History and Epidemiology

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IUAs usually occur as a result of trauma to the basal layer of the endometrium. IUAs with symptoms of hypomenorrhea or amenorrhea, infertility, and recurrent pregnancy loss are referred to as Asherman's syndrome [1]. For cases without symptoms asymptomatic intrauterine adhesion designation should be used.

The bands of fibrous tissue that are formed in the endometrial cavity in response to uterine procedures are called intrauterine adhesions (IUAs). The original description of Asherman's syndrome was based on intrauterine adhesions produced after curettage of the gravid uterus, but there are several other possible underlying causes (intrauterine operative procedures) of intrauterine adhesions.

1.1 History

Asherman's was first described in 1894 by Heinrich Fritsch, as a case of posttraumatic intrauterine adhesion. Several authors published intrauterine adhesions as single cases: Austrian gynecologist Ernst Wertheim (1864–1920), Otto Ernst Küstner (1849–1931), Gustav von Veit (1824–1903), and Josef Halban (1870–1937).

In 1927 Bass reported 20 cases of cervical obstruction in a series of 1500 patients who had undergone induced abortions.

Stamer reviewed 37 cases reported in the literature in 1946 and added 24 cases of his own with intrauterine adhesions associated with gravid uterus.

Joseph G. Asherman (1889–1968) published his work first in 1948 to describe the frequency, etiology, symptoms, and roentgenologic picture of this condition.

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1.1.1 Synonymous Are

- Fritsch syndrome
- Intrauterine adhesions (IUAs)
- Intrauterine synechiae
- Endometrial sclerosis
- Traumatic uterine atrophy
- Fritsch-Asherman syndrome [2]

1.2 Epidemiology

It is impossible to detect or estimate the true prevalence of all IUAs, as probably most cases are without symptoms. Only cases with AS, which imply pain, bleeding disorders, or impaired fertility, need treatment.

The prevalence ranges from 1.5% to 45.5% as an incidental finding. Reasons of this wide range can be the difference among the evaluated population, intrauterine operative procedure, instrument, and diagnostic method that was used.

Increasing prevalence of IUAs could be the result of more intrauterine procedures, but it can also be increased due to more effective diagnostic methods. Ultrasound with better resolution and the more widespread use of ambulatory office-hysteroscopy can be the reasons for cases being recognized more [3].

A predisposition to intrauterine adhesions could be linked to unspecific factors like age, race, geographical area, and nutritional status. In Denmark, a total of 61 unique cases of AS were found during a 10-year period, in Holland 638 women with AS were referred to a specialist center during a 10-year period, and in Saudi Arabia, 41 women were referred with AS to a specialist center during an 8-year period [4]. Chen et al. found 357 cases of AS in a 4-year period in a large women's hospital in China [5].

Any kind of intrauterine procedures can cause adhesions in the uterine cavity as a postoperative complication. Due to the status of the uterus (gravid or nongravid) outcomes could be different.

After reviewing 1856 cases, Schenker and Margalioth [6] found pregnancy as a disposing factor in 90.8%.

In the background, low level of estrogen can play a role that is needed for the regeneration of the endometrium. After pregnancy (delivery, miscarriage, or abortion) basal layer of the endometrium could be in vulnerable state, so it is more sensitive for the mechanical lesions. The basal layer appears to be most susceptible to damage in the first 4 weeks following delivery or abortion.

The development of IUA can occur after Cesarean section, postabortion/miscarriage curettage, postpartum curettage, cesarean section, and evacuation of a hydatidiform mole.

IUA's prevalence was found to be 15% or 19% after spontaneous abortion followed by D&C.

Repeated curettage following pregnancy loss also increases the risk of developing adhesions. Odds of IUA are almost double for patients with more than one miscarriage, compared to those with one.

Intrauterine gynecological procedures can cause IUAs, as well. In Schenker's [6] study Asherman's syndrome was diagnosed in 1.6% (30 out of 1856) after diagnostic curettage, and 1.3% (24 out of 1856) following abdominal myomectomy. Taskin et al. [7] found that the frequency of Asherman's syndrome was 6.7% (1 out of 15) of patients after resection of uterine septa. There are more data in literature, where IUA formation was detected after some more infrequent interventions, e.g., after bilateral uterine artery embolization (UAE) and uterine devascularization because of severe postpartum hemorrhage or any types of endometrial ablations (thermal balloon ablation 36.4%, and other types).

According to some authors, inflammatory processes do contribute to the damaging effect of trauma and act synergistically in the formation of IUAs. In a prospective cohort study, 35% of cases with known IUAs had confirmed chronic endometritis [8].

Schenker's [6] study reported genital tuberculosis as a causing factor in 4% (74 cases).

1.2.1 Pathology

The extent of the endometrial damage may not directly correlate with the severity of the symptoms. For obstructive amenorrhea, the lesion is often focal and limited to the uterine isthmus and cervical canal. A biopsy of the fundal part of the uterine cavity often reveals normal or inactive endometrium.

Histologically, Asherman's syndrome is a condition in which the endometrium becomes fibrosed. The endometrial stroma is largely replaced by fibrous tissue, and the glands are usually represented by an inactive cubo-columnar epithelium of the endometrial type. The distinction between the functional and basal layer of the endometrium is lost; the functional layer is replaced by an epithelial monolayer, which is nonresponsive to hormone stimulation; and fibrous synechiae form across the cavity. In other cases, there may be calcification or even ossification in the stroma, and the glands may be sparse and inactive or cystically dilated. Vascularity might be abundant, containing thin-walled dilated vessels, but in most cases the tissue becomes avascular.

Adhesions may involve different layers of the endometrium, myometrium, or connective tissue. Adhesions derived from each of these tissues exhibit a characteristic hysteroscopic picture. Endometrial adhesions are quite similar in appearance compared with the surrounding endometrium. Myofibrous adhesions, which are most often encountered, are characterized by the presence of a thin layer of overlying endometrium, the surface of which is furnished with many glandular ostia. The surface of connective tissue adhesions lacks an endometrial lining and contrasts markedly with the adjacent endometrium. Fibrous adhesions that show dense connective tissue exhibit no lining in contrast to surrounding endometrium.

1.2.2 Some Minutes

- The prevalence of AS in women with impaired fertility ranges from 2.8% to 45.5% depending on the subpopulation [9] and the prevalence of AS to be 4.6% among an infertile population [10].
- It is found in 1.5% of women evaluated with a hysterosalpingogram (HSG) for infertility, between 5% and 39% of women with recurrent miscarriage.
- The incidence of IUA varies between 15% and 40% after curettage [11]. After secondary removal of placental remnants or repeat curettage after incomplete abortion a prevalence of IUA was 40% [12].
- Prevalence of IUA was 19.1% diagnosed by hysteroscopy within 1 year in women diagnosed with miscarriage treated expectantly, medically, or surgically [13].
- Incidence of IUA was 10% after one curettage evaluated by HSG and after two curettages the incidence was 30.6%, when evaluated by hysteroscopy at 10 weeks after the curettages [14, 15].
- Significantly more IUAs are found after curettage compared to hysteroscopic removal (35.9% vs. 4.2%) among women with retained products of conception (RPOC) after delivery or miscarriage [16].
- First-trimester procedures cause less severe adhesions, the majority with grades 1–2 (ESGE classification) compared to postpartum procedures, where the majority have grades 3–5 [1].
- Asherman's syndrome may occur in 31% of women after the initial hysteroscopic resection of leiomyoma, and up to 46% after the second hysteroscopic resection.

Key Points

1. Heinrich Fritsch, as a case of posttraumatic intrauterine adhesion, first described Asherman's in 1894.
2. Joseph G. Asherman (1889–1968) published his work first in 1948 to describe the frequency, etiology, symptoms, and roentgenologic picture of this condition.
3. The prevalence can range from 1.5% to 45.5% as an incidental finding.
4. Any kind of intrauterine procedures can cause adhesions in the uterine cavity as a postoperative complication.
5. The extent of the endometrial damage may not directly correlate with the severity of the symptoms.

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