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See-and-treat in-office hysteroscopy versus operative hysteroscopy for the treatment of retained products of conception: A retrospective study

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Abstract

Aim: To compare the efficacy and safety of in-office hysteroscopy with a see-and-treat approach with that of operative hysteroscopy for the treatment of retained products of conception (RPOC).

Methods: We retrospectively identified all consecutive patients who underwent hysteroscopic treatment of RPOC between 2015 and 2019. We excluded patients with RPOC larger than 2 cm at preoperative transvaginal ultrasounds. Between 2015 and 2017, all hysteroscopic removals of RPOC were performed by operative hysteroscopy. Between 2018 and 2019, all cases of RPOC less than 2 cm in size were hysteroscopically removed by the see-and-treat approach in the office setting. Sociodemographic, clinical, and procedure characteristics along with complications were retrieved from medical records.

Results: Between 2015 and 2019, 119 women underwent hysteroscopic removal of RPOC equal to or smaller than 2 cm: 53 patients by in-office hysteroscopy, and 66 by operative hysteroscopy. The two groups were similar in preoperative characteristics. Although the time required to complete the RPOC removal was similar, the total procedure and assistant time were significantly higher in the operative hysteroscopy group ($p < 0.001$). Moreover, operative hysteroscopy was associated with a higher proportion of cases complicated by excessive bleeding, cervical tear, or uterine perforation ($p = 0.016$). Failure to complete the procedure was similarly reported in the two groups ($p = 0.58$).

Conclusions: In-office hysteroscopy with the see-and-treat approach for RPOC equal to or smaller than 2 cm appears as effective as operative hysteroscopy, but safer. In-office hysteroscopy may be considered the first choice for treating RPOC equal to or smaller than 2 cm.

Key words: hysteroscopy, in-office setting, operative room, retained products of conception, see-and-treat.

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Introduction

Retained products of conception (RPOC) are defined as placental or fetal tissues retained in the uterus after a miscarriage, abortion, or preterm/term delivery.[1] The incidence of RPOC varies based on the gestational age, mode of delivery, and pregnancy termination treatment (medical versus surgical).[2–4] The incidence is estimated to range between 2% and 6% of all pregnancies, and the transvaginal ultrasounds with the color Doppler are considered the reference for the diagnosis.[5]

Complications of RPOC include bleeding, infections, Asherman's syndrome, and decreased fertility.[6,7] Several studies have shown the superiority of a selective hysteroscopic resection of the RPOC over the ultrasound-guided curettage in reducing complication rates, reducing the incidence of intrauterine adhesions, and increasing pregnancy rates.[6,7] Women treated for RPOC by suction curettage have an increased risk of recurrence and placenta accreta in subsequent pregnancies than patients treated by operative hysteroscopy.[8] Operative hysteroscopy for removal of RPOC was shown to be associated with lower rates of complications, less need for repeat procedures, and fewer postoperative intrauterine adhesions.[9,10]

See-and-treat hysteroscopy is based on the use of small diameter hysteroscopes, which would allow removing the RPOC in the office setting without anesthesia. This operative hysteroscopy allows patients to resume activities immediately, avoiding the added risks of anesthesia. See-and-treat procedures are gaining popularity among all types of hysteroscopic procedures due to lower costs, higher availability, and faster return of patients to the daily routine, and RPOC removal is not an exception.[11–15] However, the see-and-treat approach in the office setting for the treatment of RPOC was shown to be a suitable alternative mainly for the ultrasound-guided intrauterine curettage.[16] Limited evidence is available concerning a comparison between the two hysteroscopic approaches. Therefore, we performed a retrospective study to compare the efficacy and safety of in-office hysteroscopy with the see-and-treat approach versus operative hysteroscopy for the treatment of RPOC.

Methods

We retrospectively identified all consecutive patients who underwent hysteroscopic treatment of RPOC between 2015 and 2019 after vaginal or cesarean delivery, miscarriage, or failed medical/surgical abortion. Patients were identified from the gynecological surgical registers of the operative room and the hysteroscopic ambulatory. Moreover, we searched the records of all hospitalizations performed during the study period, using the diagnosis-related group (DRG) codes for RPOC at admission or discharge. Sociodemographic, clinical, preoperative diagnostics, and procedure characteristics (RPOC size, length of procedure, procedure complications) were retrieved from medical records of identified patients and collected in a dedicated database. The study was approved by the Institutional review board of the Hillel Yaffe Medical Center (0096-19-HYMC). All included participants gave consent for anonymized data collection and analysis for research purposes.

From the complete list of identified records, we excluded patients with RPOC larger than 2 cm at preoperative transvaginal ultrasounds, patients with suspicion of infection, or patients who did not undergo elective procedures. The limit of 2 cm in size for RPOC was introduced because the see-and-treat approach was not used in the case of RPOC larger than 2 cm.

Between 2015 and 2017, all hysteroscopic removals of RPOC were performed in the operative room under general anesthesia by operative hysteroscopy. All procedures were carried out using cold instruments with a 10 mm resectoscope (Gynecare Hysteroscope, Johnson and Johnson, New Jersey). No energy was applied. Between 2018 and 2019, all cases of RPOC less than 2 cm in size were hysteroscopically removed by the see-and-treat approach in the office setting. All procedures were conducted without anesthesia, using a 4.3 mm Bettochi hysteroscope with cold scissors and graspers; no antibiotics were administered, and analgesics were used after the procedure as appropriate. Operative hysteroscopy remained only for RPOC large than 2 cm given in-office hysteroscopy for RPOC larger than this cut-off often requires a long procedure poorly tolerated by the patient.

All identified patients underwent treatment of RPOC by senior hysteroscopists having similar surgical experience and more than 5 years of practice in hysteroscopic surgery.

Statistical analysis

Sociodemographic, clinical, preoperative diagnostics, and procedure characteristics were summarized using standard descriptive statistics. Comparisons between the two groups were performed as appropriate:

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TABLE 1 Sociodemographic and clinical characteristics of the study population stratified by treatment group

Characteristic	Hysteroscopy with anesthesia in the operative room, $N = 66$	See-and-treat in-office hysteroscopy without anesthesia, $N = 53$	p-Value
Age (years), mean (SD)	31.4 ± 5.9	30.7 ± 4.9	0.50
Weight (kg), mean (SD)	68.3 ± 13.4	65.8 ± 12.4	0.48
Gravidity, mean (SD)	2.92 ± 2.15	2.75 ± 1.55	0.63
Parity, mean (SD)	1.70 ± 1.52	1.77 ± 1.40	0.77
Previous abortion, *N* (%)	46 (69.7%)	34 (65.4%)	0.69
Previous cesarean section, *N* (%)	16 (4.2%)	10 (18.5%)	0.51
Previous ectopic pregnancy, *N* (%)	1 (6%)	0	0.39
RPOC postabortion, *N* (%)	42 (64%)	29 (57%)	0.57
RPOC post-delivery, *N* (%)	24 (36%)	22 (43%)	
Days between abortion/delivery and hysteroscopy, median (IQR)	60 (45–83)	75 (50–120)	0.03

Note: Presented as number (*N*) and percentage (%) or mean ± SD or median and interquartile range (IQR) as appropriate.
Abbreviation: RPOC, retained products of conception.

TABLE 2 Procedure characteristics stratified by treatment group

Procedure	Hysteroscopy with anesthesia in the operative room, $N = 66$	See-and-treat in-office hysteroscopy without anesthesia, $N = 53$	p-Value
Misoprostol administration before hysteroscopy, *N* (%)	50 (76%)	29 (56%)	0.03
Average residual size on US (cm), mean (SD)	16.5 ± 5.2	12.6 ± 5.2	<0.001
Average residual size on hysteroscopy (cm), mean (SD)	12.8 ± 6.9	11.6 ± 8.02	0.42
Surgeon years of experience	13.5 ± 6.1	15.5 ± 7.00	0.18
Procedure time (min), mean (SD)[a]	20.2 ± 11	19.1 ± 11.3	0.54
Total procedure time[b] (min), mean (SD)	39 ± 18	24.3 ± 13.1	<0.001
Total assistant time[c] (min), mean (SD)	115 ± 35	33.2 ± 16.5	<0.001

Note: Presented as number (*N*) and percentage (%) or mean ± SD or median and interquartile range (IQR) as appropriate.
[a]Procedure time: time from the first cut to the end of the procedure.
[b]Total procedure time: total time spent on the operating table.
[c]Total assistant time: total time from the entry into the operative room/ambulatory until discharge from the postoperative recovery unit.

categorical variables were compared with the chi-square test or Fisher exact test; continuous variables were investigated using the T-test or Mann–Whitney *U* test based on the variable's distribution. Analyses were performed with IBM SPSS Statistics 23.0, Armonk, NY, and tests of statistical significance were conducted with a two-tailed alpha level of 0.05.

Results

Between 2015 and 2019, we identified a total of 187 women who underwent hysteroscopic treatment of RPOC. Of them, 119 patients underwent hysteroscopy due to suspected RPOC less than 2 cm in size at the preoperative transvaginal ultrasound scan: 66 (55%) women underwent operative hysteroscopy in the operative room under general anesthesia between 2015 and 2017; 53 (45%) patients underwent treatment of RPOC between 2018 and 2019 by see-and-treat hysteroscopic approach without anesthesia in the office setting. As per inclusion criteria, pathological examination confirmed RPOC in all cases. Sociodemographic and clinical characteristics of the study population stratified by treatment group are reported in Table 1. No statistically significant differences were observed

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TABLE 3 Procedure complications stratified by treatment group

Complication	OR hysteroscopy with anesthesia, $N = 66$	See-and-treat hysteroscopy without anesthesia, $N = 53$	p-Value
Total complications	8 (12.1%)	2 (3.8%)	0.18
Total complications, excluding failure to complete procedure for any reason	7 (10.6%)	0	0.016
Failure to complete procedure (due to anxiety, pain, or RPOC not totally extracted)	1 (1.6%)	2 (3.8%)	0.58
Patients with complications, excluding failure to complete procedure	6 (9.1%)	0	0.03
Excessive bleeding	1 (1.6%)	0	1.00
Fever	0	0	N/A
Cervical tear	1 (1.6%)	0	1.00
Uterine cervix or uterine perforation	3 (4.5%)	0	0.26
Laparoscopy due to complication	1 (1.5%)	0	1.00
Posthysteroscopy admission for observation	1 (1.5%)	0	0.50

Note: Complications include failure to complete procedure due to anxiety, pain, RPOC not totally extracted, fever, abdominal pain, perforation, cervical teat, false route, and/or admission for observation. Presented as number (*N*) and percentage (%).
Abbreviations: NA, not available; RPOC, retained products of conception.

between the two groups. Only a longer period between abortion/delivery and hysteroscopy was observed in the see-and-treat group.

Table 2 summarizes procedure characteristics stratified by treatment group. Larger RPOCs were observed in the operative hysteroscopy group at the preoperative ultrasounds. However, this difference was not confirmed during the hysteroscopic procedure. Surgeon experience was comparable and higher than 10 years in both groups. Regarding procedure length, the time required to complete the RPOC removal was similar in the two groups. Conversely, when the total procedure and assistant time were considered, operative hysteroscopy required a significantly higher amount of time spent on the operating table ($p < 0.001$) and in the operative room ($p < 0.001$).

Procedure complications, stratified by treatment group, are reported in Table 3. Failure to complete the procedure (due to anxiety, pain, or incomplete removal of RPOC) was similarly reported in the two groups (1.6% vs. 3.8%; $p = 0.58$). Conversely, a significantly higher proportion of patients experienced complications in the operative hysteroscopy group than in the group managed by the see-and-treat approach (10.6% vs. 0%; $p = 0.016$). Excessive bleeding, cervical tear, uterine cervix or uterine perforation, laparoscopy due to complication, and post-hysteroscopy admission for observation were observed only in the group of patients who underwent RPOC hysteroscopic removal by operative hysteroscopy in the operative room.

Discussion

This retrospective study observed a similar efficacy of operative hysteroscopy and the see-and-treat approach for treating RPOC smaller than 2 cm at the preoperative ultrasounds. Mean operative time was similar between the two surgical approaches. However, operative hysteroscopy was associated with longer total procedure and assistant time and a higher proportion of complicated procedures.

Hysteroscopic removal of RPOC is a safe and effective approach for the treatment of RPOC. Advantages of this approach over dilation and curettage have been demonstrated in several studies. However, most of the available data focused on comparing operative hysteroscopy and dilation and curettage.[6–8,10,11,17–20] Jiménez et al. published one of the first reports describing the application of the see-and-treat approach for the management of RPOC in 2009.[16] Recently, Jakopič Maček et al. reported one of the most extensive series of patients with RPOC managed with the see-and-treat approach by office hysteroscopy.[11] All these reports confirmed that the hysteroscopic removal of RPOC is feasible, safe, and potentially better than dilation and curettage even for in-office hysteroscopy with the see-and-treat

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approach. However, in-office hysteroscopy for RPOC removal has yet to be studied comprehensively with little available data. Moreover, a specific comparison between in-office hysteroscopy with the see-and-treat approach versus operative hysteroscopy in the operative room setting for treating RPOC has not been investigated appropriately.[11]

In this retrospective study, we compared two groups of homogeneous patients for sociodemographic, clinical, preoperative characteristics, and surgeon experience. All patients underwent hysteroscopic treatment of RPOC, with the procedure completed in almost all cases. Failure of procedure was observed in few patients, and the proportion of incomplete cases was not different between the two groups (1.6% and 3.8%, respectively, $p = 0.58$). This observation supports the efficacy of both approaches for the management of RPOC, in line with those reported in a recent systematic review.[21] Consistently, the average length of the procedure was similar in the two groups. In addition, the observed mean procedure length for the see-and-treat approach was similar to that reported in previous studies,[11] although previous authors used hysteroscopic morcellators whereas our surgeons used scissors and graspers.

Although our results support a similar efficacy of the two hysteroscopic approaches for treating RPOC equal to or smaller than 2 cm, we observed significant differences regarding the total procedure and assistant time and surgical complications. Operative hysteroscopy was associated with a significantly longer procedure and assistant time. The hysteroscopic treatment of RPOC in the office setting by the see-and-treat approach was confirmed associated with shorter assistance, allowing patients to leave the outpatient clinic immediately after the in-office procedure without needing a recovery room. These results align with available literature comparing operative hysteroscopy with the see-and-treat approach for other indications.[22] Quick discharge and lack of anesthesia are crucial for breastfeeding mothers, who may benefit from this approach.

Regarding procedure complications, after excluding failure of the procedure, operative hysteroscopy was associated with a significantly higher proportion of cases complicated by excessive bleeding, cervical tear, uterine cervix, and uterine perforation. None of these complications was observed in the group of patients who were managed by in-office hysteroscopy with the see-and-treat approach. Moreover, we observed cases requiring laparoscopic management of the complication only in the group of patients who underwent operative hysteroscopy in the operative room setting. These results are consistent with previous reports on operative hysteroscopy for RPOC.[17,23] Notably, although the management of severe bleeding during hysteroscopic treatment of RPOC is not standardized yet,[24,25] for this type of complication in our series we used a hemostatic agent (tranexamic acid, 1 gr i.v.); nevertheless, we acknowledge that intrauterine balloon tamponade, as well as uterotonic agents, may be considered further options to treat excessive bleeding during the hysteroscopic management of RPOC.

These observations suggest that in-office hysteroscopy with the see-and-treat approach is safer than operative hysteroscopy as reported for other indications.[22] The lower rate of complications in the see-and-treat group can be explained by performing the procedure in an awake patient without anesthesia. As previously described, the awake patient who would feel pain in the case of technical errors during the procedure may prevent uterine perforation or other lesions causing excessive bleeding.[26–28] Of note, pain during in-office hysteroscopy is a possible limitation regardless of technical errors, which has been associated with nulliparity, postmenopausal state, and unfavorable features of the cervical canal.[29]

Some strengths and limitations of the present study must be considered to interpret observed results appropriately. The main limit is the retrospective study design without randomization of patients to one of the two approaches. Therefore, although the two study groups were similar, possible sample biases cannot be excluded. In this regard, the smaller size of RPOC at the preoperative ultrasounds in the see-and-treat group may suggest some selection of the cases. However, the comparable size at hysteroscopy did not support a clinically relevant difference. Moreover, RPOC size at preoperative ultrasounds was restricted to 2 cm as per inclusion criteria to make comparable the two groups for this possible confounder. Notably, we stress that for this inclusion criteria, our conclusions cannot be extended to patients with RPOC larger than 2 cm at preoperative ultrasounds. Concerning surgeon experience, although it was not statistically significantly different, we did not investigate the experience for each approach independently. This impedes thoroughly addressing this confounder, although we expect a higher experience for operative hysteroscopy than the see-and-treat approach. Finally, the sample size

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impedes the exclusion of more rare complications of both hysteroscopic approaches. Jakopič Maček et al. studied 101 cases of RPOC in-office hysteroscopy removal and reported 2% of patients having a vasovagal reaction. Moreover, they reported that 13% of the patients had mild to moderate bleeding. However, a possible additional reason for these differences can be that Jakopič Maček et al. treated RPOC up to 3 cm, whereas our cutoff size was 2 cm.[11]

In-office hysteroscopy with the see-and-treat approach for treating RPOC equal to or smaller than 2 cm appears as effective as operative hysteroscopy, but safer, with a significantly lower proportion of cases with surgical complications. Based on our observation, in-office hysteroscopy with the see-and-treat approach may be considered the first choice for treating RPOC equal to or smaller than 2 cm, providing the advantages of a lower rate of complications and a faster recovery and discharge. However, more extensive and prospective studies are needed to confirm our results and identify other patients eligible for the see-and-treat approach who may benefit from its advantages.

Author contributions

All the authors conform to the International Committee of Medical Journal Editors (ICMJE) criteria for authorship, contributed to the intellectual content of the study, and approved the final version of the article. Nili Raz: Protocol/project development, Data collection or management, Manuscript writing/editing; Emiliya Sigal: Protocol/project development, Data collection or management; Fernando Gonzalez Arjona: Protocol/project development, Data collection or management; Carmelo Calidona: Data analysis, Manuscript writing/editing; Simone Garzon: Data analysis, Manuscript writing/editing; Stefano Uccella: Data analysis, Manuscript writing/editing; Antonio Simone Laganà: Data analysis, Manuscript writing/editing; Sergio Haimovich: Protocol/project development, Data collection or management, Manuscript writing/editing. All authors contributed to the interpretation of the results and the writing and editing of the manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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