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Complete work-up for the management of retained products of conception

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ABSTRACT

Retained products of conception represent an uncommon complication after miscarriage, planned termination of pregnancy, term spontaneous vaginal delivery or caesarean section.

The aim of this study was to review the diagnostic and therapeutic management of this condition, according to the current literature, in order to assess patients correctly and reduce the number of unnecessary procedures with all their consequences.

This updated review of the literature explores the pathophysiology, clinical features, diagnostic investigations, and treatment options for this complex condition.

Laboratory tests are normal in most cases and have limited utility. Gray scale and Color Doppler ultrasound are the first line modality for the diagnosis of RPOC, even if ultrasound features alone should not be considered as conclusive, having an overall reported sensitivity of 44-85% and a specificity of 88-94%. Hysteroscopic resection of placental remnants, in absence of electricity use, seems to be the best treatment option with low risks and less complications related to fertility.

Diagnosis and correct management of RPOC remain a major clinical challenge, since no clearly defined diagnostic criteria and treatment guidelines still exist. Hysteroscopic resection seems to be a good option, but well-designed randomized controlled trials are needed to define the best treatment modality.

Keywords: Retained products of conception; residual trophoblastic tissue; operative hysteroscopy; hysteroscopic resection; curettage

SOMMARIO

La ritenzione di prodotti del concepimento rappresenta una rara complicanza dopo un aborto, un'interruzione volontaria di gravidanza, un parto vaginale o un taglio cesareo, correlata a numerose conseguenze, a breve e lungo termine.

L'obiettivo del nostro studio è di definire un percorso diagnostico-terapeutico per un corretto inquadramento di questa condizione, anche allo scopo di ridurre le procedure non necessarie.

Si tratta di una review della letteratura corrente che include la patofisiologia, le caratteristiche cliniche, le indagini diagnostiche e le opzioni di trattamento.

I test di laboratorio sono di utilità limitata, in quanto normali nella maggior parte dei casi. L'ecografia è l'indagine di prima linea per la diagnosi, con una sensibilità del 44-85% ed una specificità del 88-94%. L'isteroscopia operativa sembrerebbe una buona opzione terapeutica, con bassi rischi e complicanze correlate alla fertilità.

Non esistono attualmente linee guida chiare sul management del materiale coriale ritenuto. Trial randomizzati controllati sarebbero utili per definirne la migliore modalità di trattamento.

INTRODUCTION

The term "Retained products of conception" (RPOC) refers to intrauterine placental remnants after miscarriage, planned termination of pregnancy, term spontaneous vaginal delivery or caesarean section. It is an uncommon complication involving approximately 1% of pregnancies, related to short-term and long-term consequences. Diagnosis and correct management of RPOC remains a major clinical challenge, since no clearly defined diagnostic criteria and treatment guidelines still exist. This lack of "standard of care" can lead problems when

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dealing with legal cases of RPOC, since complications related to retained placental tissue are emerging as a cause for malpractice claim[1,2].

The aim of this study was to review the diagnostic and therapeutic management of this condition, according to the current literature, in order to assess patients correctly and reduce the number of unnecessary procedures with all their consequences.

MATERIALS AND METHODS

This is a narrative review obtained from the PubMed database, available at https://www.ncbi.nlm.nih.gov/pubmed/. Authors searched the following key terms: such as "retained products of conception", "residual trophoblastic tissue", "placental remnants", "hysteroscopy", "curettage". We surveyed the English language literature for studies looking at this topic from 1990 to January 15, 2019. All authors identified the most relevant studies, which included systematic reviews, studies with the longest follow-up, and studies discussing pathophysiology. We identified further studies by reviewing the reference list of key articles. The search yielded a total of 48 papers, which were reviewed by the authors.

RESULTS

EPIDEMIOLOGY. The reported incidence of RPOC depends on several factors, first of all the type of analyzed population and gestational age at the event (RPOC after miscarriage, second trimester abortion, preterm or term vaginal delivery, caesarean section or mixed population). Other factors include type of treatment (surgical, medical or expectant management) and different diagnostic criteria (clinical manifestations, laboratory results, imaging, pathological examination).

Diagnosis of RPOC occurs in 1% of the deliveries although incidence ranges from 3-5% according to different authors[3,4]. The overall incidence of RPOC is 0.3% after surgical uterine evacuation in first and second-trimester abortion. The incidence ranges from 2.4 to 27% after medical abortion, depending on the chosen therapeutic regimen (mifepristone + misoprostol, single misoprostol dose, multiple misoprostol doses, methotrexate + misoprostol, or other schemes)[5].

RISK FACTORS. The most common risk factors are abnormal placental implantation such as placenta accreta, instrumental delivery, failure to progress during delivery, previous uterine surgery (previous caesarean section, uterine cavity evacuation, endoscopic surgery for congenital or acquired uterine malformations, hysteroscopic metroplasty)[6, 7].

DIAGNOSIS. The definitive diagnosis of RPOC comes from histological examination of the retained tissue: the microscopic diagnosis needs the presence of chorionic villi, so it can be surely formulated only after surgical treatment[6]. Typical signs and symptoms and other diagnostic tools can help in the identification of cases[8].

Details about the antecedent pregnancy are to be collected, including the gestational age, timing and modalities of delivery or miscarriage, previous ultrasound examinations, pathological or clinical examination of pregnancy-related tissue.

The presence of RPOC can be suspected in case of clinical signs such as: abnormal uterine bleeding or prolonged amenorrhea, fever, abdominal or pelvic pain, persisting dilated cervix at the bimanual pelvic examination. However, during routine follow up after miscarriage or delivery, a suspicion of RPOC is reported in asymptomatic women[4].

Abnormal uterine bleeding is the most commonly reported symptom, involving more than 73% of cases. It is described as heavy (and potentially resulting in anaemia) or prolonged (more than three weeks). On the other hand, amenorrhea can be due to viable trophoblastic tissue and the presence of RPOC should be suspected if the patient does not menstruate by six weeks from miscarriage or pregnancy termination, especially if she is not breastfeeding. According to Golan et al[9], the median time from pregnancy termination to admission for treatment of RPOC was more than three weeks for women with abnormal bleeding.

Pain and signs of inflammation or infection involve the 20% of patients. The median time between pregnancy termination and admission for treatment of these features is shorter, ranging from 5 to 13 days.

The remaining 5.7-6.3% of women are asymptomatic and readmission is due to a clinical or ultrasonographic suspicion at the follow up examination. The time to admission

in this group of patients is longer, up to 100 days[9].

Laboratory tests are normal in most cases and have limited utility.

- HCG levels can be high in RPOC but commonly there's no significant difference in HCG values between patients with RPOC and those without RPOC, as it remains positive for weeks after the end of a pregnancy. Past studies described that a rate of decline less than 21% at 2 days or 60% at 7 days can be suggestive for retained trophoblasts, but these data have not been further validated[10,11]. In addition, low HCG levels can't exclude the presence of RPOC, since necrotic trophoblastic tissue may be retained without secreting hormone.
- High white blood cells levels could support the hypothesis of retained trophoblastic tissue infection, but can also be a normal finding in postpartum women, due to the physiologic leukocytosis of pregnancy and labor. The white blood cells count is not useful if considered alone[12].
- Low haemoglobin supports the diagnosis of excessive and prolonged bleeding and implies further investigation, consideration of surgical intervention and assessment of coagulation system[6].

Past studies looked only at different gray scale sonographic features of RPOC but the most recent ones focused and evaluated the utility of color Doppler imaging[13]. Both gray scale and color Doppler US have to be considered as the first line imaging modality for the diagnosis of suspected RPOC, this allowing real time assessment of the uterine structures and blood flow. Nevertheless, ultrasound abnormalities alone should not be considered as conclusive evidence for RPOC in asymptomatic patients[14].

RPOC have variable appearances in sonography, with an overall reported sensitivity of 44-85% and a specificity of 88-94%[15]. The most frequently published sonographic predictors of RPOC are: endometrial mass with hyperechoic, hypoechoic or mixed echogenic patterns in the uterine cavity measuring more than 10 mm and with low-resistive index blood flow signals detected by color Doppler in the same area. This finding has a quite high sensitivity (79-88%) but a low specificity (29-58%); another predictor is an endometrial echo complex (EEC), with a thicken ranging from 8 to 25 mm in literature. The 10 mm cut-off value for endometrial thickness has a reported sensitivity of more than 80%[16] and a relatively low specificity of 20%, since this image can be observed in postpartum patients with no RPOC. On the other hand, uniform thin endometrium with no focal thickening, endometrial masses or focal vascularity excludes the presence of retained products, with a high negative-predictive value[15].

The false positive rates are 28,9% if the diagnosis is based only on sonography but specificity and negative predictive value are improved if sonographic features are associated to Color Doppler characteristics[3].

Kamaya et al in 2009[13] tried to characterize the endometrial color Doppler vascular degrees in suspected RCOP: type 0 identifies absence of vascularity in endometrium. Type 1 describes minimal vascularity, less than in the myometrium in the same image section. This is the most common sonographic pattern for RPOC, with a high positive predictive value, up to 90%. Type 2 describes moderate endometrial vascularity, equal to that in the myometrium; this finding can be identified only in patients affected by RPOC, with a positive predictive value of 100%. Type 3 describes marked endometrial vascularity, greater than that of healthy myometrium; it also has a PPV of 100% and it is probably associated with vascular linkages between retained placenta and maternal uterine vessels. RPOC with type 3 vascularity can be mistaken with Artero-Venous Malformation (AVM), since both have vascularisation with high flow velocity and low resistance[13].

Recent results underline how histopathological findings in terms of vascularisation can be related to sonographic patterns, thus influencing the clinical management and outcome of different groups of patients. After miscarriage, delivery or intrauterine death, villi tend to degenerate, showing increasing fibrosis and loss of vessels. Avascular or markedly reduced vascularity in histopathological samples of RPOC likely reflects ongoing tissue involution, with a high percentage of decidua and low percentage of villi. This is related to type 0 sonographic findings. These results support others which have found that sonographically type 0 RPOC have a higher rate of successful expectant management than vascularised RPOC. On the other hand, highly vascularised patterns

should be also properly treated, since they are related to potentially devastating blood loss if treated with blind dilation and curettage[17-20]. They could be approached, instead, with uterine artery embolization (UAE), as an effective and safe first-line treatment option[21].

Table 1
Typical ultrasonographic characteristics of intrauterine conditions mimicking RPOC.

DIAGNOSIS	MAIN UTRASONOGRAPHIC FEATURES
Blood Clots	avascular, thicken Endometrial Echo Complex
Endometrial Polyps Submucous fibroids	vascularised endometrial mass
Gestational Trophoblastic Disease	poorly defined masses with anechoic areas
	myometrial epicentre of the mass
	more than one third of depth in myometrial invasion
	placental venous lakes
Artero-Venous Malformations	abnormal hypervascular areas
	tangle of tortuous vessels
	multidirectional with high-velocity
	turbulent flow

MR imaging or CT scan can be a useful additional instrument to assess complicated cases of RPOC, but ultrasound is usually sufficient for diagnosis in most cases[6].

DIFFERENTIAL DIAGNOSIS. Other causes of abnormal uterine bleeding have to be considered, such as uterine atony/ subinvolution, vaginal or cervical trauma, hematometra, ectopic pregnancy.

Other signs or symptoms of inflammation or infection include endometritis, pelvic inflammatory disease, other causes of abdomino-pelvic infection, possibly related to complication of surgical procedures such as uterine perforation after instrumental dilation and curettage.

Many rare but potential pitfalls can mimic RPOC, both because of similar ultrasonographic features and for clinical manifestations. The most important ones are represented in **Table 1**.

First, distinguishing this condition from blood clots is the most common challenge in this setting. Blood clots appear as avascular, thicken Endometrial Echo Complex (EEC) and can be misdiagnosed with avascular RPOC.

Next, abnormalities such as endometrial polyps or submucous fibroids appear as vascularised endometrial masses.

Gestational trophoblastic disease may also have some overlapping findings. Ultrasonographic imaging includes poorly defined masses with anechoic areas, representing enlarged hydropic villi, a myometrial epicentre of the mass, more than one third of depth in myometrial invasion, placental venous lakes. The differentiation between the two conditions typically requires an accurate anamnesis, observance of HCG trend and evaluation of sonographic features[22-23].

Finally, Artero-Venous Malformations (AVM) are the most common pitfalls in mistaking the marked vascularity of RPOC. AVM are uterine vascular malformations whose aetiology is poorly understood. They can be classified as either congenital or acquired. Congenital AVM are particularly rare and generally consist of multiple small vascular connections thought to be a result of major local disturbance to the angiogenic process during development. Acquired AVM are commonly associated with uterine trauma that lead the formation of vascular abnormal connection, for example after dilation and curettage, cesarean section, myomectomy or even vaginal delivery. Rarely they have also been related to infections, trophoblastic disease and uterine or cervical malignancies. AVM ultrasonographic findings include abnormal hypervascular areas, tangle of tortuous vessels with a multidirectional with high-velocity and turbulent flow on color Doppler imaging[24-26].

COMPLICATIONS. Retained products of conception are related to short term and long term complications.

Short term complications include abnormal uterine bleeding and infections, since necrotic RPOC are susceptible to ascending dissemination and sepsis.

Long term complications include mild to severe intrauterine adhesions (IUAs), which may significantly affect future fertility outcomes and appear clinically with menstrual abnormalities up to amenorrhea, infertility, abnormal placental implantation in

further pregnancies and recurrent pregnancy loss[1,27,28]. The pathogenesis of IUAs is complex and includes endometrial trauma (mainly due to intrauterine instrumental procedures, but also to inflammation or infections), patients' constitutional characteristics, as well as the common hypo-estrogenic environment commonly found in the puerperal period. Their presence and degree can be assessed with a diagnostic hysteroscopy[29].

Side effects related to treatment with dilation and curettage (D&C) or operative hysteroscopy are also to be mentioned. They both have to be considered as quite safe procedures with a low rate of short term complications, such as uterine perforation and pelvic inflammatory syndrome requiring surgery[1,9,29].

TREATMENT OPTIONS. Expectant management, medical or surgical treatment should be considered when approaching suspected RPOC. For none of them there is evidence of a treatment of choice and no guidelines or therapeutic protocols still exist.

Expectant management can be considered in asymptomatic, hemodynamically stable patients with ultrasonographic suspicion of RPOC. There is no consensus upon how much time can these women wait until surgery is to be suggested. In one study women with highly suspicious findings at US were followed up to six weeks awaiting spontaneous expulsion of residual trophoblastic tissue. About 40% of women in whom retained tissue was seen with highly suspicious characteristics at US did not need dilation and curettage because of spontaneous resolution. For those with ultrasonographic features doubtful for retained tissue, almost 9 of 10 solved spontaneously.

These results indicate that expectant management is justified in many asymptomatic patients only presenting sonographic suspicion of retained tissue. A detailed counselling is important for those women who are requested to wait and undergo follow up for weeks. It is crucial to understand that an expectant management should be accepted in order to avoid unnecessary surgical treatments. Expectant management has to be stopped in case of abnormal uterine bleeding, signs or symptoms of infection, absence of spontaneous resolution over 6 weeks of follow up, or at the patient's request[4].

There are no guidelines on the expectant management and different opinions have been published. Some authors suggest that treatment should be performed as soon as possible, to avoid adherence of product of conception to the uterine wall and subsequent development of inflammation[30]. Chen et al published, on the other hand, that delayed surgery, employed at a median interval (MI) of 76 days (2.7 months) after termination of pregnancy, might neither accelerate the clearance of intrauterine placental remnants nor advance fertility or obstetric outcomes compared with non-surgical treatments, as the clinical efficacy and reproductive outcomes showed no difference between surgical and non-surgical treatments[31].

Medical treatment in symptomatic patients includes different regimens of therapy, depending on gestational age. Prostaglandin E1 analogue (Misoprostol) is the most commonly used drug for the first trimester incomplete miscarriage. It has low cost, low incidence of severe side effects, stability at room temperature and readily available. Its safety and efficacy have already been established by multiple studies. According to a study about treatment of suction termination of pregnancy-retained products of conception symptoms with Misoprostol 200 µg, given orally or sublingually, three times a day for six doses showed that it was 93% effective and it reduced the repeat dilation and curettage rate by 79.6%[32]. There is no agreement on specific dosing criteria and more studies are required to make a clear recommendation on the medical treatment for RPOC with Misoprostol[5].

Hershko Klement et al recently suggested that oral contraceptive pills (OCPs) containing 0.03 mg ethinylestradiol and 0.15 mg of desogestrel for 3 weeks, may be a useful medical treatment option for persisting RPOC in selected patients (<8-week gestation) wishing to avoid surgery. Out of the 12 treated patients, nine (75%) successfully expelled the RPOC after completing the three-week course of OCPs. The three women (25%) who did not resolve following OCP treatment had pregnancy products with positive blood flow on Doppler examination before treatment. These results suggest that an early pregnancy loss (<8-week gestation) with avascular RPOC is potentially manageable by combined oral contraceptive treatment and subsequent withdrawal bleed. Retained products with

sonographic evidence of blood flow are less likely to respond to OCP treatment and are probably best managed by surgical intervention [33].

Surgical approach with uterine evacuation by dilation and curettage (D&C) or vacuum aspiration has been the gold standard treatment in most centres for years[4]. However, it is a blind procedure and can be associated to persistence of intrauterine retention, which may consequently develop chronic infection. Furthermore, the trauma of the uterine lining that occurs during the procedure can cause simple to complex IUAs. The rate of IUAs diagnosed by a second look hysteroscopy after single D&C is about 18%, whereas it rises up to 40% after repeated procedures. Blind curettage is also related to the risk of uterine perforation and need for major surgery for complications[34].

Hysteroscopy can be considered both a diagnostic and a therapeutic tool for RPOC[35,36]. This technique allows the direct visualization of the retained tissue, its selective removal and the preservation of the adjacent endometrium. It is related to a very low percentage of surgical complications and lowers the number of repeated intervention for persisting retained material. It is related to a low rate of postoperative IUAs, ranging from 4 to 12.8% in literature[1,30,37]. This is probably due to reduction of trauma, which decreases risk of inflammation and scarring. Hysteroscopic loop resection (HR) with a resectoscope typically doesn't require the use of electric current, thus further minimising thermal damage and adhesions formation[8]. Remarkably, hysteroscopy can also diagnose and even treat possible congenital or acquired uterine malformations or diseases, such as septa, polyps or sub-mucosal fibroids, which may be related to infertility or spontaneous abortions[35,36].

Recent evidences show that they both have to be considered as quite safe procedures with a low rate of short term complications, such as uterine perforation and pelvic inflammatory syndrome requiring further surgery. According to Hooker et al[1], the pooled prevalence of these complications is 1%. Both techniques have similar results in terms of cumulative conception rate after treatment (81.8%), ongoing pregnancy/live-birth rate (73.2%) and miscarriage rate (12%). Nevertheless, results show that HR should be more advisable as a minimally invasive, effective procedure compared with blind and nonselective D&C, due to its lower risk of moderate IUAs (12.8 vs 29.6%). D&C is therefore associated with a significantly higher incidence of incomplete uterine evacuation, if compared to HR in women treated for RPOC[1]. Moreover, other experiences reported shorter time to subsequent conception and a lower rate of newly diagnosed infertility problems after HR compared to D&C[40-42]. Rein et al also confirmed that hysteroscopy led to significantly less intrauterine adhesions (4.2%) compared to curettage (30.8%). Rate of conception was also improved after hysteroscopic resection (68.8% versus 59.9%) and lower was the mean time to obtain pregnancy (11.5 months versus 14.5 months)[40].

Capmas et al further demonstrated that operative hysteroscopy is a valid alternative for the management of RPOC. Efficiency in this study was 91% in women with hysteroscopy and led to few complications, such as intra-uterine adhesions (7,5%). Subsequent pregnancy rate was 83% in a short mean time (around 8 months)[43].

In conclusion, many authors found that hysteroscopy is associated with low rates of intra- and post-operative complications, as well as low rates of post-procedure intrauterine adhesions[44].

Other techniques have been evaluated for the treatment of RPOC, for example assisted Uterine Arteries Embolization (UAE). Although it was repetitively reported to be effective in the conservative treatment of placenta accreta, whether the method could improve the reabsorption of placental remnants still remains to be verified. Chen et al compared patients treated with expectant management assisted with selective UAE, and patients treated with expectant management alone. They demonstrate that the interval for ultrasound to become normal was significantly longer in patient who underwent UAE. This result was surprising because assisted selective UAE did not accelerate the clearance of placental remnants inside the uterine cavity as expected, indicating that the clearance of the residual placental tissue is a slow process, if compared with the relatively faster prog¬ress for maternal menstrual cycle to return[31].

Finally, a novel and alternative approach has to be mentioned: the use of an hysteroscopic

morcellator has been suggested resulting as an effective technique for management of placental remnants, with a high rate of successfully removed RPOC, but further studies are required to compare the different methods of treatment[45].

Given the lack of clear superiority of either approach, the woman's preference is crucial in decision making[46].

Recent retrospective cohort studies about different surgical techniques for the treatment of RPOC are listed in **Table 2**.

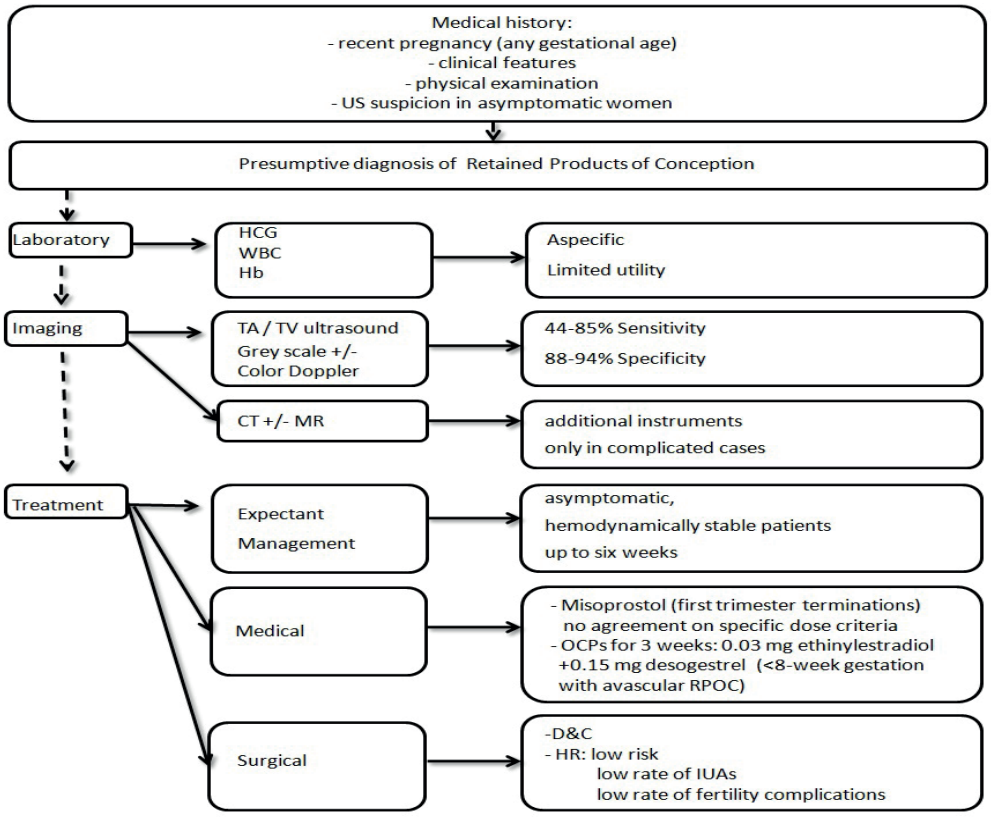
Table 2
Published studies about surgical treatment of RPOC (Pubmed, English language, 2008–2018)

Reference	Nr of cases	Treatment groups	Type of Pregnancy
Van den Bosch 2008 (4)	128	98.8% expectant management 1.2% immediate curettage	17.8% 1st trimester miscarriage 40% 2nd trimester demise 2.7% 3rd trimester delivery 36% termination of pregnancy
Jiménez 2009 (36)	84	77% office hysteroscopy 23% curettage	56% abortion 33% vaginal delivery 11% caesarean section
Faivre 2009 (34)	50	100% hysteroscopic resection	80% 1st trimester abortiona 4% 2nd trimester abortiona 16% term delivery
Golan 2011 (9)	159	100% hysteroscopic resection	55.3% surgical termination 27.0% medical termination 17.6% delivery
Rein 2011 (40)	95	44% curettage 56% hysteroscopic resection	92.6% surgical termination (1st or 2nd trimester) 7.4% term delivery
Hamerlynck 2013 (45)	105	100% hysteroscopic morcellation	5.7% incomplete miscarriage 33.3% missed abortion 2.9% 1st trimester TOP b 3.8% 2nd trimester TOP b 54.3% normal birth
Ben Ami 2014 (29)	177	46.9% hysteroscopic resection 53.1% curettage	47.5% delivery 52.5% abortion
Smorgick 2017 (44)	50	100% Operative hysteroscopy blunt use of the resectoscopic loop	52% 1t trimester medical abortion (mifepristone- misoprostol) 48% early pregnancy failure (misoprostol)
Ganer Herman 2018 (27)	178	100% hysteroscopic resection	52% abortion 47,7% delivery
Capmas 2018 (43)	114	100% hysteroscopic resection	35% medical and surgical miscarriage 17% delivery 9% caesarean delivery 33% medical and surgical abortion 16% others
Chen 2018 (31)	65	60% non surgical treatment 40% surgical treatment	76% 2nd trimester abortion 24% 3rd trimester abortion or vaginal delivery

[a] including both surgical and medical treatment
[b] TOP= Termination Of Pregnancy (including both spontaneous abortion and voluntary termination of pregnancy)

Figure 1 represents in a concluding flow chart the complete management of RPOC.

Figure 1.
Management of Retained Products of Conception



US= Ultrasound; HCG= Human Chorionic Gonadotropin; WBC= White Blood Cells; Hb= Haemoglobin; TA= Trans Abdominal; TV= Trans Vaginal; CT= Computed Tomography; MR= Magnetic Resonance; OCPs= Oral Contraceptive Pills; D&C= Dilatation and Curettage; HR= Hysteroscopic Resection

DISCUSSION

Persistence of RPOC can lead to several short- and long-term complications in women in fertile age. It represents an emerging cause for malpractice claim and the problem with dealing with this kind of condition is the absence of a "standard of care", with no clear diagnostic and therapeutic guidelines nor recommendations. Treatment priorities in these patients are unknown and need to be defined[2].

No clinical, sonographic nor intra-procedural variables correlate with the presence of trophoblastic tissue in cases of suspected RPOC, so proceeding with a diagnostic / operative hysteroscopy in suspected cases after an initial period of evaluation seems to be a good option, since it is the less invasive procedure with the highest sensitivity[47,48]. Operative protocols, to define which patients are eligible for diagnostic hysteroscopy in case of suspected US evaluation after delivery, have been proposed[48]. The rationale is to treat women properly with an operative hysteroscopy in case of positivity for RPOC and to avoid unnecessary exams and surgical procedures in "low risk" patients. Careful counselling must be done in all cases, to increase patients' compliance[48]. As authors we all agree with the current evidence that favours hysteroscopic resection of placental remnants in absence of electricity use, being a surgical technique associated with low risks, low rate of IUAs and less complications related to fertility[38-42]. The current literature still lacks evidences strong enough to support the benefit of this technique on the traditional blind curettage. Only one study protocol for a randomized controlled trial has been published in France, to standardize the surgical treatment for incomplete spontaneous abortion[37]. Other well-designed randomized controlled trials should be performed in order to define the best treatment for retained products of conception.

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