Journal of Rawalpindi Medical College (JRMC); 2019;23(2): 93-96

Original Article

Diagnostic Accuracy of Endovaginal Scan in Detection of Retained Products of Conception after Incomplete Abortion

Kulsoom Iqbal,[1] Sidra Manzoor,[1] Rabia Waseem Butt,[1] Manal Niazi,[2] Ume Kulsoom,[3] Umairah Kalim[4]
1.Department of Diagnostic Radiology,HITEC Institute of Medical Sciences. Taxila Cantt;2. Department of Diagnostic Radiology, Islamabad Medical & Dental College,Islamabad;3.Department of Ddiagnostic Radiology, Benazir Bhutto Shaheed Hospital Rawalpindi;4. Uppal Diagnostic centre Wah Cantt.

Abstract

Background : To determine diagnostic accuracy of Endo-vaginal Scan (EVS) in detection of retained products of conception (RPOC) in patients with incomplete abortion.

Methods: In this prospective study 200 pregnant females, with gestational age <20 weeks and with persistent vaginal bleeding, diagnosed clinically with retained products of conception, were included. Endo-vaginal ultrasound scan pelvis was done in real time in axial and saggital planes. Imaging of the examination was directed towards evaluation of the uterus and any intrauterine contents. Endometrial thickness of >12mm on EVS was considered positive for diagnosis of RPOC which was later on confirmed with histopathology(HP) . Comparisons was then made between EVS and HP findings.

Results: Mean age of selected patients was 30.8 years age ± 3.9 and mean gestational age 17.2 weeks ± 1.8 SD . Patients positive on EVS were 63.0% and patients positive on HP were 72.5%. Sensitivity, specificity, PPV, NPV and accuracy were found to be 71.7%, 60.0%, 82.5%, 44.6% and 68.5% respectively.

Conclusion: Endovaginal ultrasonography allows detection of RPOC with reasonable accuracy. .

Key Words: Transvaginal ultrsonography, Retained products of conception, Endometrial thickness

Introduction

Early miscarriage is seen in approximately 10%-16% of pregnancies identified on clinical basis and among those clinically diagnosed as complete abortion 45% will be reported as having retained products of trophoblastic tissue on ultrasound examination.[1-4] A miscarriage is the most frequent complication of a pregnancy and the greatest risk factor for miscarriage is maternal age.[5,6] Incomplete miscarriage is seen on ultrasound as mixed echogenecity in the uterine cavity with or without a gestational sac with the distortion of the endometrial midline.[7] Clinically these patients present with abdominal pain along with vaginal bleeding. The retained tissue acts as source of infection and can cause continuous prolonged haemorrhage, abdominal pain and fever. On evaluating clinically, the diagnosis of retained product of conception is often not accurately made due to non specific signs and symptoms. The current management of retained products of conception involve surgical dilatation and evacuation, which can further complicate the condition by uterine perforation, bowel damage, infection and uterine adhesions.[8]

Endovaginal ultrasonography is an effective and easy method for the evaluation of retained tissues of conception in patients having post abortal bleeding. In cases where ultrasound findings are borderline, cross sectional imaging is useful.[9] Many sonological features such as thickened endometrium, endometrial mass, irregular endo-myometrial interface, heterogenous endometrial fluid or hyperechoic focus are mentioned as retained products of conception. Among these commonly used parameter for the detection of retained product of conception on endovaginal scan is endometrial thickness. However there is a wide range of difference in cutoff endometrial thickness taken for diagnosis of retained product of conception. Endometrial thickness more than 12 mm had an acceptable sensitivity and specificity in detecting retained products of conception . [10,11]

Patients and Methods

In this prospective study, performed at Department of Radiology, Pakistan Institute of Medical Sciences, Islamabad , 200 pregnant females, with gestational age <20 weeks and with persistent vaginal bleeding, diagnosed clinically with retained products of conception, were included. Patients with suspected

ectopic pregnancy, suspected molar pregnancy and those having vaginal bleeding but negative urine pregnancy test were excluded.In endo-vaginal ultrasound scan pelvis was examined in real time in axial and saggital planes. The imaging of the examination was directed towards evaluation of the uterus and any intrauterine contents. Endometrial thickness of >12mm on EVS was considered positive for diagnosis of RPOC which was later on confirmed with histopathology(HP) . Comparison was then made between EVS and HP findings. Frequency percentages for categorical data like true positive and true negative were calculated. The results were analyzed by creating 2 x 2 contingency tables which displayed the numbers of subjects who were positive on EVS and were also positive on HP (true positives), who were EVS positive but were HP negative (false positives), who were EVS negatives but were positive on HP (false negatives) and who were EVS negative and were also HP negatives (true negatives). The table allows us to see at a glance the proportion of true positives, false positives, true negatives and false negatives.

Results

Mean age of patients was 30± 3.9 years, while mean gestational age was 17.2± 1.8 weeks (Table1). Results of EVS showed that there were 63.0 % of patients who were positive and 37.0 % were negative as per our operational definition (Table 2). Histopathology results showed that 72.5% of patients were positive and 27.5% were negatives as per criteria defined(Figure 1;Table 3). In study population 52% were true positives, 16.5% were true negatives, 11% were false positives and 20.5% were false negatives. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy of 91.1%, 89.1%, 94.2%, 83.7% and 90.4% respectively (Table 4).

Table 1: Demographic Profile of the study Population

	Mean± SD	Range
Age (years)	30.8 ± 3.9	19.0 – 41.0
Gestational age (weeks)	17.2± 1.8	12-20

Table 2: Endovaginal ultrasonography (EVS) results

	Number	Percentage
Positive	126	63.0
Negative	74	37.0
Total	135	100.0

Table 3: Histopathology (HP) results

	Number	Percentage
Positive	145	72.5
Negative	55	27.5
Total	135	100.0

Table 4: Cross-tabulation of TVS and Histopathology results

	Histopathology (HP)		
Endovaginal ultrasonography(EVS)	Positive	Negative	Total
Positive	104(52%; True Positives)	22(11.0%; False Positives)	126
Negative	41(20.5%; False Negatives)	33(16.5%; True Negatives)	74
Total	145	55	200

Sensitivity: 71.7%;Specificity: 60.0% ;Positive Predictive Value: 82.5% ;Negative Predictive Value : 44.6% ;Over all Accuracy : 68.5%

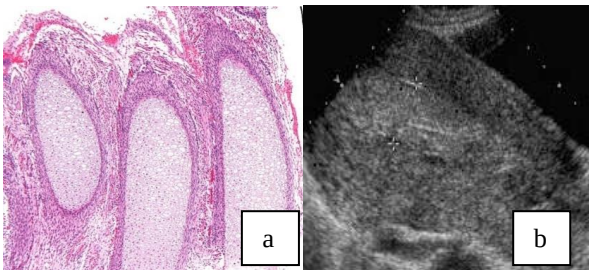

Figure 1: (a)Products of conception i-e Chorionic villi (HP) (b) TVS showing RPOCs

Discussion

The histopathologic diagnosis of retained products is based on the detection of chorionic villi, which signifies persistent trophoblastic or placental remnants. Clinically these patients present with vaginal bleeding and abdominal pain .The retained tissue acts as source of infection and can cause continuous prolonged haemorrhage, abdominal pain and fever. On clinical evaluation the diagnosis of retained products of conception is often not accurately made due to non specific signs and symptoms and the current management of retained product of conception involve surgical dilatation and evacuation, which can further complicate the condition by uterine perforation, bowel damage, infection and uterine adhesions. Endovaginal sonographic (EVS) evaluation is generally helpful in patients with complications. Thickening of Central Endometrial Echo (CEE) or a focal mass in the uterus is a useful ultrasound para meter suggesting retained products. Nevertheless, only gray-scale findings are insufficient for complete and definitive diagnosis. Demonstration of blood flow in a thick CEE or a focal mass at Doppler US enhances

the positive predictive value for diagnosing RPOC.[12] When US findings are borderline, CT or MRI may be useful and typically demonstrates an enhancing intrauterine mass lesion in patients having RPOC. Pitfalls in diagnosis are uncommon, however, include vascularized RPOC, that may be confused with arterio-venous malformation of uterus; true uterine arterio-venous malformations, invasive molar pregnancy, hematoma and incomplete involution of the site of implantation of placenta. Studies revealed that transverse measurement of endometrium more than 12 mm as detected by TVS has an appreciable diagnostic value for the detection of retained tissue. [13,14]

Wong SF, et al concluded that endovaginal scan is a helpful adjunct with the clinical evaluation in females with early miscarriage. [15] Matijevic R, et al evaluated the diagnostic value of clinical as well as sonographic parameters in the management of residual trophoblastic tissues. They concluded that gray scale sonography alone or in combination with color Doppler imaging shows better diagnostic accuracy as compared to the conventional parameters used for the detection of RPOC.[16]Atri M, et al assessed and concluded that a focally increased blood flow as assessed on duplex Doppler is the best indicator for the presence of RPOC. [17]

Durfee SM, et al identified one hundred sixty-three cases of early miscarriage and the results concluded that if no endometrial fluid or mass is seen and that the measurement of endometrium is < 10 mm, presence of RPOCs is very unlikely. [18] According to Kamaya A, et al endometrial vascularity shows high correlation with presence RPOC . [19]

It is suggested that finding of high echogenecity material on sonography is highly suggestive of residual gestational tissues, absence of which RPOC are extremely less likely.[20,21] Clinical evaluation combined with sonographic features offers a good approach towards the accurate diagnosis of RPOC. Uterine measurements are most accurately obtained by transvaginal sonography.[22] Expectant management of abortion using sonographic features to determine eligibility, can reduce significantly the number of unnecessary uterine evacuations, depending on the criteria used. Although sonographic evaluation may be potentially helpful in discernment of RPOCs but in routine practice, accuracy of ultrasound in routine clinical practice has not yet been established due to mixed results in the literature. The main concerns of the use of ultrasound are with respect to thermal effects of the insonated tissue and due to the production of gas-filled bubbles which may lead to cavitation of tissue.[23-25]

Conclusion

Endovaginal ultrasonography allows detection of RPOC with reasonable accuracy

References

1. Choi TY, Lee HM, Park WK, Jeong SY, Moon HS. Spontaneous abortion and recurrent miscarriage: a comparison of cytogenetic diagnosis in 250 cases. Obstet Gynecol Sci. 2014;57:518–25.
2. .Maged A, Gaffar H, Mostafa W. Role of transvaginal ultrasound in detection of retained product of conception after abortion. Saudi J Health Sci. 2012;1:151-55.
3. Jenderny J. Chromosome aberrations in a large series of spontaneous miscarriages in the German population and review of the literature. Mol Cytogenet. 2014;7:38-41.
4. Bottomley C, Bourne T. Diagnosing miscarriage. Best Pract & Res Clin Obstet & Gynaecol. 2009;23:463-77.
5. van den Berg MM, van Maarle MC, van Wely M, Goddijn M. Genetics of early miscarriage. Biochim Biophys Acta. 2012;12:1951–59.
6. Kroon B, Harrison K, Martin N, Wong B, Yazdani A. Miscarriage karyotype and its relationship with maternal body mass index, age and mode of conception. Fertil Steril. 2011;95:1827–29.
7. Casikar I, Bignardi T, Riemke J, Alhamdan D, Condous G. Expectant management of spontaneous first-trimester miscarriage:prospective validation of the "2 week rule". Ultrasound Obstet Gynaecol. 2010;35:223-27.
8. Atri M, Rao A, Boylan C, Rasty G, Gerber D. Best predictors of grayscale ultrasound combined with color doppler in the diagnosis of retained products of conception. J Clin Ultrasound. 2011;39:122-24.
9. Sellmyer MA. Physiologic, histologic, and imaging features of retained products of conception. Radiographics 2013;33(3):781–96
10. Karimpour M. Accuracy of Transvaginal sonography in detecting retained products of conception in correlation with pathologic findings and clinical examination. Pak J Radiol. 2010;203:130-33.
11. Atri M, Rao A, Boylan C, Rasty G, Gerber D. Best predictors of grayscale ultrasound combined with color doppler in the diagnosis of retained products of conception. J Clin Ultrasound. 2011;39:122-25.
12. Sellmyer MA, Desser TS, Maturen KE, Jeffrey RB Jr, Kamaya A.Physiologic, histologic, and imaging features of retained products of conception.Radiographics. 2013;33:781-96.
13. Karimpour M. Accuracy of transvaginal sonography in detecting retained products of conception in correlation with pathologic findings and clinical examination. Pak J Radiol. 2010;203:130-33
14. Ustunyurt E, Kaymak O, Iskender C, Ustunyurt OB, Celik C.Role of transvaginal sonography in the diagnosis of retained products of conception.Arch Gynecol Obstet. 2008;277:151-54.
15. Wong SF, Lam MH, Ho LC. Transvaginal sonography in the detection of retained products of conception after first-trimester spontaneous abortion. J Clin Ultrasound. 2002;30:428-32.
16. tijevic R, Knezevic M, Grgic O, Zlodi-Hrsak L. Diagnostic accuracy of sonographic and clinical parameters in the

prediction of retained products of conception. J Ultrasound Med. 2009;28:295-99.
17. Atri M, Rao A, Boylan C, Rasty G, Gerber D. Best predictors of grayscale ultrasound combined with color Doppler in the diagnosis of retained products of conception. J Clin Ultrasound. 2011;39:122-27.
18. Durfee SM, Frates MC, Luong A, Benson CB.The sonographic and color Doppler features of retained products of conception.J Ultrasound Med. 2005;;24(9):1181-86
19. Kamaya A, Petrovitch I, Chen B, Frederick CE, Jeffrey RB.Retained products of conception: spectrum of color Doppler findings.J Ultrasound Med. 2009;28:1031-41.
20. Debby A, Malinger G, Harow E, Golan A, Glezerman M. Transvaginal ultrasound after first-trimester uterine evacuation reduces the incidence of retained products of conception. Ultrasound Obstet Gynecol. 2006;27:61-64.
21. Abbasi S, Jamal A, Eslamian L, Marsousi V.Role of clinical and ultrasound findings in the diagnosis of retained products of conception.Ultrasound Obstet Gynecol. 2008;32:704-07.
22. Merz E, Miric-Tesanic D, Bahlmann F. Sonographic size of uterus and ovaries in pre- and postmenopausal women. Ultrasound Obstet Gynecol. 1996;7:38-41.
23. .Reece EA, Assimakopoulos E, Zheng XZ. The safety of obstetric ultrasonography: concern for the fetus. Obstet Gynecol. 1990;76:139-43.
24. Callen, PW. The Obstetric Ultrasound Examination. In: Ultrasonography in Obstetrics and Gynecology. New York: WB Saunders Company; 2000.
25. Miller MW, Brayman AA, Abramowicz JS. Obstetric ultrasonography: a biophysical consideration of patient safety--the "rules" have changed. Am J Obstet Gynecol. 1998;179:241-45.

Contribution of Authors: Kulsoom Iqbal=A,B,E,F;Sidra Manzoor = A,C,E; Rabia Waseem Butt=A,C,D;Manal Niazi=C,D; Ume Kulsoom=C,D;Umairah kalim=D,E
Key for Contribution of Authors : A= Conception/ Study/ Designing /Planning; B= Experimentation/Study conduction;C=Analysis/Interpretation/ Discussion; D= Manuscript writing;E= Critical review;F= Facilitated for reagents/Material/Analysis