ORIGINAL ARTICLE

ACCURACY OF TRASVAGINAL SONOGRAPHY IN DETECTING RETAINED PRODUCTS OF COCEPTION IN CORRELATION WITH PATHOLOGIC FINDINGS AND CLINICAL EXAMINATION

Maryam Karimpour

Emam Hospital, Jundishapur University of Medical Science, Ahvaz, Iran.

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ABSTRACT

OBJECTIVE: To compare the diagnostic accuracy of transvaginal sonographic versus clinical estimation in women suspected to have retained products of conception, and also characterize the sonographic appearances of retained products of conception(RPOC) in an attempt to reduce the number of unnecessary surgical interventions following evacuations. **METHOD:** 109 patients whom suspected to have retained products of conception based on clinical and transvaginal sonographic were studied and finally clinical and sonographic finding were compared to post evacuation histopathological reports. **RESULTS:** Histophathological analysis confirmed the presence of RPOC in 68 women (62.4%).The sensitivity of clinical examination was higher to ultrasound evaluation, while the specificity, PPV, NPV and diagnostic accuracy of ultrasound was higher than the clinical estimation. Mean endometrial thickness with RPOC was 14.4 versus 7.1 mm. The sensitivity and specificity of the endometrial thickness greater than 12 mm for detecting RPOC was 66.2% and 97.6% respectively. **CONCLUSION:** Based on our current experience, it seems, that combination of clinical data and ultrasonographic findings are more reliable for detection of RPOC and thus lowering the rate of unnecessary invasive procedures. According to this study an endometrial thickness of 12 mm or more by transvaginal sonography, has the best diagnostic accuracy for detection of RPOC.
Keywords: RPOC; Retained products of conception; Transvaginal sonography

Introduction

The diagnosis of retained products of conception (RPOC) in a woman with postpartum or post abortion bleeding represent a major clinical challenge.[1] The incidence of RPOC has been reported as 0.4-3.8%.[2] Clinical signs and symptoms of RPOC including vaginal bleeding, abdominal pain and fever.[3] The presence of RPOC is a potential for development of complications such as hemorrhage, endometritis[4] and even Asherman's syndrome.[5]

Pelvic sonography is widely used to confirm presence of RPOC in suspected patients and selection of patients for conservative or surgical management, but there is no consensus in literatures regarding the optimal sonographic criteria for detection of RPOC.[6] Many sonographic features such as endometrial mass, thick endometrium, irregularity of myometrial - endometrial interface, complex endometrial fluid or echogenic focus without apparent endometrial mass are mentioned as presence of RPOC.[7] Among them, endometrial thickness is the most commonly used parameter, but unfortunately there is no consensus in literature regarding optimal endometrial thickness for a diagnosis of RPOC,[7] and suggested cutoff level has a wide range from 5-12 mm.[8]

The aim of this study was to compare the diagnostic accuracy of clinical versus sonographic examination in detection of RPOC in postpartum or post abortive women, and also determine an optimal cutoff level of endometrial thickness for detection of RPOC.

Correspondence : Dr. Maryam Karimpour
Emam Hospital,
Jundishapur University of Medical Science,
Ahvaz, Iran.
E-mail: karimpour_dr@yahoo.com

Materials and Methods

Since November 2009 to December 2010, 238 women referred to Emam hospital associated to Jundishapur University of Medical Science Ahvaz, southern Iran, with clinical symptoms of RPOC (including vaginal bleeding, abdominal or pelvic pain and fever) post-partum or post abortion, were enrolled. The initial presence of intrauterine pregnancy was established by serum ß-HCG and pervious ultrasound in all the patients. Initially a gynecologist exam the patients with clinical symptoms or signs of RPOC (including large soft and tender uterus, cervical dilatation, and active bleeding as observed by speculum) and then referred them for transvaginal Doppler ultrasonography. It was carried out using a 5-7 MHZ probe and various sonographic findings were recorded. Finally, following both clinical and sonographic examination, 109 women underwent curettage and the extracted material was sent for pathological evaluation. Other 129 patients received therapeutic or conservative managements and excluded from study.

The final diagnosis of the RPOC was made on the basis of histopathological report. Finally two groups with or without RPOC and various features on ultrasound, clinical signs and symptoms were compared.

Statistical Analysis

The data were analyzed using the statistical package for the social science (SPSS, version 17).Descriptive parameters were expressed as mean ±SD, minimum and maximum. The sensitivity, specificity, positive and negative predictive values and diagnostic accuracy of ultrasounic and clinical evaluations were calculated and compared. To determine the correlation between sonographic findings and the presence of RPOC, Spearman, Kendall and Pearson tests were used.

Results

Histopathological analysis confirmed the presence of RPOC in 68 women (62.4%). The mean (±SD) maternal age was 29.3(±5.7) years, and mean gestational age was 17(±12.38) weeks. The median pariety was 2(range 1-11), and median gravidity was 1(range 0-5). The mean interval between delivery or abortion and sonographic examination was 12 (range 1-90) days. A comparison of clinical symptoms of patient with and without RPOC according to histopathological reports is shown in (Tab. 1).

Presenting symptoms	Without RPOC (N=68)	With RPOC(N=41)
Abdominal pain	25	13
Pelvic pain	28	10
Vaginal bleeding	61	38
Fever	0	1

Table 1: Clinical symptoms of women with and without RPOC

Vaginal bleeding was the most frequent presenting symptom in both women with in without RPOC. (56% vs. 34.9% respectively).

In gynecological examination, the most frequent finding was active bleeding as observed by speculum, in both women with and without RPOC. (45% vs. 26.6%) respectively. A comparisons of gynecologic examination findings symptoms of patient with and without RPOC according to histopathological reports is shown in (Tab. 2).

Gynecologic examination finding	With RPOC (N=68)	Without RPOC (N=41)
Large soft and tender uterus	3	3
Cervical dilatation	3	12
Active bleeding as observed by speculum	49	29

Table 2: Gynecologic examination findings in women with and without RPOC

In transvaginal sonography, the most frequent finding in patients with RPOC was hypoechoic uterine contents (30.3%) and in patients without RPOC was irregularity of endometrial myometrial interface (22.9%). Sonographic findings in patients with and without RPOC are compared and shown in (Tab. 3).

The mean endometrial thickness in patient with and without RPOC was 14.4 and 7.1 mm respectively. By using Kendall and Spearman tests, we don't found any significant correlation between irregularity of endometrial myometrial interface, hypo or hyperechoic uterine contents, endometrial mass, presence of flow in a localized area in uterine cavity, and resistive index of uterine spiral arteries, with the presence of RPOC.

Sonographic finding	With RPOC (N =68)	Without RPOC (N =41)
Irregularity of endometrial myometrial interface	(4.29%) 32	(9.22%) 25
Hyperechoic uterine contents	(22%) 24	(3.7%) 8
Hypoechoic uterine contents	(3.30%) 33	(9.11%) 13
Endometrial mass	(3.7%) 8	(0%) 0
Flow in a localized area in uterine cavity	(0%) 0	(9.0%) 1
Resistive index of uterine spiral arteries	13.0 ± 45.0	58.0 ± 48.0
Endometrial thickness	2.6 ± 4.14	01.2 ± 1.7

Table 3: Findings of Doppler transvaginal sonography in women with and without RPOC

But there was a significant correlation between endometrial thickness and the presence of RPOC. The diagnosis of RPOC could be made with a sensitivity of 66.2%, specificity of 97.6%, and positive and negative predictive value of 97.82% and 63.49% respectively, when endometrial thickness of 12mm was chosen as cutoff. This cutoff level had the best diagnostic performance. (Tab. 4)

Endometrial thickness(mm)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	LR (%)
thickness≥6	98.8	17.1	66.6	87.5	1.19
thickness≥8	92.6	61	79.74	83.3	2.37
thickness≥10	79.4	87.8	91.52	72	6.5
thickness≥12	66.2	97.6	97.82	63.49	27.58
thickness≥14	100	0	62.4	0	1

Table 4: Sensitivity,specificity ,PPV,NPV and LR of endometrial thickness in detection of RPOC arranged in groups with 2mm range of endometrial thickness

Finally, we compared the sensitivity , specificity, positive and negative predictive values , and diagnostic accuracy between ultrasonographic evaluation and clinical estimation as predictors for RPOC. (Tab. 5)
The sensitivity based on clinical examination was higher compared to those based on ultrasonographic evaluation, while specificity, PPV, NPV and diagnostic accuracy of ultrasound evaluation was higher than the clinical estimation.

	Sonographic Evaluation (%)	Clinical Estimation (%)
Sensitivity	86.76	100
Specificity	41.43	0
Positive Predictive value	71.08	62.38
Negative predictive value	65.38	0
Diagnostic accuracy	69.7	62.4

Table 5: Comparsion between sonographic and clinical evaluation, regarding the RPOC as confirmed by histhological examination

Discussion

Transvaginal sonography is currently used to evaluate the uterine cavity and in particular detection of RPOC. In the literature many sonographic findings are mentioned for determination of RPOC. In our study, there was no significant correlation between irregularity of endometrial myometrial interface, hypo or hyperechoic uterine contents, endometrial mass and the presence of RPOC. Although in other studies, findings such as hyperechoic material in uterine cavity[3] or the presence of echogenic mass in uterine cavity[9] has mentioned as the most specific sonographic findings of ROPC, but in those studies correlation of findings are not evaluated with statistical analysis, and it seems that these findings are subjective and dependent on experience of sonographist. Also in our study we don't found any significant correlation between findings of transvaginal Doppler sonography (i.e. flow in a localized area in uterine cavity and resistive index of uterine spiral arteries) and the presence of RPOC. Role of Doppler sonography in detection of RPOC has been questioned by some authors and albeit .In a study done by Kamaya et al[10] in years 2005 to 2008, endometrial vascularity was highly correlated with RPOC, but even in that study and several other studies such as Abbasi et al[3] lack of vascularity in an endometrial mass or localized area in uterine cavity could not rule out RPOC, and it seems that Doppler sonography has a supplementary, rather than consistent role in evaluation of suspected RPOC. In our study the sensitivity and specificity of transvaginal sonography in detection of RPOC was 86.76% and 44.43% respectively. Ben –Ami et al[5] also find a similar sensitivity (78.2%), but very lower specificity (10.3%) for ultrasound in detection of RPOC.in our study, transvaginal sonography has a higher specificity, PPV, NPV and diagnostic accuracy in detection of RPOC compared with clinical examination, but the sensitivity was higher on the basis of clinical examination, compared with transvaginal sonography. Ben –Ami et[5] reported significant higher specificity and PPV for clinical examination in detection of RPOC compared with ultrasound findings. They reported higher sensitivity for sonography versus clinical examination, that is inconsistent with our results, but even Ben-Ami et al[5] and Wong et al[7] recommended a combination of ultrasonographic and clinical evaluation in detection of RPOC. Leung et al[11] and Zare et al[6] also recommended use of combination of sonographic and clinical

evaluation in detection of RPOC. In our study endometrial thickness greater than 12 mm has the best diagnostic performance to detect RPOC, with a sensitivity and specificity of 66.2% and 97.6% respectively. Several studies have reported the various cutoff levels for ruling out RPOC. In one study , 8mm has been suggested as the cutoff level with a sensitivity of 100% and specificity of 80%[12] and in another study the researcher reported 13mm as the cutoff level with a sensitivity and specificity of 85% and 64% respectively.[7] But these findings are inconsistent with our data, since we had obtained lower specificity with these thicknesses.

In our study, the minimal endometrial thickness with RPOC was 6 mm that is compatible with sawyer et al[12] Kurtz et al[13] and Zare et al[6] findings.

Conclusion

Clinical examination has a higher sensitivity in detection of RPOC as compared to transvaginal ultrasonography, but sonography has higher specificity, PPV, NPV and diagnostic accuracy in detection of RPOC compared with clinical evaluation. So according to our study transvaginal sonography and clinical data are complementary for more accurate detection of RPOC. In addition between several sonographic findings, only endometrial thickness significantly correlates with the presence of RPOC, and endometrial thickness greater than 12mm has the best value for confirming presence of RPOC. Conservative management below the above mentioned cutoff level in accordance to clinical findings may be appropriate and might avoid unnecessary surgical intervention until a better diagnostic approach is introduced with case control studies.

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