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One of the main challenging issues in gynecologic practice is the high rate of adhesion re-formation after initial treatment in patients with Asherman's syndrome (AS). The incidence has been increasing over the last few decades, with a reported recurrence rate of up to 30% (1/3 with mild-to-moderate adhesions, and 2/3 with severe adhesions) likely due to an increase in iatrogenic endometrial trauma [1].

Hysteroscopic techniques have improved over the years and have allowed direct visualization of the uterine cavity. It has revolutionized the approach to the management of intrauterine adhesions (IUA), becoming the gold standard approach for the diagnosis, treatment, and follow-up of this challenging condition (Fig. 13.1). The aim of the therapeutic approach is to re-establish a pear-like-shaped uterine cavity and therefore its physiological function, facilitating communication between the endometrial cavity and both the cervical canal and the fallopian tubes. On the other hand, it is important to establish a well-defined postoperative management, focused on reducing the risk of adhesion re-formation.

Complete resolution of intrauterine adhesions is not always possible with a single procedure, especially in severe stages. For this reason, most treatment protocols include a follow-up hysteroscopy evaluation of the uterine cavity to assess endometrial restoration after the initial surgery. If this is not done, an increased obstetric risk could be observed. Therefore, it seems imperative to define the appropriate

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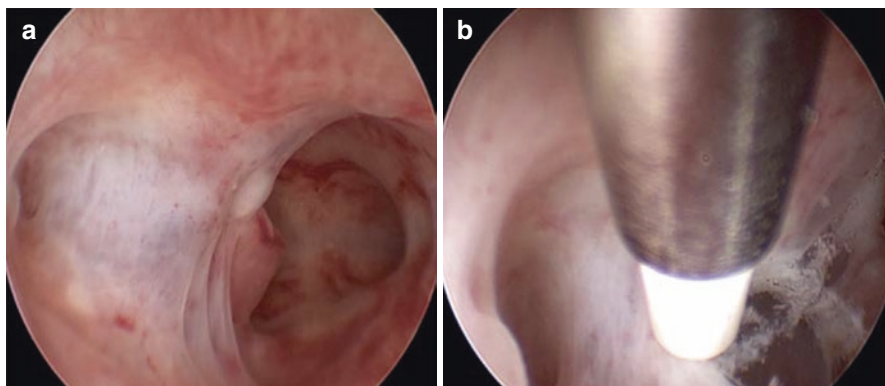


Fig. 13.1 (a, b) Adhesiolysis of moderate-to-severe intrauterine synechiae of marginal type using a 5-Fr bipolar electrode

follow-up strategy for the postoperative management of patients undergoing treatment of intrauterine adhesions.

It is important to distinguish and classify the IUA as primary when forming “ex novo,” and as secondary when recurring at sites where adhesiolysis had been previously performed [2, 3]. Secondary adhesions are frequently reported in patients with a history of gynecologic procedures both for diagnostic and therapeutic purposes, or with an intracavitary trauma precipitating scar formation in the endometrium and its basal membrane, resulting in approximation and subsequent fusion of surfaces of opposite uterine walls [4, 5].

IUAs are a relevant, often unavoidable, short- or long-term consequence of hysteroscopic surgery, and the frequency with which they develop depends mainly on the type of surgical procedure, being particularly high in case of metroplasty, myomectomy, and endometrial ablation [4, 6].

Moreover, it is difficult to assess the impact of an individual intervention on the recurrence of intrauterine adhesions, as several modalities are often used in combination, and there are no much data comparing the different available treatment options. Consequently, there is no consensus on postoperative management of patients with AS.

Good surgical practice and technique are considered the “key points” for avoiding the development of IUA after hysteroscopic adhesiolysis:

- The scarred area should be resected up to the healthy myometrium providing a clean and healthy healing plane [5, 7].
- In the presence of a hard and dense adhesive area, a circular block resection should be performed (ideally under ultrasound guidance), freeing the midcavitary adhesions.
- In the event that the access to the uterine cornual area and the identification of the fallopian tubal ostia are not possible, following the balloon dilatation of the cavity, an ultrasound guide *spirotome* insertion can be used to obtain access to the cornua.

- It is important to highlight the type of energy used during the procedure. Retrospective study conducted by Mazzon et al. [8] found a very low frequency of IUA after myomectomy when using a combination of monopolar energy and cold knife resection [8]. In a retrospective case series, Touboul et al. [9] determined the rate of uterine synechiae after bipolar hysteroscopic myomectomy among fertile patients and found that using bipolar energy to perform the resection is associated with lower IUA recurrence rate compared to monopolar energy, but randomized controlled trials to evaluate this fact are still needed [9]. Another advantage of using bipolar energy is that this system requires no cervical dilatation, does not require the use of dispersive return electrodes, nor generates stray currents, therefore minimizing complications and decreasing the possibility of adhesion re-formation (Fig. 13.2).

It should also be noted that dilatation of the cervical canal in AS can be especially difficult due to the fact that IUAs can be often associated with fibrosis at the internal or external cervical os which leads to higher risk of uterine perforation. Novel mini-resectoscope with a smaller scope diameter (5 mm), requiring minimal

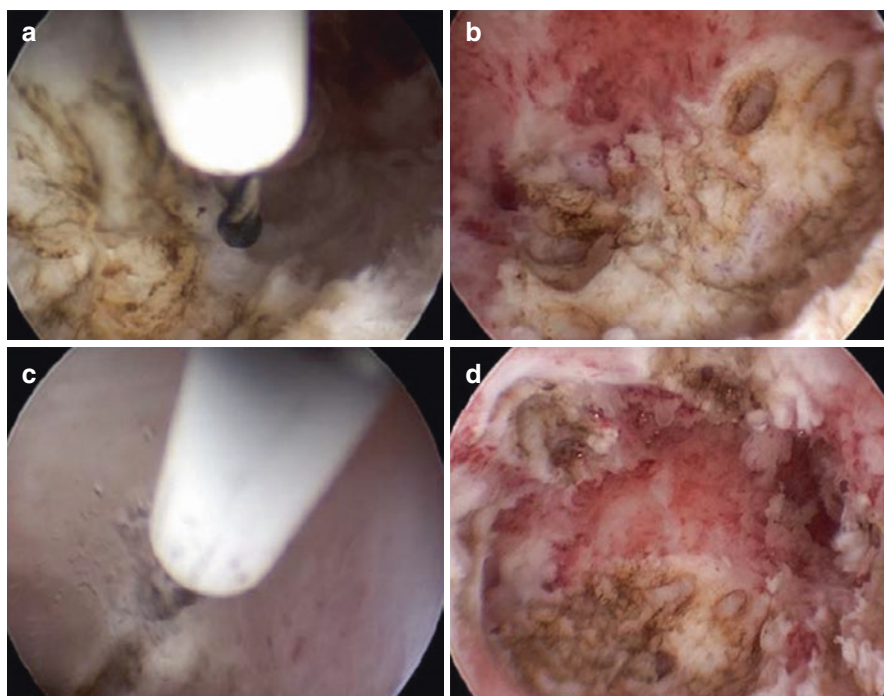


Fig. 13.2 (a–d) Treatment of Asherman’s syndrome with a 5-Fr bipolar electrode. First, the fibrous patches protruding into the cavity are removed (a, b); then multiple longitudinal incisions (about 4 mm in depth) are made on the fibrotic tissue overlying the uterine wall (c), starting from the fundus and proceeding as far as the isthmic region. Hysteroscopic intracavitary view upon completion of the procedure (d)

cervical dilatation, is the ideal device for hysteroscopic adhesiolysis, reducing the chance of cervical trauma, both for preventing adhesion re-formation and reducing operative morbidity.

Different strategies have been proposed to prevent the recurrence of adhesions after surgery but no consensus regarding the optimal method has yet been defined, due to the poor quality of evidence in the literature.

Recent literature data emphasize the role of “relook” or “early second-look” hysteroscopy (usually performed a few days after surgery) after many intracavitary procedures, being particularly recommended in cases of severe Asherman’s syndrome.

As a matter of fact, complete resolution of adhesions is not always possible with a single procedure, especially in severe stages, where a high recurrence rate is documented. Timely recognition of recurrence of adhesions is essential to provide the best outcome; therefore it may be needed to perform a second surgery [10]. For this reason, most treatment protocols include a follow-up hysteroscopic procedure to assess endometrial restoration after the initial surgery.

Currently, there is no clear consensus on how to perform the follow-up management of patients undergoing intrauterine lysis of adhesions.

13.1 Follow-Up Modalities

- Ultrasound
- Hysterosalpingography
- Second-look hysteroscopy

Ultrasound is an accurate and cost-effective tool for measuring endometrial thickness.

Hysterosalpingography has the advantage to check tubal patency also allowing to “see” thin adhesions.

Hysteroscopy remains the only method allowing direct visualization inside the uterine cavity providing an accurate estimation of adhesion recurrence and it is the most commonly used modality in clinical practice.

In a randomized study, Pabuccu et al. [11] compared two different approaches in preventing IUA re-formation after hysteroscopic adhesiolysis, to evaluate the importance of an early hysteroscopy after the initial hysteroscopic surgery for secondary prevention of postoperative IUA. Thirty-six patients (group 1) with an intrauterine device (IUD) inserted at the time of the initial hysteroscopic adhesiolysis had an early “second-look” in-office hysteroscopy 1 week later (with further adhesiolysis when needed) and a “third-look” in-office hysteroscopy 2 months later and were compared to 35 patients (group 2) who also had an IUD placed at the initial procedure, but did not undergo early second-look hysteroscopy 1 week later. Both groups underwent 2 months of the same estrogen and progestin therapy. At follow-up, the IUA formation rate was significantly lower in group 1 ($p < 0.05$) [11].

Robinson et al. [12] evaluated the role of serial office hysteroscopy performed every 1–3 weeks after hysteroscopic adhesiolysis in 24 patients. Each operative hysteroscopy was also followed by hormonal therapy (25 days of oral conjugated estrogens [2.5 mg] and 5 days of combined conjugated estrogen/medroxyprogesterone acetate [2.5/10 mg] therapy). As a result, AS improved in 92% of cases. In a recent study, Sebbag et al. [13] analyzed the prevalence of IUA development in women undergoing hysteroscopic resection of submucous myomas, polyps, and intrauterine synechiae, evaluating the efficiency of a second-look hysteroscopy to diagnose and treat postsurgical adhesions. They found that in 55.2% of cases, IUA could be treated by second-look hysteroscopy.

- *These results therefore validate the need for performing a second-look diagnostic hysteroscopy following surgical hysteroscopies.*
- *Although many studies now recommend very early second-look hysteroscopy, the right interval between the initial operative procedure and the second-look hysteroscopy has not been defined yet.*

Kodaman and Arici [14] proposed that if adhesions were to recur, they would be formed by the 5th postoperative day, after the time called “lag period” of wound healing.

According to Shokeir et al. [15], there is a different histological composition of the adhesions based on the time elapsed after the surgery. IUAs formed immediately after the surgery are mainly composed of grade I vs. grade II/III; indeed, early office hysteroscopy allows the lysis of newly formed adhesions, which are usually thin and filmy and easy to cut, whereas adhesions appearing a longer time after the initial operation are thick and fibrous needing more extensive surgery. Nevertheless, there is no solid evidence on how early the second-look hysteroscopy has to be performed [15].

Evidence extrapolated from laparoscopic surgery indicates that a repeat hysteroscopy within 48 h of the initial procedure is likely to facilitate the final removal of adhesion reformation. This procedure could be done without anesthesia, using the hysteroscope and the hysteroscopic grasping forceps, and all intrauterine material barrier placed at the initial procedure (i.e., hyaluronic acid gel) should be removed. Adhesions are recognized and easily lysed in this early stage. Reinsertion of an adhesion barrier such as hyaluronic acid is recommended and a final hysteroscopic evaluation is planned after the first or second menstrual period.

Frequently, the hysteroscopic second-look procedure performed within 1 month after the initial surgery, following the next menstrual cycle, seems to be an effective prophylaxis strategy for recurrent synechiae. It allows to evaluate the normalization of the uterine cavity, along with the option of immediate lysis of any small persistent synechiae.

It is important to provide an adequate follow-up after the initial hysteroscopic lysis of IUA. Traditionally, authors variably performed a “follow-up” hysteroscopy 2–4 months after the initial procedure. However, data is limited and mostly obtained from non-randomized studies with few patients limiting the available data to draw conclusions from.

As we stated at the beginning of this chapter, hysteroscopy is a simple, safe, and useful procedure for the evaluation of postsurgical IUA, both for treatment and follow-up of intrauterine pathology; then, hysteroscopy may also be useful for verifying the efficacy of anti-adhesive methods.

Over the years, different preventive adhesion measures have been studied. Barrier methods are widely used for the prevention of postoperative IUA based on the idea that the separation of endometrial layers after hysteroscopic surgery helps to prevent adhesion recurrence and could promote physiological endometrial regeneration [10]. More difficult-to-evaluate IUA prevention options are the use of intrauterine device (IUD) and hormonal and antibiotic therapy, because of their use in association with other IUA prevention strategies.

Regarding postoperative estrogen treatment, it has not yet been standardized in terms of dose, duration, route of administration, or combination with progesterone. Estrogen supplementation is commonly given postoperatively to stimulate endometrial growth, producing beneficial effects in patients with IUA undergoing adhesiolysis.

The use of anti-adhesive gels to prevent or reduce postoperative adhesion formation is generally a well-accepted practice. A higher number of randomized and non-randomized studies have shown that intrauterine use of anti-adhesive gels is an effective strategy to reduce the need for repeated interventions after hysteroscopic surgery due to postoperative IUA formation [5, 7, 16–20].

Different anti-adhesive gels have been used (described *in detail in Chap. 11*):

1. Auto-cross-linked hyaluronic acid (ACP) gel
2. Hyaluronate–carboxymethyl cellulose membrane (CH)
3. Polyethylene oxide-sodium carboxymethyl-cellulose (POC) gel

A reduction of development of de novo post-hysteroscopic IUA and a significant decrease in adhesion severity have been observed after application of ACP gel or CH. Moreover, promising results are also related to the use of POC gel [5].

In cases where additional prevention by permanent cavity distention is necessary, it is recommended to place a device inside the uterine cavity such as a **Word catheter**: it combines the advantages of the IUD and Foley catheter without having their disadvantages (discomfort, as well as the risk of ascending infections). The Word catheter should be left in place for a period of 1–3 months and is removed by perforation of the balloon with the hysteroscope in an office procedure (Fig. 13.3a, b).

13.2 AAGL/ESGE 2017: Guideline for Postoperative Assessment After Treatment of Intrauterine Adhesions

Follow-up assessment of the uterine cavity after treatment of IUAs is recommended, preferably with hysteroscopy: **Level B**.

To conclude, there is a paucity of high-quality data regarding IUAs. Despite advances in hysteroscopic surgery, and various methods for prevention of recurrent

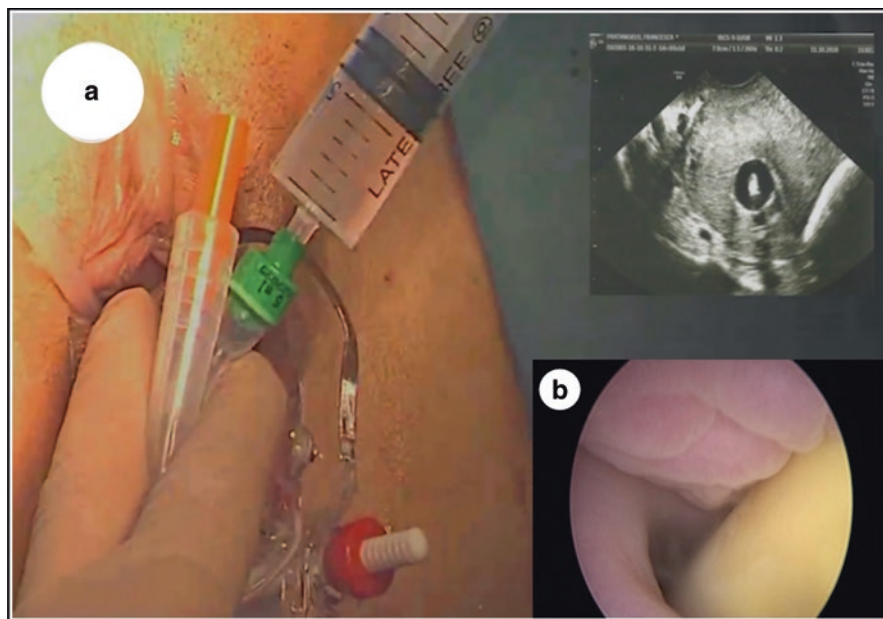


Fig. 13.3 (a, b) Insertion of a 10 French silicone balloon under ultrasound control for cavity dilatation (a). In b, hysteroscopic view of Word catheter

adhesive disease, AS recurrence rates remain high, so we must continue to investigate the ideal follow-up strategy looking for the best technique that reduces new adhesion formation. Although routine early second-look hysteroscopy could be recommended for all women undergoing extensive hysteroscopic resection, randomized prospective controlled trials are still needed to determine the optimal anti-adhesive method for routine use in all women undergoing gynecological intra-uterine procedures.

Key Points

1. One of the main challenging issues in gynecologic practice is the high rate of adhesion re-formation after initial treatment in patients with Asherman's syndrome.
2. The aim of the therapeutic approach is to re-establish a pear-like-shaped uterine cavity and therefore its physiological function, facilitating communication between the endometrial cavity and both the cervical canal and the fallopian tubes.
3. Good surgical practice and technique are considered the "key points" for avoiding the development of IUA after hysteroscopic adhesiolysis:
4. Follow-up modalities are ultrasound, hysterosalpingography, and second-look hysteroscopy.
5. Follow-up assessment of the uterine cavity after treatment of IUAs is recommended, preferably with hysteroscopy.

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