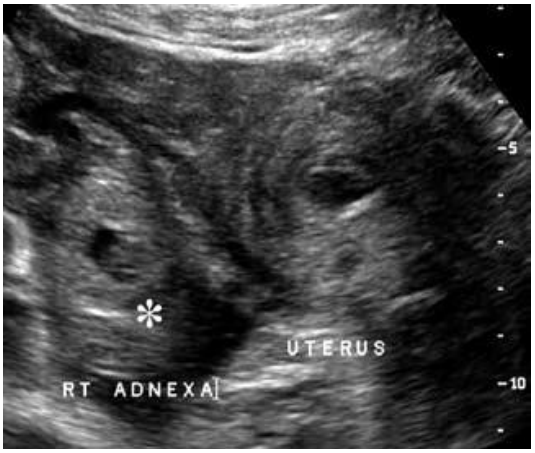


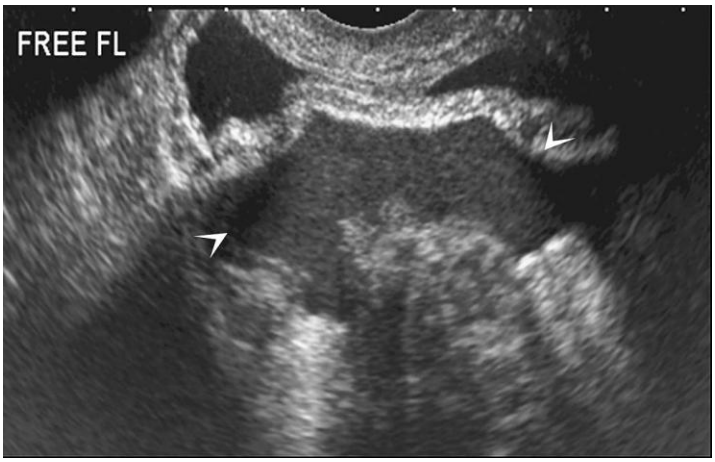




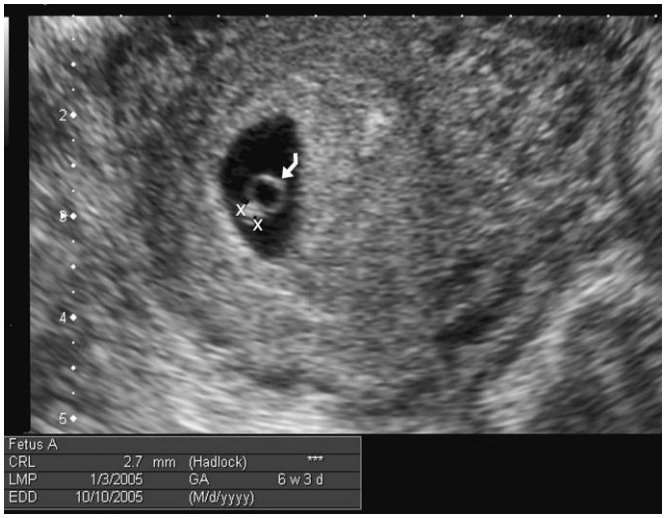




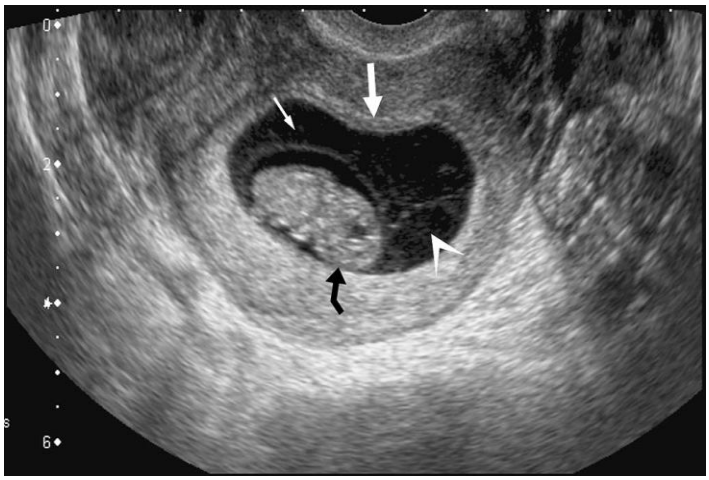




Ectopic pregnancy with cul-de-sac fluid



Normal 6-week gestation.).



Embryonic stage of intrauterine pregnancy.

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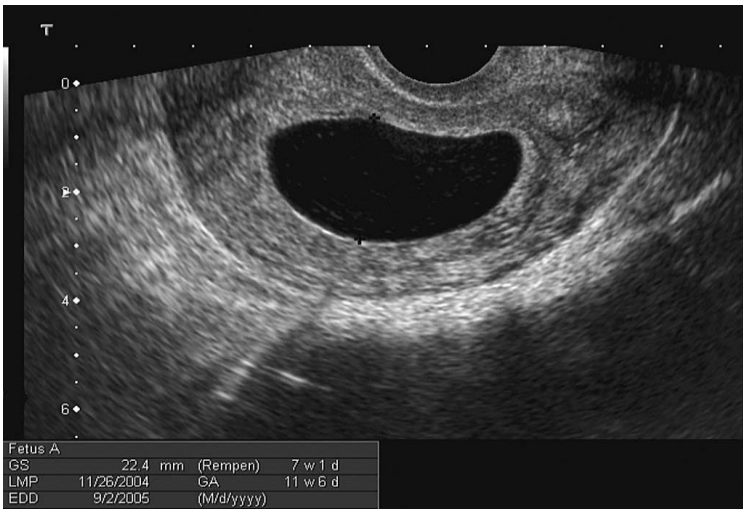
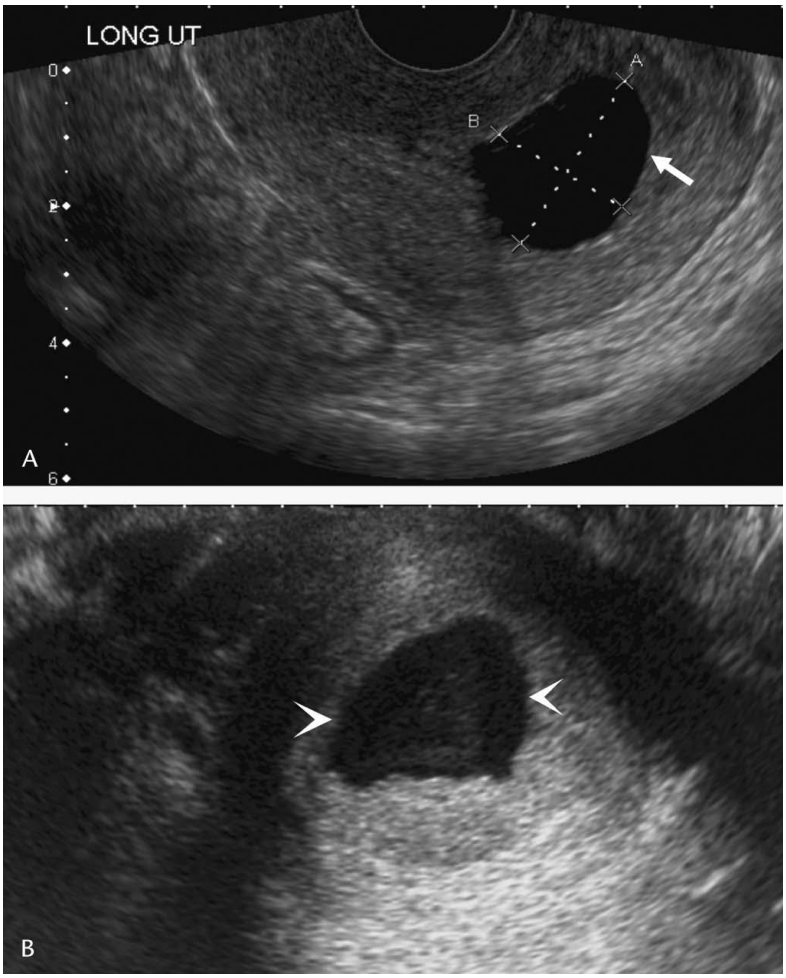
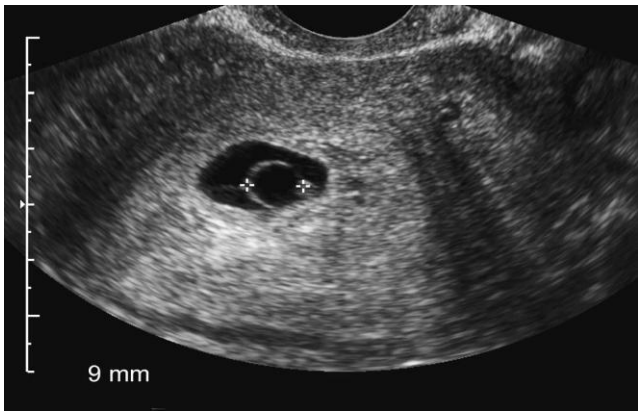


Anembryonic gestation.



Abnormal intrauterine gestational sac



Abnormally large yolk sac.

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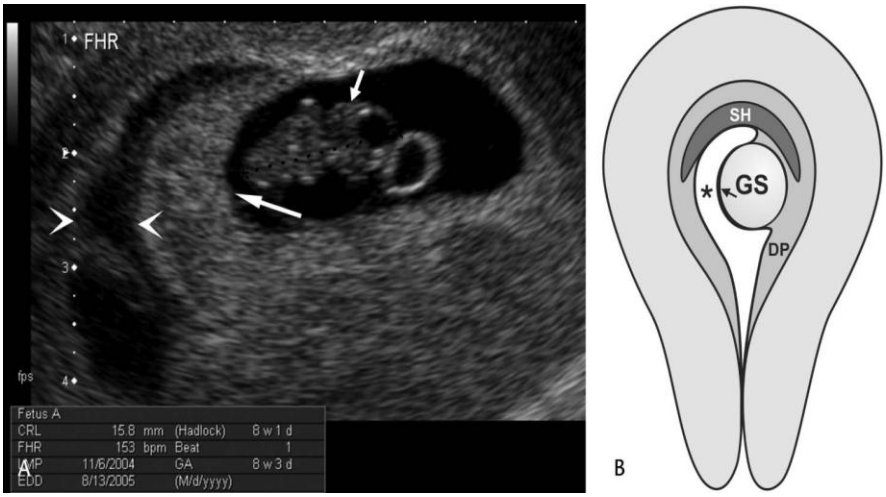
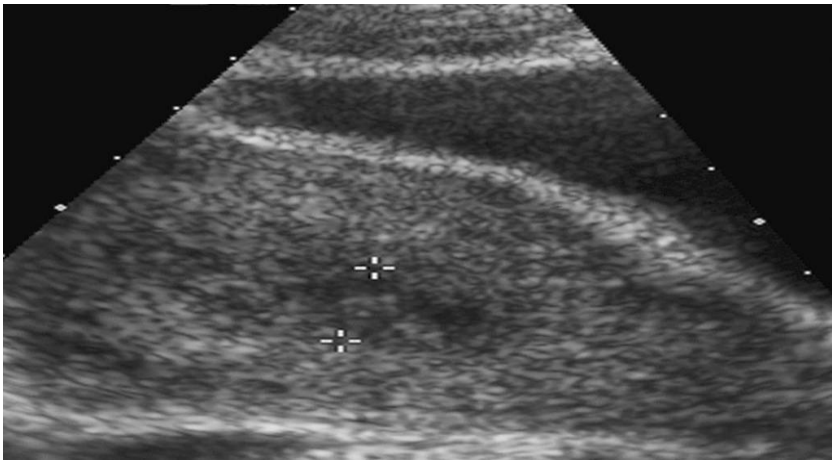
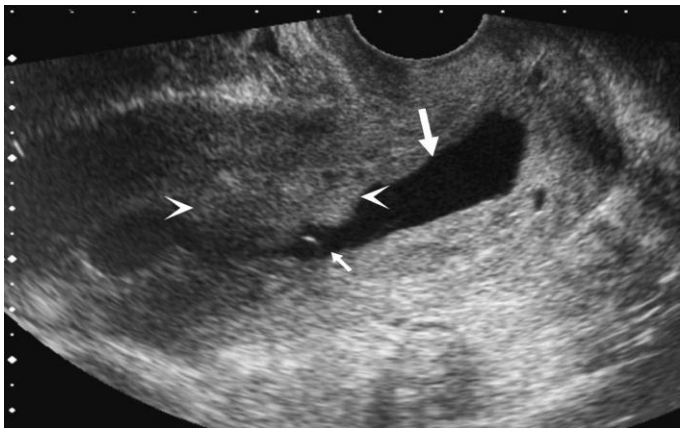


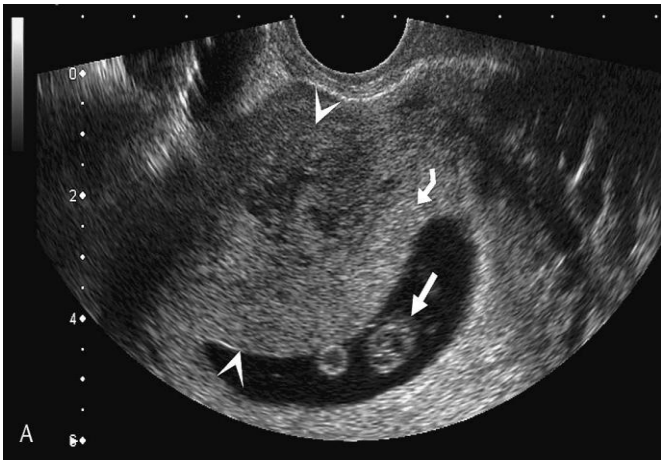
subchorionichemorrhage (TVUS)



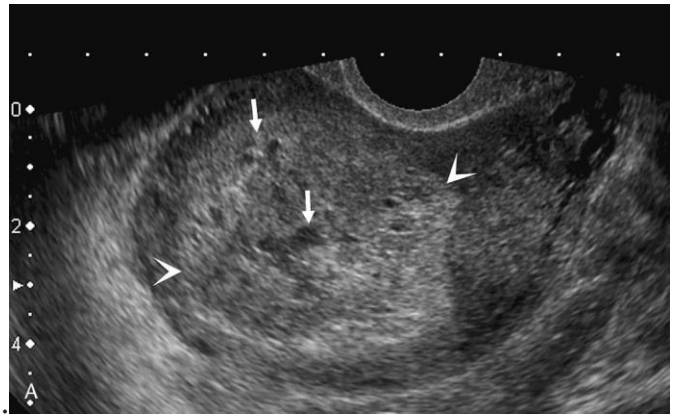
Pseudogestational sac. Sagittal TVUS



Abortion in progress. Sagittal TVUS



Partial mole.



DISCUSSION

Sonography is a safe and non invasive method of diagnosis in modern obstetrics. Bleeding in the first trimester is one of the most frequent complications in pregnancy. The clinical approach although helpful has its own limitation and we need additional information before one can take active measures. Besides the women who experience this complication can be informed of the probable outcome. For this the accuracy of diagnosis is done by ultrasound.

Clinically the differential diagnosis in this series of patients with bleeding per vagina was limited mainly to threatened abortion, ectopic pregnancy, missed abortion, incomplete abortion and gestational trophoblastic disease(GTD). It is impossible to diagnose blighted ovum clinically. Histopathological examination of the evacuated material was done only in doubtful cases. Early decision was made regarding the line of management depending on the scan findings. This avoided the unnecessary complication of delayed treatment. Ultrasonographically diagnosed series is discussed here.

In our study of 128 cases, 40 cases were threatened abortion, 20 cases were complete abortion, 15 cases were missed abortion, 15 cases were inomplete abortion, 14 cases were inevitable abortion, 3 cases were blighted ovun, 8 cases were ectopic pregnancy and 6 cases were molar pregnancy. In these 128 cases, 93 ended in pregnancy failure. In 40 cases of threatened abortion, 21 cases had full term normal delivery, 7 cases had pre term delivery, 2 cases had spontanious abortion, 3 cases underwent mtp with tubectomy and 7 cases lost follow up .

In this study the maximum incidence of abortion were noted between 21 to 25 years (39.06%). Abortion rate is also more in gravida 2 and 3(54.68%). Outcome was better if the bleeding was for less than two days and ultra sound was confirmatory in all except in two cases diagnosis was wrong. In few doubtful cases transvaginal sonography was done to confirm the diagnosis but , the findings were same.

The diagnosis by ultrasound wad done in all cases except in 2 cases, one is molar pregnancy which was diagnosed by HPR. Other one was ectopic pregnancy, diagnosed during laparotomy. The diagnostic accuracy of ultrasound in this study is 98.5%.

Kukard, Coetze, et al (1998) did the similar study in 300 patients i.e. "a comparison between ultrasonic and clinical diagnostic reliability in early pregnancy complications". In this study in 10% of the cases, there was difficulty in diagnosis but the ultrasound they were accurately diagnosed and the result was 100%. [32]

Lucie Morin, Michiel, et al (2005) studied on "ultrasound evaluation of first trimester pregnancy complications". They showed that spontaneous loss rate in the presence of subchorionic hematoma is approximately 9% and it is increased in pregnancy less than 8 weeks.[2]

Keith, Bernard , et al (1995)in his study of 35 patients showed that good trophoblastic reaction around the gestational sac is a very good prognostic sign for continued viability, a sac more than 2 cms in diameter without embryonic echoes is a poor prognostic sign. Diagnosis of blighted ovum can only be made by ultrasonography. [33]

M Khanam, Nahid Yusuf and co workers (2005) studied on outcome of threatened abortion in 100 cases over 1 year. In that 54 cases were discharged by taking conservative

treatment. Among the 46 cases of follow up data, 26 had normal pregnancy, 2 cases developed IUD, 4 cases had preterm labor, 12 cases had placenta previa and two cases developed IUGR. So, the conclusion of the study was first trimester vaginal bleeding is an independent risk factor for adverse obstetric out come and is directly proportional to the amount of bleeding. [34]

Michella, Williams et al (1991) in their study showed that adverse infant outcome were associated with first trimester vaginal bleeding. [19]

Tuladhar and co workers (2009) in their study showed that ultra sound in early pregnancy is a reliable and accurate to differentiate between normal pregnancy and an abnormal/ pathological pregnancy. [6]

Reem Hasan, Dona D and co workers (2009) studied that heavy bleeding in first trimester accompanied by pain, is associated with higher risk of miscarriage. Spotting and light episodes are not, especially if early i.e. only 1 to 2 days. [4]

S.Munim, N. Khowaja et al (2004) in their study, they performed usg by transabdominal route but in cases, where resolution was not clear they adopted trans vaginal route. [13]

This study showed that ultrasound is useful in primary care and emergency settings throughout pregnancy and ultra sound evaluation is the main stay of examination in patients with first trimester bleeding.

CONCLUSION

Ultrasound has been proved as an important diagnostic tool in obstetrics. In the present study it has played a very important role in the diagnosis of cause of first trimester bleeding. Ultrasound should be done in all patients with uterine bleeding in early pregnancy and it should be repeated in doubtful cases till a definite diagnosis is reached. This avoids prolonged maternal anxiety and unwanted hospital stay and there by cost. If the first examination reveals no cardiac activity or if the resolution of image is not clear, it is advisable to repeat the ultrasound after 2 weeks.

In first trimester bleeding, the history and clinical findings, which often misleading and if totally relied upon can lead to delay in diagnosis. Pulse echo ultrasound has been consistently shown by many authors to be safe, rapid and an extremely accurate aid for diagnosis and management of early pregnancy bleeding.

It can diagnose threatened abortion positively and thus gives a tremendous psychological boost to the patient. Missed abortion, blighted ovum and incomplete abortion are reliably diagnosed in most cases, long before the pregnancy test becomes negative, so that these patients can be treated without undue delay and thus emergency management may be avoided and hospital stay considerably reduced. Patient with complete abortions were accurately identified so that, unnecessary curettage was avoided with a consequent reduction in morbidity.

Ultrasound diagnosis helped in prompt institution of treatment in first trimester bleeding in a better manner before any complication could develop.

Hence, ultrasound is safe, non invasive, easily available, cost effective and gains prime priority compared to other investigations in diagnosing first trimester bleeding.

SUMMARY

In this prospective study, the value of ultrasound in the diagnosis of cause of vaginal bleeding in the first trimester of 128 women was assessed. Ultra sonogram enabled the diagnosis of threatened abortion, blighted ovum, missed abortion, retained products of conception, complete abortion, molar pregnancy and ectopic gestation. Ultrasound proved to be a better diagnostic tool in correctly diagnosing the cause of vaginal bleeding. Ultra sound was confirmatory in all, but in two cases diagnosis was wrong i.e. One case of ectopic pregnancy was diagnosed during laparotomy and the other case of molar pregnancy was misdiagnosed as threatened abortion and the diagnosis was confirmed after HPR report. Demonstration of fetal pole with cardiac pulsation was the most important prognostic feature for the continuation of pregnancy.

This study also showed that the outcome was better if the bleeding was for less than 2 days. Among these 128 cases, threatened abortion was the commonest cause for bleeding. This was observed in 40 cases, 21 cases had full term delivery. Out of these 21 cases, for 4 cases emergency LSCS was done for obstetric reasons. 7 cases had pre term vaginal delivery, 2 cases ended in spontaneous abortion and 3 cases underwent MTP with tubectomy.

There were 15 cases of missed abortion. There were no complications like disseminated intravascular coagulation in any of these patients. In 10 cases of blighted ovum, none of them were diagnosed clinically but ultra sound diagnosis was done accurately in all and confirmed by histopathology report. There were 8 cases of ectopic pregnancies, in that all cases were tubal abortion. Apart from vaginal bleeding, lower abdominal pain was the

commonest symptom in all patients. All of them under went ultrasound examination but 7 patients were diagnosed accurately, 1 patient was diagnosed during laparotomy.

There were 6 cases of vesicular mole 5 patients were diagnosed accurately by ultrasound but 1 patient was misdiagnosed as missed abortion and was confirmed by HPR report.

In the present study ultrasound helped to diagnose complete, incomplete abortion and inevitable abortion very accurately.

The accuracy of ultrasound in diagnosing the cause of bleeding per vagina in the first trimester is 98.5%. Hence sonar is the only imaging modality today, by which accurate assessment of first trimester bleeding can be done from diagnostic and prognostic point of view.

BIBLIOGRAPHY

LIST OF REFERANCES

1. Dr. Muhammad Ali, Dr. Mansoor Ahmad, Dr. Rashida Hafeez. Ultrasonography; its value in the management of first trimester vaginal bleeding. The professional, 2005; VOL:12 :118-124 .

2. Lucie Morin, MD, Montreal QC, Michiel C. Van den Hof, MD, Halifax NS. Ultrasound Evaluation of First Trimester Pregnancy Complications. Obstet gynecol J, 2005;27:581-585.

3. Nestor N. Demianczuk, MD, FRCSC, Edmonton AB , Michiel C.Van den Hof, MD, FRCSC, Halifax NS. The use of first trimester ultrasound. Obstet gynecol J, 2003;25:864-9.

4. Reem Hasan, Donna D. Baird, Amy H. Herring, Andrew F. Olshan, Michele L. Jonsson Funk, and Katherine E. Hartmann. Association between First-trimester vaginal bleeding and miscarriage. J ACOG, 2009;114:860-7.

5. Jaunlaux F, Nicolaides K H. Early ultrasound diagnosis and follow up of molar pregnancies. Ultrasound obstet gynecol, 1998; 11:367-77.

6. AS Tuladhar, A Giri Tuladhar,DB Karki, A Shrestha And S Pradhan. Role of ultrasound in early pregnancy in differentiating normal and abnormal pregnancies. Original Article Nepal Med Coll J 2009; 11(2): 127-129

7. Vikram Dogra, MD, Raj Mohan Paspulati, MD, and Shweta Bhatt, MD.First Trimester Bleeding Evaluation. Obstet gynecol J, 2005;21:69-85

8. E. JAUNIAUX, J. JOHNS and G. J. BURTON. The role of ultrasound imaging in diagnosing and investigating early pregnancy failure. Ultrasound Obstet Gynecol 2005; 25: 613–624.

9. Kurt T, Barnhart, MD, Ingrid Katz, Presumed diagnosis of ectopic pregnancy. Obstet gynecol, 2002; 100:505-10

10. Hugh P. Robinson. Detection of fetal heart movement in first trimester of pregnancy using pulsed ultrasound. British Medical Journal, 1999; 4: 466-468.

11. Christopher b everett elizabeth preece. Women with bleeding in the first 20 weeks of pregnancy: value of general practice ultrasound in detecting fetal heart movement. British Journal of General Practice, 1996; 46: 7-9.

12. Drysdale K, Ridley D, Walker K, et al. First trimister scaning as a screening tool for high risk and abnormal pregnancies. J OBSTET GYNECOL,2002;22:159-65.

13. S. Munim, N. Khowaja. Effectiveness of early pregnancy ultrasound in diagnosing fetal abnormalities high risk women. Department of Obstetrics and Gynaecology, The Aga Khan University Hospital, Karachi. JPMA, 2004;54:542-5.

14. F. Davari-Tanha, M. Shariat, M. Kaveh, M. Ebrahimi and S. Jalalvand. Threatened abortion: arisk factor for poor pregnancy out come. 2005;20:486-490.

15. Dittakarn Boriboonhirunsarn MD, MPH, PhD, Suwannee Buranawattanachoke MD. Ultrasonographic characteristics in patients clinically diagnosed with threatened abortion. J Med Assoc Thai 2007; 90 (11): 2266-70.

16. Margit Mantoni, MD. ultrasound signs in threatened abortion and their prognostic significance. Obstet gynecol,2000;65:471-75.

17. Heiner C Bucher, Johannes G Schmidt. Does routine ultrasound scanning improve outcome in pregnancy? Meta-analysis of various outcome measures. BMJ, 1993;307:13-7.

18. Heemann Bussmann, Emy Korn. Feasibility of an ultrasound service on district health care level in botswana. J international health,2001;12:1023-1031.

19. Michelle A, Williams. Adverse infant outcome associated with first trimester vaginal bleeding. Obstet Gynecol, 1991;14:78-82.

20. Bennett G I, Bromley B, Liebermane. Subchorionic hemorrhage in first trimester Pregnancies:prediction of pregnancy out come with sonography. Radiology,1996;200:803-6.

21. Steven R. Goldstein, Bala R. Subramanyam, B. Nagesh Raghavendra, Steven C.Horii, Susan Hilton. Subchorionic Bleeding in Threatened Abortion: Sonographic Findings and Significance. AJR,1983; 141:975-978,

22. Jurkovic D, Ross Ja, Nicolaides Kh. Expectant management of missed miscarriage. BR. J Obstet Gynecol.1998;105:670-671.

23. Ralph S, Freeman, Guillermo T L. et al. gestational trophoblastic disease. Obstet and gynecol clin N Am. 1996 ; 23 (2) : 545 -568.

24. Clarisa R. Gracia, Md, And Kurt T. Barnhart, Md, Msce .Diagnosing Ectopic Pregnancy:Decision Analysis Comparing Six Strategies. Obstet Gynecol 2001;97:463-70.

25. Amy Hummel, and Clarisa R. Gracia, MD. Diagnosis of Ectopic Pregnancy. 2002;100:423-26.

26. Bruce McLaren and Julia M Shelley. Reported management of early-pregnancy bleeding and miscarriage. MJA, 2002;176:63-66.

27. E. Moschos And D. M. Twickler. Endometrial thickness predicts intrauterine pregnancy in patients with pregnancy of unknown location. *Ultrasound Obstet Gynecol* 2008; 32: 929–934.

28. Gezginc K, Guktolgu, Ergun. First trimester bleeding and joint pain. Balkan military Medical review. 2007 ; 10 (2) :88 – 84.

29. Paspulati R M, Shweta B, Shrif N. Sonographic evaluation of first trimester bleeding Radio clinic N am.2004 ; 42 : 297 – 314.

30. Daya, Salim. Accuracy of gestational age estimated by means of fetal crown rumpLength measurement. AMJ Obstet Gynecol. 1998 ; 168 : 903 – 908.

31. Isabel S, Compbell S, Gruzins J G. Ultrsonic assessment of complication during first trimester of pregnancy : A prospective randomized case control study. The lancet 1998; 2 : 1237 – 1240.

32. R. F. P. KUKARD, M.COETZEE. A Comparison between Ultrasonic and Clinical Diagnostic Reliability in Early Pregnancy Complications. S. Afr. Med. J1998; 48, 2109.

33. Keith G. Bernard, Peter L. Cooperberg. Sonographic Differentiation between Blighted Ovum and Early Viable Pregnancy. AJR 1995;144:597-602.

34. M Khanam, Nahid Yusuf, Fatema Ashraf. Out Come of Threatened Abortion in aSeries of100 Cases in RMCH. TAJ, 2005; 18: 2.

CASE PROFORMA

Sonographic evaluation of first timister bleeding

Name :

Age :

Socio economic status :

Address :

DOA :

Presenting Complaints :

Obstetric History :

Married Life :

Score :

Details of previous pregnancy

History of contraception :

Menstrual History :

LMP:

EDD:

PMC:

Past History :

Family History :

Personal History:

General Physical Examination:

Built and Nourishment :

Height :

Weight :

Pallor :

Edema :

Systemic Examination:

CVS :

RS :

P/A :

P/V :

Provisional Diagnosis :

Investigation :

Hb% :

Blood grouping & Rh typing :

Urine routine :

UPT Tests :

RBS :

HBs Ag :

HIV :

Ultrasound report :

Definitive treatment:

SAMPLE OF INFORMED CONSENT FORM

BLDE UNIVERSITY, BIJAPUR

RESEARCH INFORMED CONSENT FORM

TITLE OF THE TOPIC: SONOGRPHIC EVALUATION OF FIRST TRIMESTER BLEEDING AND ITS OUTCOME.

PRINCIPLE INVESTIGATOR: **DR. SMITA PATIL**

PG GUIDE NAME: **DR. P.B.JAJU MD, DGO**

Professor in OBG

PURPOSE OF RESEARCH:-

I have been informed that this study is safe, non invasive, easily available, cost effective and is a preliminary investigation in diagnosing the causes for first trimester bleeding.

PROCEDURE:-

I understand that relevant history will be taken and I will undergo detailed clinical examination after which ultrasound will be done.

RISK AND DISCOMFORTS:-

I understand that I may have some discomfort but there is no major risk involved with ultrasound examination.

BENEFITS:-

I understand that my participation in this study will help the investigator to understand the need of USG in diagnosing the condition and help in the better management.

CONFIDENTIALITY

I understand that medical information produced by this study will become part of hospital records and will be subjected to confidently records and privacy regulation of BLDE university. Information of a sensitive personal nature will be a part of medical records, but will be stored in the investigator research file and identified only by code number; the code key connecting name to numbers will be kept in a separate secure location.

If the data are used for publication in the medical literature or for teaching purpose no names will be used and other identifiers such as photographs and audio or video tapes will be used only with my special written permission. I understand that I may see the photographs and video tapes and hear the audio tapes before giving this permission.

I understand that the revelant designated authority and industrial sponsor are permitted to have access to my medical records and to the data produced by the study for audit purpose . However they are required to maintain confidentiality.

Request for more information

I understand that I may ask more questions about the study at time and understand that I will be informed of any significant new finding discovered during the course of this study which which might influence my continued participation. If during the study or later I wish to discuss my participation or concerns regarding this study with a person not directly involved I am aware that the other staff member are available to talk with me.

The copy of this consent form will be given to me to keep for careful reading.

Refusal or withdrawal of participation

I understand that my participation is voluntary and that I may refuse to participate or withdraw consent and discontinue participation in the study if at any time she feels the need and explain me the reason to do so and help to arrange for my further appropriate treatment.

Injury statement

I understand that in the unlikely event or any injury due to my participation in the study will be reported promptly, then medical treatment will be available to me but no further compensation would be provided by the hospital. I understand that by my agreement to participate in this study I am not waiving any of my legal rights.

I confirm that the **DR SMITA PATIL** has explained to me the purpose of research, the study procedures that I will undergo and the possible risks and discomforts as well as benefits that I may experience. Alternatives to my participation in the study have also been discussed. I have read and understand this consent form. Therefore, I agree to give my consent to participate as a subject in this research project.

Participant:
date:

Guardian:
date:

I have explained to Mrs. _____ the purpose of the research, the procedure required and the possible risks and benefits to the best of ability.

Investigator :
date :

MASTER CHART KEY BOARD

1. Name of patient
2. IP/OP No.
3. Age in years.
4. Gravida. Para. Abortion.
5. Duration of Bleeding (days)
6. State of cervix
7. Size of uterus(weeks)
8. Clinical diagnosis
9. Gestational sac
10. Fet.Pole & CRL in mm
11. Card.motion & Fetal Movement
12. USG diagnosis
13. Final diagnosis
14. Pregnancy outcome & Treatment
15. Hospital stay in days

MASTER CHART

S.NO	1	2	3	4	5	6	7	8(Cd)	9	10	11	12(Ud)	13(Fd)	14	15
1	BHAGYASHREE	417	28	G1	1	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	T.D	3
2	RAJASHREE	858	22	G2P1L1	2	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	D&c	4
3	NEELAMMA	553	23	G3P2L2	3	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	T.D	3
4	KAVITA	11348	30	G3P1L1A1	2	Closed	6	M.A	+	Fp	+	Thr.A	Thr.A	P.T	2
5	MALLAMMA	1174	26	G2P1L1	4	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	T.D	2
6	ZANILA	8222	28	G1	3	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	T.D	2
7	SHIVAMMA	13475	25	G2P1L1	2	Closed	10	Thr.A	+	27	+	Thr.A	Thr.A	T.D	3
8	KIRTI	16995	29	G3P2L2	1	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	D&c	2
9	GURUDEVI	13932	28	G4P2L2A1	2	Closed	8	M.A	+	26	+	Thr.A	Thr.A	T.D	2
10	PRIYANKA	14868	24	G4P1L1A2	4	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	T.D	3
11	BANNAWWA	3795	29	G3P1L1A1	3	Open	12	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
12	LALITA	3871	28	G2P1L2	2	Open	6	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
13	SHILPA	2926	25	G1	4	Open	8	Inev.A	-	-	-	Inc.A	Inc.A	D &c	1
14	BASSAMMA	4121	20	G1	2	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	D&c	2
15	PREMA	17266	32	G5P2L2A2	3	Closed	10	Thr.A	+	27	+	Thr.A	Thr.A	M.T.P	2
16	KALABAI	137	26	G2P1L1	1	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	M.T.P	2
17	BHARATI	9311	24	G2P1L1	3	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	D&c	3
18	SUREKHA	2757	27	G2A1	2	Open	6	Com.A	-	-	-	Com.A	Com.A	-	1
19	SUJATHA	3708	34	G3P1L1A1	1	Open	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
20	SAIRABANU	15999	28	G1	5	Closed	10	Thr.A	+	-	+	M.A	M.A	D&C	1
21	BEJUM JHA	217	22	G1	2	Open	8	Ect.pg	-	-	+	Ect.pg	Ect.pg	LAP	5
22	REKHA	845	32	G3P1L1A1	3	Open	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
23	SUSHILA	18003	27	G2P1L1	4	Closed	10	Thr.A	+	-	+	M.A	M.A	D&C	1
24	ASHWINI	14993	28	G3P2L2	1	Open	6	Com.A	-	-	-	Com.A	Com.A	-	1
25	BORAMMA	3340	24	G2P1L1	5	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	T.D	1
26	REKHA	11682	29	G2A1	2	Closed	8	Thr.A	+	-	+	Thr.A	Thr.A	T.D	1
27	SUJATHA	15164	28	G1	3	Open	10	Thr.A	+	27	+	Thr.A	Thr.A	M.T.P	1
28	BHAGYASHREE	17538	25	G2P1L1	2	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	D&c	
29	INDUMATHI	6121	19	G2P1L1A1	1	Closed	8	Mol.pg	-	-	+	Mol.pg	Mol.pg	S.E	1
30	MALABAI	6318	30	G3P2L2	3	Closed	6	Thr.A	-	-	-	BO	BO	D&c	1
31	PARVEEN	7530	24	G2P1L1	3	Open	8	Ect.pg	-	-	+	Ect.pg	Ect.pg	LAP	5
32	LAKSHMI	8272	25	G3P2L2	3	Closed	8	Thr.A	-	-	-	BO	BO	D&c	1

MASTER CHART

33	SWETHA	9455	28	G4P2L2A1	2	Closed	6	Thr.A	-	-	-	BO	BO	D&c	1
34	RAJESHWARI	9797	20	G1	4	Closed	8	Mol.pg	-	-	+	Mol.pg	Mol.pg	S.E	1
35	VIJAYLAKSHMI	11711	29	G2P1L1	2	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	T.D	2
36	JYOTHI	12111	32	G3P2L2	3	Open	8	Com.A	-	-	-	Com.A	Com.A	-	1
37	DANNAMMA	12055	24	G2P1L1	4	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	T.D	2
38	UMADEVI	14663	26	G1	2	Closed	10	Com.A	-	-	-	Com.A	Com.A	-	2
39	SUVARNA	1010	25	G5P1L1A3	3	Closed	8	Thr.A	+	-	+	M.A	M.A	D&C	2
40	PARVATI	8232	27	G2P1L1	2	Closed	8	Com.A	-	-	-	Com.A	Com.A	-	1
41	LAKSHNIBAI	4187	28	G1	1	Open	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	2
42	ANITA	9288	29	G4P3L3	1	Closed	8	Thr.A	-	-	-	Com.A	Com.A	-	1
43	SUMANGALA	9628	24	G3P1L1A1	2	Closed	6	Thr.A	+	-	+	M.A	M.A	D&C	2
44	SHANTA	12928	27	G1	2	Closed	6	M.A	-	-	-	Com.A	Com.A	-	1
45	SUNITHA	14399	31	G5P4L4	3	Closed	8	Thr.A	-	-	-	BO	BO	D&c	2
46	JAYASHREE	14650	28	G2P1L1	2	Open	8	Ect.pg	-	-	+	Ect.pg	Ect.pg	LAP	1
47	BHARATI	15648	19	G1	4	Closed	10	Thr.A	+	27	+	Thr.A	Thr.A	T.D	2
48	VANISHREE	15864	22	G3P2L2	2	Closed	8	Com.A	+	26	+	Thr.A	Thr.A	D&c	
49	SHRUTI	459	28	G4P3L3	2	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	T.d	2
50	VIDYA	9872	27	G3P2L2	5	Closed	8	Com.A	+	25	+	Thr.A	Thr.A	D&c	
51	RASHMI	2319	23	G1	1	Closed	10	Thr.A	-	-	-	Com.A	Com.A	-	2
52	HAFZA	2909	24	G2P1L1	2	Open	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
53	SHRADHA	62854	26	G4P2L2A1	1	Open	6	Inc.A	-	-	-	Inc.A	Inc.A	D&c	2
54	KALLAWWA	3218	22	G1	1	Closed	6	Thr.A	+	-	+	M.A	M.A	D&C	1
55	KALAVATI	2724	32	G3P1L1A1	2	Closed	6	Thr.A	+	-	+	M.A	M.A	D&C	2
56	NIRMALA	3935	27	G5P4L4	2	Closed	8	Com.A	+	-	+	M.A	M.A	D&C	1
57	SANGAMMA	6954	24	G2P1L1	4	Closed	8	Thr.A	-	-	-	Com.A	Com.A	-	2
58	JAJIBAI	7021	18	G1	2	Open	8	Ect.pg	-	-	+	Ect.pg	Ect.pg	LA P	1
59	MAMTAZ	8637	28	G3P2L2	1	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	T.D	2
60	VIMALA	9074	31	G4P3L3	2	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	T.D	1
61	GANGAMMA	10595	25	G3P1L1A1	2	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	T.D	2
62	RUKSHANA	10339	28	G1	1	Closed	10	Inev.A	-	-	+	Inev.A	Inev.A	D&C	2
63	SIDDAMMA	13959	24	G2P1L1	2	Open	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	2
64	MERRY	17819	19	G1	2	Closed	6	Inev.A	-	-	+	Inev.A	Inev.A	D&C	2
65	SUCHITRA	18733	28	G4P3L3	2	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	T.D	1

MASTER CHART

66	KAMALA	641	25	G2P1L1	2	Open	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
67	ANITHA	1119	24	G1	1	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	T.D	1
68	GEETA	1731	29	G3P1L1A1	2	Open	8	MA	-	-	+	---	Mol.pg	S.E	1
69	MEENAKSHI	3340	25	G2P1L1	1	Open	10	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
70	SHAKUNTALA	4604	20	G1	1	Closed	6	Thr.A	-	-	-	Com.A	Com.A	-	1
71	BEENABAI	4622	31	G3P1L1A1	2	Closed	8	Com.A	+	-	+	M.A	M.A	D&C	1
72	RUKMINI	4764	24	G2P1L1	2	Closed	8	Thr.A	-	-	-	Com.A	Com.A	-	1
73	PADMA	11682	26	G3P2L2	3	Closed	8	Thr.A	-	-	-	BO	BO	D&c	1
74	BANU	16234	27	G1	2	Closed	8	Thr.A	-	-	-	Com.A	Com.A	-	1
75	SHABANA	17538	23	G2P1L1	1	Open	6	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
76	LEENA	2671	34	G3P1L1A1	1	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	D&c	1
77	AARTHI	17234	24	G1	1	Closed	8	MA	+	-	+	Thr.A	Thr.A	D&c	1
78	SWEETY	12585	28	G2P1L1	2	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	D&c	1
79	ROMA	13724	29	G5P4L1	2	Open	8	M.A	+	26	+	Thr.A	Thr.A	D&c	1
80	SHAILA	12684	22	G1	2	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	P.T	1
81	KASTURI	12372	21	G1	2	Closed	6	Thr.A	-	-	-	Com.A	Com.A	-	1
82	SARASWATHI	11568	23	G2A1	1	Closed	6	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
83	HEMA	452	22	G2P1L1	1	Closed	10	Thr.A	+	-	+	M.A	M.A	D&C	1
84	BHAGYA	8564	24	G1	1	Closed	8	Com.A	-	-	-	Com.A	Com.A	-	2
85	SAVITRI	23154	27	G2P1L1	2	Closed	8	Com.A	-	-	-	Com.A	Com.A	-	1
86	PREMA	15852	29	G1	2	Closed	6	M.A	+	Fp	+	Thr.A	Thr.A	D&c	2
87	KAVITA	9656	35	G3P2L2	1	Closed	8	Inev.A	-	-	+	Inev.A	Inev.A	D&C	1
88	MUNNI	3258	24	G1	1	Closed	8	Thr.A	-	-	-	BO	BO	D&c	1
89	PUTLABAI	6546	29	G3P2L2	2	Closed	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	1
90	BORAMMA	2546	26	G2P1L1	1	Closed	6	M.A	+	Fp	+	Thr.A	Thr.A	P.T	1
91	SAROJINI	1258	24	G1	2	Open	8	Inev.A	-	Fp	+	Inev.A	Inev.A	D&C	1
92	TARABAI	1349	28	G2P1L1	1	Closed	8	Inc.A	-	-	-	Inc.A	Inc.A	D&c	2
93	KASHIBAI	6548	32	G3P1L1A1	2	Closed	6	Thr.A	+	-	+	M.A	M.A	D&C	1
94	MALLAMMA	5879	23	G1	3	Closed	6	Inev.A	-	Fp	+	Inev.A	Inev.A	D&C	2
95	GEETA	1493	22	G2P1L1	4	Open	8	Ect.pg	-	-	+	Ect.pg	Ect.pg	LAP	5
96	SAVITA	3152	30	G3P1L1A1	2	Closed	8	Thr.A	+	25	+	Thr.A	Thr.A	D&c	1
97	RINKI	3182	24	G1	2	Closed	6	Thr.A	+	Fp	+	Thr.A	Thr.A	P.T	1
98	SUVARNA	3194	25	G2P1L1	1	Closed	8	Thr.A	+	26	+	Thr.A	Thr.A	D&c	1

MASTER CHART

99	SAKSHI	3164	24	G2A1	4	Open	8	Inev.A	-	26	+	Inev.A	Inev.A	D&C	1
100	BHAVYA	5846	19	G1	2	Open	8	Inev.A	-	Fp	+	Inev.A	Inev.A	D&C	1
101	SOUMYA	2549	23	G2P1L1	4	Closed	6	Thr.A	-	-	-	BO	BO	D&c	1
102	PRACHI	9999	27	G3P2L2	2	Closed	6	Thr.A	-	-	-	BO	BO	D&c	1
103	SAAHIKALA	4531	22	G1	3	Closed	8	Thr.A	-	-	+	---	Ect.pg	LAP	5
104	VEENA	7351	30	G5P4L4	2	Closed	8	Thr.A	-	-	-	Com.A	Com.A	-	1
105	RUCHITA	1985	34	G3P2L2	1	Closed	8	Thr.A	-	-	-	Com.A	Com.A	-	1
106	PRAGYA	483	23	G1	3	Open	6	M.A	-	-	-	Com.A	Com.A	-	1
107	BHAGIRATI	2586	24	G2P1L1	2	Closed	6	Thr.A	+	-	+	M.A	M.A	D&C	1
108	KADAMBARI	3691	29	G2P1L1	1	Closed	8	Thr.A	+	-	+	M.A	M.A	D&C	2
109	KALPANA	1837	23	G1	3	Open	8	Thr.A	+	-	+	M.A	M.A	D&c	1
110	SHAILA	1973	31	G4P1L1A2	2	Open	6	Inev.A	-	Fp	+	Inev.A	Inev.A	D&C	2
111	ROSY	1973	22	G1	1	Open	8	Inev.A	-	Fp	+	Inev.A	Inev.A	D&C	2
112	SAKKUBAI	2946	29	G2P1L1	1	Closed	8	Mol.pg	-	-	+	Mol.pg	Mol.pg	S.E	2
113	SHARADHA	2584	28	G3P2L2	2	Open	8	Inev.A	-	Fp	+	Inev.A	Inev.A	D&C	1
114	SONAL	1964	20	G1	4	Closed	6	Ect.pg	-	-	+	Ect.pg	Ect.pg	LAP	5
115	ROOPALI	3842	32	G3P1L1A1	4	Open	8	M.A	+	-	+	Thr.A	Thr.A	P.T	1
116	BHUVANESHWARI	4681	27	G4P3L3	2	Open	8	Inev.A	-	Fp	+	Inev.A	Inev.A	D&C	1
117	ASHWINI	2468	24	G1	1	Closed	8	Thr.A	-	-	-	Com.A	Com.A	-	1
118	JYOTI	2354	27	G3P2L2	5	Closed	6	Thr.A	-	-	-	Com.A	Com.A	-	2
119	NIRMALA	6541	29	G2P1L1	5	Open	8	Thr.A	-	Fp	+	Inev.A	Inev.A	D&C	1
120	SUHASHINI	5555	24	G1	2	Closed	8	Thr.A	-	-	-	BO	BO	D&c	1
121	VANDANA	2007	29	G2P1L1	5	Open	6	Thr.A	-	Fp	+	Inev.A	Inev.A	D&C	2
122	MEGHA	2358	30	G4P3L3	2	Open	8	MA	-	-	+	Mol.pg	Mol.pg	S.E	1
123	SWATHI	9861	22	G1	4	Open	8	MA	-	Fp	+	Inev.A	Inev.A	D&C	2
124	TULSA	3467	28	G2P1L1	5	Open	10	Inc.A	-	-	+	Mol.pg	Mol.pg	D&c	1
125	TUNGABAI	3579	22	G1	2	Closed	6	Thr.A	+	Fp	+	M.A	M.A	D&C	1
126	LAKSHMI	1649	30	G4P1L1A2	4	Open	8	M.A	+	Fp	+	M.A	M.A	D&c	1
127	RATNABAI	4528	22	G2P1L1	1	Closed	8	Ect.pg	-	-	+	Ect.pg	Ect.pg	LAP	5
128	ANUSHA	5463	29	G1	1	Open	8	M.A	-	-	-	BO	BO	D&c	1