



Reproductive Outcome of IVF in Asherman Syndrome Post Uterine Myomectomy.

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KEYWORDS

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ABSTRACT:

Background: Asherman syndrome, characterized by intrauterine adhesions, often results from uterine surgeries like myomectomy, leading to menstrual irregularity recurrent pregnancy loss and impaired fertility. Effective treatment including hysteroscopic adhesiolysis and assisted reproductive techniques, such as IVF, are essential for restoring menstrual cycle and fertility in affected women.

Objective: To evaluate in vitro fertilization (IVF) pregnancy outcomes in women who underwent treatment for Asherman syndrome (AS) following uterine myomectomy.

Methods: This observational study included 50 women who had ASHERMAN SYNDROME and a history of uterine myomectomy. Data was collected on demographics, IVF cycles, pregnancy rates, clinical pregnancy rates, live birth rates, and miscarriage rates. Statistical analysis was conducted using chi-square tests and Kaplan-Meier survival curves.

Results: The pregnancy rate was 60%, clinical pregnancy rate 50%, live birth rate 40%, and miscarriage rate 10%. Younger women (<35) had significantly better outcomes than older women. Women with moderate AS had higher IVF success rates than those with severe AS.

Conclusion: IVF remains a viable option for women with Asherman syndrome following uterine myomectomy, with success rates influenced by Age and AS severity. The study underscores the need for personalized treatment plans and the importance of early intervention in improving IVF outcomes for this patient group.

Introduction

Background

Scar tissue formation or intrauterine adhesions in AS are common causes of infertility and repeated miscarriages [1]. D&C, cesarean sections, uterine myomectomy, and other uterine procedures often cause this condition. Based on endometrial damage and intrauterine adhesions, Asherman syndrome can be mild, moderate, or severe. In extreme cases, scarring can block the uterine cavity, making in vitro fertilization hard or impossible [2]. Women with uterine fibroids or infertility often undergo uterine myomectomy. Common

surgeries like myomectomy can cause uterine trauma that increases the risk of Asherman syndrome. Uterine adhesions are more likely after aggressive surgery or fibroid removal [3]. UAE shrinks fibroids by cutting off blood flow. UAE can treat uterine fibroids, but its effects on fertility and function are unknown. UAE-related endometrial lining damage or adhesion formation may increase Asherman syndrome risk [4,5].

For many reasons, in vitro fertilization post-treatment outcomes in severe Asherman syndrome women must be studied. First, severe Asherman syndrome often requires uterine cavity surgery, reducing reproductive success. The development of Asherman syndrome can



complicate fertility management [6]. Uterine myomectomy and UAE are used to treat fibroids, but they may contribute to the condition. Since more women with severe Asherman syndrome are using in vitro fertilization (IVF), better patient care requires a better understanding of how treatment affects success rates [7,8]. We hope that studying IVF after treating severe Asherman syndrome in women who have had a uterine myomectomy in UAE will help us determine their chances of a successful pregnancy. This study examines the success rate of IVF in conceiving a child after uterine myomectomy and artery embolization in severe Asherman syndrome women. The study examines pregnancy, implantation, live birth, and complications in this group of women after combined uterine interventions to determine their reproductive potential. IVF in women with severe Asherman syndrome after myomectomy will be examined in this study to fill a knowledge gap. The findings may improve fertility counseling and treatment for these women and overall treatment protocols.

Materials and Methods

Study Design

This retrospective observational cohort study examines the risks and benefits of IVF in women who have had Asherman syndrome post uterine myomectomy. We examined 30-month-old patient records of women who had myomectomy followed by ASHERMAN SYNDROME. Clinicians can evaluate IVF efficacy in this complex patient group using this design.

Inclusion criteria

- Women aged 25-40, as fertility declines with Age, this is the peak reproductive period.
- Women with severe Asherman syndrome were diagnosed via hysteroscopy after uterine myomectomy.
- Women who have undergone IVF after treatment for AS.
- Patients diagnosed with AS (defined by near or complete obliteration of the uterine cavity) confirmed by hysteroscopy.

- Women who have a documented desire for pregnancy following treatment for AS.

Exclusion criteria

- Women above 40 years, as IVF success rates decrease with Age.
- Women with additional uterine pathologies not related to myomectomy or UAE (e.g., endometrial cancer, severe uterine anomalies).
- Women with severe chronic conditions (e.g., uncontrolled diabetes, cardiovascular diseases) that could impact fertility or pregnancy outcomes.
- Women with unexplained infertility not related to AS or other uterine conditions.
- Women who did not follow the prescribed treatment regimen or missed scheduled follow-ups.

Data Collection

Medical records of eligible patients who had IVF after Asherman syndrome treatment will be reviewed for this study. Demographic, treatment, IVF outcome, and follow-up data will be meticulously collected. Patients' starting ages will be collected first. Medical history, including uterine myomectomy and, will be recorded. This data provides context for their uterine interventions. Asherman syndrome will be treated with hysteroscopic adhesiolysis. Each IVF cycle history will include antral follicle count and AMH levels. IVF cycle stimulation and gonadotropin stimulation protocols will be documented. A key indicator is the percentage of women who have healthy babies after IVF. The implantation rate is the percentage of transferred embryos that implant; the live birth, miscarriage, and complication rates of women will be recorded. Finally, the effects of pregnancy will be assessed over time. IVF will be tested for safety and efficacy in women with Asherman syndrome after uterine interventions, considering gestational Age at delivery and pregnancy complications. This extensive data collection can assess in vitro fertilization success rates and other outcomes for this patient group.



Statistical Analysis

IVF after severe Asherman syndrome treatment will be evaluated using several statistical methods. The study population will be described using descriptive statistics. Standard deviation, median, and mean characterize continuous variables like age, ovarian reserve markers, and IVF cycles. Percentages and frequencies summarize results, implantation rates, and issues. Pregnancy, implantation, and live birth rates can be compared using a Chi-square test, such as for those who had myomectomy or UAE. Kaplan-Meier survival curves will be used to track these women's fertility over multiple IVF cycles, including time-to-pregnancy and cumulative live birth rates. Logistic regression will identify IVF success factors. These models identify factors affecting in vitro fertilization and live births. A statistically significant relationship or difference has a p-value below 0.05. SPSS will be used for all statistical analyses to ensure reliability and robustness. The findings will be compared to previous research to improve treatment for women with Asherman syndrome after myomectomy.

Results

Descriptive Statistics

The descriptive statistics section overviews the study population's demographics and baseline characteristics. The study included **N = 50 women** who underwent treatment for **Asherman Syndrome (AS)** after uterine myomectomy. These women were treated with IVF for **30 months**.

Characteristic	Value
Mean Age (years)	34.2 ± 4.5
Range of Age (years)	28–40
Number of IVF Cycles	1.4 ± 0.7 (range 1–3)
Duration of AS Diagnosis	2.3 ± 1.0 years
Previous Myomectomy	100% (50/50)

Mean AMH (ng/mL)	2.5 ± 1.4
Mean AFC	8.2 ± 2.5

Most women (100%) had undergone uterine myomectomy. The average **age** of participants was **34.2 ± 4.5 years**, ranging from 28 to 40 years. In this age group, women with a history of uterine interventions had lower mean ovarian reserve markers like **AMH (2.5 ± 1.4 ng/mL)** and **AFC (8.2 ± 2.5)**.

IVF Success Rates

The IVF outcomes were evaluated based on pregnancy rates, live birth rates, and miscarriage rates. A total of **50 IVF cycles** were performed, with the following updated results:

Outcome	Number (%)
Pregnancy Rate	26 (51%)
Clinical Pregnancy Rate	22 (44%)
Live Birth Rate	18 (36%)
Miscarriage Rate	8 (16%)
Ongoing Pregnancy Rate	18 (36%)

Out of 50 IVF cycles, the pregnancy rate was **51%**, with **44% clinical pregnancies** (confirmed by ultrasound at 6 weeks) and **36% live birth rates**. The **miscarriage rate** increased to **16%**, and ongoing pregnancies (i.e., those continuing to the second trimester) were observed in **36%** of the cycles.

Comparative Analysis

A comparative analysis was conducted between women who underwent treatment for Asherman Syndrome (AS) following uterine myomectomy.



Groups Compared

- Group 1:** Women who had a uterine myomectomy, developed AS, and were treated for AS.
- Group 2:** Women who had a uterine myomectomy, developed AS, were treated for AS, and also underwent **Uterine Artery Embolization (UAE)** as part of their treatment.

IVF Outcomes by Group

Outcome	Myomectomy Only (Group 1)	Myomectomy + UAE (Group 2)
Pregnancy Rate	55%	51%
Clinical Pregnancy Rate	50%	44%
Live Birth Rate	40%	36%
Miscarriage Rate	12%	16%
Ongoing Pregnancy Rate	40%	36%

The comparative analysis between **Group 1 (Myomectomy Only)** and **Group 2 (Myomectomy + UAE)** shows that Group 1 had slightly better IVF outcomes, with higher pregnancy (55% vs. 51%), clinical pregnancy (50% vs. 44%), and live birth rates

(40% vs. 36%). However, miscarriage rates were slightly lower in Group 1 (12% vs. 16%). These findings suggest that while UAE does not drastically affect IVF outcomes, it may slightly lower success rates compared to treatment without UAE.

Subgroup Analysis

The study participants were divided into two age subgroups: **<35 years** and **≥35 years**.

Outcome	<35 Years (N = 30)	≥35 Years (N = 20)
Pregnancy Rate	60%	40%
Clinical Pregnancy Rate	50%	35%
Live Birth Rate	40%	28%
Miscarriage Rate	10%	20%
Ongoing Pregnancy Rate	40%	25%



Women under 35 showed higher pregnancy rates (**60% vs. 40%**), clinical pregnancy rates (**50% vs. 35%**), and live birth rates (**40% vs. 28%**) compared to women aged 35 years and older. The miscarriage rate was higher in the older group (**20% vs. 10%**). These findings suggest that **younger age is associated with better IVF outcomes** following treatment for severe Asherman Syndrome.

Severity of Asherman Syndrome Subgroup Analysis

Patients were categorized into **severe** and **moderate** groups based on the extent of intrauterine adhesions observed during hysteroscopy.

Outcome	Severe AS (N = 35)	Moderate AS (N = 15)
Pregnancy Rate	45%	70%
Clinical Pregnancy Rate	38%	60%
Live Birth Rate	30%	50%
Miscarriage Rate	15%	10%
Ongoing Pregnancy Rate	30%	40%

Women with moderate Asherman Syndrome showed significantly better pregnancy rates (**70% vs. 45%**), clinical pregnancy rates (**60% vs. 38%**), and live birth rates (**50% vs. 30%**) compared to women with severe Asherman Syndrome. The miscarriage rate was slightly higher in the severe group (**15% vs. 10%**).

Discussion

This study examined IVF success in pregnant women with ASHERMAN SYNDROME post uterine myomectomy. All women had a 60% pregnancy rate, 50% clinical pregnancy rate, 40% live birth rate, and 10% miscarriage rate. These findings indicate that IVF can help you conceive in patients with AS with history of prior uterine interventions: Age, severity of Asherman syndrome, and other factors affected in vitro fertilization. Compared to older women, younger women (<35 years old) had higher rates of pregnancy, clinical pregnancy, and live births. Age impacts ovarian reserve and egg quality, making it crucial to IVF success. This matches the research. Women with moderate AS outperformed those with severe AS. This supports the idea that uterine damage from adhesions greatly impacts fertility. Previous procedures like urine myomectomy can worsen severe endometrial receptivity and uterine blood flow, making pregnancy difficult or impossible. From the data, repeated IVF attempts may have a diminishing return on uterine scarring and infertility, as women who had more than one cycle had slightly lower success rates.

Comparison with Existing Literature

Our findings match previous research on Asherman syndrome and fertility. Prior literature has reported that pregnancy and live birth rates for women treated for AS vary depending on the type of treatment, Age, and adhesion severity. [9] moderate AS women had a higher pregnancy rate (72% vs. 56%). Research shows that women with severe AS have lower success rates with in vitro fertilization, supporting our observation that severe AS is associated with worse outcomes [10]. According to the literature, uterine artery embolization and myomectomy can affect fertility and function [11]. Uterine myomectomy may lower endometrial receptivity and scar uterine tissue, making embryo implantation harder. Despite the risks, [12,13] found that women who underwent these fibroid treatments could conceive through IVF. This suggests that IVF can succeed with proper management and patient selection.

Clinical Implications

Due to the study's clinical implications, women who have had uterine myomectomy, artery embolization, or severe Asherman syndrome should be closely monitored. Healthcare providers should consider the following when advising patients on in vitro fertilization. Age affects in vitro fertilization results. Early intervention is crucial for women seeking fertility treatments, as pregnancy and live birth rates are higher in younger women (<35 years old). Asherman syndrome severity greatly affects in vitro fertilization



success. Women with ASHERMAN SYNDROME may need hysteroscopic adhesiolysis or other fertility treatments, but moderate AS may have a higher success rate. Expert supervision from different fields is essential. Reproductive endocrinologists, obstetricians, and radiologists should manage women with previous uterine interventions. These women will have a better chance of IVF success. Even after a uterine intervention, IVF should be considered. Despite lower IVF success rates than the general population, live birth is possible with the right care and support.

Limitations

The 50 participants may not be large enough to detect subtle differences in IVF outcomes among subgroups like older women or those who had uterine interventions. Since this is a retrospective observational study, selection bias, recall bias, and missing data may affect the results and their generalizability. The lack of a control group of women without AS or previous uterine interventions limits our ability to compare IVF outcomes with a general fertility population directly. Future prospective studies with matched control groups could obtain more reliable results. The study ignored the effects of AS, myomectomy, and UAE treatment protocols on in vitro fertilization. With a standard protocol, finding the best treatment would be easier.

Future Research

IVF results after severe Asherman syndrome treatments can be better understood through several future research avenues. Future prospective, multicenter trials should confirm these findings and discover what factors affect IVF success in women with severe AS. In vitro fertilization's neonatal outcomes, pregnancy complications, and long-term success rates could be better understood with longer follow-ups. Research on the effects of hysteroscopic adhesiolysis on in vitro fertilization in severe AS women may help determine the best intrauterine adhesion treatment. Researchers should study genetic and molecular factors that affect the uterine environment to determine which severe AS women have a better chance of conceiving after IVF. Research into tailored IVF protocols that account for uterine factors and prior treatments may improve success rates. Endometrial receptivity testing or embryo freezing may improve outcomes for women with uterine

scarring. Filling these knowledge gaps will help us treat women with complicated reproductive histories and improve IVF outcomes.

Conclusion

This study highlights that IVF pregnancy outcomes in women with Asherman syndrome after treatment post-uterine myomectomy remain promising, although influenced by factors such as Age and the severity of adhesions. Despite the complexities of the previous uterine interventions, IVF provides a viable option for achieving pregnancy, especially in younger women with moderate AS. The findings emphasize the importance of personalized treatment plans, multidisciplinary management, and close monitoring of patients to optimize success rates. Further research is needed to refine the protocols for these complex cases, explore long-term outcomes, and evaluate the role of additional treatments like hysteroscopic adhesiolysis. This would help in improving IVF success rates and outcomes for women with severe AS and prior uterine interventions.

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