



Role of Ultrasonography in Investigating the Causes of Bleeding per Vaginum in the first Trimester of Pregnancy

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Introduction

- Vaginal bleeding in early pregnancy is a relatively common presentation in the acute obstetric and gynecological setting, and ultrasonography remains the safest and fastest way of evaluating these patients.
- The causes of bleeding during the first trimester include various types of abortions, ectopic pregnancy, and molar pregnancies.
- Clinical history and pelvic examination are inadequate in assessing the prognosis in such conditions.
- The objective of our study was to evaluate the role of ultrasound in the evaluation of a patient with first trimester bleeding to determine the accuracy of ultrasound in the diagnosis of early pregnancy failure and to guide the obstetrician for the correct management of the case.

Objectives of the Study

- To evaluate the role of ultrasonography in a patient with bleeding per vaginum in the first trimester of pregnancy.
- To correlate ultrasound findings with clinical diagnosis, thus helping the treating obstetrician in deciding the management protocol.

Materials and Methods

- We studied 30 cases of pregnant women

who presented with bleeding per vaginum during the first trimester. The main source of data for this study were women who presented with bleeding per vaginum in the first trimester of pregnancy and referred to the department of radiodiagnosis from the department of Obstetrics and Gynecology in Konaseema Institute of Medical Sciences and Research Foundation, Amalapuram, for the period of 16 months.

- All patients were evaluated with clinical history, clinical examination, and ultrasonography.
- Ultrasonographic examination was done using the following machines.
 - PHILIPS CLEARVUE 650.
 - GE LOGIQ F8.

Inclusion Criteria

- Patients presenting anywhere from the first day of the last menstrual cycle to 12 weeks of pregnancy with complaints of bleeding per vagina are included in the study.

Exclusion Criteria

- Women of reproductive age with a missed period with a negative urine pregnancy test.
- Patients who refuse to get admitted to the hospital.
- All non-obstetrical causes of vaginal bleeding.
- All patients with more than 12 completed weeks of gestation.

Results

- Age distribution of patients

Age in years	Number of cases	percentage
18-20	6	22.5
21-25	20	66.7
26-30	3	8.8
31-35	1	2
Total	30	100

- Parity distribution

Parity	Number of cases	Percentage
Primi	11	35
Multi	19	65
Total	30	100

- Type of marriage

Type of marriage	Number of cases	Percentage
Consanguineous	5	15.7
Non-consanguineous	25	84.3
Total	30	100

- Duration of amenorrhea

Duration of amenorrhea	Number of cases	Percentage
<8 wks	1	0.3
8-10 wks	12	42.7
>10 wks	19	57
Total	30	100

- Duration of bleed

Duration of bleed	Number of cases	Percentage
1-2 days	24	81
3-4 days	6	19
Total	30	100

- Pain abdomen

Pain abdomen	Number of cases	Percentage
Present	18	58.8
Absent	12	41.2
Total	30	100

- Ultrasound examination findings

USG finding	Number of cases	Percentage
Gestational sac	22	75.5
Fetal node	15	50
Fetal cardiac activity	13	44.1
Yolk sac	14	49
Liquor less	4	13.7
Subchorionic bleed	2	8.8

Open	28	96.1
Partially open	1	2.9
Closed	1	0.9

Physical examination		Number (n)=30	Percentage
Uterine size	<10	14	48
	10-12	15	52
Cervix	Closed	29	98
	Partially open	1	2
Fornices	No tenderness	29	98
	Tenderness	1	2

Clinical findings	Clinical diagnosis		USG diagnosis		Final diagnosis	
	Number of cases	percent age	Number of cases	percent age	Number of cases	percent age
Complete abortion	1	4.9	3	10.8	3	10.8
Ectopic gestation	1	3	1	1	1	1
Incomplete abortion	9	31.4	7	24.5	7	24.5
Threatened abortion	17	56.9	13	44.1	13	44.1
Inevitable abortion	1	2.9	1	2.9	1	2.9
Missed abortion	1	2.9	1	2.9	1	5.9
Hydatidiform mole	0	0	1	2.9	1	2.9
Early embryonic demise	0	0	1	2.9	1	2.9
Anembryonic gestation	0	0	1	2.9	1	2.9
Total	30	100	30	100	30	100

Correlation & Evaluation of Clinical Diagnoses with Final Diagnoses

The validity of Clinical Diagnoses with Final Diagnosis:

Parameters	True positive	False-positive	False-negative	True negative
Viable intrauterine pregnancy	11	5	1	11
Non-viable intrauterine pregnancy	6	5	8	9
Ectopic pregnancy	1	0	1	28

Parameter	Sensitivity	Specificity	PPV	NPV	Accuracy	P-value
Viable intrauterine pregnancy	89	68	69	89	77	<0.001
Non-viable intrauterine pregnancy	45	63	55	53	54	0.05
Ectopic pregnancy	33	100	100	96	96	<0.001

Treatment

Treatment	Frequency	Percentage
Conservative	13	46.1
D&C	14	49
Laparotomy	3	4.9
Total	30	100

Outcome

Outcome	Frequency	Percentage
Full-term normal delivery	9	30.4
Terminated	21	69.6
Total	30	100

Discussion

- Bleeding per vaginum in the first trimester is one of the most common obstetric problems, and it is also one of the commonest causes for the majority of the emergency admissions to the obstetrics department and also a common indication for ultrasound examination in the first trimester of pregnancy.
- Only with history and clinical examination of the patients, it is impossible to arrive at a definitive diagnosis. The causes of bleeding cover a spectrum of conditions ranging from a viable pregnancy to non-viable pregnancy. The most common causes include various types of abortions, ectopic gestation, EED, and AG, etc. Ultrasonography has opened new dimensions in the diagnosis of first trimester bleeding so that specific treatment with medical or surgical can be immediately instituted.
- Ultrasound guides clinicians by early diagnosis to appropriate management of the patient's condition accordingly and prevents complications.
- Ultrasonography indicates the need for a Dilatation and Curettage by diagnosing retained products of conception in the uterine cavity and gives a good index for evacuation in cases of abortion.
- Curettage is necessary if residual contents are seen but not when the uterus though bulky, appears empty in which it may lead to complications.
- The Sonographic landmarks of the normal first trimester of pregnancy have been well recognized, and they include identification of gestational sac, fetal pole, fetal cardiac activity, movements, yolk sac and amnion, biometry, which can help in the diagnosis of pathological pregnancy.
- USG has got excellent identification features that could differentiate normal pregnancy from pathological pregnancy, which warrants immediate termination and redirects the pregnancy outcome, which has been clearly documented.
- Ultrasonography is an excellent tool to assess the prognosis of the pregnancy, like whether the safe continuation of the pregnancy is possible or not, especially in subjects who present with a poor obstetric history, vaginal bleeding, or abdominal cramps in early pregnancy who pose a diagnostic challenge to the clinicians and sonographers.
- Clinical history and pelvic examination are inadequate in assessing the cause of bleeding and the prognosis. Ultrasound (both TAS and TVS) plays an important role in the evaluation of the causes of the first trimester bleeding, prognosis, and predict the status of abnormal pregnancy.
- Ultrasonography is a non-invasive modality, which is extremely useful to arrive at an accurate diagnosis and management of cases appropriately.

Comparison of Causes of Bleeding in First Trimester of Bleeding in some Previous Studies

Study	P Reddi Rani et al		Rama sofet et al		Present study	
	Number	%	Number	%	Number	%
Cause of bleeding						
Various types of abortions	17	61	20	77.5	26	88.2
Ectopic pregnancy	6	21	3	10	2	5.8
Hydatidiform mole	5	18	1	5.5	1	2.9

Prevalence of Subchorionic Bleeding in TA Cases Comparison with few studies Available

Study	Number of cases	%
Steven R etal 1983	10	20
Jan fog pederson et al 1990	62	18
Present study	2	11.1

Comparison of Clinical vs USG Diagnosis in few Studies

Study	USG diagnosis	Clinical diagnosis	Disparity	
			Number	%
Jaideep malhotra et al	150	102	48	32
P Reddi Rani et al	100	58	32	42
Present study	30	19	11	36.2

Comparison of Frequency of Occurrence of Outcomes after Ultrasound for Bleeding in the First Trimester

Study	Viable	Non-viable
Herz et al 1980	0.58	0.42
Nyberg et al 1986	0.44	0.52
Stabile et al 1986	0.64	0.36
Charles W Schaubberger et al 2005	0.44	0.33
Present study	0.44	0.50

Comparison of USG Accuracy with Some of the Studies Available

Causes of bleeding	Study of Rama Sofat	Study of Neelam SB	Present study
Threatened abortion	95.5	98.2	100
Missed abortion	50	100	100
Incomplete abortion	50	100	100
Blighted ovum	100	0	--
Ectopic pregnancy	87.5	--	100
Hydatidiform mole	100	100	100
Inevitable abortion	100	--	100
Complete abortion	--	--	100

Conclusion

- First trimester vaginal bleeding in pregnancy is a common obstetric problem, and correct management of cases depends on the correct diagnosis of the condition. An ultrasound can provide women with considerable information about normal pregnancy and pathological pregnancy at no cost in terms of invasiveness or medical risk.
- The common causes of bleeding during the first trimester include abortions, ectopic pregnancy, and molar pregnancy. Ultrasound is a safe, valuable, non-

invasive, non-ionizing, and easily available method of investigation to assess the patients with first trimester bleeding, which is highly accurate in diagnosing the actual causes of bleeding and guides the clinician in choosing the appropriate line of management and prevents mismanagement of the cases.

- Ultrasound can assess some findings, which are helpful in predicting the prognosis of the pregnancy.
- In the present study, various types of abortions constituted the commonest cause of first trimester bleeding. All cases were

diagnosed correctly on ultrasonography with 100% sensitivity and accuracy and managed appropriately.

- So, ultrasonography helped in establishing

the correct diagnosis and to decide the line of management. Ultrasonography also helped to avoid unnecessary curettage and infections to patients.



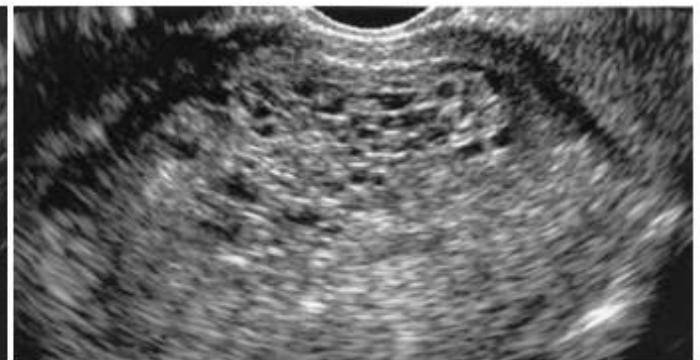
- Incomplete abortion in a 23-year-old female with complaints of spotting PV since 1 day.

- Sonography reveals echogenic contents in the endometrial cavity – suggestive of retained products of conception.



- Missed abortion in a 22-year-old pregnant woman with 2 months of amenorrhea, came with complaints of bleeding per vaginum since 2 days. Sonography reveals

intrauterine gestation of 8 weeks 6 days with no cardiac activity. Features are suggestive of missed abortion.



- Complete molar pregnancy in a patient of 28-year-old female presented with vaginal bleeding since 2 days.
- TV sonography reveals Complex

echogenic mass containing small irregular cysts that are surrounded by fluid collection within the endometrial cavity suggestive of complete molar pregnancy.



- Anembryonic gestation in a 27-year-old female with H/O 2 months of amenorrhea.
- Sonography reveals an empty gestational sac of 7 weeks 2 days and absent yolk sac and fetal node suggestive of a blighted ovum.

- In the present study, we found that ultrasound was dependent on the operator, and diagnosis relies on the expertise, technique, training, and experience of the operator

Limitations of the Study

- The number of cases in the present study was small, but it gives a valuable guideline for further investigation and management of cases to clinicians. Further studies are required with a large number of cases to assess the appropriate accuracy and sensitivity of the ultrasound in patients with first trimester bleeding per vaginum.
- Most of the cases are diagnosed with TAS, and some cases are diagnosed with TVUS, which are not diagnosed correctly on TAS. Accuracy of comparison of TAS and TVS is not done.

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