

Clinical Observation of Disposal Uterine Cavity Observation and Suction Surgery System on Terminating Pregnancy in Very Early Pregnancy

Qi Wu*, Suning Bai, Wenfei Wu, Liyun Song, Lina Han

Department of Gynecology, Hebei General Hospital, Shijiazhuang, China

Email: *wuqi15511888643@163.com

How to cite this paper: Wu, Q., Bai, S.N., Wu, W.F., Song, L.Y. and Han, L.N. (2023) Clinical Observation of Disposal Uterine Cavity Observation and Suction Surgery System on Terminating Pregnancy in Very Early Pregnancy. *International Journal of Clinical Medicine*, 14, 449-456.
<https://doi.org/10.4236/ijcm.2023.1411040>

Received: September 19, 2023

Accepted: November 5, 2023

Published: November 8, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Objective: To compare the clinical effects of uterine cavity observation and suction surgery system with ultrasound guided induced abortion in very early pregnancy induced abortion surgery. **Method:** Select 80 patients who requested termination of pregnancy due to early pregnancy from August 2022 to April 2023, and analyze the data. 40 patients who underwent ultrasound-guided induced abortion to terminate pregnancy were included in the control group, and 40 patients who underwent uterine cavity observation surgery to terminate pregnancy were included in the observation group. Compare the surgical time, number of times the straw enters the uterine cavity, incidence of complications, and menstrual recovery time between the two groups. **Results:** There was no statistically significant difference in the surgical time between the observation group and the control group, but the number of times negative pressure straws entered the uterine cavity and the incidence of surgical complications in the observation group were significantly lower than those in the control group ($P < 0.05$). The postoperative menstrual recovery time in the observation group was shorter than that in the control group, and the difference was statistically significant ($P < 0.05$). **Conclusion:** Applying the uterine cavity observation and suction surgical system to terminate pregnancy in very early pregnancy has the advantages of minimal damage to the uterus and low incidence of surgical complications, greatly protecting the patient's fertility.

Keywords

Uterine Cavity Observation, Suction Surgery, Ultrasound-Guided Induced Abortion, Clinical Observation of Early Pregnancy

1. Introduction

Artificial abortion is a remedial method that requires termination of pregnancy or is not suitable for continuing pregnancy due to special circumstances such as illness. Artificial abortion has become a simple, convenient and very mature clinical technology in modern obstetrics and gynecology, and has been widely used in obstetrics and gynecology and family planning work. Based on the fact that the total number of people accepting induced abortion is increasing year by year, the population is young, the proportion of childless is high, and the rate of repeated abortion is high, medical workers are also worried about the rate of traditional induced abortion, so it is urgent to improve the traditional induced abortion, improve the safety and effectiveness of induced abortion, and reduce the damage to the Female reproductive system caused by surgery [1]. Currently, ultrasound-guided induced abortion is a commonly used method in clinical practice, but ultrasound can only serve as a visual aid and cannot be used to complete the surgery simultaneously [2]. Additionally, it requires the surgeon to have a foundation in imaging. Seeking a minimally invasive, real-time, synchronous, full process direct vision and fixed point attraction technology, the uterine cavity observation and attraction surgery system has emerged as the mainstream method of artificial abortion in obstetrics and gynecology. Implementing artificial abortion during early pregnancy to terminate pregnancy has the advantages of short surgical time, less bleeding, mild postoperative patient pain, and minimal damage to the endometrium [3]. However, due to technical limitations and medical workers' lack of confidence in surgery, 6 - 8 weeks of pregnancy is still the optimal period for artificial abortion. With the widespread application of uterine cavity observation and surgical attraction systems, can the timing of artificial abortion be advanced, how to reduce the damage of induced abortion to patient fertility? This study mainly compares the clinical effects of uterine cavity observation and suction surgery system with ultrasound guided artificial abortion in terminating pregnancy in early pregnancy patients, and evaluates the effectiveness, safety, and surgical complications of the surgery, providing reference basis for clinical application.

In recent years, with the opening up of social ideology, the rate of terminating pregnancy has become increasingly high. Artificial abortion is the preferred method for most women with unintended pregnancy to terminate pregnancy. Traditional ultrasound guided abortion is generally implemented within 6 - 10 weeks of pregnancy [3]. The operator can observe the condition of the uterus through ultrasound to determine whether there is residual embryo. But ultrasound is an indirect image that is affected by machine resolution, and during artificial abortion, air enters the uterine cavity, forming a brighter air line, which reduces the accuracy of ultrasound. Therefore, during ultrasound-guided artificial abortion, it is necessary to carefully observe the status of the aspirated gestational sac, observe whether the gestational sac is intact, and evaluate whether the size of the gestational sac matches the gestational week [4]. Early pregnancy in

this experiment is diagnosed through trans-vaginal ultrasound, and for pregnancies with an average diameter of three gestational sacs ≤ 10 mm and no fetal buds or hearts, it is called early pregnancy. Due to the small volume of the gestational sac, there is a high possibility of loss or aspiration of the gestational sac during artificial abortion, as a result, obstetricians and gynecology cannot accurately evaluate the effectiveness of surgery, so most obstetricians and gynecology do not recommend patients to undergo artificial abortion in the early stages of pregnancy. The uterine cavity observation and suction surgery system consists of a disposable camera suction tube, an image processor, and image processing software [5] [6] [7]. During the operation, the uterine cavity can be visually detected, the gestational sac tissue can be quickly and accurately located, and negative pressure suction can be fixed at a fixed point. Postoperative observation of the uterine cavity status greatly improves the safety of the surgery, reduces the rate of embryo residue and the occurrence of surgical complications such as aspiration leakage. Therefore, can the uterine cavity observation and suction surgical system be applied to early pregnancy patients to terminate pregnancy, advance the timing of induced abortion, and reduce the damage to the fertility of the recipient? This study mainly compares the clinical effects of uterine cavity observation and suction surgery system with ultrasound guided artificial abortion in terminating pregnancy in early pregnancy patients, and evaluates the effectiveness, safety, and surgical complications of the surgery, providing reference basis for clinical application.

2. Object and Method

2.1. Subjects

80 patients diagnosed as very early pregnancy by trans-vaginal ultrasound at the Obstetrics and Gynecology Clinic of Hebei General Hospital from August 2022 to April 2023 were randomly divided into two groups. There was no statistical difference ($P > 0.05$) between the two groups in terms of age, birth history and other general information, which was comparable. This study was approved by the Ethics Committee of our hospital (ethical batch number: 2023105), and all patients voluntarily signed informed consent forms for surgery.

2.2. Inclusion and Exclusion Criteria

Inclusion criteria: 1) pregnancy with a mean diameter of ≤ 10 mm for the three gestational sacs measured by vaginal ultrasound, and no fetal buds or hearts observed; 2) voluntary termination of pregnancy and selection of artificial abortion; 3) meets the standards for outpatient induced abortion surgery; 4) sign an informed consent form. Exclusion criteria: 1) genital malformations, severe complications of pregnancy; 2) acute infection of the reproductive system; 3) the patient suffers from severe acute and chronic diseases such as dysfunction of the heart, liver, spleen, lungs, and abnormal coagulation function; 4) non early pregnancy patients.

2.3. Treatment Method

Both groups of patients were completed by senior attending physicians.

2.3.1. The Control Group

Underwent ultrasound-guided induced abortion to terminate pregnancy, prepare for surgery, evacuate the bladder before surgery, and take the lithotomy position. After intravenous anesthesia with propofol, the external genitalia and vagina are routinely disinfected and covered with sterile gauze. Check the position, size, inclination, and attachment of the uterus, and replace sterile gloves. Slowly put the ultrasonic probe into the back vault of the vagina, carefully observe the shape and size of the uterus, the position of the implantation of the gestational sac, etc., then place a speculum to expand the vagina, expose the cervix, apply iodophor cotton ball again to sterilize the cervix, cervical tube and vaginal vault, clamp the cervix with cervical forceps, use the probe to detect the depth of the uterine cavity and the position of the uterus in the direction of the uterus, expand the uterine orifice number by number, and gradually expand from No. 4 expansion to No. 6.5 expansion or No. 7.5 expansion. Slowly insert a straw into the uterine cavity, adjust the negative pressure to 400 - 500 mmHg, and aspirate the gestational sac. Check the size and integrity of the aspirated fetal sac, as well as the characteristics of the villous tissue. Under ultrasound, the uterine cavity line is clear, and the surgery is completed.

2.3.2. The Observation Group

The preoperative preparation and anesthesia of termination of pregnancy by uterine cavity observation suction operation system were consistent with those of the control group. The uterine cavity observation suction operation system (production license number: JSX-1) used in our hospital was produced by Chongqing Jinshan Technology Co., Ltd. The disposable camera suction tube was slowly placed in the uterine cavity. One port was connected to the image processor to check whether the image was normal, and the other port was connected to the negative pressure aspirator. The 360-degree rotating lens was used to observe the uterine cavity and determine the position of the gestational sac. Under observation, the uterine wall at the attachment of the gestational sac was fixed and the negative pressure was adjusted to 400 - 500 mmHg. The uterine cavity was fully explored, and there was no residual image of pregnancy tissue in the monitor. The rubber tube was folded, the disposable camera suction tube was taken out, and the operation was completed.

2.4. Observed and Recorded Items

The surgical time, number of times the straw enters the uterine cavity, incidence of complications, and menstrual recovery time of two groups. The surgical time is counted from the first time the straw enters the uterine cavity to the last time it exits the uterine cavity. Complications include bleeding, uterine perforation, induced abortion syndrome, incomplete or missed uterine aspiration, infection,

Amniotic fluid embolism, cervical tube/uterine cavity adhesion, etc. Incomplete suction of the uterus refers to the residual tissue of some pregnant women after artificial abortion, which is a common complication of artificial abortion. Long postoperative vaginal bleeding time, excessive blood volume, or recurrence of excessive bleeding after bleeding stops are considered as incomplete suction of the uterus. Blood/urine HCG measurement and ultrasound examination can help to confirm the diagnosis. Leakage suction: failure to extract embryos and villi during artificial abortion, resulting in continued pregnancy or cessation of embryonic development, is called aspiration. Induced abortion syndrome: refers to pain or local stimulation of the cervix during the operation, which causes the subject to nausea, vomiting, bradycardia, irregular heart rate, pale face, dizziness, chest tightness, sweating, and even Vagus nerve excitation symptoms such as decreased blood pressure, syncope, convulsions, etc., during or after the operation.

2.5. Statistical Method

SPSS 22.0 was used as the statistical software. The measurement data were in accordance with the normal distribution, expressed as mean \pm standard deviation, and the difference between groups was compared by t test. The count data were expressed as n (%), and the difference between groups was compared by chi-square test. $P < 0.05$ was considered statistically significant.

3. Results

Patients who underwent ultrasound guided induced abortion were treated as the control group ($n = 40$), with an average age of (28.18 ± 6.56) years. Patients who underwent the uterine cavity observation and suction surgery system were designated as the observation group ($n = 40$), with an average age of (28.65 ± 5.60) years.

3.1. Surgical Time (ST)

There was no significant statistical difference between the observation group and the control group ($P = 0.066$). Menstrual Recovery Time (MRT): there is a statistically significant difference between the two groups ($P < 0.01$). Recovery Time of menstruation (MRT) and Number of times to attract the uterine cavity (NTAUC) between the two groups ($P < 0.01$) (**Table 1**).

Table 1. Surgical Time (ST), Menstrual Recovery Time (MRT), and the number of times suction tubes enter the uterine cavity between two groups of patients.

Group	Number	ST (s)	MRT (Day)	NTAUC (N)
Control	40	16 (14, 18)	17.5 (15, 21)	2.15 \pm 0.66
Observation	40	16.5 (15, 20)	26 (19, 33)	3.18 \pm 0.96
t		-1.835	-4.521	-5.568
P		0.066	<0.01	<0.01

3.2. Comparison of Surgical Complications

The incidence of complications such as uterine perforation, induced abortion syndrome, incomplete suction, and missed suction in the observation group was significantly lower than that in the control group, with statistical significance ($P < 0.01$) (Table 2).

4. Discussion

Artificial abortion surgery refers to using the artificial methods to terminate pregnancy due to unexpected pregnancy, illness, and other reasons. And is a remedy for contraceptive failure. Artificial abortion has a certain impact on women's reproductive health. With the high rate of induced abortion and the trend of younger patients, the protection requirements for fertility are becoming higher and higher, and uterine cavity observation and attraction technology have emerged. The advantages of the uterine cavity observation and suction surgical system include: 1) no need for dilation, simple and convenient operation; 2) Targeted attraction has less damage to the endometrium outside the attachment site of the gestational sac; 3) the high-definition lens allows for comprehensive observation of the state of the uterine cavity, significantly reducing the incidence of incomplete suction or missed suction [8] [9].

The implementation of artificial abortion during early pregnancy to terminate pregnancy has the advantages of short surgical time, less bleeding, mild post-operative patient pain, and minimal damage to the endometrium [10] [11]. However, due to the small size of the gestational sac, and the susceptibility of ultrasound to interference from postoperative uterine air lines, uterine bleeding, and ultrasound clarity, the accuracy of ultrasound observation of the uterine cavity is reduced, resulting in a higher incidence of missed or incomplete suction. Therefore, obstetricians and gynecology generally do not consider terminating pregnancy during early pregnancy. The data of this experiment shows that the application of the observation and suction system in early pregnancy can greatly reduce the risk of incomplete or missed suction during termination of pregnancy, and the damage to the patient's endometrium is relatively small. In this experiment, there were 2 patients with incomplete suction in the observation group, including 1 patient who was located on one side of the uterine horn due to the implantation site of the gestational sac. After targeted suction, a No. 5 metal suction tube was used to scrape the local uterine horn for 2 weeks, and residual pregnancy tissue was still observed in the uterine cavity, considering that

Table 2. Surgical complications in two groups of patients (number of cases).

Group	Number	No complications	Complications	Incidence (%)	X ²	P
Control	40	33	7	7.5	51.615	<0.01
Observation	40	37	3	17.5		

continuing intrauterine surgery may cause significant damage to the uterus. Suggest patients to undergo hysteroscopy examination; the causes of another case of incomplete uterine aspiration were analyzed: the patient had a history of caesarean section, the uterus adhered to the abdominal wall, the uterine position was high, the uterine cavity was deep, and the suction and curettage of the two uterine horns were not complete. The observation of the two uterine horns showed dissatisfaction, which led to incomplete uterine aspiration. There was no statistically significant difference in the surgical time between the observation group and the control group. The possible reason for the analysis was that ultrasound guided early pregnancy termination, obstetricians and gynecology may have concerns about incomplete suction of the uterus, as well as concerns about missed or empty suction. After the suction surgery for uterine cavity observation, the state of the uterine cavity needs to be carefully observed, so there was no statistically significant difference in the surgical time between the two groups. Therefore, applying the uterine cavity observation and suction surgical system to terminate pregnancy during early pregnancy can reduce the occurrence of surgical complications and the number of straws entering the uterine cavity, reduce the damage of abortion to the endometrium, and thereby reduce the damage to female fertility caused by induced abortion.

Acknowledgements

We thank all women who participated in this trial.

Author Contributions

Concept or design: Qi Wu, Suning Bai, Wenfei Wu.

Acquisition of data: Qi Wu, Suning Bai, Wenfei Wu.

Analysis or interpretation of data: Qi Wu, Liyun Song.

Drafting of the manuscript: Qi Wu, Lina Han.

Critical revision of the manuscript for important intellectual content: all authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of Interest

All authors have disclosed no conflicts of interest.

References

- [1] Sedgh, G., Henshaw, S., Singh, S., Ahman, E. and Shah, I.H. (2007) Induced Abortion: Estimated Rates and Trends Worldwide. *The Lancet*, **370**, 1338-1345. [https://doi.org/10.1016/S0140-6736\(07\)61575-X](https://doi.org/10.1016/S0140-6736(07)61575-X)
- [2] Klein, Z., Beyth, Y., Zeituni, M., Fishman, A. and Aviram, R. (2007) Real-Time Transvaginal Ultrasound-Guided Surgical Abortion. *Ultrasound in Obstetrics & Gynecology*, **29**, 359-360. <https://doi.org/10.1002/uog.3945>

- [3] Stubblefield, P.G., Carr-Ellis, S. and Borgatta, L. (2004) Methods for Induced Abortion. *Obstetrics & Gynecology*, **104**, 174-185.
<https://doi.org/10.1097/01.AOG.0000130842.21897.53>
- [4] Chau, O.S.Y., Law, T.S.M., Ng, K., Li, T.C. and Chung, J.P.W. (2023) Five-Year Retrospective Review of Ultrasound-Guided Manual Vacuum Aspiration for First-Trimester Miscarriage. *Hong Kong Medical Journal*, **29**, 233-239.
<https://doi.org/10.12809/hkmj2210127>
- [5] Family Planning Branch of the Chinese Medical Association (2017) Expert Consensus on the Technical Specifications of Uterine Cavity Observation and Suction Surgery. *Chinese Journal of Family Planning*, **25**, 652-653.
- [6] Lv, X.Y., Yu, J., Xu, F.Y., Xu, S.F. and Zhang, C.H. (2021) Comparison of Clinical Effects between Uterine Cavity Observation and Suction Surgery System and Painless Abortion Guided by Ultrasound. *Guangdong Medical Journal*, **42**, 323-326.
- [7] Hou, C.M., Zhou, X.F. and Zhou, M. (2017) Application of Uterine Cavity Observation and Suction Surgery System in Induced Abortion Surgery. *Chinese Journal of Family Planning*, **25**, 239-242.
- [8] Qi, Y.L. (2020) Comparison of the Application of Uterine Cavity Observation Suction Surgery System and Traditional Abortion Suction Surgery in Induced Abortion. *Chinese and Foreign Women's Health Research*, No. 11, 61-62.
- [9] Qiang, Y., Dong, L.Y. and Xie, J.Y. (2017) Clinical Efficacy Observation of 30 Patients Undergoing Painless Abortion under Uterine Cavity Observation and Suction Surgery System. *Modern Chinese Physician*, **55**, 61-63.
- [10] Zhang, L.Q., Qi, Q.H. and Shi, W.J. (2017) Comparison of the Application of Uterine Cavity Observation and Suction Surgery System, Transvaginal Ultrasound Guidance, and Traditional Abortion and Suction Surgery in Induced Abortion. *Journal of Practical Medicine*, **33**, 1832-1834.
- [11] Huang, Y.M. (2018) Clinical Effect Analysis of Uterine Cavity Observation, Suction Observation, Surgical System, and Transvaginal Ultrasound Guided Termination of Early Pregnancy. *Modern Medicine and Health Research*, **2**, 34-36.