Predictors of Postpartal Retained Products of Conception

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Abstract. *Background: Retention of products of conception (RPOC) following delivery is rare. Clinicians often have the impression that a high proportion of patients with sonographically suspected RPOC following surgery have a negative histopathology. Hence, we aimed to report our single-center experience with suspected RPOC and histopathological outcome after surgery. Patients and Methods: In this retrospective analysis, patients who underwent surgery due to suspected postpartum RPOC were analyzed for potential predictive clinical and sonographic parameters. Results: A total of 32 patients with histopathologically-confirmed RPOC were compared with 21 patients with a negative histopathological report for RPOC. Endometrial hyperechogenic mass and clinical parameters such as pain, fever and bleedings were not predictive for RPOC. Increased age ($p=0.001$) and vaginal delivery ($p=0.040$) were significantly associated with RPOC. Conclusion: Clinical presentation alone is not predictive for RPOC. Vaginal delivery and younger age seem to be a risk factor and therefore have to be considered in patients with suspected RPOC.*

Retention of products of conception (RPOC) following delivery is rare, with an incidence of 1-6% (1, 2), which seems to depend on the gestational age of the pregnancy, with the highest frequency after second-trimester delivery or termination of pregnancy (3). Usually patients present with vaginal bleeding (2, 4), pain, infection or hypomenorrhea and infertility due to intrauterine adhesions (2, 5, 6).

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Asymptomatic patients are diagnosed with RPOC in routine postpartum examinations (2).

The diagnosis of RPOC by transvaginal ultrasonography is generally based on the detection of increased endometrial thickness and volume. Furthermore, the presence of hyperechoic material inside the cavity, or complex endometrial fluid also play a role in diagnosis of RPOC (7-9).

It is known that RPOC has variable appearance in sonography, with an overall reported sensitivity of 44-85% and specificity of 88-94% (10-15). Clinicians often have the impression that a high proportion of patients with sonographically suspected RPOC following surgery have a negative histopathology.

Hence, we aimed to report our single-center experience with suspected RPOC and histopathological outcome after surgery. Of special interest was the assessment of predictors of RPOC and diagnostic accuracy of ultrasound, and whether surgery might be avoided in selected patients.

Patients and Methods

In this retrospective analysis, patients who underwent surgery due to suspected postpartum RPOC were included. Patients were treated at the Department of Gynecology and Obstetrics of the University Hospital Cologne.

Patient characteristics, histopathological data and potential predictors were assessed.

The medical records of all patients were obtained from the comprehensive electronic hospital information system (ORBIS® OpenMed; AGFA HealthCare NV, Mortsel, Belgium) and patient records of the university hospital. The clinical and histological characteristics of each patient and each surgical procedure were also extracted from the patient records. Data collected for the study included patient demographics, gynecological history, clinical presentation and sonographic evaluation. Data also included gestational age, delivery type (vaginal or caesarean), multiple pregnancies, presence of postpartum hemorrhage and histopathological results.

Patients with histopathologically confirmed RPOC (group 1), defined as the presence of remnants of placental trophoblastic origin, were compared with patients with negative histopathological results for RPOC (group 2).

Table I. Patient characteristics.

Characteristic	Group 1 (n=32)	Group 2 (n=21)	p-Value
Age (years)			
Mean±SD	34.8 (4.4)	30.5 (4.6)	0.001
BMI (kg/m ²)			
Mean±SD	28.0 (5.3)	28.2 (5.1)	0.854
Gestational age (weeks)			
Mean±SD	37.6 (3.9)	36.8 (3.9)	0.164
Parity (%)			
I	50	61.9	0.052
II	37.5	19.0	
III	9.4	9.5	
IV	3.1	0	
Delivery mode (%)			
Caesarean section	18.8	42.9	0.040
Vaginal delivery	81.3	52.4	
Time from delivery to surgery (days)			
Mean±SD	27.4 (25.2)	20.9 (25.3)	0.382
Curettage	68.8	76.2	
Surgery (%)			
Diagnostic hysteroscopy and curettage	9.4	9.5	
Operative hysteroscopy	15.6	9.5	0.885

BIM: Body mass index. Group 1: Patients with histopathologically-confirmed retention of products of conception (RPOC); group 2: patients with negative histopathological report for RPOC; *p*-values: Mann-Whitney *U*-test for quantitative data or Fisher's exact test for qualitative data are two-sided.

All reported *p*-values (Mann-Whitney *U*-test for quantitative data or Fisher's exact test for qualitative data) are two-sided and considered statistically significant when less than 0.05. Statistical analysis was carried out with SPSS Statistics (IBM Corp., Armonk, NY, USA).

Results

A total of 53 patients were included into this retrospective analysis. The diagnosis of RPOC was confirmed in histopathological reports of 32 cases (group 1). In total, 21 patients had a negative histopathological report for gestational tissue (group 2).

Among the patients with histopathologically confirmed RPOC, the mean age was 34.8 compared to 30.5 years in patients with negative histopathology (*p*=0.001). The mean time from delivery to surgery was 27 days *versus* 21 days respectively, but did not differ significantly. Main characteristics of both groups are presented in Table I. The rate of vaginal delivery was significantly higher in group 1 with 81.3% compared to group 2 with 52.4% (*p*=0.040).

Among patients of group 1, 68.8% underwent curettage, 9.4% a diagnostic hysteroscopy with combined curettage, while 15.6% of patients underwent operative hysteroscopy, which did differ significantly from that of group 2 (Table II). A sonographic intrauterine hyperechoic mass lesion was diagnosed in 84.0% in group 1 compared to 76.2% in group 2 (*p*>0.05). Parameters of clinical presentation such as fever,

abdominal pain and vaginal bleeding were not significantly different between the groups. These results are presented in Table III.

Discussion

In the current analysis, 52 patients with suspected RPOC were identified. According to this analysis, RPOC was proven histologically in 61.5% of patients. The results confirmed those of a prior analysis of Matijevic *et al.* (16), who reported a rate of 58% which stresses the complexity of diagnosis of RPOC.

Prior studies evaluated potential parameters of ultrasound as predictors of RPOC. Although endometrial thickness has been reported to be a significant predictor (10, 15, 17-20), in our analysis, endometrial hyperechogenic mass was not appropriate for predicting RPOC. Clinical symptoms such as bleeding, pain and fever were not predictors of RPOC in our analysis, in contrast to results presented by Kamaya *et al.* (17). Differences in results might be explained by the difference in mean gestational age of patients analyzed, which in our study was higher compared to that of Kamaya *et al.* (17).

Furthermore, patient age as well as mode of delivery seem to be significant predictors of RPOC according to our results, which is in line with results of a prior study proving borderline significance for age (*p*=0.06) and mode of delivery (*p*=0.08) (21).

Table II. *Potential predictive parameters for retention of products of conception (RPOC).*

Characteristic	Group 1 (n=32)	Group 2 (n=21)	p-Value
Prior abortion (1 abortion or more) (%)	25.0	19.1	0.263
Prior caesarian section (%)	12.5	19.0	0.696
Prior vaginal delivery (1 or more) (%)	37.5	23.8	0.380
Prior curettage (1 or more) (%)	15.7	19.0	0.410
Smoking status (%)			0.068
Non smoker (%)	81.3	76.2	
Smoker (%)	18.8	14.3	
Gestational diabetes (%)	6.3	4.8	>0.99
Infection with β -streptococcus (%)	12.5	0	0.315

Group 1: Patients with histopathologically-confirmed RPOC; group 2: patients with negative histopathological report for RPOC.

Table III. *Clinical symptoms and sonographic findings.*

Characteristic	Group 1 (n=32)	Group 2 (n=21)	p-Value
Postpartum fever (%)	6.3	19.0	0.185
Postpartum abdominal pain (%)	15.6	28.6	0.296
Increased vaginal bleeding after delivery (%)	78.1	71.4	0.666
Sonographic mass lesion (%)			>0.99
Yes	84.4	76.2	
No	6.3	4.8	

Group 1: Patients with histopathologically-confirmed retention of products of conception (RPOC); group 2: patients with negative histopathological report for RPOC.

Patients who underwent cesarean section appeared to have a reduced risk for RPOC compared to those who had a vaginal delivery due to standardized intraoperative curettage in all patients who underwent cesarean section.

Conclusion

The analysis indicates that clinical presentation alone is not predictive for RPOC. Vaginal delivery and older age seem to be risk factors for RPOC and therefore have to be considered in patients with suspected RPOC.

Conflicts of Interest

The Authors have no conflict of interest to declare in regard to this study.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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