Benha Journal of Applied Sciences (BJAS) **print: ISSN 2356–9751**
Vol. (6) Issue (4) Part (2) (2021), (267-272) **online: ISSN 2356–976x**
http://bjas.journals.ekb.eg

Diagnostic Accuracy of Ultrasonography in Women with Postabortive and Postpartum Hemorrhage

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Abstract

Background: The retained design products (ROC) make around 1% of all births difficult and are characterised as placental trophoblastic residues. The purpose of this research was to assess the diagnostic accuracy of sonography in individuals who believed they had retained placental fragments after and after the abortion. Methods: 150 postpartum and post abortion women were included in the research, in whom the placenta examination raised suspicions of placental pieces retained. The uterine cavity was manually explored by all these ladies. Prior to the operation, all patients were separated into two groups using two-dimensional sonographic images. The first group comprised of individuals in whom sonography echoes were revealed that may appear as trophoblastic residual tissue, echogenic, hypo-echoic and mixed intra-cavitarian patterns. The second category included women who were considered to have an empty uterus or nothing but an intrauterine accumulation of fluid. Results and Conclusion: Six of these individuals exhibited little and clinically insignificant remaining trophoblastic tissue. Sonography indicated retaining placental tissue in 33 individuals. All these individuals have been verified residual trophoblastic tissue by pathological testing. Sonography is an efficient technique to assess the retention of placental fragments in postpartum and post-abortion patients. Normal sonographic results may avoid the necessity for uterine cavity physical investigation. A doubtful sonographical finding is not a useful technique to differentiate placental fragments from blood clots alone.

Keywords: Ultrasonography, Postoperative, Postpartum, Hemorrhage.

1. Introduction

Retented design products (ROC) make about 1% of all births difficult and are characterised as residues of placental trophoblastic origin [1].

Undiagnosed and not adequately treated, it may lead to a subsequent haemorrhage of the postpartum due to subinvolution, infections and intrauterine adhesion. The greatest cause of maternal morbidity and death is postpartum haemorrhage worldwide [2].

Therefore it is essential to acknowledge signs and symptoms promptly that may occur in a woman with postpartum problems by retaining goods. Variable RPOC presentations are observed, however the most frequent clinical signs include an enlarged cervical uterus, open cervical os, stomach discomfort, vaginal bleeding and fever[3].

These symptoms are unfortunately extremely unspecific, making diagnosis more difficult. There are many illnesses producing them and they may develop even in a normal postpartum uterus. This leads us to the conclusion that knowledge of the normal postpartum period is essential for the diagnosis of a pathology. Ultrasound seems increasingly to be a helpful technique for the diagnosis of RPOC, and more precisely than a clinical presentation alone [4].

The problem with ultrasound results is that they are based on indications that may also be seen in the normal postpartum uterus. Varied studies also reveal different results, which makes it even more perplexing, as the most sensitive of RPOC. Nulliparity, maternal age, labour induction, uterine surgery in the woman's history and placenta accreta were known risk factors for RPOC [2].

The ideal standard for RPOC IS dilation and curettage therapy (D&C). This technique is not without dangers, though. Further problems occur in 7% and may lead to hysterectomy [1]. They include uterine perforation, cervical laceration and subsequent synechia development.

To prevent needless procedures and potential consequences, before contemplating this therapy, we must be as confident as possible of diagnosing RPOC. A more cautious attitude should otherwise be maintained.

The objective of this research was to assess the diagnostic accuracy of ultrasound in postpartum haemorrhages and post abortive bleeding, which were believed to contain retained design products (RPOC). To assess the ultrasonographic characteristics of retained conception products (RPOC) and histopathological correlations.

2. Patients and methods

A prospective research on (150) instances of post-abortion bleeding at BENHA University Hospital, which is a tertiary reference hospital from January 2017 to 1 July 2018, was performed. The ladies involved in the research received informed permission and the ethics committee of the medical faculty at the BENHA University agreed to the study.

Each lady in the research had ultrasound and physical examined. All ultrasound tests were conducted using commercial-accessible real-time equipment with a 3,5-MHz transabdominal convex test and a 5-MHz vaginal test (Toshin Sonolayer Capasee SSA, Tokyo, Japan).

The ladies were evaluated with a fairly full urinary bladder. Sample mild compression was applied and uterine contractions were measured. In the longitudinal, transverse and coronal sections, the uterus was evaluated. In order to exclude out uterine abnormalities, the coronal section was examined. The maximal anteroposterior (AP) diameter of the uterus and the uterine cavity were measured in the longitudinal section, perpendicular to the endometrium. The same measurements were also taken from the uterine fundus at a distance of 5 em. The shape and location of the uterus were documented, along with the presence in the uterine cavity of fluid, heterogeneous substances or gas.

The scans have either been categorised normal, indicating only an empty uterus or fluid or having a questionable uterine content; the Sonographic predictors were a separate mass with echogenic, hypoecoic and/or mixed echogenic patterns of a thickness greater than 10 mm for the presence of retained trophoblastic tissue.

2.1. Inclusion criteria:

- All cases of postpartum hemorrhage of vaginally delivered women between 28 weeks and full-term gestational age.
- All cases of post-abortivehemorrhage with a gestational age less than 20 weeks.

2.2. Exclusion criteria:

- Cesarian section delivered women.
- Cases in which it is obvious that a cotyledon is missed.
- Patients with predominant clinical symptoms and signs of puerperal endometritis.
- Traumatic postpartum hemorrhage.

All cases in the study are subjected to:-

- Complete history taking.
- Clinical Examination.
- Laboratory investigations: CBC, PT, PTT. INR, Serum creatinine ALT,AST, Fasting & 2hr postprandial blood sugar

The cases after sonography divided into 2 categories:

Group 1: This group has the sonographic criteria of RPOC. (An echogenic mass is present in the uterine cavity). All the women in this group underwent surgical evacuation (curettage) and the extracted material was sent for Histopathological evaluationon the same day; AS evidence of chorionic villi in tissue samples obtained following D&C.

1. **Group (2)** this group is with uterine bleeding but without the sonographic criteria of RPOC. (Empty uterine cavity), All the women in this group underwent surgical evacuation (curettage) and the extracted material was sent for Histopathological evaluation as a therapeutic and diagnostic method.

2.3. Statistical analysis

The sensitivity, specificity, positive and negative predictive values, and diagnostic accuracy of the ultrasonic and Histopathological evaluations were calculated and compared. Descriptive parameters are expressed as mean ± SD. Frequencies are given as percentages. Student's t-test was used to analyze demographic variables. The StatsDirect comparison of two independent proportions test was use_d to compare sensitivity, specificity, positive and negative predictive values, and diagnostic accuracy. $P < 0.05$ was considered to be significant. Calculations were performed using SPSS for Windows version 11.0.

4. Results

The studied patients were classified into 2 groups, Group I (+ ve sonographic criteria of RPOC) were 33 patients (22%) and Group II (ve sonographic criteria of RPOC) were 117 (78%).

Table 1, shows no statistical significant difference (p-value > 0.05) between group I and group II as regard age.

Table (1) comparison between group I and group II as regard age.

Variables		Group I (N=33)	Group II (N=117)	P-value
Age (Years)	Mean	30.5	31.2	0.08
	±SD	2.6	1.9	
	Range	22 - 44	20 - 43	

Table (2) shows no statistical significant difference (p-value > 0.05) between group I and group II as regard parity.

Table (2) comparison between group I and group II as regard parity.

Variables		Group I (N=33)	Group II (N=117)	P-value
Parity	Primiparous	13 (39.4%)	53 (45.3%)	0.54
	Multiparous	20 (60.6%)	64 (54.7%)	

Table (3) shows no statistical significant difference (p-value > 0.05) between group I and group II as regard history of prior postpartum bleeding.

Table (3) comparison between group I and II as regard history of prior postpartum bleeding.

Variables		Group I (N=33)	Group II (N=117)	P-value
History of Prior Postpartum Bleeding	Positive	21 (63.6%)	59 (50.4%)	0.17
	Negative	12 (36.4%)	58 (49.6%)	

Table (4) shows no statistical significant difference (p-value > 0.05) between group I and group II as regard birth weight.

Table (4) comparison between group I and group II as regard birth weight.

Variables		Group I (N=33)	Group II (N=117)	P-value
Birth Weight (Gram)	Mean	3540	3470	0.27
	±SD	20.5	29.7	
	Range	(798 - 6200)	(553 - 5660)	

Table (5) shows no statistical significant difference **(p-value > 0.05)** between group I and group II as regard breast feeding.

Table (5) Comparison between group I and group II as regard breast feeding.

Variables		Group I (N=33)	Group II (N=117)	P-value
Breast Feeding	Positive	25 (75.8%)	95 (81.2%)	0.49
	Negative	8 (24.2%)	22 (18.8%)	

Table (6) shows no statistical significant difference (p-value > 0.05) between group I and group II as regard estimated bleeding at delivery.

Table (6) comparison between group I and II as regard estimated bleeding at delivery.

Variables		Group I (N=33)	Group II (N=117)	P-value
Estimated bleeding at delivery(ml)	Mean	1200	1190	0.91
	±SD	450	490	
	Range	(200-3500)	(100-2800)	

Table (7) shows statistically significant difference (p-value < 0.05) between group I and group II as regard blood transfusion.

Table (7) comparison between group I and group II as regard blood transfusion.

Variables		Group I (N=33)	Group II (N=117)	P-value
Blood transfusion	Yes	15 (45.5%)	22 (18.8%)	0.002
	No	18 (54.5)	95 (81.2%)	

Table (8) shows statistically significant difference (p-value < 0.05) between group I and group II as regard using uterotonic drugs.

Table (8) Comparison between group I and group II as regard using uterotonic drugs.

Variables		Group I (N=33)	Group II (N=117)	P-value
Uterotonic Drug	Yes	33 (100%)	103 (88%)	0.036
	No	0 (0%)	14 (12%)	

Table (9) shows no statistical significant difference (p-value > 0.05) between group I and group II as regard laboratory data.

Table (9) Comparison between group I and group II as regard using laboratory data.

Variables		Group I (N=33)	Group II (N=117)	P-value
Hb (g/dl)	**Mean**	11.7	11.8	
	±SD	1.7	1.2	0.7
WBCs (x10^3/ul)	**Mean**	5.6	6.1	0.2
	±SD	2.3	8.1	
PLT (x10^3/ul)	**Mean**	195.5	187.5	0.1
	±SD	20.8	27.4	
INR	**Mean**	1.1	1.09	0.8
	±SD	0.1	0.2	
RBS (mg/dl)	**Mean**	110.5	116.4	0.09
	±SD	10.4	11.7	
AST (u/L)	**Mean**	30.4	29.6	0.5
	±SD	8.6	5.7	
ALT (u/L)	**Mean**	19.5	18.4	0.1
	±SD	4.6	3.5	
Create (mg/dl)	**Mean**	0.9	0.8	0.06
	±SD	0.1	0.1	

Table (10) shows statistically significant difference (p-value < 0.05) between group I and group II as regard U/S findings.

Table (10) comparison between group I and group II as regard U/S findings.

Variables		Group I (N=33)	Group II (N=117)	P-value
Endometrial thickness	**Mean**	21.5	12.6	
	±SD	4.6	6.8	< 0.001*
Endometrial thickness >10mm	**Yes**	33 (100%)	58 (49.6%)	
	No	0 (0%)	59 (50.4%)	< 0.001*
Hyperechoic mass	**Yes**	30 (91%)	25 (21.4%)	
	No	3 (9%)	92 (78.6%)	< 0.001*

Table (11) shows statistically significant difference {p-value < 0.05) between group I and group II as regard histo-pathological examination.

Table (11) Comparison between group I and II as regard histo-pathological examination.

Variables		Group I (N=33)	Group II (N=117)	P-value
Trophoblastic tissue	**Yes**	33 (100%)	6 (4.2%)	
	No	0 (0%)	111 (95.8%)	< 0.001*

Using roc curve, it was shown that endometrial thickness can be used to discriminate between group I and group II at a cutoff level of > 0.8, with 94% sensitivity,92% specificity, 94.7% PPV and 90.5% NPV. figure (1)

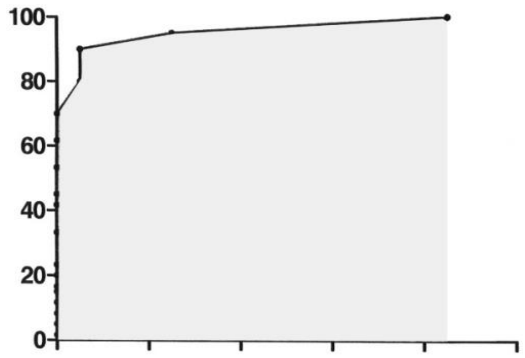

Fig. (1) ROC curve between patients group and control group as regard MELD score.

5. Discussion

The difference (p-value < 0.05) between group I and group II in blood transfusion in the current research was statistically significant. Mulic-Lutvica and Axelsson said in their research that more patients from Group 1 got blood transfusions and antibiotics in accordance with results of another study. Blood transfusions have been used in 8 patients in Group 1 and in 3 patients in Group 2 for subsequent postpartum haemorrhage. In the remaining eight instances, blood transfusions were carried out in Group 2 for the treatment of primary postpartum hemorrhage [5].

On just the thickness of the endometrium, According to our data from the U/S results, 100% of patients in Group I exhibited a very significant endometrial thickness of more than 10mm (p-value < 0.001). The average endometrial thickness of Group I was 21.5 mm and group II 12.5 mm with a significant difference (p-value < 0.001).

Comparisons between group I and group II for ultrasonography and histopathology are statistically significant (p-value < 0.001). In 117 instances, the ultrasound evaluated negative RPOC criteria: 95.8 percent stated to be —ve Histo-pathological Trophoblastic tissue. In Group I (n=33) sonography showed doubtful uterine concentration (distinct masses with a thickness >10 mm, 91% echogenic matter in the uterine cavity), which has verified +ve Trophoblastic Tissue in 100% of histopathologic instances.

The sensitivity of sonography for predicting retained conception products was 94 percent using the rock curve. The specificity of 92% was 94.7% PPV and 90.5% NPV. The K-measuring of the agreement between the two measures was 0.646 (P <0.001). The thickness of the endometrium was demonstrated to distinguish between group I and group II at a cut-off of >8mm.

Several investigations have shown different cut-off values for the exclusion of RPOC. Similar to our findings, in one study8 mm a cut-off level with a sensitivity and a specificity of 100% and 80% were proposed. In another investigation, 13 mm were reported as a cut-off level with a sensitivity of 85% and a specificity of 64%. [6].

Previous research have tried to predict preserved sonographic design results. Hertzberg and Bowie were able to predict an empty uterus in 24 individuals with adverse sonographic signs using transabdominal sonography in 53 patients with postpartum hemorrhage[1].

In a combination of postpartum and post-aportatory patients with late afterpartum or post abortion bleeding, Achiron et al. utilised a transvaginal technique and were able to foresee a benign clinical course when the uterus was deemed empty. There has been no pathologic correlation since these individuals have been chosen for conservative therapy. With Doppler investigations, they were able to differentiate between remaining trophoblasts and clots or decidual debris [7].

Other researchers have been able to anticipate tissue retention in post-abortion and postpartum haemorrhage from their experience with sonohysterography. We decided to investigate a particular group of individuals who were believed to have incomplete placentas [8], that is, asymptomatic postpartum patients.

Our findings show that a strong negative predictive value for this group of patients may be achieved without the requirement of specialist further testing using two-dimensional sonography. Images acquired from the uterine cavity transabdominal channel were adequate to forecast the empty uterus accurately. We believe that this may be because the enlarged uterus is close to the abdominal wall.

As we wanted to provide a practical and easily accessible method which could be used quickly in the delivery room area, we decided not to utilise Doppler colour sounding or sonohysterography as described by others. The transvaginal method may be less pleasant for a postpartum patient and could not be accessible in the birth area. For these individuals, the transabdominal technique has been shown to be adequately accurate [9].

Sonography was conducted by professional sonographers in this research. The practitioner would not always have access to such a consultancy. Since we believe that it is possible to train residents in postpartum patients to identify an empty uterus according to the technology described, we are now conducting a study in which residents with minimum training in sonography perform the exams in the same patient group in order to determine whether these results are valid when sonography is performed by non-experts. When regular exams of placenta generate suspicion of a missing placental piece, uterine exploration with anaesthetic is conventional treatment. Our results support the notion that an invasive procedure should be avoided if a transabdominal ultrasonography in such a patient indicates an empty uterus.

6. Conclusion

Sonography is an efficient technique to assess the retention of placental fragments in postpartum and post-abortion patients. Normal sonographic results may avoid the necessity for uterine cavity physical investigation. A doubtful sonographical finding is not a useful technique to differentiate placental fragments from blood clots alone.

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