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Original Article

Hysteroscopy in Pregnancy-Related Conditions: Descriptive Analysis in 273 Patients

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ABSTRACT **Study Objective:** To describe the feasibility of office hysteroscopy in patients with pregnancy-related problems such as retained trophoblastic tissue, persistent molar tissue, pregnancy with *in situ* intrauterine device (IUD), isthmocele, embryoscopy, and osseous metaplasia.

Design: Retrospective cohort chart review of use of hysteroscopy in 273 patients with pregnancy-related conditions (Canadian Task Force classification II-2).

Setting: University tertiary-care hospital.

Patients: Office hysteroscopy with the indication of pregnancy-related conditions such as retained trophoblastic tissue, pregnancy with IUD, molar pregnancy, cesarean scar defects, and fetal death were studied. The study included 273 patients: 185 with retained trophoblastic tissue, 14 with persistent molar tissue, 7 with an *in situ* IUD, 22 with symptomatic isthmocele, 41 with embryoscopy, and 4 with osseous metaplasia.

Intervention: Diagnostic and operative office hysteroscopy.

Measurements and Main Results: Variables studied included resolution of abnormal uterine bleeding in patients with persistent trophoblastic tissue, normalization of β-human chorionic gonadotropin levels in patients with persistent molar tissue, continuation of pregnancy after retrieval of lost IUDs, resolution of postmenstrual bleeding in patients with symptomatic isthmocele, rate of uncontaminated embryonic tissue after embryoscopic biopsy, and successful extraction of bony tissue in patients with osseous metaplasia. Office hysteroscopy enabled resolution of most cases of retained trophoblastic tissue (91.8%) and all 14 cases of persistent molar tissue. 7 IUDs were extracted from pregnant patients. Fifteen isthmoceles resolved with office hysteroscopy, and 7 were resected in the operating room. A normal karyotype was obtained in 37 embryoscopies (90.2%). Four osseous metaplasia cases resolved with either office hysteroscopy (75%) or resectoscopy in the operating room (25%).

Conclusion: Office hysteroscopy is a safe and minimally invasive treatment for pregnancy-related conditions, with good clinical and functional results. Journal of Minimally Invasive Gynecology (2014) 21, 417–425 © 2014 AAGL. All rights reserved.

Keywords: Embryoscopy; Intrauterine device; Isthmocele; Office hysteroscopy; Osseous metaplasia; Persistent molar tissue; Persistent trophoblastic tissue

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Improvements in surgical technology such as reduction of endoscopic caliber or development of bipolar energy have enabled the hysteroscopic surgeon to efficiently and safely treat some pregnancy-related conditions in an office-based setting. Conditions such as retained trophoblastic tissue after spontaneous miscarriage, molar pregnancy, or delivery; occurrence of pregnancy with an *in situ* IUD; diagnosis of an embryo malformation in a retained

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abortion; or presence of continuous postmenstrual bleeding after cesarean section can be safely and efficiently managed via office hysteroscopy.

Persistence of trophoblastic or placental tissue after abortion or delivery is a common issue that induces problems such as abnormal uterine bleeding (AUB), infection of the residual tissue, or secondary infertility, as well as complications from repeated dilation and curettage (D&C) such as uterine perforation or development of uterine adhesions (Asherman syndrome) [1]. The diagnosis is usually based on symptoms (presence of AUB) and transvaginal ultrasonography (TVUS) [2]. Office hysteroscopy can be useful for resolution of persistent trophoblastic or placental tissue.

In gestational trophoblastic disease, β-human chorionic gonadotropin (β-hCG) levels may sometimes remain persistently high after evacuation, and the source may not be found in the extension study. In such cases, Doppler TVUS is useful when a hypervascularized region in the uterus is found.

Removal of intrauterine devices (IUDs) in early pregnancy, when the patient wishes to continue the pregnancy and IUD threads are not visible, is clinically challenging. Pregnant women with an IUD are at high risk of adverse outcomes in pregnancy because of the high prevalence of intra-amniotic infection or development of amniotic band syndrome. Hysteroscopy can be useful in this setting.

Problems derived from deficient healing of the cesarean scar after cesarean section delivery are only recently being considered. These include AUB, secondary infertility, and dysmenorrhea, as well as a potentially higher risk of complications such as ectopic pregnancy and difficulties during gynecologic procedures such as uterine evacuation, hysterectomy, endometrial ablation, and insertion of an IUD [3–7]. This cesarean scar defect, or isthmocele, can be an incidental finding in the absence of symptoms. Although the prevalence of symptomatic or clinically relevant isthmocele is difficult to quantify, it has been reported to range from 19.4% to 88% [8,9]. In a retrospective review, 76% of women with sonographically detected isthmocele had postmenstrual spotting, 16% had mid-cycle bleeding, and 8% had both [10,11]. The proposed mechanism of AUB related to isthmocele is accumulation of blood and debris in the pouch (the deficient scar from the hysterotomy). This retained material seeps out more slowly, with the classic finding of light, persistent vaginal bleeding after menses or postmenstrual spotting. This spotting is typically a filant, adherent, dark red mucus. Some authors have reported an association between isthmocele and infertility [11,12]; the proposed mechanisms are alteration of the cervical mucus, difficulty in sperm transport, and chronic endometrial inflammation. One of the most serious problems associated with isthmocele is implantation of a gestational sac in the pseudocavity [13]. This type of ectopic pregnancy is difficult to diagnose and can be misdiagnosed as incomplete spontaneous abortion, low implanted intrauterine pregnancy, or cervical ectopic pregnancy [14].

The diagnosis of isthmocele is made by means of TVUS, with identification of a triangular hypoechoic defect in the myometrium in the site of the previous hysterotomy. Ofili-Yebovi et al [15] defined the degree of deficiency by the ratio of the myometrial thickness at the scar to the thickness of adjacent myometrium. A ratio of 50% was defined as severe deficiency [12,16]. Isthmocele can also be diagnosed at hysteroscopy with direct visualization. It appears as a dome in the anterior part of the cervical canal or lower uterine segment [6], like a pseudouterine cavity. At close exploration, the internal cervical os can be visualized posteriorly to this pseudocavity. The pouch can contain blood and is usually surrounded by a fibrotic ring [7]. Hysteroscopy has proved efficient for managing isthmocele.

One of 6 clinical pregnancies ends in spontaneous miscarriage, and 2 of 3 spontaneous miscarriages are attributed to chromosomal abnormalities [17]. The detection of aneuploidy or polyploidy provides a causal explanation for the developmental defect. Risk of recurrence in these couples is not substantially increased [18]; however, samples obtained via D&C are so severely damaged that morphologic examination is limited [19]. Transcervical embryoscopy in missed abortion is an endoscopic technique for direct visualization of the deceased embryo inside the uterus and for performance of directed biopsies. Unlike samples obtained via instrumental or spontaneous evacuation, those from transcervical embryoscopy are not damaged, which enables more precise genetic evaluation.

Osseous metaplasia is persistence or transformation of embryonic or fetal bone, resulting in calcification or ossification. Sorinola et al [20] described the first case in 1884, when the presence of bony tissue in the endometrium was attributed to spontaneous differentiation of fibroblasts to osteoblasts. In 1954, Adamson and Sommers [21] associated a causal effect of osseous metaplasia with a previous abortion. Osseous metaplasia is rare, with $<$100 cases described in the literature and an estimated incidence of 3 in 10 000. A history of previous pregnancy is reported in $>$80% of cases [22]. Clinical symptoms range from a casual finding in an otherwise asymptomatic woman to menstrual irregularities, metrorrhagia, and secondary infertility.

The objective of the article is to describe our findings in a series of 273 patients with the above referenced pregnancy-related conditions during the past 10 years.

Material and Methods

During the past 10 years, 10 325 office hysteroscopies were performed at our institution (Puerta de Hierro University Hospital, a tertiary-care hospital in Madrid, Spain). We designed a retrospective cohort chart review of hysteroscopies with the indication of pregnancy-related conditions including retained trophoblastic tissue, pregnancy with an IUD, molar pregnancy, cesarean scar defect, and fetal death. Of 273 patients (2.6%) identified, 185 had

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