

Evaluation of Ultrasonography in Assessment of First Trimester Bleeding

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I. Introduction

Vaginal Bleeding occurring in an early pregnancy pose diagnostic challenges for both obstetrician and sonologist. It is a symptom that frequently interrupts the normal development of early gestation. Despite the latest technological development and laboratory diagnosis the desired goal of early recognition is often not achieved.

Vaginal bleeding during first trimester has been estimated to occur in 16% of all pregnant women while frequency of spontaneous abortion is estimated at 10-20%. Prior to the era of ultra sonogram diagnosing the cause of bleeding in First Trimester has been based on history and clinical findings and often confirmed by positive or negative pregnancy test. These are neither specific in indicating the cause of bleeding nor they aid in decision-making.

II. Materials And Methods

Type of the Study: Cross – sectional study

Cases: 150 patients admitted in labor ward with first trimester bleeding are selected for the study. Patients with history of amenorrhoea upto 3 months complaining of bleeding per vaginum and lower abdominal pain are selected for the study.

Period: Period of One year 01.09.2014 to 01.10.2015

Place: Government Tirunelveli Medical College Hospital, Tirunelveli.

Methods of Study: In these 150 patients with history of 3 months of amenorrhoea with complaints like vaginal bleeding, lower abdominal pain were subjected to ultrasound examination (trans abdominal & trans vaginal if needed). Urine \square HcG examination was also done.

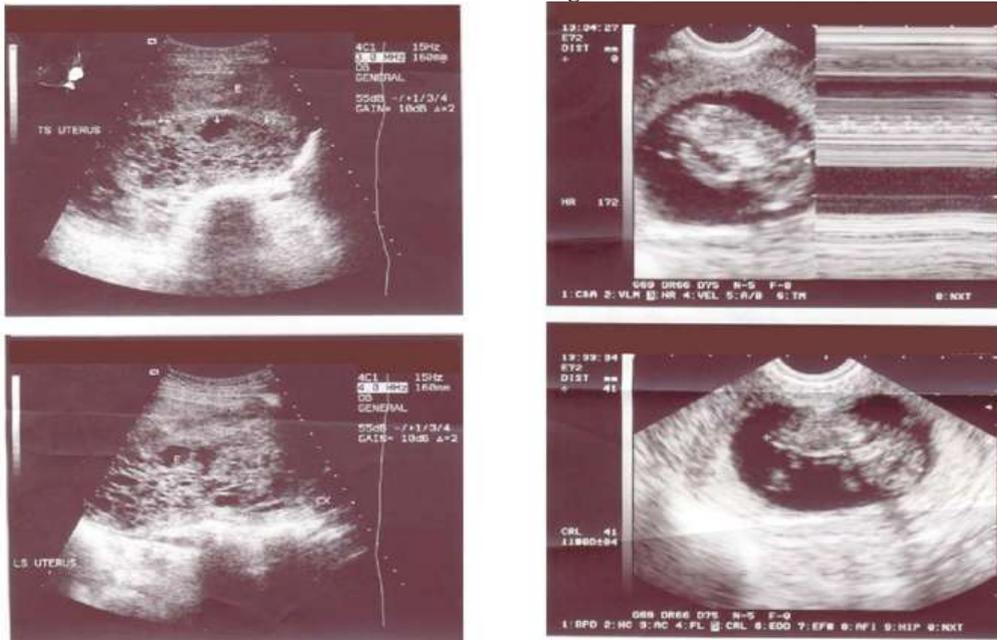
The patients were followed up accordingly.

- Patients with ultrasound findings of Threatened abortion were followed up with repeat ultrasound examinations and then outcome were studied.
- Patients with features of missed abortion and Blighted ovum in ultrasound examination were subjected to Digital evacuation and curettage.
- Patients with features of molar pregnancy in ultrasound examination were subjected to evacuation.
- Patients with findings of ectopic pregnancies underwent laparotomy.
- Patients with findings of delayed periods were discharged.
- Patients with findings of Low lying placenta were followed up and repeat ultrasound examinations were done later.
- Patients with findings of ovarian cysts which were found to be functional cysts < 6cm in size were followed up.

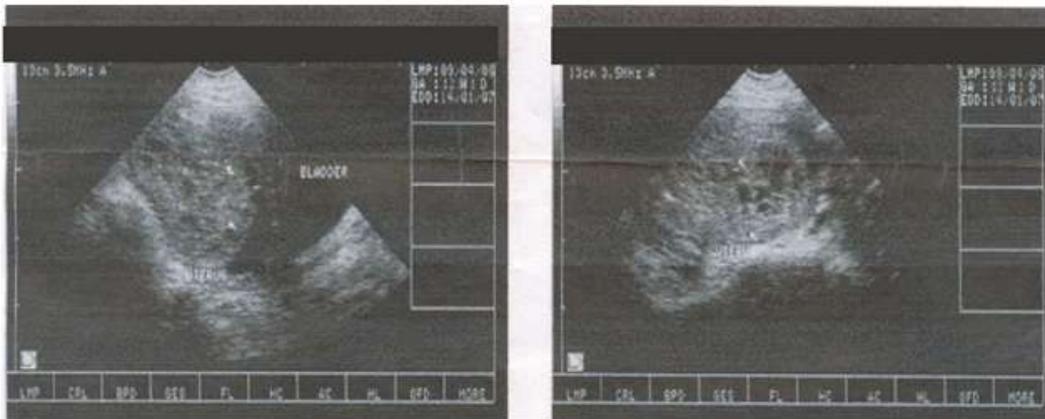
Incomplete Abortion



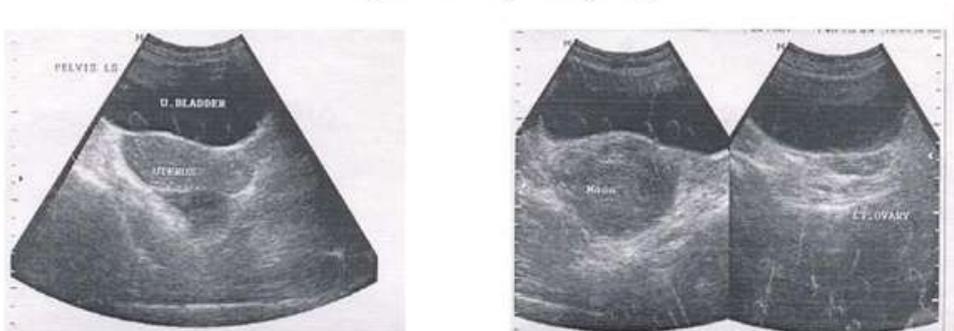
Bicornuate Uterus With Vesicular Mole Single Viable Intra Uterine Gestation



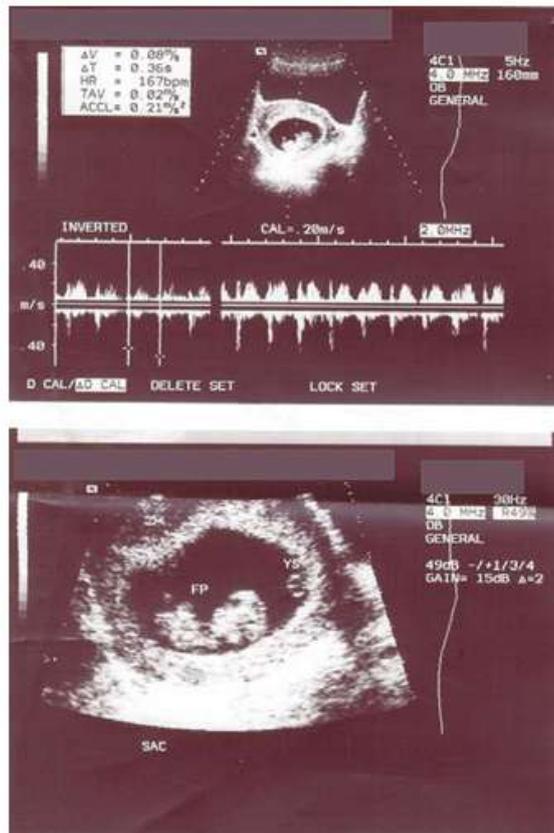
Complete Molar Pregnancy



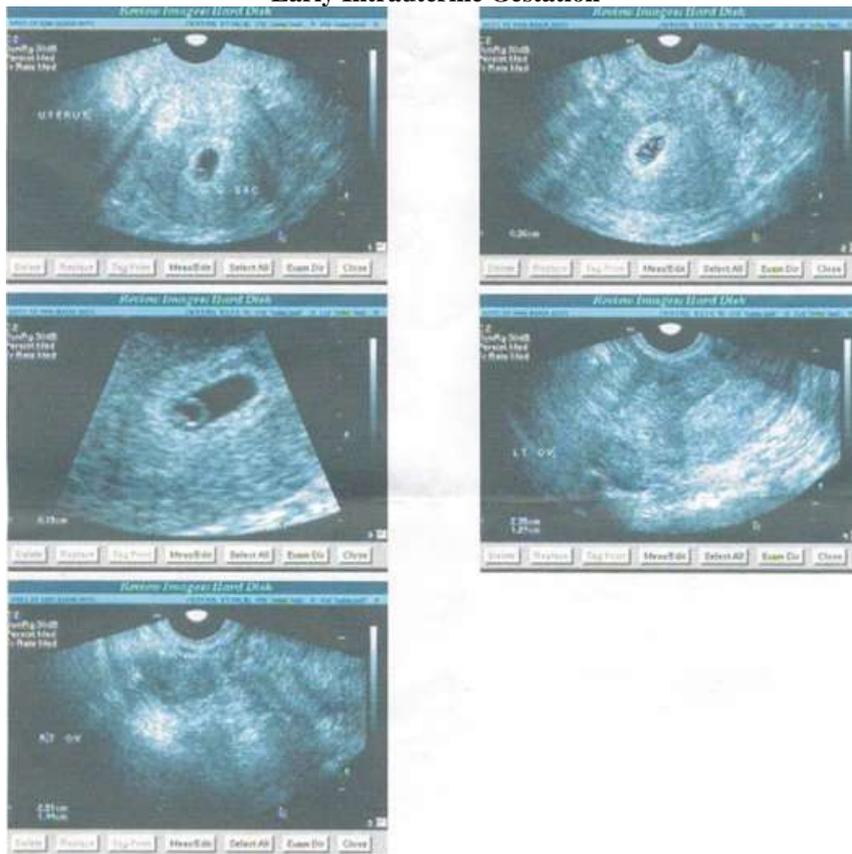
Ruptured Ectopic Pregnancy



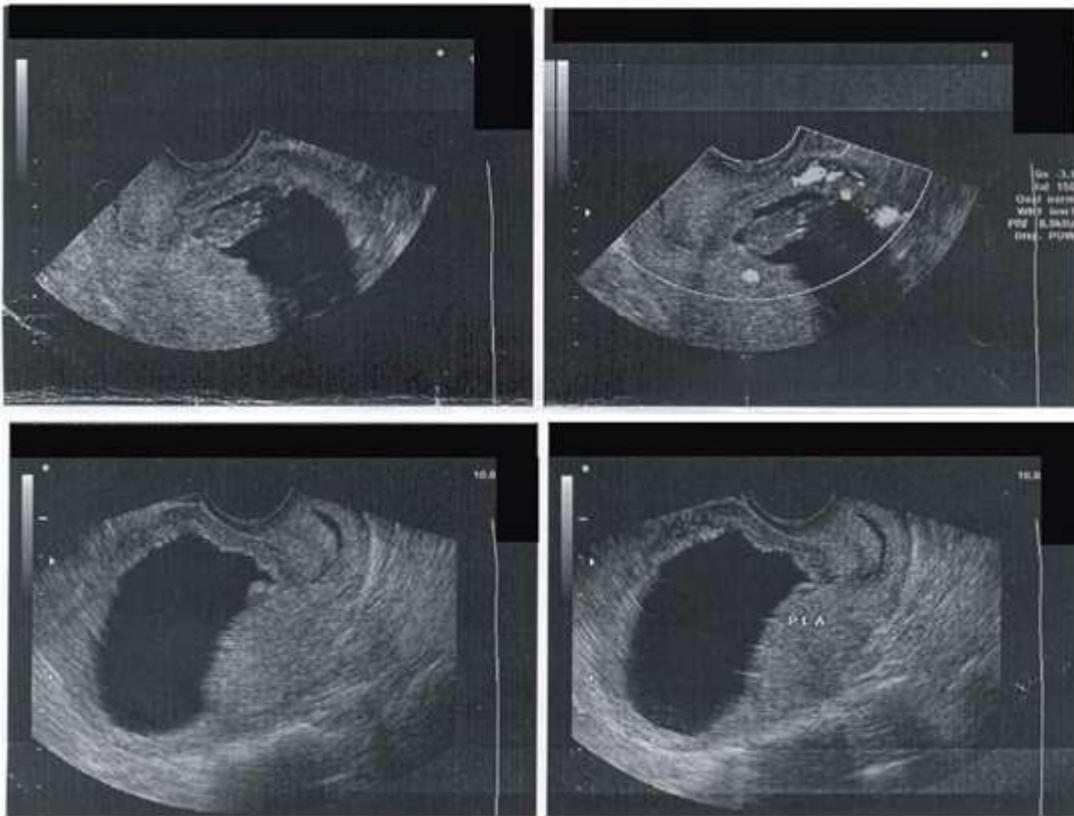
Threatened Abortion



Early Intrauterine Gestation



Missed Abortion



III. Analysis

Table 1 Age wise distributions

| Age | Number | Percentage |
|---------------|--------|------------|
| < 20 Years | 17 | 11.33 |
| 20 – 25 years | 84 | 56 |
| 25- 30 years | 35 | 23.33 |
| > 30 years | 14 | 9.33 |

This table analyzed the age wise distribution.

- In less than 20 years, there were 17 cases (11.33%).
- Between 20-25 years, there were 84 cases (56%).
- Between 25-30 years, there were 35 cases (23.33%).
- 14 cases were aged more than 30 years (9.33%).

Age wise distribution

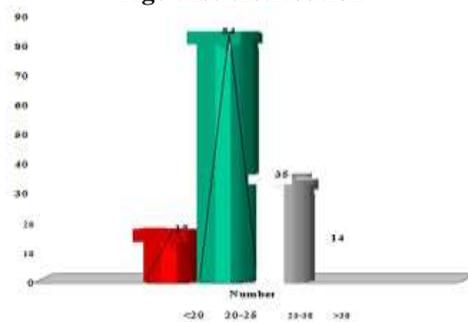


Table 2 Parity Distribution

| | Number | Percentage |
|-------|--------|------------|
| Primi | 59 | 39.33 |
| Multi | 91 | 60.66 |

- In this study 59 (39.33%) patients were primi gravidae.
- 91 patients (66.66%) were multi gravidae.

Table 3 Outcome in First Trimester Bleeding

| | | | Clinical Diagnosis | | USG Diagnosis | | Final Diagnosis | |
|--------------------------------|------|------------------------|--------------------|-------|---------------|-------|-----------------|-------|
| | | | No | % | No | % | No | % |
| Threatened Abortion | | | 86 | 57.33 | 49 | 32.66 | 49 | 32.66 |
| Missed Abortion | | | 8 | 5.33 | 21 | 14 | 21 | 14 |
| Blighted Ovum | | | - | - | 29 | 19.33 | 29 | 19.33 |
| Incomplete Abortion | | | 16 | 10.66 | 20 | 13.33 | 20 | 13.33 |
| Complete Abortion | | | 7 | 4.66 | 2 | 1.33 | 2 | 1.33 |
| Delayed periods | | | 9 | 6 | 3 | 2 | 3 | 2 |
| Complete mole | | | 2 | 1.33 | 5 | 3.33 | 5 | 3.33 |
| Partial Mole | | | - | - | 2 | 1.33 | 2 | 1.33 |
| Ectopic Pregnancy | | | 22 | 14.66 | 19 | 12.66 | 19 | 12.66 |
| Low Lying placenta | | | - | - | 3 | 2 | 3 | 2 |
| Ovarian | cyst | complicating pregnancy | - | - | 3 | 2 | 3 | 2 |
| Fibroid complicating pregnancy | | | - | - | 1 | 0.66 | 1 | 0.66 |
| Bicornuate uterus | | | - | - | 1 | 0.66 | 1 | 0.66 |

This table shows the various outcome in patients with First Trimester bleeding. Threatened abortion were diagnosed in 86 (57.33%) patients clinically and was confirmed in 49 (32.66%) patients by the ultrasonography. The remaining 37 cases which were wrongly diagnosed clinically as threatened abortion turned out to be pregnancy failures by the ultrasonography.

All the 8 cases (5.33%) diagnosed clinically as missed abortion were confirmed by ultrasonography. In addition 13 cases of threatened abortion were diagnosed as missed abortion by the ultrasonography. No case of blighted ovum was diagnosed clinically but all the 29 (19.33%) cases were diagnosed by ultrasonography. Incomplete abortion was diagnosed clinically in 16 cases (10.66%) but with ultrasonography 20 cases (13.33%) turned out to be incomplete abortion. Ectopic pregnancy was diagnosed clinically in 22 cases (14.66%) but confirmed by ultrasonography in 19 cases (12.66%) only. The remaining 3 cases turned out to be that of incomplete abortion by ultrasonography. Complete abortion was confirmed by ultrasonography only in 2 cases (1.33%) but it was wrongly diagnosed clinically in 7 cases (4.66%). Partial molar pregnancy was diagnosed by the ultrasonography in 2 cases (1.33%) and none of them were diagnosed clinically. By ultrasonography 5 cases (3.33%) were diagnosed as complete molar pregnancy. Of these only 2 cases (1.33%) were diagnosed clinically. Low lying placenta and ovarian cyst were diagnosed as associated condition in 2% of cases by ultrasonography. Fibroid uterus was diagnosed as associated condition in 1 case by ultrasonography. Bicornuate uterus was diagnosed in 1 case by ultrasonography.

Outcome in I Trimester Bleeding

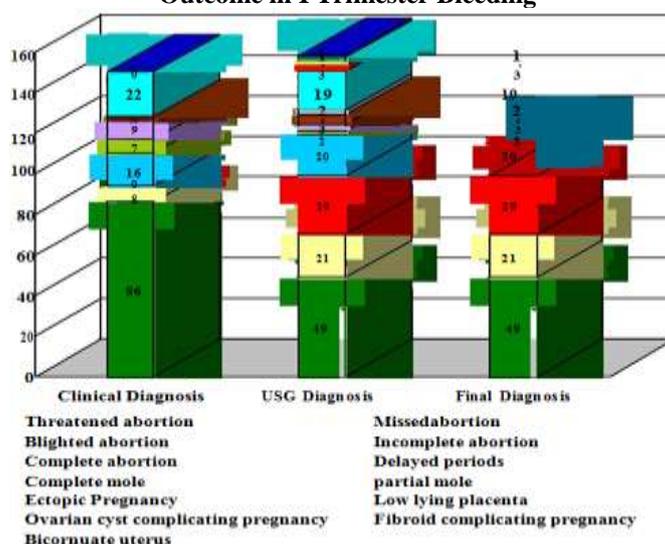
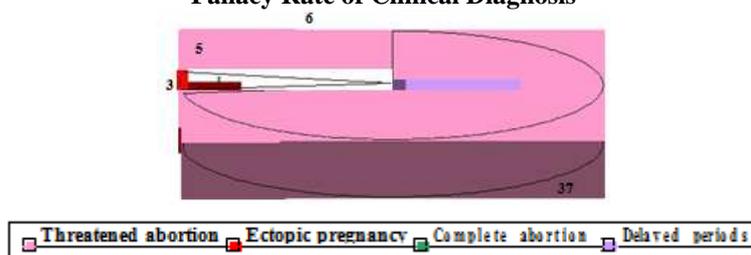


Table 4 Fallacy Rate of Clinical Diagnosis

| No | Clinical Diagnosis | No of false Diagnosis | Fallacy Rate |
|----|--------------------------|-----------------------|--------------|
| 1 | Threatened Abortion (86) | 37 | 43.02 |
| 2. | Ectopic Pregnancy (22) | 3 | 13.63 |
| 3. | Complete abortion (7) | 5 | 71.42 |
| 4. | Delayed periods (9) | 6 | 66.66 |

This tabulation gives the fallacy rate of clinical diagnosis. In total there were 51 wrong clinical diagnosis giving a fallacy rate of 48%. Threatened abortion was diagnosed by clinical methods in 86 patients, where 37 cases of first trimester bleeding which was wrongly diagnosed clinically as threatened abortion turned out be pregnancy failures by USG giving a fallacy rate of 43.02%.

Fallacy Rate of Clinical Diagnosis



The other 3 groups included are Ectopic pregnancy, complete abortion, and delayed periods. 13.63 % of Ectopic pregnancy, 71.42% of complete abortion and 66.66% of delayed periods were wrongly diagnosed clinically.

Table 5 Correlation between menstrual age and clinical assessment

| No | Menstrual age in weeks | Correlation | | No Correlation | |
|----|------------------------------|-------------|-------|----------------|-------|
| | | No | % | No | % |
| 1. | 8 weeks and less | 11 | 31.43 | 24 | 68.57 |
| | Total No of patients (35) | | | | |
| 2. | 8weeks - 10weeks | 25 | 49.02 | 26 | 50.98 |
| | Total Number of patients(51) | | | | |
| 3. | 10weeks – 12 weeks Total | 20 | 31.25 | 44 | 68.75 |
| | Number of patients (64) | | | | |

This table shows the correlation between period of amenorrhoea and clinical assessment of uterine size. In those who presented at 8weeks or less than 8 weeks, there were about 35 patients.

Of these the uterine size correlated with period of gestation in 11 cases giving a percentage of 31.43%. In another 24 cases there was no correlation i.e., the size of the uterus was smaller than the gestational age giving a percentage of 68.57. Out of 51 patients who were admitted with 8-10 weeks of pregnancy, in 25 patients the gestational age correlated clinically giving a percentage of 49.02. In another 26 cases there was no correlation i.e. the size of the uterus was smaller than the gestational age giving a percentage of 50.98

Of the 64 patients who were admitted with the gestational age of 10-12 weeks pregnancy, in 20 patients the gestational age corresponded to the dates giving a percentage of 31.25%. In another 44 cases there were no correlation giving percentage of 68.75.

Correlation between menstrual age and clinical assessment

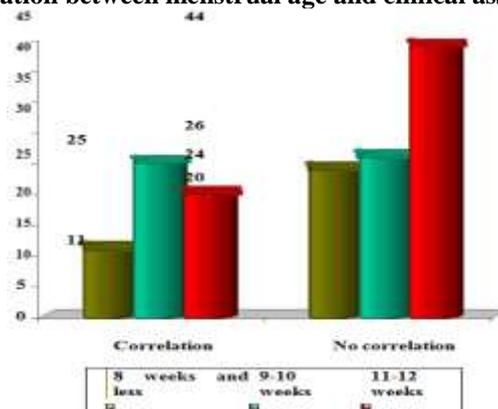


Table 6 Comparison of Reliability of gravindex & ultrasound diagnosis

| No | Diagnostic reliability | Gravindex | | Ultrasound | |
|----|-------------------------|-----------|------|------------|-----|
| | | No | % | No | % |
| 1. | Positive – Confirmatory | 96 | 64 | 150 | 100 |
| 2. | Weakly positive | 51 | 34 | - | - |
| | Contributory | | | | |
| 3. | False positive | 1 | 0.66 | - | - |
| 4. | Negative | 2 | 1.33 | - | - |
| 5. | False Negative | - | - | - | - |

This table compares the reliability of urine gravindex with ultrasound diagnosis.

- The gravindex test was confirmatory in 96 cases (64%), while it was contributory in 51 cases (34%).
- False positive in 1 case (0.66%).
- Negative in 2 cases (1.33%).

Ultra sound examination was confirmatory in all cases. (100%)

Table 7 Comparison of Fallacy rates of clinical Diagnosis, gravindex and USG Diagnosis

| No | Parameters | Fallacy Rate | |
|----|--------------------|--------------|------|
| | | Number | % |
| 1. | Clinical Diagnosis | 51 | 34 |
| 2. | Gravindex | 1 | 0.67 |
| 3. | Ultrasound | - | - |

This table compares the fallacy rate of clinical diagnosis, gravindex and ultrasound examination.

- By clinical diagnosis alone, 51 cases were wrongly diagnosed resulting in fallacy rate of 34%. Gravindex method resulted in 1 false positive diagnosis giving a fallacy rate of 0.67%
- No fallacy rate in ultrasound examination.

Table 9 Fetal Pole and Outcome

| Outcome | Fetal Pole Present | | Fetal Pole absent | |
|---------------|--------------------|-------|-------------------|-----|
| | No | % | No | % |
| Favourable | 43 | 61.43 | Nil | - |
| Un favourable | 27 | 38.57 | 56 | 100 |

The presence of Fetal pole and pregnancy Outcome is tabulated in this column. Ultrasonographically fetal pole was seen in 70 patients. Of these in 43 patients pregnancy continued inspite of bleeding resulting in a percentage of 61.43.

- for cases without fetal pole.
- 27 cases (38.57%) aborted.
- All the 56 cases with empty sac without fetal pole underwent termination of pregnancy. This confirms 100% abortion rate

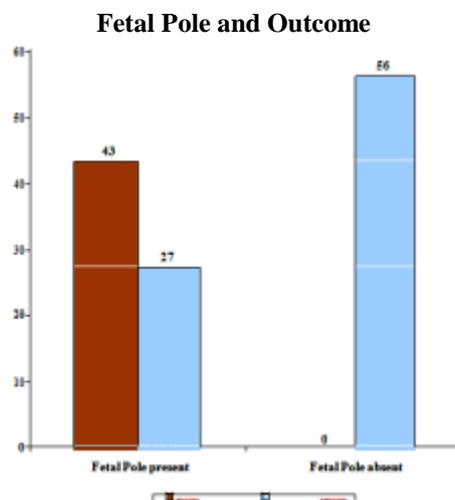


Table 10 Outcome in ultrasound diagnosis of threatened abortion

| Number | Outcome | Number | Percentage |
|--------|-----------------------|--------|------------|
| 1. | Term fetus | 36 | 73.46 |
| 2. | Preterm Fetus | 7 | 17.94 |
| 3. | II trimester abortion | 3 | 6.12 |
| 4. | I trimester abortion | 3 | 6.12 |

The outcome of patients who were diagnosed by the ultrasonography as threatened abortion is analyzed in this table. In clinically suspected cases of threatened abortion, 49 cases were proved by Ultrasonography as cases of threatened abortion.

- Out of 49 patients, 36 patients who went upto term and delivered normal healthy babies resulting in a percentage of 73.46.
- In this group, 7 patients (17.94%) went for premature labor.
- 6.12% ended up in First and second trimester abortion respectively.

Outcome in ultrasound diagnosis of threatened abortion

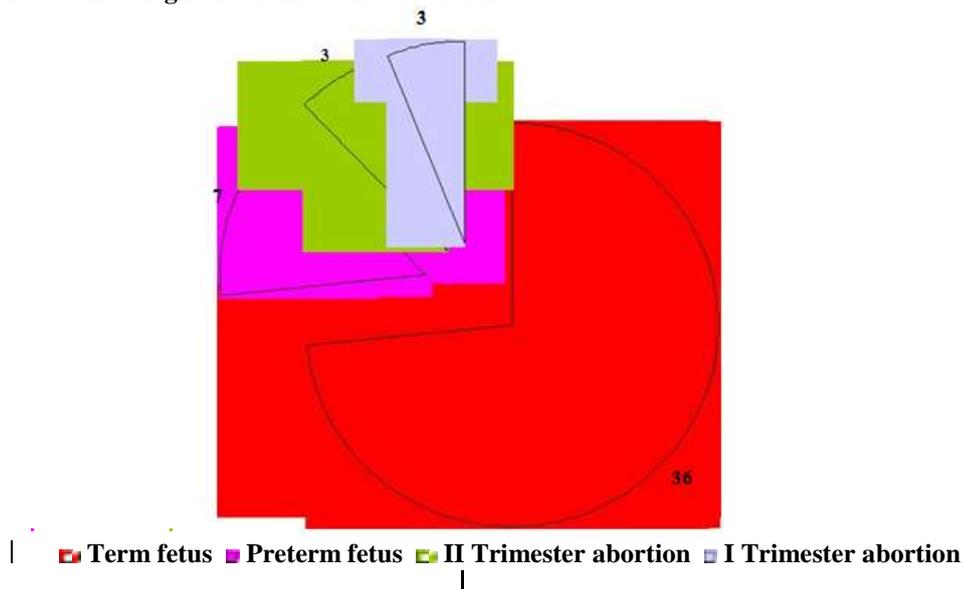


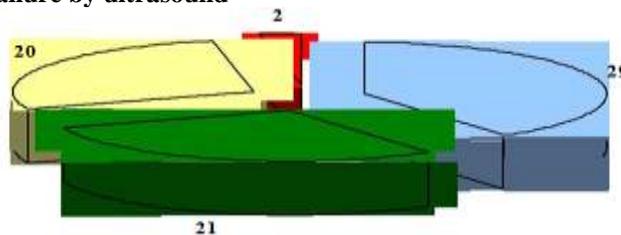
Table 11 Diagnosis of pregnancy failure by ultrasound

| S.No. | Type of Pregnancy Failure | Number | Percentage |
|-------|---------------------------|--------|------------|
| 1. | Blighted Ovum | 29 | 40.27 |
| 2. | Missed abortion | 21 | 29.16 |
| 3. | Incomplete abortion | 20 | 27.77 |
| 4. | Complete abortion | 2 | 2.77 |

In analyzing the patients with diagnosis of pregnancy failure by ultra sound examination, the type of pregnancy failure recognized by ultrasound examination was either blighted ovum, missed abortion or incomplete abortion or complete abortion.

- Blighted ovum was diagnosed in 29 patients (40.27%).
- Missed abortion was diagnosed in 21 cases (29.16%).
- Incomplete abortion was diagnosed in 20 cases (27.77%)
- Complete abortion was diagnosed in 2 cases(2.77%)

Diagnosis of pregnancy failure by ultrasound



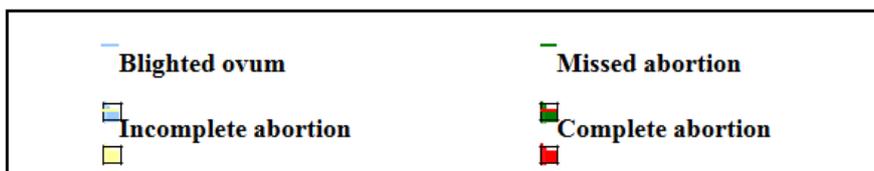


Table 12 Low Lying placenta in First Trimester & Outcome

| S.No | Outcome | Number | Percentage |
|------|-----------------------------------|--------|------------|
| 1. | Placenta migration to normal site | 2 | 66.67 |
| 2. | Spontaneous abortion | 1 | 33.33 |

Low lying placenta was diagnosed by the ultrasonography in 3 cases.

- On follow up of these 3 cases, 2 (66.67%) went to term with placental migration to normal position .
- One (33.33%) case of low lying placenta aborted.

Table 13 Ultrasound Diagnosis of Gestational Trophoblastic Disease

| Outcome | Number | Percentage |
|-----------------------------|--------|------------|
| Partial molar degeneration | 2 | 28.57 |
| complete molar degeneration | 5 | 71.43 |

The incidence of molar pregnancy in cases of first trimester bleeding in our study was 7/150 (4.66%). Partial molar degeneration was seen in 2 cases (28.57%) and complete molar degeneration in 5 cases (71.43%). All were subjected to suction evacuation.

Ultrasound diagnosis of gestational trophoblastic disease

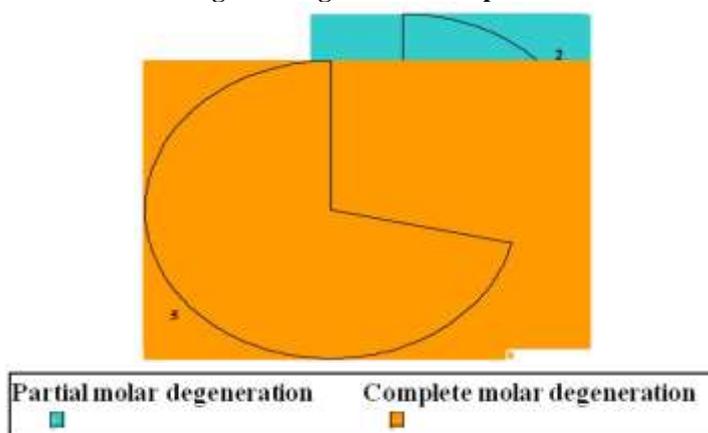


Table 14 Ovarian cyst complicating pregnancy

| Diagnosis | Clinical Diagnosis | | Ultrasound | |
|-----------|--------------------|---|------------|------|
| | No | % | No | % |
| 1 | - | - | 7 | 4.66 |

In our study, associated abdomino pelvic pathology, which were not diagnosed by clinical examination were diagnosed by USG. In 7 cases (4.66%) ovarian cyst was diagnosed as associated condition along with pregnancy. Of these majority of them 6 cases (85.71%) were functional cysts. They were managed conservatively. One patient had haemorrhagic corpusluteal cyst along with ectopic pregnancy - which was removed during laparotomy.

Table 15 Duration of hospital stay after diagnosis

| Duration of hospital stay | Number | Percentage |
|---------------------------|--------|------------|
| 2 days | 41 | 27.33 |
| 2 – 7 Days | 83 | 55.33 |
| > 7 days | 26 | 17.33 |

This table analyzed the hospital stay after the diagnosis.

- 41 (27.33%)patients stayed in the hospital for 2 days.

- 83(55.33%) patients stayed in the hospital for 2 – 7 Days.
- 26 (17.33%) patients stayed for > 7 days in the hospital.

Table 16 Ectopic Pregnancy: Clinical Diagnosis Vs Ultrasound

| Outcome | Number | Percentage |
|----------------------|--------|------------|
| Clinical Diagnosis | 22 | 14.66 |
| Ultrasound Diagnosis | 19 | 12.66 |

This table analyzed the diagnosis of Ectopic pregnancy by clinical and ultrasound examination.

Clinically 22 cases were diagnosed as ectopic pregnancy resulting in 14.66%. By ultrasonography 19 cases were diagnosed as ectopic pregnancy resulting in 12.66%, which is significantly lesser than clinical diagnosis.

This again proves the superiority of ultrasonography in diagnosing the etiology of first trimester bleeding.

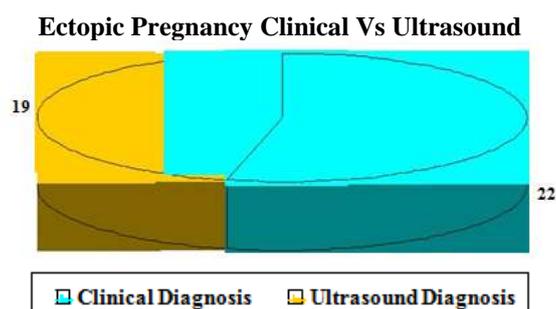


Table 17 Fallacy rate in the Diagnosis of Ectopic Pregnancy

| Outcome | Number | Percentage |
|----------|--------|------------|
| Clinical | 3 | 15.78 |
| USG | Nil | Nil |

This table gives the fallacy rate of clinical and ultrasound examination in ectopic pregnancy. 3 cases (15.78%) had a false diagnosis by clinical examination. Ultrasonography did not give any wrong diagnosis

Table 18 Outcome of the study

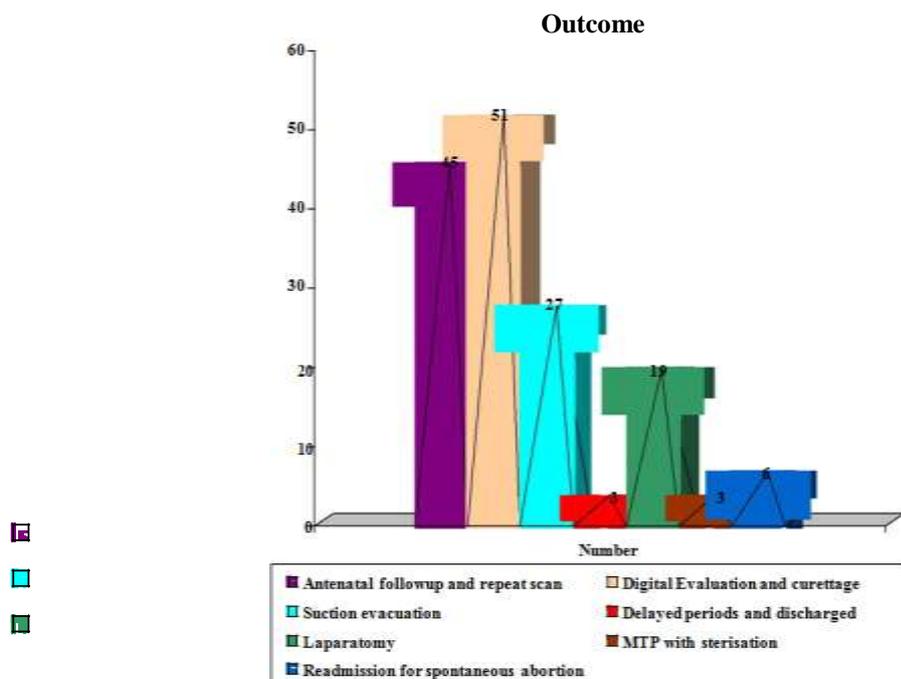
| S.No | Management | Number | Percentage |
|------|--------------------------------------|--------|------------|
| 1. | Antenatal follow up and repeat scan. | 45 | 30 |
| 2. | Digital Evacuation & curettage | 51 | 34 |
| 3. | Suction Evacuation and curettage | 27 | 18 |
| 4. | Delayed periods and discharged | 3 | 2 |
| 5. | Laparotomy for Ectopic pregnancy | 19 | 12.66 |
| 6. | MTP with sterilisation | 3 | 2 |
| 7. | Readmission for spontaneous abortion | 6 | 4 |

This table analysed the various outcome in first trimester bleeding. The cases were followed up during the course of pregnancy with regular antenatal care and ultrasonography till delivery in 30%. Digital Evacuation & curettage was done in 51 cases (34%) of blighted ovum and missed abortion Suction Evacuation and Curettage was done in 27 cases (18%) of molar pregnancy and incomplete abortion.

Laparotomy were done in 19 cases (12.66%) for ectopic pregnancy one of these ended in total abdominal hysterectomy due to ruptured cornual ectopic pregnancy in a multi gravida.

3 multi gravida patients underwent Medical termination of pregnancy with sterilisation.

6 cases, diagnosed as threatened abortion were readmitted for spontaneous abortion and underwent digital evacuation and curettage.



IV. Discussion

Ultrasound is a non invasive, easily accessible and highly diagnostic tool in the modern era of obstetrics.

Accurate diagnosis and proper intervention is mandatory to save not only the fetus but also the mother. Hence the differential diagnosis must be kept in mind before deciding further management.

Depending upon the correct diagnosis the management may vary from conservative observation to invasive laparotomy.

Ultrasonography nowadays has become a single most effective tool in diagnosing all the causes of first trimester bleeding. The differential diagnosis in our study included

- 1) Threatened abortion
- 2) Missed abortion
- 3) Blighted ovum
- 4) Complete abortion.
- 5) Incomplete abortion
- 6) Gestational Trophoblastic Disease
- 7) Ectopic pregnancy

It is impossible to diagnose cases clinically like low lying placenta and partial molar degeneration but ultrasound examination confirmed the diagnosis in all cases correctly.

Thus the ultrasound diagnosis helps in the correct line of management thereby, reducing the

- a. hospital stay,
- b. anxiety and
- c. in few cases it avoids unnecessary laparotomy.

In our study, 11.33% of the patients were in less than 20years, 56% were between 20-25 years, 23.33% were between 25-30 years 9.33% were above 30 years.

Threatened abortion

| Study | Incidence | Percentage |
|------------------|-----------|------------|
| Rajan et al | 324 | 48 |
| Stabilie & G. | 227 | 48.7 |
| Grudzilkas et al | | |
| Joupilla et al | 236 | 45 |
| Our study | 49 | 32 |

Thus in our study, even though it is a small cohort study, the incidence of threatened abortion is in par with other studies.

Viability outcome in Threatened abortion

| | | |
|-------------|----------|--------|
| Rajan et al | 217cases | 93.33% |
| Our study | 36 cases | 91.40% |

In Rajan et al study, of cases of threatened abortion with viable fetus, 93.33% continued for term pregnancy and had healthy term infants. It is in par with our study.

Early diagnosis, timely intervention & necessary treatment initiated immediately has culminated in improving the viability outcome.

Anembryonic pregnancy

| Study | No. | % |
|-----------|-----|----|
| How et al | - | 45 |
| Our study | - | 40 |

In our study 40% of cases diagnosed as anembryonic pregnancy. These patients underwent dilatation and curettage.

Irregular sac and pregnancy outcome

Irregular sac in ultrasound almost confirms the non-viability of the conceptus. In our study, 34 cases had irregular sac. All of them resulted in nonviable pregnancy and termination of pregnancy with a specificity of 100%. This is at par with Nyberg et al who had a specificity of 99%. Absence of fetal pole and pregnancy outcome Absence of fetal pole in trans abdominal sonography by 7weeks is indicative of non viable pregnancy.

| Scan finding | Nyberg et al | Our study |
|-----------------------|--------------|-----------|
| Irregular Sac | 99% | 100% |
| Absence of fetal pole | 100% | 100% |

In Nyberg et al study, absence of yolk sac or embryo ended in termination of pregnancy with 100% specificity. It is in par with our study. Absence of fetal echo was diagnosed in 56 cases, all of which ended in termination with 100% specificity.

Incomplete Abortion

| | |
|--------------------------------|--------|
| Stabile and G.Grudzinkas et al | 8.8% |
| Drumm's et al | 28.1% |
| Neelam bharath et al | 22% |
| Our study | 13.33% |

Ultrasound has been proved to be the diagnostic tool in the diagnosis of incomplete abortion. In our study, incomplete abortion was diagnosed by ultrasound examination with 100% specificity in 13.33% of cases. Digital evacuation and curettage was done immediately.

Complete Abortion

| | |
|--------------------------------|------|
| Stabile and G.Grudzinkas et al | 0.9% |
| Our study | 2% |

Ultrasonography confirms complete abortion (2% of cases) with reliability. It avoids unnecessary Digital evacuation and curettage, an invasive procedure for the patient.

Gestational Trophoblastic Disease

| | |
|----------------------|-------|
| Drumm's et al | 8% |
| Neelam bharath et al | 2% |
| Malhotra et al | 1% |
| our study | 4.36% |

Out of 150 cases molar pregnancy was diagnosed in 7 cases by ultrasound. Of these 7 cases, 2 cases were diagnosed clinically. The uterus size was greater than period of amenorrhoea in these 2 cases. Suction evacuation and curettage were done. The specimen sent for histopathological examination. Follow up with quantitative estimation of HcG were done.

Ectopic Pregnancy

| | |
|--------------------------------|-------|
| Stabile and G.Grudzinkas et al | 12.6% |
| Levi et al | 9.2% |
| Romasufat et al | 8% |
| Our study | 12% |

Ectopic pregnancy was diagnosed in our study in 12% of cases. It is in par with other studies since our study is conducted in a tertiary referral centre, many cases were referred late and hence medical / conservative management could not be done. So, all the cases were managed surgically. Of these, one case ended in total abdominal hysterectomy in a multi gravida due to ruptured cornual ectopic pregnancy with profuse bleeding.

Low Lying placenta & their outcome

| | |
|---------------|-----|
| Mantoni et al | 85% |
| Our study | 66% |

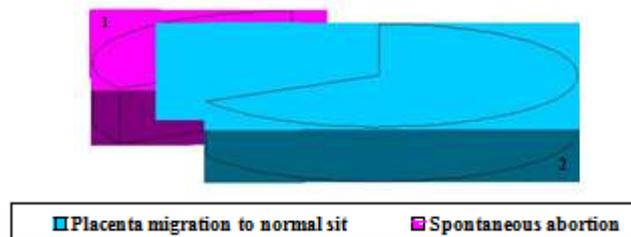
Mantoni et al determined that the majority of patients (85%) with a low lying placenta had viable pregnancy. In our study, 66% of patients with low lying placenta had live term babies.

Ovarian cysts were diagnosed along with pregnancy as associated condition in 7 cases. Of these 6 were functional cysts. A hemorrhagic cyst was present in left ovary in one case of ectopic pregnancy. Left ovarian cystectomy was done during laparotomy. On the right side, ampullary portion of the tube was the site of ectopic pregnancy and Salphingo Oophrectomy was done on right side.

- One case of fibroid uterus was diagnosed along with pregnancy.
- One case of bicornuate uterus was diagnosed along with molar pregnancy.

Medical termination of pregnancy along with sterilisation were done in 3 cases of multigravida.

Low lying placenta in First trimester and outcome



V. Conclusion

Ultra Sonography has been proved as an important diagnostic modality in obstetrics. It is an easy available, diagnostic modality and it helps in the earlier diagnosis of complications of first trimester bleeding. In the above study it was demonstrated that it played an important part in diagnosis of first trimester bleeding. This diagnosis helped in prompt treatment of first trimester pregnancy in a better manner before any complication could develop.

If relied upon the history and clinical findings, it can lead to delay in diagnosis and it may lead to various complications and may increase the morbidity of the patients.

By earlier diagnosis not only the mortality and morbidity are reduced but also the earlier management reduced the hospital stay of the patients.

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