Medtronic

Retained products of conception (RPOC)

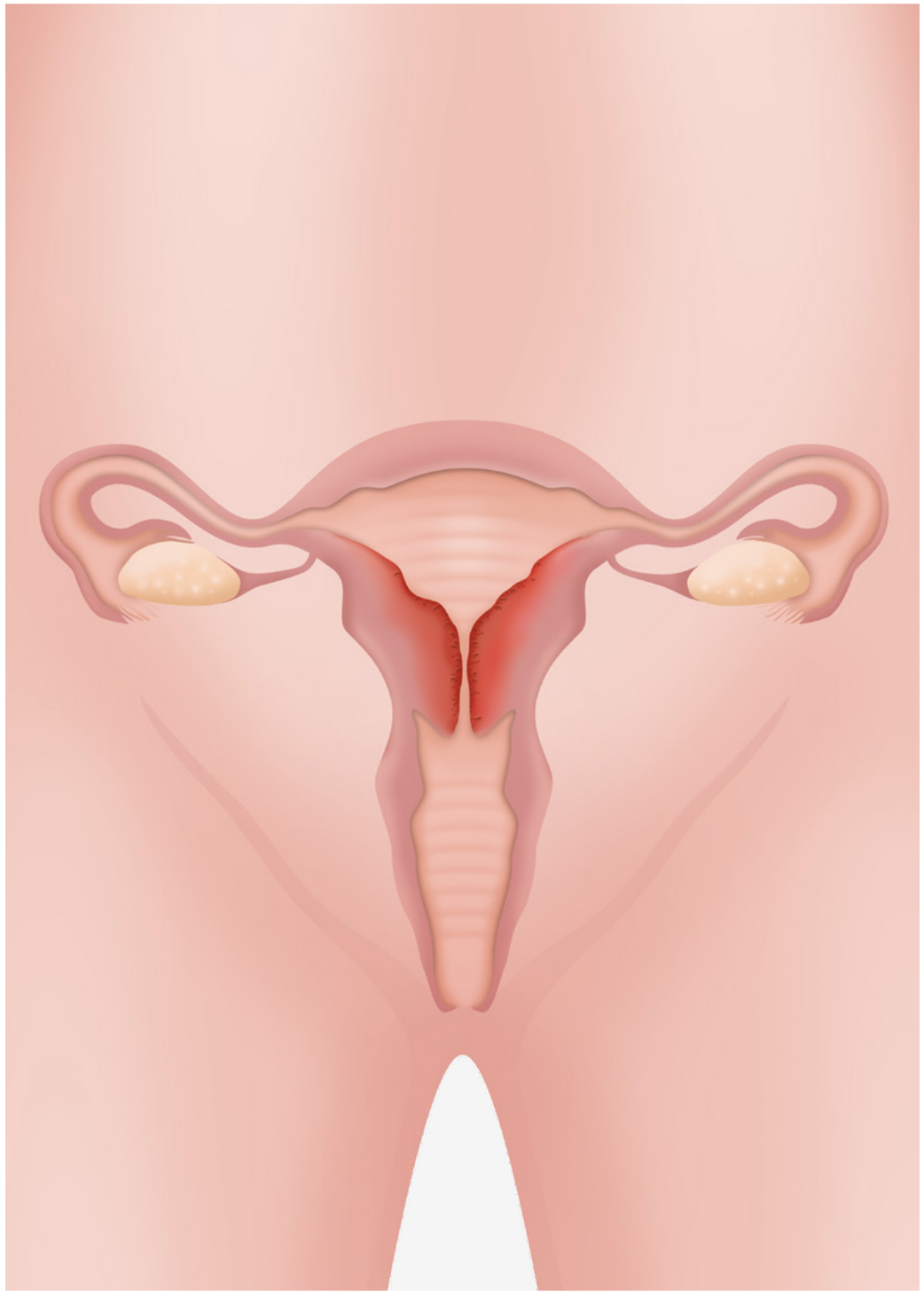
Discover Dossier

Pathology

Common[1] pregnancy complication

Retained products of conception (RPOC) refers to residual placental or fetal intrauterine tissue that remains after a spontaneous pregnancy loss (miscarriage), medical and surgical pregnancy termination, or vaginal or cesarean delivery.[2]

This document predominantly focuses on RPOC following a miscarriage.



Patient presentation

The existence of RPOC may be suspected based on clinical signs and ultrasound findings, such as the presence of abnormal bleeding, abdominal pain and/or fever, a persisting dilated cervix, and sonographic appearance of residual placental or fetal tissue in the uterine cavity or cervical canal.[3]

Early pregnancy loss[4]

Accepted treatments of early pregnancy loss include expectant, medical and surgical management. Although these options differ in process, all have been shown to be reasonably effective and accepted by patients.

- In women without medical complications or symptoms requiring urgent surgical evacuation, treatment plans can safely accommodate patient treatment preferences.
- There is no evidence that any approach results in different long-term outcomes.
- Patients should be counseled about the risks and benefits of each option.

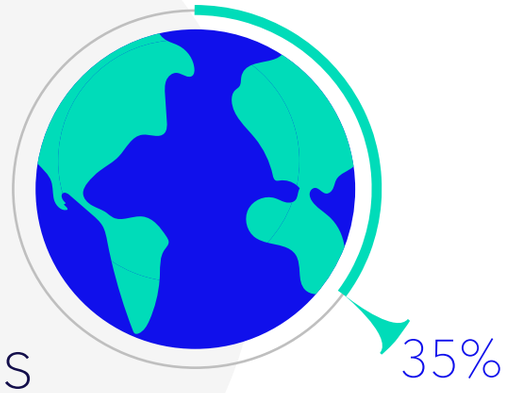
Burden on Patients and Society

Incidence rate varies by causation

There are approximately

213m worldwide annual pregnancies

35%* do not end in live birth.[5]



Of the nearly 15% of pregnancies that end in spontaneous loss,

Approximately 20% of women will likely experience RPOC.[1]

The incidence of RPOC seems to depend on the gestational age of the pregnancy, with RPOC occurring most frequently after a second-trimester loss.

Lastly, retention of products of conception following delivery has shown an incidence of between 3-5%.[1]

*Due to either spontaneous loss or induced abortions

Risk factors

The incidence of RPOC seems to depend on the gestational age of the pregnancy, with RPOC occurring most frequently after a second-trimester loss.[1]

It has been found that an earlier gestational age (between 12 and 17 weeks) at delivery and using placental forceps to remove the placenta were significant risk factors of RPOC after miscarriage.[6]

Patients who deliver vaginally, and are of an older maternal age, appear to be at a higher risk.[7] See table below:

Table 1:
Patient characteristics between patients with confirmed RPOC (Group 1) and without (Group 2)[7]

Characteristic	Group 1 (n=32)	Group 2 (n=21)	p-Value
Age (years)			
Mean±SD	34.8 (4.4)	30.5 (4.6)	0.0001
BMI (kg/m²)			
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

Click to enlarge table

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

Short- and long-term complications

Short-term complications of RPOC include bleeding and infections, while long-term complications include formation of intrauterine adhesions (IUA, also called Asherman's syndrome) which may significantly affect future reproductive outcomes due to infertility, miscarriages, and pregnancy complications such as placenta accreta.[8]

Intrauterine adhesions are frequently encountered, in one in five women, after miscarriage.[9] In more than half of these, the severity and extent of adhesions was mild, with unknown clinical relevance.[9]

- Risk factors for adhesion formation were recurrent miscarriages and Dilation & Curettage (D&C) procedures.[9]

Humanistic burden

The complications of RPOC are not limited to only clinical presentation but could compound the psychological symptoms of anxiety and depression after suffering a spontaneous abortion.[10]

Results from a patient survey emphasized the fact that evacuation of the retained products of conception after miscarriage is a trauma that is too often dismissed as a routine surgical procedure by the medical staff involved.[11]

If left untreated, the woman could develop longer-term complications, such as intrauterine adhesions, which could impact fertility, result in future miscarriages, or even cause pregnancy complications.[3,8]

Current Care Paradigm for Miscarriage Management

Three distinctive miscarriage management treatment pathways[4]

The current care paradigm consists of expectant management, medical management, and surgical management.

The optimal management necessitates complete evacuation of the uterus with minimal endometrial damage and minimal need for future follow-up and intervention.

A patient's treatment pathway is usually decided upon by three main factors: patient presentation/ symptoms, time of occurrence (i.e., pregnancy trimester), and patient preference.

Treatment Pathways

Expectant Management

Medical Management

Surgical Management

Click here to view clinical guidelines from National Institute for Health Care Excellence (NICE)[12]

Clinical guidelines from NICE: Miscarriage management[12]

Expectant Management

First-line treatment for 7 to 10 days for women with confirmed diagnosis of miscarriage.

Explore other treatment options if:

- the woman is at increased risk of hemorrhage (for example, she is in the late first trimester) or
- she has previous adverse and/or traumatic experience associated with pregnancy (for example, stillbirth, miscarriage or antepartum hemorrhage) or
- she is at increased risk from the effects of hemorrhage (for example, if she has coagulopathies or is unable to have a blood transfusion) or there is evidence of infection.

Medical Management

Offer vaginal misoprostol for the medical treatment of missed or incomplete miscarriage. Oral administration is an acceptable alternative if this is the woman's preference.

Surgical Management

Where clinically appropriate, offer women undergoing a miscarriage a choice of:

- Manual vacuum aspiration under local anesthetic in an outpatient or clinical setting or
- Surgical management in a theatre under general anesthetic.

Expectant management

Expectant management allows spontaneous passage of retained products of conception and should be considered for women with incomplete miscarriages.[10]

This pathway should generally be limited to gestations within the first trimester.[4]

Patients undergoing expectant management may experience moderate-to-heavy bleeding and cramping.[4]

Expectant management was found to result in complete uterine evacuation over three days in 79% of cases of incomplete miscarriage,[13] but can take up to 8 weeks for some women.[4]

However, efficacy has been shown to be as low as 37% after seven days when expectant management was used to treat women with miscarriage mostly diagnosed as early fetal demise.[14]

Medical management

Medical management involves the use of drugs to aid expulsion of retained products.

Treatment regimens include the use of the antiprogesterone, mifepristone, and a prostaglandin analogue, the most commonly used of which is misoprostol.[15]

- Misoprostol-based regimens at larger doses have been shown to be more effective than a smaller dose, and vaginal or sublingual is more effective than oral administration.[4]

This pathway can be considered in women without infection, hemorrhage, severe anemia, or bleeding disorders who want to shorten the time to complete expulsion but prefer to avoid surgical evacuation.[4]

Even though serious adverse events are extremely rare, a small percentage of women may experience bleeding resulting in blood transfusion and pelvic infection. The more common side-effects are fatigue, headache, and dizziness.[16]

Of the nine randomized controlled trials published, success rates for this care pathway were as low as 13% to as high as 93%.[17,18]

Surgical management

Surgical management is the immediate removal of the tissue with the assistance of surgical instruments.

Surgical management of RPOC is recommended by the American College of Gynecology (ACOG) for women who present with hemorrhage, hemodynamic instability, or signs of infection, as well as those who present with certain comorbidities.[4]

This approach is also preferred by many women because of the immediate completion of the miscarriage process with less follow-up.[4]

The three most common surgical approaches are:

- Dilation & Curettage
- Suction Curettage
- Hysteroscopic Evacuation

Dilation & curettage / suction curettage

For almost a century, dilation and blind removal through sharp, blunt, or suction curettage (D&C) has been used to surgically treat RPOC.[19]

- Traditional D&C has low costs, a relatively short learning curve, and a simple preprocedural setup.[20]
- D&C and suction curettage in the first trimester are safe procedures. However, these procedures are done blindly and rely mainly on experience of the surgeon.[19]
- The documented complications of blind techniques are heavy bleeding, infections (endometritis and pelvic inflammatory disease), uterine perforations, persistant RPOC, and intrauterine adhesions (IUAs).[3,21]
- The rate of IUAs after D&C for miscarriages is 16% and higher in cases of a repeat D&C, although the clinical significance of the adhesions is unclear.[9]

Hysteroscopic evacuation

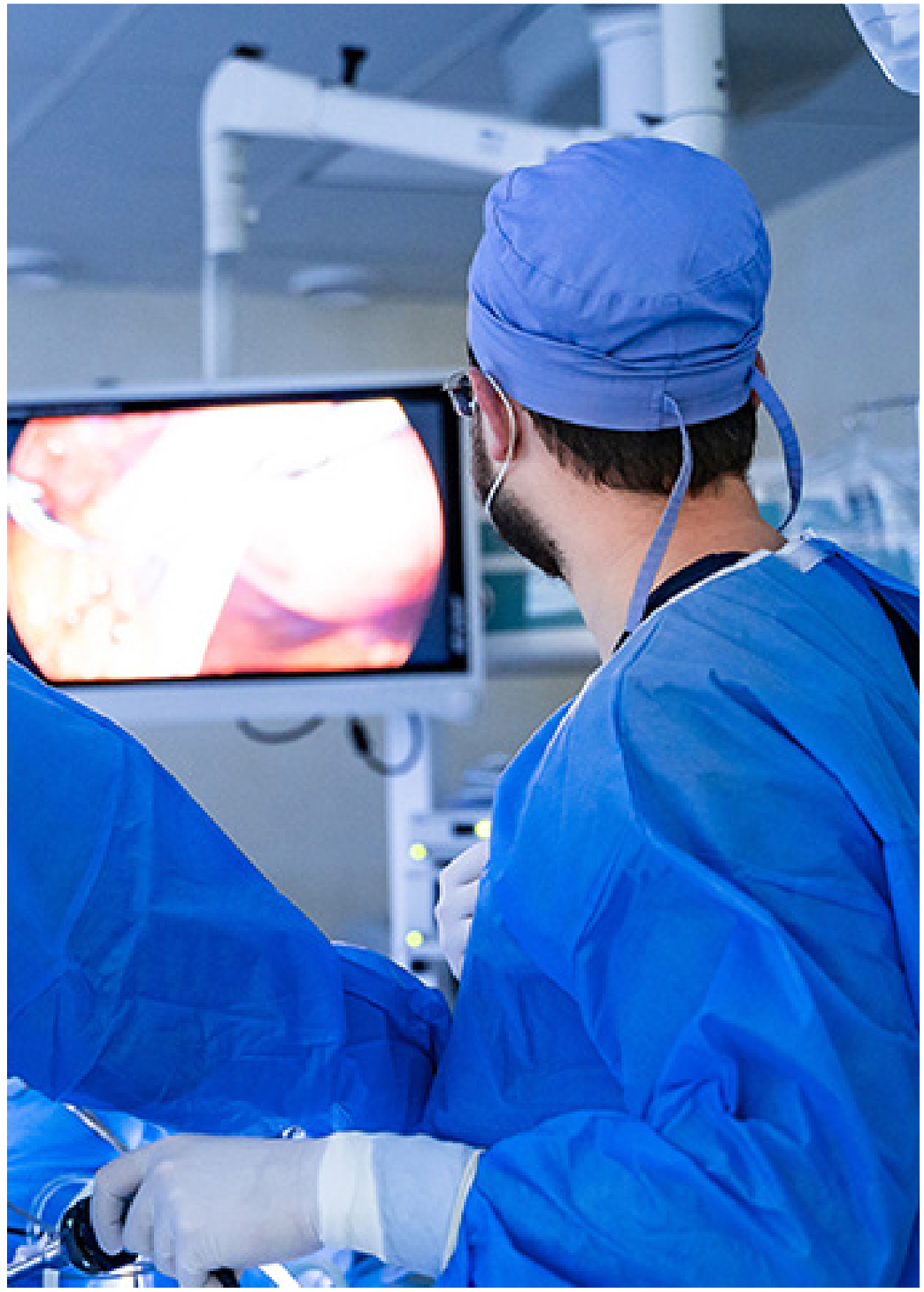
Hysteroscopy is an incisionless procedure, where the surgeon uses a hysteroscope to visualize the uterine cavity. If a pathological or structural abnormality is identified, the surgeon may opt to perform a therapeutic surgery using instruments through the working channel of the hysteroscope. This involves cutting the tissue into small pieces to remove them from the uterine cavity.

Hysteroscopy is considered the gold standard for the diagnosis and treatment of intrauterine disorders. Over the last 10 years, several studies have been conducted to evaluate the efficacy of hysteroscopy for the treatment of RPOC.[19]

The different options of hysteroscopic resection are:

- **Resectoscope:**
  used with or without current
- **Mechanical resection:**
  uses a blade to cut tissue that is then removed through the device and captured in a specimen trap

Documented complications from hysteroscopic evacuation include uterine perforation, fluid overload, and formation of intrauterine adhesions.[19]



Clinical Evidence

Hysteroscopic evacuation vs. D&C[3]

Hysteroscopic evacuation may be a preferable surgical treatment in women suspected of RPOC due to fewer intrauterine adhesions (IUAs) and incomplete evacuations are encountered. Similar reproductive outcomes were reported compared with D&C.

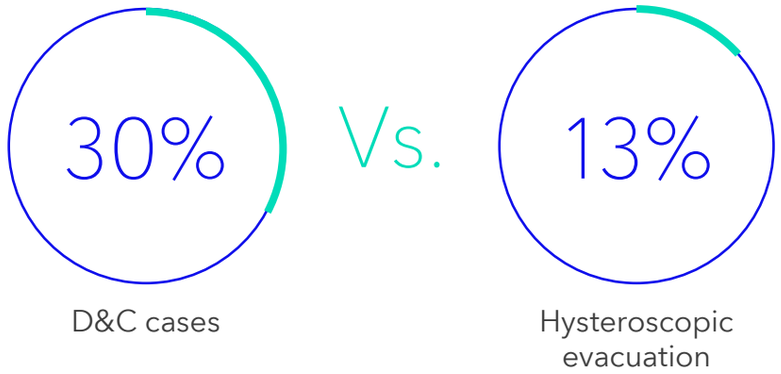
Design: Systematic Review

Interventions: Hysteroscopic resection loop (primarily without current) vs. Blind D&C (with or without suction)

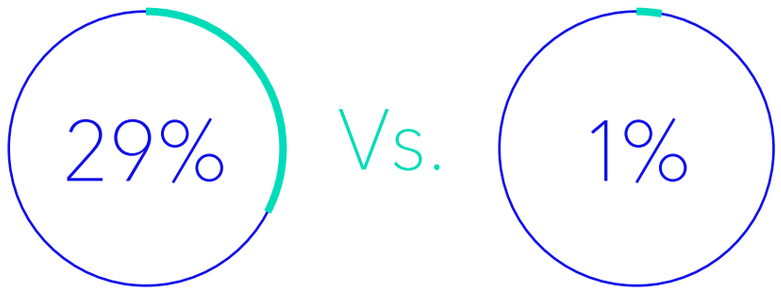
Endpoints	Hysteroscopic Evacuation	D&C
Tissue Evacuation	99% evacuation	71% evacuation
IUA Growth	13%	30%
Focused Resection	✓	✗
Visualization	✓	✗

Mechanical hysteroscopic tissue removal was not used in the studies included in this review.

Intrauterine adhesions were encountered in:



Incomplete evacuation was encountered in:



D&C is associated with IUA formation and serious reproductive sequalae such as:

- Amenorrhea
- Subfertility
- Ectopic pregnancy
- Pregnancy complications (preterm delivery, postpartum hemorrhage, growth restriction, etc.)

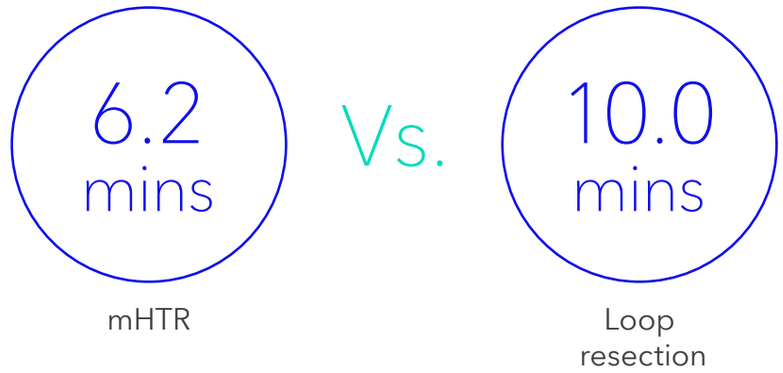
mHTR vs. Loop resection[22]

Mechanical hysteroscopic tissue removal (mHTR) is a faster alternative than loop resection. Both techniques are safe and show high rates of complete removal and tissue availability and low rates of de novo intrauterine adhesions.

Design: RCT; mHTR (n=46) & Loop resection (n=40)

Interventions: TruClear™ soft tissue shaver plus vs. Loop resection with Karl Storz resectoscope, without activation of bipolar current

Median operating times



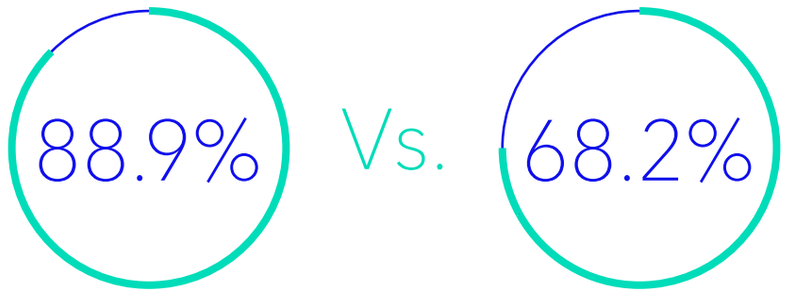
mHTR vs. Loop Resection[23]

Hysteroscopic evacuation of RPOC seems to have no detrimental effect on reproductive outcome and no significant effect on pregnancy rate.

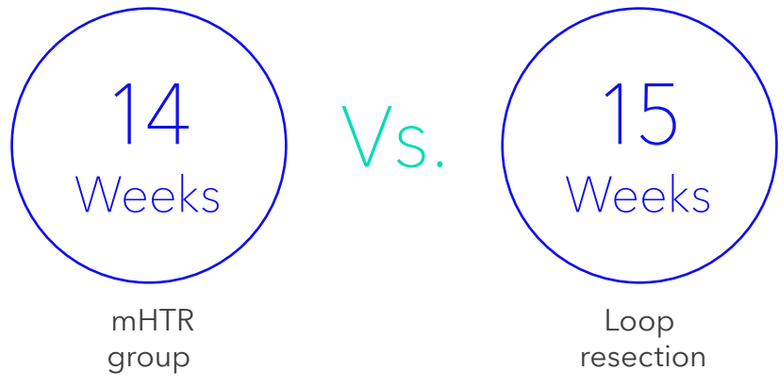
Design: Cohort study; Sample size hysteroscopic morcellation (n=27) and loop resection (n=22)

Interventions: TruClear™ System vs. Karl Storz Bipolar Loop Resection

Live birth rate was:



Median time to pregnancy was:



mHTR[24]

Mechanical hysteroscopic tissue removal (mHTR) seems to be an effective technique for management of placental remnants.

Design: Retrospective case series, 105 procedure analysis

Interventions: TruClear™ System

94.3% completeness of pathology removal

85.7% of procedures had **no** reported adverse events

- **5.7%** Uterine perforation
  - **4 women** during cervical dilation
  - **2 women** during hysteroscopic procedure

In 23 follow-up cases, only 1 patient (4.4%) was observed to have a mild IUA

All tissue is collected and **available for pathologic analysis**

mHTR[20]

Mechanical hysteroscopic tissue removal (mHTR) seems to be a safe and feasible technique for management of early missed abortion. This method may have potential as an innovative treatment of miscarriage in selected cases.

Design: Prospective pilot study of 10 cases

Interventions: TruClear™ System

24 mins
mean procedure duration

90%
completeness of evacuation

No
adverse events reported

In follow-up office hysteroscopy of 4 cases,
no evidence of adhesions

Executive Summary

RPOC

Retained products of conception (RPOC) is a common pregnancy complication.

Incidence rate:

These vary by the manner in which the pregnancy was lost:

- Spontaneous Loss: 57%[1]
- Post delivery: 3-5%[1]

Risk Factors :

- Spontaneous abortion in the first trimester[25]
- Earlier gestational age at delivery and using placental forceps were at high risk after miscarriage.[6]

Complications:

- Short-term: Bleeding and infections[8]
- Long-term: Intrauterine adhesions[8]
- Pregnancy complications[3,8]

Treatment

The current care paradigm consist of expectant management, medical management, and surgical management.

Three main factors for a patient's treatment pathway:

- Patient presentation / symptoms
- Time of occurrence (i.e., pregnancy trimester)
- Patient preference

Expectant management should generally be limited to gestations within first trimester.[4]

- 79% of cases to resolve over three days[13]

Medical management is an option for women without certain co-morbidities who want to shorten time to complete expulsion but prefer to avoid surgical evacuation.[4]

- Success of this approach varies from 13% to 93%[17,18]

Surgical management is the immediate removal of tissue.

- Three common surgical approaches: Dilation & Curettage, Suction Curettage, and Hysteroscopic Evacuation

Evacuation with the TruClear™ System

TruClear™ When performing a hysteroscopy using the TruClear™ system, you get:

- Visualization throughout the procedure
- Precise tissue resection

Evidence has shown TruClear™ to have:

- Faster operative time than other hysteroscopic resection approaches[22]
- Nearly 94% complete pathology removal[20,24]
- Tissue sampling available for pathology analysis[24]
- Minimal post-operative adhesion growth[22]

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