

# Intrauterine Adhesions: Causes and Treatment Outcomes among Thai Women

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**Objective:** To explore the causes and treatment outcomes of intrauterine adhesions among Thai women.

**Material and Method:** This retrospective cross-sectional study recorded and analyzed the demographic data, causes, and treatment outcomes of 75 patients who underwent hysteroscopic adhesiolysis between January 2004 and June 2015 at Maharaj Nakhon Chiang Mai Hospital, Chiang Mai, Thailand.

**Results:** The most common etiology of intrauterine adhesions was a history of early pregnancy termination by curettage (68%). Sixty-nine percent of the patients had menstrual abnormalities. Twenty-two percent of the patients had severe adhesions. Tuberculous endometritis caused the most severe case. Sharp hysteroscopic adhesiolysis improved the condition in 77.7% of the patients. The outcomes of the patients with mild to moderate IUA were better than those with severe intrauterine adhesions (88.2% vs. 43.8%, respectively) ( $p = 0.001$ ). Fifty-one patients planned to conceive, and 49% succeeded after hysteroscopic surgery.

**Conclusion:** Menstrual abnormalities were the most common presentation of intrauterine adhesions. The most common cause of intrauterine adhesions was early pregnancy termination by curettage. However, tuberculosis endometritis caused the most severe case. Hysteroscopic adhesiolysis significantly improves menstrual function and fertility outcomes; mild to moderate cases have a better prognosis.

**Keywords:** Asherman syndrome, Intrauterine adhesions, Amenorrhea, Curettage, Abortion, Hysteroscopic adhesiolysis

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Intrauterine adhesions occur as a consequence of the healing of a severe injury at the basal layer of the endometrium. Intrauterine adhesions may partially or completely obliterate the uterine cavity, resulting in conditions such as amenorrhea, menstrual abnormalities, infertility, recurrent pregnancy loss, and cyclical abdominal pain<sup>(1,2)</sup>. The most common cause of intrauterine adhesions is postpartum intra-uterine curettage after spontaneous miscarriage or induced abortion, especially in the case of medically unsupervised abortion<sup>(1-4)</sup>. Other implicated factors are postpartum curettage, cesarean section, and evacuation of hydatidiform mole<sup>(1,3,4)</sup>. Adhesions after injury of the nonpregnant uterus followed by diagnostic curettage, cervical biopsy, abdominal myomectomy, hysteroscopic surgery, or insertion of an intrauterine

device have been reported less often<sup>(1,2)</sup>. Intrauterine adhesions might have different causes in different populations, depending on health care and health policy<sup>(3,4)</sup>.

Hysteroscopy is the method of choice for diagnosing and managing Asherman Syndrome<sup>(1,2)</sup>. The treatment outcome after hysteroscopic adhesiolysis is good among patients with mild adhesions, but poor with severe adhesions<sup>(1,2)</sup>. Various methods, such as non-copper intrauterine device (IUD) or hormonal treatment, have been used to prevent the recurrence of adhesions, but there is still no consensus on the most appropriate regimen<sup>(1,2)</sup>.

The present study explored the causes and treatment outcomes among Thai patients with intrauterine adhesions. The findings will help guiding medical staff in planning better strategies for preventing intrauterine adhesion.

## Material and Method

The Ethics Committee of the Faculty of Medicine, Chiang Mai University approved the present

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study. The demographic data, causes, and treatment outcomes were collected from the medical recorded files of the patients diagnosed as intrauterine adhesions by hysteroscopy between January 1, 2004 and June 30, 2015 at the Maharaj Nakhon Chiang Mai Hospital, Chiang Mai, Thailand.

All patients underwent hysteroscopic adhesiolysis by sharp dissection using a 30-degree, 4-mm, rigid hysteroscope inserted through a 5-mm diagnostic sheath with 0.9% NaCl as the distention media.

Demographic data, including age, parity, clinical presentation, and predisposing factors, were collected. Severe adhesion was defined as adhesion that involved more than 3/4 of the uterine cavity, agglutination or thick bands<sup>(5)</sup>. Continuous data were reported as mean  $\pm$  SD or median (range), depending on the data distribution. The categorical data were reported as percentages. The difference between treatment outcomes were compared and analyzed using an independent sample t-test for continuous data and Chi-squared test for ordinal data. A non-parametric test was used for data that were not normally distributed. Statistical analysis was performed using SPSS for Windows, version 16 (Chicago, SPSS Inc). A *p*-value less than 0.05 was considered statistically significant.

## Results

Seventy-five patients were diagnosed as having intrauterine adhesions (IUA) and treated by sharp hysteroscopic adhesiolysis. The mean age of the patients was 34.4 $\pm$ 5.5 years. Sixty-four patients (85.3%) had a history of pregnancy or abortion. Sixty patients had histories of abortion (48.3% once, 28.3% twice and 23.3% more than twice). Most of the patients presented with menstrual abnormalities and infertility, as shown in Table 1. The median duration of symptoms was 14 months (3 months to 13 years).

A history of early pregnancy termination by curettage was the most common cause of intrauterine adhesions (68%), followed by fractional curettage at 5.3%. Other predisposing factors were shown in Table 2.

Of the 75 patients, 54 had a mild to moderate degree of intrauterine adhesions, 16 patients had severe adhesions, and five patients had no recorded degree of severity. The causes of the severe adhesions varied; early pregnancy termination by curettage was the leading cause (10 patients), with fractional curettage, hydratidiform mole suction and curettage, manual removal of placenta, and tuberculous endometritis. The

**Table 1.** Clinical presentation of 75 patients diagnosed with intrauterine adhesions and treated by hysteroscopic surgery

Presentation	No. of patients	Percentage
Primary amenorrhea	1	1.3
Secondary amenorrhea	33	44.0
Primary infertility <sup>a</sup>	8	10.7
Secondary infertility <sup>b</sup>	14	18.7
Menometrorrhagia	6	8.0
Oligomenorrhea	4	5.3
Recurrent pregnancy loss <sup>c</sup>	9	12.0
Total	75	100

<sup>a</sup> Two patients in this group had hypomenorrhea

<sup>b</sup> Three patients in this group had amenorrhea, two patients had hypomenorrhea

<sup>c</sup> One patient in this group had hypomenorrhea

**Table 2.** Predisposing factors of intrauterine adhesions among 75 patients diagnosed with intrauterine adhesions and treated by hysteroscopic adhesiolysis

Predisposing factors	No. of patients	Percentage
Early pregnancy termination by curettage	51	68.0
Fractional curettage	4	5.3
Manual vacuum aspiration	3	4.0
Suction and curettage	2	2.7
Hysteroscopic exam with uterine perforation	1	1.3
IUD	1	1.3
Tuberculous endometritis	1	1.3
Manual removal of placenta	3	4.0
Hysteroscopic myomectomy	3	4.0
Unexplained	6	8.0
Total	75	100

predisposing factor was not recorded in two of the severe cases.

All of the patients underwent hysteroscopic adhesiolysis; 64 patients (85.3%) once, and 11 patients (14.7%) more than once. Among the 16 women with severe adhesions, two had one adhesiolysis procedure, two had the procedure twice and four more than twice. One patient with a history of tuberculous endometritis underwent adhesiolysis six times, with some improvement in the hysteroscopic finding each time.

The adjunctive treatment after hysteroscopic adhesiolysis varied among the patients. Thirty-one patients were treated with estradiol valerate (4-8 mg per day) for one to three months and medroxy progesterone acetate (10 mg) for 7 to 10 days. Of the patients treated with a barrier method, all were treated with a Lippes loop, except one patient with severe adhesions who was treated with a pediatric Foley catheter for five days.

Patient age difference did not correlate with the predisposing factors or the degree of severity of intrauterine adhesions ( $p = 0.41$ ). The treatment outcomes for 72 of the patients were shown in Table 3 (three patients were lost to follow-up). The outcomes of patients with mild to moderate IUA were better than those with severe IUA ( $p = 0.001$ ). Of the patients with mild to moderate degrees of intrauterine adhesions, treatment outcomes did not differ significantly between hysteroscopic adhesiolysis alone and a combination of hysteroscopic adhesiolysis with hormone and/or a physical barrier (IUD, Foley catheter) ( $p = 0.56$ ).

Of the 94 hysteroscopic adhesiolysis operations, 11 patients (14.6%) had uterine perforations; of these, eight patients had severe intrauterine adhesions.

Fifty-one patients planned to conceive following hysteroscopic surgery; 25 of the 51 (49%) succeeded in becoming pregnant, of which all but one of the pregnancies resulted in live births. One pregnancy was terminated at 12 weeks gestation due to a blighted ovum. One patient underwent a

hysterectomy immediately after delivery due to placental accretion and uncontrolled bleeding. The time to conception ranged from three months to nine years. Of the 26 patients who did not become pregnant, 14 patients were menstruating and under follow-up investigation and 12 patients were awaiting another hysteroscopic surgery.

## Discussion

The prevalence of intrauterine adhesions among patients with secondary amenorrhea was around 5%<sup>(6,7)</sup>. However, the present study showed that intrauterine adhesions were also found in women who had hypomenorrhea or even regular menstruation, which confirmed that intrauterine adhesions can also be found in women with a normal menstrual cycle<sup>(1,2,8)</sup>. Some patients presented with infertility<sup>(1)</sup>. Women with intrauterine adhesions with secondary amenorrhea were lower in (44%) compared to a previous study at 64%<sup>(3)</sup>, with rates varying in other studies<sup>(1,4,9,10)</sup>. This difference is probably due to differences in the recruitment method of the studies, with our study specifying patient records with a history of hysteroscopy, rather than a complaint of abnormal menstruation.

Twenty-nine percent of patients in the present study were referred to the hospital to investigate infertility; therefore, the patients in this study were prone to have lower rates of amenorrhea and severe adhesions.

The leading cause of intrauterine adhesions in the present study was early pregnancy termination

**Table 3.** Treatment outcomes classified by degree of severity and treatment regimen

Intrauterine adhesions	Menstruation	
	Improved	No change
Mild to moderate (51)	45 (88.2%)	6 (11.8%)
Hysteroscopic adhesiolysis alone	20	2
Hysteroscopic adhesiolysis + hormone	18	2
Hysteroscopic adhesiolysis + hormone + barrier	7	2
Severe (16)	7 (43.8%)	9 (56.2%)
Hysteroscopic adhesiolysis alone	2	1
Hysteroscopic adhesiolysis + hormone	2	4
Hysteroscopic adhesiolysis + hormone + barrier	3	4
Severity not identified (5)	4 (80.0%)	1 (20.0%)
Hysteroscopic adhesiolysis alone	3	1
Hysteroscopic adhesiolysis + hormone	0	
Hysteroscopic adhesiolysis + hormone + barrier	1	
Total (72)	56 (77.8%)	16 (22.2%)

by curettage (68.0%), similar to one study (67.6%)<sup>(9)</sup>, but higher than two other studies (42-57.8%)<sup>(3,4)</sup>. The most severe degrees of adhesion in the present study was caused by tuberculous endometritis, which was similar to other studies<sup>(1,11)</sup>. However, mild genital tuberculosis had minimal effect or caused only filmy adhesions<sup>(11)</sup>.

Manual vacuum aspiration (MVA) is widely used for early pregnancy termination. This appears to help avoid endometrial injury secondary to medical evacuation<sup>(12,13)</sup>. The MVAs have been performed in Maharaj Nakhon Chiang Mai Hospital since 2007. Patients with IUA following MVA were much lower than following curettage<sup>(14)</sup>. Of the patients with IUA in this study, only three followed manual vacuum aspiration (MVA), while 51 followed early pregnancy termination by curettage. Although this study was not designed to, nor could it determine the real incidence of intrauterine adhesions after MVA or curettage, MVA may prevent the patient who needs operative pregnancy termination from suffering intrauterine adhesions<sup>(12)</sup>.

The hysteroscopic adhesiolysis outcomes in the present study were similar to other studies<sup>(2,4,15,16)</sup>, and patients with severe intrauterine adhesions had a poor treatment prognosis<sup>(2,4)</sup>. Uterine perforation was the most common complication of this procedure (2-5%)<sup>(1,2)</sup>, especially in those patients with severe adhesions<sup>(1,2)</sup>. Carefully guided hysteroscopic surgery can reduce the incidence of perforation, especially in patients who are suspected to have severe adhesions<sup>(1,2,17)</sup>. In cases of severe adhesions, this surgery requires extensive experience. Transabdominal ultrasound guidance or laparoscopy concomitant with hysteroscopic adhesiolysis would help prevent this complication<sup>(1,2)</sup>.

Intrauterine adhesions reformed at a high rate, especially in patients with severe adhesions<sup>(1,4,18)</sup>. Various methods have been used to prevent their reforming. Physical barriers, such as intrauterine devices and balloon catheters, have been used as an adjunctive treatment<sup>(1,19)</sup>. Estrogen treatment might also stimulate endometrium regeneration and promote re-epithelization after surgery<sup>(1)</sup>. However, adjunctive treatment provided no significant benefit in the cases of mild to moderate intrauterine adhesion treatment<sup>(1)</sup>. The meta-analysis of randomized controlled trials showed that auto-cross linked hyaluronan gel prevented intrauterine adhesions reforming after hysteroscopic surgery<sup>(20)</sup>.

The treatment outcomes in the present study

were considered successful based on patient records showing normal menstruation. A second hysteroscopic investigation was not performed in the patients with normal menstruation, which assumed indicated that they had been cured of intrauterine adhesions. Some studies used a further hysteroscopy to explore the uterine cavity after surgery<sup>(1,18)</sup>. However, no significant finding recommends a further hysteroscopy as routine practice.

A strength of the present study was its large sample size, particularly given that intrauterine adhesion is an uncommon disease. Although the present study was carried out retrospectively, and therefore some of the data is limited, it does point out the clinical presentation, causes and treatment outcomes, giving a clearer picture of intrauterine adhesion. More randomized controlled trials are needed to determine the benefit of adjunctive treatment after hysteroscopic adhesiolysis.

## Conclusion

In our study of Thai patients with intrauterine adhesions primarily presented with menstrual abnormalities and infertility. The most common cause of intrauterine adhesions was early pregnancy termination by curettage; however, the most severe degree of intrauterine adhesion was caused by tuberculous endometritis. Hysteroscopy was the method of choice for diagnosis and treatment, which significantly improved menstrual function and fertility outcomes. The outcomes of patients with mild to moderate IUA were better than those with severe IUA. The benefits of adjunctive treatment to prevent reformation of adhesions were still inconclusive.

## What is already known on this topic?

The most common cause of intrauterine adhesions is postpartum intra-uterine curettage after spontaneous miscarriage or induced abortion. The causes of intrauterine adhesions might differ between different populations, depending on health care and health policy. Hysteroscopy has been the method of choice in the diagnosis and management of Asherman syndrome.

## What is this study adds?

The most common cause of intrauterine adhesions in Thailand was early pregnancy termination by curettage, however the most severe degree of intrauterine adhesions was caused by tuberculous endometritis. Hysteroscopy was the method of choice

for diagnosis and treatment, which significantly improved menstrual function and fertility outcomes.

#### Potential conflicts of interest

None.

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## สาเหตุและผลการรักษาโรคพังผืดในโพรงมดลูกในหญิงไทย

ชาญฤทธิ์ พงศ์พัฒนาวุฒิ, ทวีวัน พันธศรี, โอภาส เศรษฐบุตร, อุษณีย์ แสนหมี่

วัตถุประสงค์: เพื่อศึกษาสาเหตุของโรคพังผืดในโพรงมดลูกและรายงานผลการรักษาในประเทศไทย

วัสดุและวิธีการ: รวบรวมข้อมูลจากผู้ป่วย 75 คนที่เข้ารับการผ่าตัดเลาะพังผืดในโพรงมดลูกด้วยกล้องส่องผ่านโพรงมดลูกในช่วงเดือน มกราคม พ.ศ. 2547 ถึง มิถุนายน พ.ศ. 2558 ที่โรงพยาบาลมหาสารคามเชิงใหม่ โดยบันทึกข้อมูลพื้นฐาน สาเหตุ วิธีและผลการรักษา

ผลการศึกษา: ผู้ป่วยส่วนใหญ่ที่เข้ารับการรักษามีประจำเดือนผิดปกติ (ร้อยละ 69) สาเหตุที่พบบ่อยที่สุดของพังผืดในโพรงมดลูกคือ การขูดมดลูกเพื่อยุติการตั้งครรภ์ (ร้อยละ 68) โดยมีผู้ป่วยจำนวนร้อยละ 22 ที่มีพังผืดขั้นรุนแรง และผู้ป่วยที่เคยติดเชื้อวัณโรคในโพรงมดลูกมีอาการรุนแรงที่สุด ทั้งนี้การผ่าตัดเลาะพังผืดทำให้ผู้ป่วยกลับมามีประจำเดือนได้ถึงร้อยละ 77.7 และผู้ที่มีพังผืดน้อยจะมีผลการรักษาที่ดีกว่าผู้ที่มีพังผืดชนิดรุนแรง (ร้อยละ 88.2 เทียบกับร้อยละ 43.8) ( $p = 0.001$ ) ผู้ป่วยจำนวน 51 คน มีความพร้อมที่จะมีบุตรและร้อยละ 49 สามารถตั้งครรภ์ได้หลังรับการผ่าตัด

สรุป: ประจำเดือนผิดปกติเป็นอาการนำของโรคพังผืดในโพรงมดลูกได้บ่อยที่สุด ส่วนสาเหตุของโรคนี้ที่พบบ่อยที่สุดคือ การยุติการตั้งครรภ์ด้วยการขูดมดลูก แต่สาเหตุที่ทำให้เกิดพังผืดรุนแรงที่สุดเกิดจากวัณโรคในโพรงมดลูก ทั้งนี้การผ่าตัดเลาะพังผืดด้วยกล้องส่องผ่านมดลูกให้ผลการรักษาที่ดี โดยเฉพาะอย่างยิ่งในกลุ่มที่มีความรุนแรงของโรคน้อย

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