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Postpartum retained products of conception: Retrospective analysis of the association with third stage of labor placental complications[☆]



Noam Smorgick^{*}, Nagham Ayashi, Orna Levinsohn-Tavor, Yifat Wiener, Moshe Betser, Ron Maymon

Department of Obstetrics and Gynecology, Assaf Harofe Medical Center, Affiliated with Sackler School of Medicine, Tel Aviv University, Israel

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ABSTRACT

Objective: To compare the prevalence of postpartum retained products of conception (RPOC) among parturients with a history of third stage of labor placental complications and parturients without those complications.

Study design: All women operated for postpartum RPOC following vaginal delivery by hysteroscopy or suction curettage between January 2013 and December 2017 were included in the study. Their medical records were reviewed for the occurrence of third stage of labor placental complications (including early postpartum hemorrhage treated with uterotonics, manual separation of the placenta, and revision of the uterine cavity for removal of cotyledons).

Results: The study cohort included 172 women operated for postpartum RPOC following vaginal delivery by operative hysteroscopy (143 cases, 83.1%) or by suction curettage (29 cases, 16.9%). Third stage of labor placental complications were reported in 65 (37.8%) cases, while 107 (62.2%) women had an uncomplicated third stage of labor. When considering all vaginal deliveries in our institution during the study period, the risk for RPOC was significantly higher among parturients with third stage of labor placental complications compared to those with an uneventful third stage of labor (3.7% versus 0.3%, $p < 0.001$, Odds ratio = 12.5, 95% confidence interval 9.0–17.3).

Conclusion: Postpartum RPOC following vaginal delivery were more common in parturients with third stage of labor placental complications. However, the majority of postpartum RPOC cases were diagnosed in women reported to have an uncomplicated third stage of labor. Thus, focused postpartum ultrasound follow-up of women considered at risk for RPOC will not identify all cases.

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Introduction

Retained products of conception (RPOC) are identified in up to 1% of deliveries [1]. The clinical presentation of RPOC includes postpartum hemorrhage, endometritis, and suspicious ultrasound findings (such as an echogenic uterine mass with color Doppler flow) in asymptomatic women [2]. Third stage of labor placental complications (including early postpartum hemorrhage treated with uterotonics, manual separation of the placenta and revision of the uterine cavity for removal of cotyledons) are considered risk

factors for RPOC [3]. Thus, patients with third stage of labor placental complications may be offered clinical and sonographic follow-up in the early postpartum period, aimed to identify those women with suspected RPOC. We previously reported that 4% of parturients with third stage of labor placental complications who were included in a postpartum clinical and sonographic follow-up protocol were diagnosed with RPOC [4]. However, the prevalence of RPOC among women without third stage of labor placental complications is unknown.

The aim of this study was to evaluate the prevalence of RPOC following vaginal delivery in women with and without third stage of labor placental complications, and to compare their clinical and surgical characteristics.

Methods

A computerized search was performed to identify women operated for RPOC in our institution from January 2013 to

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^{*} Corresponding author at: Division of Minimally Invasive Gynecologic Surgery, Department of Obstetrics and Gynecology, Assaf Harofe Medical Center, Zeriffin, Beer Yaakov, 70300, Israel.

E-mail address: nsmorgik@asaf.health.gov.il (N. Smorgick).

December 2017 (ICD-9 code 667.14). We subsequently selected all cases operated for postpartum RPOC following vaginal delivery in our department (N = 172), and excluded cases operated for post-abortion RPOC (N = 126), cases of RPOC following cesarean delivery (N = 19), and cases of RPOC following vaginal delivery who delivered in outside hospitals (N = 22). The medical records were retrospectively reviewed for the patients' demographics, medical and gynecologic history, and for their obstetrical history, focusing on the occurrence of stage third of labor complications related to placental problems (including early postpartum hemorrhage treated with uterotonics, manual separation of the placenta and revision of the uterine cavity for removal of cotyledons). The surgical findings and procedures for RPOC removal were retrospectively reviewed.

The prevalence of surgically treated RPOC was calculated among all vaginal deliveries (i.e., spontaneous vaginal deliveries and instrumental vaginal deliveries) and among women with third stage of labor placental complications following vaginal delivery (identified by computerized search for their respective ICD-9 codes). The study's flow chart is shown in Fig. 1.

The surgical procedures for RPOC removal included operative hysteroscopy and suction curettage. The choice of the surgical procedure was at the discretion of the managing surgeons, based on their surgical expertise and the patients' clinical presentation. When possible, operative hysteroscopy was the preferred surgical approach, using a technique previously described [4]. All procedures were performed under general anesthesia. On discharge, patients were prescribed a course of oral antibiotic treatment (typically Amoxicillin/clavulanic acid, 875 mg twice daily for 7 days) and a combined estrogen and progesterone preparation (11 days of 2 mg estradiol valerate followed by 10 days of 2 mg estradiol valerate and 0.5 mg norgestrel).

In accordance with our departmental protocol for management of patients with RPOC, a follow-up office hysteroscopy was recommended 6–8 weeks after the operative procedure. On that visit, the uterine cavity was assessed for post-operative intrauterine adhesions, classified as minimal, moderate or severe [5].

The statistical analysis was performed using the SPSS software (IBM Corp.). Descriptive variables are presented as mean \pm standard deviation or as median (range). Frequencies were compared with the Chi square test or with the Fisher's exact test. Means and medians were compared with the Student *T* test, or with the ANOVA test as appropriate. A two-tailed *p* value <0.05 was

considered statistically significant. The odds ratio was calculated with a 95% confidence interval.

The study was approved by the Institutional Review Boards. As a retrospective study based on medical records, participants' informed consent was not required.

Results

During the study period, 36,453 women delivered vaginally in our institution, and of those 1742 (4.8%) were treated for third stage of labor placental complications. Subsequently, 172 women underwent a surgical procedure for RPOC removal by operative hysteroscopy (143 cases, 83.1%) or by suction curettage (29 cases, 16.9%). Among the women operated for RPOC, third stage of labor placental complications were reported in 65 (37.8%) cases, while 107 (62.2%) women have had an uneventful third stage of labor. Thus, the rates of surgically treated RPOC among all vaginal deliveries during the study period was very low (172 out of 36,453 deliveries, 0.5%). Among women who delivered vaginally without third stage of labor placental complications a similar low prevalence of surgically treated RPOC was found (107 out of 34,711 deliveries, 0.3%). However, among women with third stage of labor placental complications, the rate of surgically treated RPOC was significantly higher (3.7%, $p < 0.001$, odds ratio = 12.5, 95% confidence interval 9.0–17.3) (Fig. 1).

We compared the demographic and clinical characteristics of women with and without third stage of labor placental complications who were subsequently operated for RPOC (Tables 1 and 2). There were no statistically significant differences in patients' age, parity, history of Cesarean section or history of abortion between the groups. Among the 65 women with RPOC and third stage of labor placental complications, these complications included manual removal of the placenta in 24 cases, treatment with uterotonics for early postpartum hemorrhage in 23 cases, and revision of the uterine cavity for removal of cotyledons in 18 women.

The patients' clinical presentation upon admission for surgical RPOC removal included vaginal bleeding, signs of endometritis and suspicious ultrasound findings in asymptomatic women (Table 2). Women with history of third stage of labor placental complications were more likely to undergo surgery because of suspicious ultrasound findings rather than clinical symptoms of vaginal bleeding or signs of endometritis compared with the group with uncomplicated third stage of labor (33.8% versus 15.9% respectively, $p = .004$).

The post-operative pathology examination was consistent with products of conception in 108 (62.8%) cases. The rates of pathologic confirmation for RPOC was similar among women with and without a history a third stage of labor complications (69.2% versus 58.9%, $p = 0.1$).

From the study cohort, 116 patients (comprising 67.4% of the study cohort) presented for diagnostic hysteroscopy follow-up to detect post-operative intrauterine adhesions. Intrauterine adhesions were found in 19 (16.3%) of them and included minimal adhesions in 12 cases and moderate adhesions in seven cases. There were no statistically significant differences between the rate of postoperative intrauterine adhesions among women with history of third stage of labor placental complications and those with uneventful third stage of labor (13.6% versus 20.8% respectively, $p = 0.3$).

Discussion

Postpartum RPOC are a rare complication of vaginal delivery. To the best of our knowledge, this is the first study to investigate the association between RPOC and third stage of labor placental

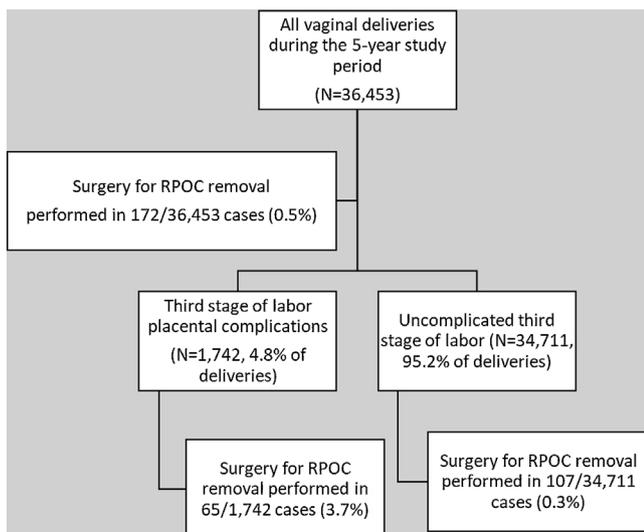


Fig. 1. The study's flow chart.

Table 1

The comparison of demographic, obstetrical and surgical characteristics of women with and without third stage of labor complications who were subsequently operated for RPOC.

Parameter	Third stage of labor complications (N = 65)	Uneventful third stage of labor (N = 107)	P value
Age (years)	31.6 ± 4.9	30.6 ± 4.9	0.2
Gravidity	2 (1–10)	2 (1–7)	0.9
Parity	2 (1–8)	1 (1–5)	0.4
Gestational age at birth (weeks)	38.7 ± 1.9	39.1 ± 1.7	0.3
Birth weight (g)	3145 ± 569	3178 ± 453	0.7
History of Cesarean section(s)	1 (1.5)	4 (3.7)	0.4
History of induced abortion(s)	6 (9.2)	17 (15.9)	0.2
History of spontaneous abortion(s)	13 (20.0)	21 (19.6)	0.9
Time period from delivery to surgery (months)	1.4 ± 0.7	1.6 ± 0.9	0.1
Surgical procedure for RPOC removal			
Operative hysteroscopy	55 (84.6)	88 (82.2)	0.8
Suction curettage	10 (15.4)	19 (17.8)	

Data is shown as mean ± standard deviation, median (range), or number (%).

Table 2

The comparison of patients' clinical presentation at time of surgery for RPOC removal of women with and without third stage of labor complications.

Parameter	Third stage of labor complications (N = 65)	Uneventful third stage of labor (N = 107)	P value
Vaginal bleeding	41 (63.1)	75 (70.1)	0.004
Suspected endometritis	2 (3.1)	15 (14.0)	
Suspicious ultrasound findings in asymptomatic women	22 (33.8)	17 (15.9)	

Data is shown as or number (%).

complications in a large cohort of parturients over a 5-year period, albeit using a retrospective design. Women with a history of third stage of labor placental complications appear to be at significantly increased risk for postpartum RPOC when compared to women with uncomplicated third stage of labor. In women with third stage of labor complications, clinical and sonographic postpartum follow up may be offered and could allow for early diagnosis and treatment of RPOC [3]. However, it is clearly inappropriate to offer this focused ultrasound follow up to all parturients in view of the rarity of postpartum RPOC and the disadvantages of over-diagnosis and over-treatment.

Hysteroscopy has been recently described as a surgical approach for removal of RPOC. This technique appears to have some advantages over the traditional suction curettage, with possibly lower rates of postoperative adhesions [4]. The results of the current study support this surgical approach, with the majority of patients undergoing hysteroscopy for removal of RPOC, and low rates of postoperative intrauterine adhesions diagnosed on follow up hysteroscopy.

The benefit of early diagnosis and treatment of RPOC in reducing the risk for postoperative intrauterine adhesions is debatable. In a previous retrospective cohort of women treated by hysteroscopy for removal of RPOC, we did not find a significant association between the rates of intrauterine adhesions and the time-period from delivery to surgery [2]. However, Hooker et al. reported that delayed interventions for RPOC are associated with significant immediate and long-term complications [6]. In addition, delayed diagnosis and treatment could be associated with medico-legal concerns, especially in those women with subsequent infertility attributed to intrauterine adhesions [7].

The management of asymptomatic women with ultrasound findings suspicious of postpartum RPOC is controversial. There is limited information on expectant management and/or medical treatment with uterotonics such as misoprostol [8]. Our approach is to initially perform an expectant management with sequential ultrasound exams, followed by operative hysteroscopy in cases with persistent ultrasound findings considered highly suspicious

for RPOC, namely echogenic uterine cavity foci with positive color Doppler flow [1]. However, offering surgical procedures to asymptomatic women may be criticized as over-treatment, especially in view of the rate of pathology confirmed RPOC in the current and previous studies of 65%.

This study is limited by its retrospective design. It is possible that some patients with postpartum RPOC were operated in other hospitals, and thus our rate of RPOC may be an underestimation of this complications. In addition, the identification of cases by ICD-9 codes could have introduced bias due to incorrect coding. The surgical management of RPOC by hysteroscopy or suction curettage was at the discretion of the managing physician rather than a systematic protocol and this could have influenced our results.

In conclusion, the rate of surgically treated postpartum RPOC is low, especially in those women with uncomplicated third stage of labor. Women with third stage of labor placental complications are at increased risk for postpartum RPOC but represent a minority from all surgically treated RPOC. Thus, focused clinical and ultrasound postpartum follow up offered to patients considered at risk for RPOC will not identify all cases.

Declaration of interest statement

The authors have no conflict of interest to disclose.

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