

DIAGNOSTIC ACCURACY OF TRANSVAGINAL ULTRASOUND IN CLINICALLY SUSPECTED CASES OF RETAINED PRODUCTS OF CONCEPTION

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ABSTRACT

Aim: The aim of this study was to determine the diagnostic accuracy of transvaginal ultrasound (TVUS) in clinically suspected cases of retained products of conception taking histopathology findings as gold standard. The author had already reported the sensitivity for the detection of RPOC using conventional medium frequency (3.5 MHz) probe through transabdominal approach and has tried to assess the improvement in the sensitivity using trans vaginal sonographic approach. This study was not designed to compare efficacy of transabdominal with Trans vaginal sonography for the detection of retained products of conception for which another research project is underway in the same department results of which will be published in due course of time.

Material and Methods: The study was conducted in the Department of Diagnostic Radiology, Lahore General Hospital, Lahore. All patients included in the study were within the age bracket of 15-45 years who attended Emergency and/or Outpatient Department (OPD) from June 2009 to May 2013 and were referred by Gynaecology Department on the suspicion of having Retained Products of Conception (RPOC) on the basis of history and/or clinical examination. Detailed relevant history and physical examination findings were recorded in all the cases. Transvaginal ultrasound with a 7.5 MHz convex array transducer was performed in each of the referred cases. The cases underwent histopathology of the extracted material. The results of transvaginal ultrasound and histopathology were compared taking histopathologic findings as gold standard.

Results: A total of 160 patients with clinical suspicion of Retained Products of Conception were registered during this period. The highest number of patients, i.e 68 (42.5%) were aged between 26-35 years. Out of 160 patients, 85 patients (53.12%) had RPOC on TVUS. After comparison of results of Transvaginal ultrasound with histopathology, the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of TVUS were 97.6%, 96.05%, 96.4%, 97.3% and 96.8% respectively.

Conclusion: We recommend TVUS for the evaluation of retained products of conception because it is a highly accurate and convenient imaging modality and can play a significant role in decreasing unnecessary surgical intervention and exploration of uterine cavity hence reducing the attendant possible complications (endometritis, adhesion formation, infertility etc), planning management and estimating patient's prognosis.

Keywords: Retained Products of Conception, Transvaginal Ultrasound.

INTRODUCTION

Retained products of conception (RPOC) are considered to be the most common reason for hospital referral & readmission in the postpartum period¹. Reported incidence of RPOC is 0.4-3.8% of all deliveries². Secondary postpartum hemorrhage is common clinical symptom of RPOC with an alarming incidence of upto 48.5% in postpartum group³.

The diagnosis of RPOC is a major clinical challenge as their evacuation often requires dilatation

and curettage⁴ which may need to be performed in approximately 70% of patients referred with secondary postpartum hemorrhage. Despite its simplicity and relative safety, there is reported 8.5% incidence of major morbidity related to uterine evacuation, with uterine perforation and atony being the most important³.

On the other hand, RPOC may cause prolonged bleeding, endometritis and sometimes intrauterine adhesions and infertility⁵. Reported complication rate varies between 4 to 10%⁶.

Transvaginal ultrasound (TVUS) is considered to be more reliable than clinical diagnosis alone in the detection of RPOC⁷. TVUS has a sensitivity of 94%, specificity of 98%, positive predictive value of 84% and negative predictive value of 99% for detection of RPOC. There is no consensus in literature regarding optimal sonographic criteria for detection of RPOC but most commonly used parameter is endometrial mass measuring greater than 10 mm (including both layers of the endometrium at the midesagittal plane)³ appearing as hyperechoic, hypoechoic, or mixed echogenicity soft tissue structure in the uterine cavity,

With improved ultrasonographic technology and experience with its use, transvaginal sonographic (TVUS) evaluation has shown increasing promise for early detection of RPOC in our setting that may help avoid unnecessary curettage in women with suspected RPOC after labor or abortion. The studies done so far have shown variable results and the present study is an endeavour to assess the usefulness of addition of TVUS to clinical impression for improving the diagnosis of RPOC.

MATERIAL AND METHODS

The study was conducted in the Department of Diagnostic Radiology, Lahore General Hospital, Lahore, a tertiary care institution serving a large segment of the urban population of Lahore belonging to medium and lower socio economic class. Most of the patients referred to this hospital, with a huge daily combined turnover of more than 3,000 patients in OPD and COD, had been delivered and/or manipulated outside this institution who sought consultation after developing Post partum hemorrhage usually 4 to 24 days after delivery or abortion. All patients presenting with clinical suspicion of RPOC (based on history and/or clinical evaluation) referred by an experienced gynaecologist (Sami.S) from Outdoor as well as COD of Lahore General Hospital, Lahore and meeting the inclusion criteria were evaluated sonographically. Informed consent for transvaginal sonography from all the patients included in the study was taken. A record was made of demographic features i.e. age, and address. Transvaginal sonogram (TVUS) using 7.5 MHz convex array transducer (Esoate Mylab 20 and Mylab 20 plus, Holland) was carried out with clean condom sheath covering the transducer head by the author and co-author (Akhtar S). Clear visualization of the cervix, uterine cavity, both fallopian tubes and ovaries was acquired. Transvaginal sonographic diagnosis i.e. presence or absence of RPOC using the before mentioned criteria was recorded by the same observers. This time, unlike previous study by the same author

whereby patients were divided into four groups based on the thickness of endometrial mass, 10 mm antero posterior thickness was selected as the only criterion for inclusion in the study. This change in inclusion criterion was made considering the exquisite resolution and clarity of endometrial mass visualization due to higher frequency of the probe (7.5 MHz for TVUS versus 3.5 MHz in Transabdominal Sonography). All patients with clinical suspicion of RPOC underwent Dilatation and Curettage irrespective of sonographic findings. Extracted material was submitted for histopathology. The results of TVUS and histopathology were compared taking histopathology as gold standard.

STATISTICAL ANALYSIS

All the data was analyzed with SPSS version 10. The variables included age, Transvaginal Sonographic Diagnosis i.e. presence or absence of RPOC and histopathology results i.e. presence or absence of RPOC. For quantitative data i.e. age, mean and standard deviation was calculated. For qualitative data i.e., TVUS Diagnosis and histopathology results frequencies and percentages were calculated. A 2x2 table was used to calculate sensitivity, specificity, positive predictive value, negative predictive value and accuracy of TVUS for RPOC taking histopathology as gold standard

RESULTS

This study was conducted on 160 patients with clinical suspicion of RPOC for a period of forty eight months (from June 2009 to May 2013) in the Department of Diagnostic Radiology, Lahore General Hospital, Lahore in collaboration with Gynecological units of the same institute.

The age of patients ranged from 15 to 45 years with mean age 29.45 ± 7.89 years. The highest number of patients were aged between 26-35 years i.e. 68 (42.5%). 42 patients (26.25%) were aged between 36-45 years and 50 patients (31.25%) were aged between 15-25 years (Tab.I)

Table-I: Distribution of subjects by age n = 160

Age (years)	Number	Percentage %
15-25	50	31.25%
25-35	68	42.5%
35-45	42	26.25%
Total	160	100%
Mean \pm SD	29.45 \pm 7.89	

Out of 160 patients, 85 patients (53.12%) had RPOC on TVUS whereas remaining 75 patients (46.8%) could not be labeled as cases of RPOC on

TVUS findings. Out of these 75 patients, 57 patients (35.63%) had decidua or blood clots, 09 patients (5.63%) had an impression of endometritis, 06 patients (3.75%) had trophoblastic disease and 03 patients (1.87%) had endometrial polyp on TVUS. (Tab.II)

Table-II: Distribution of subjects by TVUS diagnosis n=160

TVUS Diagnosis	Number	Percent5age
RPOC	85	53.12%
Decidua or bood clot	57	35.63%
Endometritis	09	5.63%
Trophoblastic diseases	06	3.75%
Endometrial polyp	03	1.87%
Total	160	100%

The specimens collected from curettage showed RPOC in 84 (52.50%) patients while 76 samples (47.5%) were reported negative for RPOC on histopathologic examination. Histopathology reports of the 76 patients revealed that 55 patients (34.38%) had decidua or blood clots, 10 patients (6.25%) were suffering from endometritis, 06 patients (3.75%) had trophoblastic disease whereas 05 patients (3.12%) had endometrial polyp on histopathology. (Tab.III)

Table-III: Distribution of subjects by histopathology diagnosis n=160

Histopathology Diagnosis	Number	Percentage
RPOC	84	52.50%
Decidua or blood clot	55	34.38%
Endometritis	10	6.25%
Trophoblastic diseases	6	3.75%
Endometrial polyp	5	3.12%
Total	160	100%

Table-IV: Comparison of TVUS and Histopathology n=160

TVUS	Histopathology (Gold Standard)		Total
	Positive	Negative	
Positive	82 (TP)	03 (FP)	85
Negative	02 (FN)	73(TN)	75
Total	84	76	160

Key:

TP = True positive

FP = False positive

FN = False negative

TN = True negative

On comparison of results of TVUS with histopathology, out of 160 patients, 82 patients were true positive, 73 patients, true negative; 03 patients, false positive and 02 patient, false negative (Table- IV).

The sensitivity of TVUS was 97.6%, specificity 96.05%, diagnostic accuracy 96.8%, positive predictive value 96.4% and negative predictive value 97.3%. (Tab.V)

Table V: Sensitivity, Specificity, PPV, NPV and diagnostic accuracy of TVUS for RPOC.

Sensitivity	97.6%
Specificity	96.05%
Positive predictive value	96.4%
Negative predictive value	97.3%
Diagnostic accuracy	96.8%

DISCUSSION

Residual trophoblastic tissue complicates nearly 1% of all pregnancies. It occurs most commonly after termination of pregnancy, but may also occur following spontaneous vaginal delivery or Caesarean section⁹. Common symptoms include fever, vaginal bleeding and abdominal or pelvic pain. Residual trophoblastic tissue is considered to be a cause of uterine adhesions and Asherman's syndrome¹⁰. Because the possible sequel may be serious, early diagnosis of residual trophoblastic tissue is crucial. The introduction of ultrasonographic examination into the gynaecological practice contributed greatly to the identification of remnants of a recent pregnancy. Early studies using the transabdominal technique reported conflicting results^{11, 12, 13}. The introduction of TVUS improved the diagnostic accuracy of ultrasound to detect the retained trophoblastic tissue^{14,15}.

In this study, out of the 160 patients with clinical suspicion of RPOC, 84 patients (52.5%) had RPOC and 76 patients (47.5%) had other pathologies. This is in agreement with literature findings which state that RPOC account for about 50-58% cases of postpartum hemorrhage¹⁶. Out of 76 other pathologies, decidua or blood clot is noted in 34.38% of cases, which is again in agreement with previous study, which stated that decidua or blood clot is the most common differential diagnosis¹⁷. Other alternative diagnoses were endometritis, placental trophoblastic diseases and endometrial polyp on histopathology. This is in concordance with recent studies that show these to be the important differential/alternative diagnoses in clinically suspected cases of RPOC^{18, 19}.

In this study age range of the patients is 15-45 which lies close to that described in literature in which

age range was 19-42 years²⁰. Similarly, mean age of the patients in this study is 29.45 ± 7.89 years, which is close to the mean age documented in literature i.e. 29.8 years²¹.

In the present study, comparison of results of TVUS with histopathology show that out of 160 patients, 82 patients were true positive, 73 patients were true negative, while 03 patients were false positive and 02 patients were false negative. The overall sensitivity of TVUS was 97.6%, specificity 96.05% and diagnostic accuracy 96.8% while the positive predictive value of TVUS was 96.4% and its negative predictive value was 97.3%. These results are close to results of another study in which TVUS was reported to have a sensitivity of 81%, specificity of 94%, positive predictive value of 93% and a negative predictive value of 83%²². Results of the present study are also supported by other studies^{23, 24}.

CONCLUSION

TVUS is a highly accurate, safe and convenient imaging modality for the evaluation of Retained Products of Conception and is valuable for guiding treatment options thereby decreasing unnecessary intervention. It plays an integral role in early detection of RPOC, planning management and assessing patient's prognosis. It is strongly recommended that every patient suffering from Post partum hemorrhage should be subjected to TVUS examination, especially if the clinical findings are equivocal. and decision to go for any intervention should be made based on the combined Clinico-Radiological impression. Using this approach, false positive cases on clinical assessment may be reduced to a minimum. Absence of endometrial mass on TVUS virtually rules out any possibility of RPOC. As a sizeable proportion of the patients suspected to be harboring RPOC on clinical examination can be diagnosed to be having blood clot rather than RPOC on TVUS, an emergency Curettage is to be withheld till the time a TVUS has been performed. In this way 40-50% of patients may be kept under observation and majority of them may not require any surgical intervention hence decreasing work load of busy Gynaecology Departments on one hand and averting stress and possible complications in a significant percentage of the patients. The patient be reassured and asked for a revisit to the OPD within a week when most likely the post partum hemorrhage might have abated.

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