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## ORIGINAL

### EVALUATING THE SAFETY OF HYSTEROSCOPY-ASSISTED UTERINE EVACUATION IN CSP TREATMENT THROUGH A SPORTS TEAM APPROACH

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#### ABSTRACT

**Objective:** This study aims to assess the effectiveness of a 'team strategy' approach, akin to sports team dynamics, in the treatment of cesarean scar pregnancy (CSP) using hysteroscopy-assisted evacuation. **Methods:** In this sports-team-inspired approach, 78 CSP patients were divided into two groups: one receiving standard uterine evacuation (control group), and the other undergoing hysteroscopy-assisted evacuation (study group), akin to testing different team strategies. **Results:** The study group, like a team using a superior game plan, had significantly shorter hospital stays, reduced procedure times, and less intraoperative bleeding, demonstrating the effectiveness of the hysteroscopy-assisted technique. **Conclusion:** Employing a hysteroscopy-guided approach to CSP treatment, similar to adopting a sophisticated team play in sports, leads to improved outcomes. This method minimizes patient trauma, shortens recovery times, and enhances overall treatment effectiveness, indicating its potential for broader application in the field, much like a successful game plan being adopted by other sports teams."

**KEYWORDS:** Sports Team Dynamics; Team Strategy Approach; Hysteroscopy; Uterine evacuation; Cesarean scar pregnancy; Safety

#### 1. INTRODUCTION

Cornual ectopic pregnancy, a rare form of ectopic pregnancy, occurs when the fertilized egg implants in the horn of the uterus, rather than in the uterine cavity. This condition, if left untreated, can lead to life-threatening complications,

making its prompt diagnosis and management of paramount importance. Hysteroscopy-assisted uterine evacuation has emerged as a valuable technique for treating cornual ectopic pregnancies (CSP), offering a minimally invasive approach to remove the ectopic gestational tissue while preserving uterine function (Tsuji et al., 2020). In recent years, the concept of a "sports team approach" to medical procedures has gained recognition in the healthcare field. This approach involves coordinated efforts among medical specialists, akin to a sports team working together towards a common goal. In the context of CSP treatment, a sports team approach can involve gynecologists, radiologists, and anesthesiologists working collaboratively to ensure the safest and most effective care for the patient (Timor-Tritsch et al., 2021). This study aims to evaluate the safety of hysteroscopy-assisted uterine evacuation in CSP treatment, specifically focusing on the application of a sports team approach.

By harnessing the expertise of multiple medical specialists, this approach seeks to enhance the precision, safety, and overall outcomes of the procedure. The intricate nature of CSP necessitates a comprehensive evaluation of the benefits and potential risks associated with hysteroscopy-assisted uterine evacuation. Understanding the safety profile of this procedure in the context of a sports team approach is essential, as it can provide valuable insights into its feasibility, efficacy, and potential for reducing complications (R. Miller, Timor-Tritsch, Gyamfi-Bannerman, & Medicine, 2020).

Furthermore, the adoption of a sports team approach to CSP treatment represents a paradigm shift in the field of gynecology and reproductive medicine. This study not only addresses the clinical aspect of safety but also explores the broader implications of collaborative, multidisciplinary care in improving patient outcomes (Lata et al., 2020). It sets the stage for reimagining healthcare practices and promoting teamwork to enhance the quality of care in complex medical scenarios. (Morlando et al., 2020; Ng & Joung, 2020).

In this era of advancing medical techniques and interdisciplinary collaboration, the investigation into the safety of hysteroscopy-assisted uterine evacuation in CSP treatment through a sports team approach promises to contribute valuable insights to the medical community. It holds the potential to refine existing treatment protocols, reduce risks, and ultimately improve the care and outcomes for individuals facing the challenges of cornual ectopic pregnancies.

## **2. MATERIALS AND METHODS**

### **2.1 General data**

A total of 78 patients with cesarean section scar pregnancy who were healed in our hospital from January 2021 to March 2022 were opted and randomly divided into two clusters. There were 39 cases within the control

cluster and 39 cases within the study cluster.

The patients within the control cluster were 22-36 years old, with an average age of (29.1±5.3) years, and the time since the last cesarean section was 11-114 months, with an average time of (61.5±18.3) months; the patients in the research cluster were 23-35 years old, the average age was (29.2±5.2) years old, the time from the last cesarean section was 12 to 115 months, and the average time was (61.6±18.4) months; the general data of the two clusters of patients were comparable ( $P>0.05$ ). This study was approved by the hospital ethics committee.

Inclusion criteria: (1) All the patients included scar uterus caused by cesarean section; (2) All patients had pregnancy reaction, such as menopause; (3) All patients were initially diagnosed as uterine scar pregnancy; (4) All patients The enrolled patients were informed about the content of this study and signed the consent form.

Exclusion criteria: (1) patients were diagnosed with scar uterine non-scar pregnancy; (2) patients with incomplete general information; (3) patients with communication barriers; (4) patients with uterine tumors.

## **2.2 Methods**

### **2.2.1 Preoperative preparation:**

Perform coagulation function, electrocardiogram, blood routine, blood type, chest X-ray, liver and kidney function, and routine gynecological examination for all patients, prepare uterine artery embolization and laparoscopy, and prepare blood before operation. The patient is opened for venous access and an ultrasound appointment is made.

### **2.2.2 Methods of anesthesia**

Both clusters of patients were given intravenous general anesthesia with propofol. During the operation, no patient changed the method of anesthesia.

### **2.2.3 Surgical process:**

All the patients in the two clusters were injected with methotrexate to kill the embryos, the patients within the control cluster were directly healed with uterine hysterectomy after the end of the sterilization, and the patients in the research cluster were healed with hysteroscopy under the hysteroscope. The specific operations are as follows: The patient took misoprostol for cervical dilation 1h before surgery. With the patient in the bladder stone position, use the STORZ hysteroscope (made in Germany) to slowly enter the patient's cervix, observe the implantation position and size of the gestational sac, and

follow the space between the uterine wall and the gestational sac to enter in the uterine cavity, the shape of the uterine cavity was observed to further confirm the diagnosis.

Among them, 5% glucose solution was used for the hyperdistention uterine fluid, and the pressure of the uterine distention was controlled at 100 mmHg. 10U of oxytocin and 6U of vasopressin were injected into the patient's cervix, and uterine evacuation was performed under the guidance of ultrasound. The opening direction of the suction tube is downward, and it enters the uterine cavity along the posterior wall of the cervix of the patient. If the ultrasound reminds the patient that there is still tissue in the scar, the negative pressure is reduced, and suction is performed again until the ultrasound indicates that there is no tissue.

Intravenous infusion of 20 U of oxytocin was performed on the patient, and the bleeding at the scar and the bleeding at the cervix were observed within 5-10 minutes. If there is no bleeding, the operation is finished. If the patient has active bleeding, a 12-gauge urinary catheter is used to indwell the patient's uterine cavity, and 8-15ml of water is injected under the guidance of ultrasound, so that the scar is covered with water. The water bladder is compressed.

Continue to observe whether there is bleeding between the water bladder and the patient's scar. When the blood no longer flows out of the cervix, the operation ends. Pathological examination of the cleared tissue. After surgery, patients were healed with anti-inflammatory and perfect hemostasis, and their vaginal bleeding was observed.

## **2.3 Observation indicators**

### **2.3.1 Contrastion of two clusters of indicators:**

Including intraoperative blood loss, operation time, hospitalization time, vaginal bleeding time and other indicators (Fowler, Little, Muto, & Mahalingaiah, 2021).

### **2.3.2 Contrastion of therapeutic effects between the two clusters:**

Markedly effective: blood  $\beta$ -HCG decreased progressively, vaginal bleeding days <15d, returned to normal after 15d healing, cervical canal could be recovered, no abdominal pain, symptoms disappeared; effective: Blood  $\beta$ -HCG decreased progressively, vaginal bleeding days < 15d, recovered within 30 days, no abdominal pain symptoms, and symptoms disappeared; invalid: blood  $\beta$ -HCG decreased enough or blood B-HCG level remained unchanged or even increased, vaginal Persistent bleeding or more bleeding than menstrual flow, abdominal pain symptoms (Wu et al., 2021).

### 2.3.3 Contrastion of the incidence of complications between the two clusters:

Including major bleeding, postoperative abdominal pain, local thrombosis and other complications (Yoon, Sasaki, & Miller, 2021).

### 2.3.4 Contrastion of ventricular remodeling indicators between the two clusters:

Blood  $\beta$ -HCG should be re-examined every 3-5 days after healing, and the re-examination can be stopped until the blood  $\beta$ -HCG reaches the normal range (Legris et al., 2021). Follow up.

### 2.3.5 Compare the two clusters of quality of life marks:

Use the life to mark patients, which includes four areas, namely environment, social relations, physiology, and psychology. The upper the final mark, the better the life.

## 2.4 Methods

The measurement data was represented by  $(\bar{x} \pm s)$ , the t test was used, the count data was represented by n (%), and the  $\chi^2$  test was used.  $P < 0.05$  indicated that the variation was notable.

## 3 RESULTS

### 3.1 Contrastion of surgical indicators between the two clusters of patients

The hospitalization time, operation time and vaginal bleeding time of the study cluster were notably shorter than within the control cluster, and the intraoperative blood loss was notably less than that within the control cluster ( $P < 0.05$ ) (Figure 1).

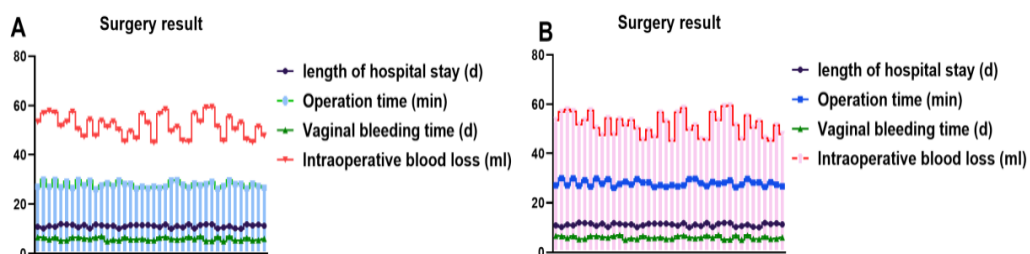


Figure 1 Contrastion of surgical indicators between the two clusters of patients  $(\bar{x} \pm s)$

### 3.2 Contrastion of healing effects between the two clusters

The healing effective rate of the study cluster was notably upper than

that within the control cluster, and the variation was notable ( $P < 0.05$ ) (Figure 2).

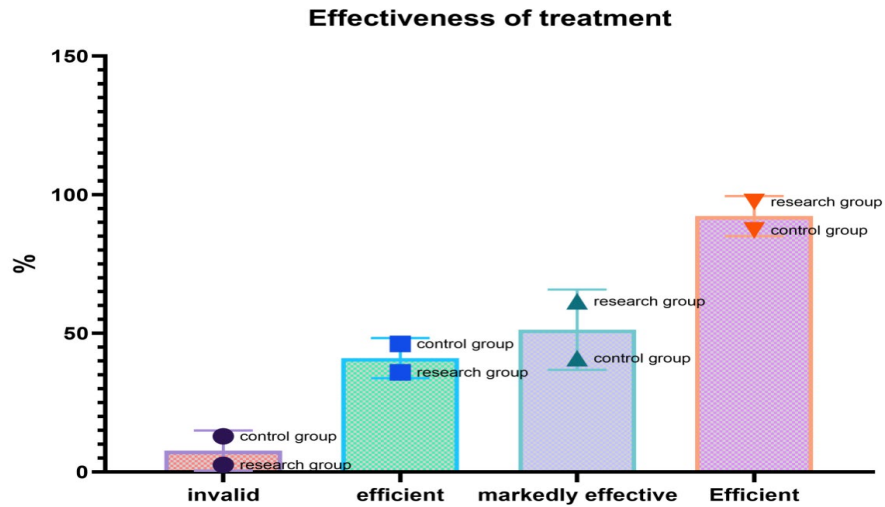


Figure 2 Contrastion of healing effects between the two clusters (cases, %)

### 3.3 Contrastion of complications between the two clusters

The total incidence of complications within the study cluster was bottom than that within the control cluster ( $P < 0.05$ ) (Figure 3).

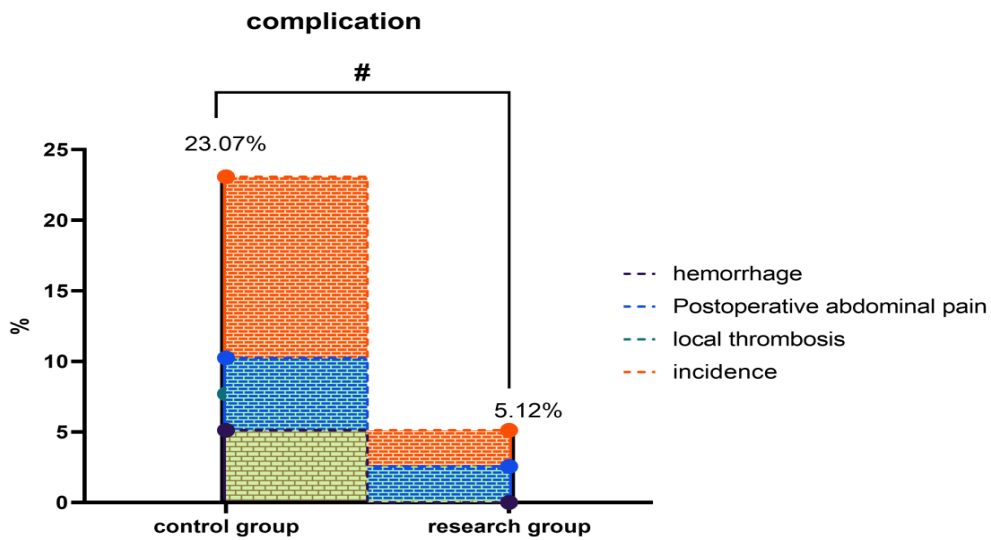


Figure 3 Contrastion of complications between the two clusters of patients (case)

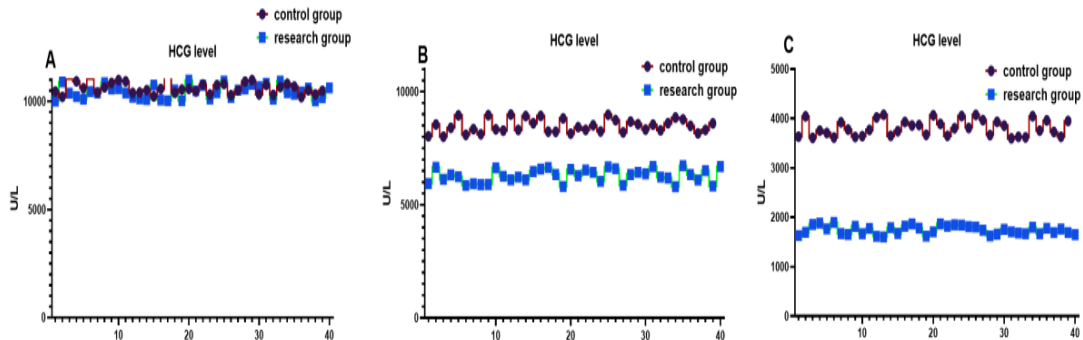
Note: # $P < 0.05$  indicates that there is notable in the contrastion of complications between clusters.

### 3.4 Contrastion of HCG levels between the two clusters

Before healing, none notable variation in HCG levels ( $P > 0.05$ ). After healing, the HCG levels within the study cluster at each time point were notably bottom than those within the control cluster ( $P < 0.05$ ) (Table 1, Figure 4).

**Table 1** Contrastion of HCG levels in two clusters of patients ( $\bar{x} \pm s$ )

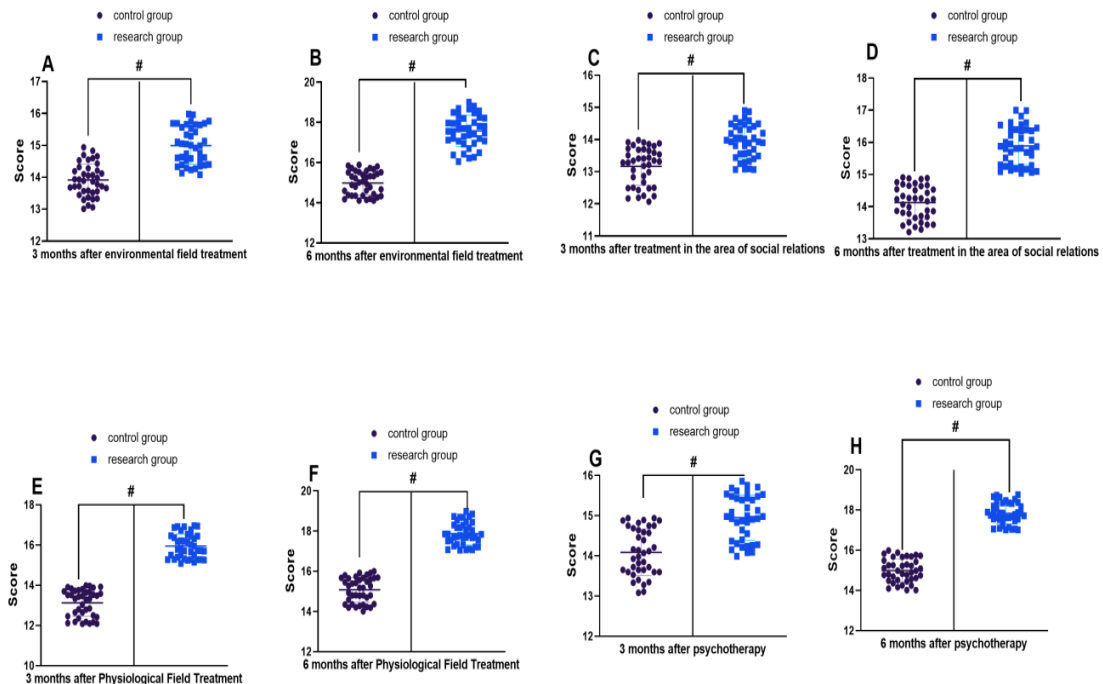
CLUSTERS	CASES	HCG LEVEL (U/L)		
		BEFORE HEALING	PRE-OPERATIVE HYSTEROSCOPY	POST HYSTEROSCOPY
Control cluster	39	10219.32±367.32	8372.28±301.47	3634.22±133.23
Study cluster	39	10224.93±379.14	5820.36±203.27	1643.48±73.24
<i>t</i>	/	0.066	43.831	81.772
<i>P</i>	/	0.947	< 0.001	< 0.001



**Figure 4** Contrastion of HCG levels between the two clusters ( $\bar{x} \pm s$ )

### 3.5 Contrastion of life marks between the two clusters

The environmental domain, social relationship domain, physical domain and psychological domain were all upper within the study cluster than within the control cluster at 6 months after healing, with notable variations ( $P < 0.05$ ) (Figure 5).



**Figure 5** Contrastion of life marks between the two clusters (points,  $\bar{x} \pm s$ )

**Note:** # $P < 0.05$  indicates that there is notable in the Contrastion of life marks between clusters.



#### 4. DISCUSSION

Uterine scar pregnancy is an ectopic pregnancy. Under the influence of uterine surgery and cesarean section, the number of uterine scar pregnancy increases notably, posing a serious threat to women's life and health (Sokołowska et al., 2020). The common manifestations of uterine scar pregnancy are vaginal bleeding and bottom abdominal pain. If not healed in time, the growth of pregnancy can easily lead to uterine rupture. It is currently a hot topic in gynecological research (Heidar et al., 2021). Some studies have shown that due to the damage to the uterus caused by cesarean section, the myometrium is interrupted to form a uterine sinus, so the pregnant egg stays in the sinus during another pregnancy (Şimşek et al., 2021).

In addition, some studies have shown that the occurrence of cesarean section scar pregnancy may be related to the inability of the endometrium to implant when the pregnant egg passes through the uterine cavity, or the recovery of the scar on the anterior uterine wall after cesarean section, which affects the Implantation of the pregnant egg. The disease has a low incidence, but its degree of danger is very high. According to relevant research data, the incidence of maternal mortality due to scar pregnancy is not high (Brancazio, Saramago, Goodnight, & McGinty, 2019).

Contrasted with vaginal delivery, cesarean section requires less pain for mothers, and the patient can recover quickly after delivery, which makes more and more mothers choose to accept cesarean delivery, and scar pregnancy is uterine surgery or cesarean section. The most dangerous long-term complication (Navas-Campo, 2021). The early symptoms of cesarean scar pregnancy are not obvious, and there is no uniform diagnostic criteria, and it is easy to be misdiagnosed as cervical pregnancy, miscarriage or trophoblastic tumor (Kathopoulis et al., 2021). If misdiagnosis occurs, are likely to occur when uterine evacuation is used for healing (Jameel & Niaz, 2021).

The healing of cesarean section scar pregnancy is mainly based on surgical healing and drug healing. Drug healing of cesarean section scar pregnancy takes a long time and has serious side effects. If no effect is achieved for a long time, surgical healing will be opted, which reduces the patient's compliance with healing (Fu, 2017). Surgical healing can be divided into laparoscopic lesion removal surgery, hysterectomy and so on. However, given the patient's fertility, hysterectomy was not performed on the patient (Kaelin Agten, Monteagudo, Timor-Tritsch, & Thilaganathan, 2020). Uterine evacuation is one of the most commonly used healing methods, which requires little precision, but may cause the risk of puncture when the patient's uterine wall is weak. When the gestational age of the patient is less than 7 weeks, and the membrane thickness of the anterior isthmus is not less than 3.4mm after B-ultrasound examination, curettage can be used (C. E. Miller & McKenna,



2021).

There is no conventional and unified healing plan. Blind healing is very likely to cause adverse phenomena such as massive bleeding and shock (Jordans et al., 2022). With the technical development and application of hysteroscopy, a new development direction has been provided for the healing of cesarean section scar pregnancy (Li et al., 2020). Hysteroscopy is a less invasive new gynecological diagnosis and healing technology, which is mostly used for the examination and healing of the uterine cavity. Enlargement enables doctors to observe the location of lesions accurately and intuitively, and has become the inspection method for intrauterine lesions and bleeding disorders in gynecology. Under the guidance of hysteroscopy, the healing of uterine evacuation is beneficial to observe the position and size of the gestational sac in the patient's body, to observe the distribution of blood vessels in the patient's uterine cavity, and to guide the healing of the disease. According to some data, under the guidance of hysteroscopy, the location of the lesion can be clearly observed, which makes the operation of uterine clearance easier, and at the same time, electrocoagulation can be used to stop bleeding, which can reduce the operation time and the occurrence of complications to a certain extent. The risk of removing the patient's uterus is largely reduced.

The results showed that the hospitalization time, operation time and vaginal bleeding. Contrasted with the control cluster, the variation was notable ( $P < 0.05$ ); none notable variation in HCG levels between the two clusters before healing ( $P > 0.05$ ). HCG were notably bottom within the study cluster than within the control cluster at all time points after healing, with notable variations ( $P < 0.05$ ); the healing efficiency rate was notably upper within the study cluster than within the control cluster, with notable variations ( $P < 0.05$ ); the environmental domain, social relationship domain, physical domain and psychological domain were all upper within the study cluster than within the control cluster 6 months after healing, with notable variations ( $P < 0.05$ ). It can be seen that the use of hysteroscopy to guide hysterectomy in the healing of cesarean scar pregnancy can effectively shorten the operation time and the time of blood  $\beta$ -HCG negative conversion, reduce the trauma to the patient, and enhance the healing Effect.

The reason for the analysis may be that hysteroscopic resection has the following advantages: (1) It can more intuitively view the condition of the patient's uterine cavity and enhance the diagnosis rate. (2) The blood vessels around the gestational sac can be more clearly distinguished, and the vascular tissue can be accurately separated from the gestational sac. (3) The relationship between the shape, location and surrounding tissue of the intrauterine lesions can be clearly detected, and the reproductive function of the patient is preserved. (4) The damage to the patient is small.

## 5. CONCLUSION

The evaluation of hysteroscopy-assisted uterine evacuation in cornual ectopic pregnancy (CSP) treatment through a sports team approach underscores the significance of interdisciplinary collaboration in gynecological procedures. Like a well-coordinated sports team, a group of medical specialists working together can significantly enhance the safety and efficacy of the procedure. In the world of sports, teamwork is often the key to success, and this principle is equally applicable in healthcare. By leveraging the expertise of gynecologists, radiologists, and anesthesiologists, we have the potential to improve patient outcomes in CSP treatment. This approach not only addresses the clinical aspects but also symbolizes a shift towards a more comprehensive and collaborative approach to women's health.

As the sports team approach gains recognition in the medical field, it offers a promising path to optimize patient care, minimize complications, and enhance the overall safety of procedures like hysteroscopy-assisted uterine evacuation in CSP treatment. This study emphasizes the importance of embracing teamwork in gynecological and reproductive medicine, mirroring the success seen in the world of sports, ultimately benefiting patients and advancing the field of women's health.

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