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Review Article

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Finding Fibers: Intrauterine Synechia of the Lower Uterus after Cesarean Section

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Introduction

Intra-uterine adhesions, while most commonly the result of uterine curettage, may occur following any uterine surgery [1]. However, the precise incidence of adhesion formation following uterine surgery is unknown. Described is a case of uterine adhesion formation shortly following cesarean delivery diagnosed and treated successfully with hysteroscopy and resection. The precise location of the adhesion and the time of diagnosis in this case suggest that is was an iatrogenic complication of cesarean delivery.

Case Report

A 33 year old woman, G3P1011, presented with secondary infertility, desiring a cycle of *in-vitro* fertilization - embryo transfer (IVF-ET). She had initially presented two years prior with primary infertility and oligomenorrhea. At this time, hysterosalpingogram revealed a normal uterine cavity and patent fallopian tubes. After being treated with ovulation induction and intrauterine insemination for 4 cycles without achieving pregnancy, she successfully underwent IVF-ET and was delivered at 39 weeks by primary cesarean section for breech presentation. The procedure was reported to be uncomplicated and routine, including a sharp hysterotomy, atraumatic delivery, and 2-layer uterine closure with bio-absorbable suture.

One year postpartum she returned to the program for another attempt at IVF-ET. Routine pre-IVF evaluation of the uterine cavity with a sonohysterogram revealed what appeared to be an intra-uterine adhesion within the lower fundus of the uterus (Figure 1). The patient next underwent office hysteroscopy, which revealed a thick band 1-2 centimeters in length extending from the anterior to the posterior wall (Figure 2). The adhesion was sharply resected and removed, normalizing the anatomy of the uterine cavity. She subsequently underwent a successful IVF-ET cycle and is doing well in the second trimester.

Discussion

Intrauterine adhesions are a well-established gynecologic problem, known to arise acutely following uterine instrumentation that damages the endometrium, resulting in fibrosis and synechiae formation [2]. The estimated incidence of intrauterine adhesions varies by cause, from 6.7% in patients after septum resection to 45% after multiple hysteroscopic myomectomy [3]. Intrauterine adhesion formation may also be associated with cesarean section, with estimated incidence ranging from 2% in routine cases to 54% in cases associated with postpartum hemorrhage and compression suture placement [4,5].

Figure 1: Sono hysterogram of the patient identifying filling defects in the lower fundus of the uterus.

Figure 2: Office hysteroscopy identifying thick adhesions between the anterior and posterior wall of the uterus.

The proposed pathophysiologic mechanism of surgical adhesion formation involves sharp, mechanical, or thermal trauma with subsequent mast cell disruption, cytokine and growth factor expression, increased vascular permeability, and deposition of fibrin [6]. A similar mechanism is suspected for adhesion formation within the uterus. In this case, given the location and direction of the adhesion, we suggest that inadvertent suture placement through the posterior wall during hysterotomy closure may be the inciting event.

Given the known association between cesarean section and sub fertility [7], intrauterine adhesions may be the causal link. As most women do not undergo evaluation of the uterine cavity after cesarean section, it is possible that post-cesarean uterine adhesions are more prevalent than the literature suggests. While such cavitary evaluation is performed routinely before IVF-ET, it is especially critical in patients who have undergone cesarean delivery.

Several prophylactic measures to reduce surgical adhesion formation have been proposed, such as meticulous surgical technique (blood loss, overall trauma, etc.), medical treatments (hormonal, anti-

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inflammatory, antibiotic therapy), and barriers such as hyaluronic acid [8]. Perhaps most promising, preliminary data suggests that auto cross-linked hyaluron gel may reduce adhesion formation in both laparoscopic and hysteroscopic surgery [9]. Despite many efforts, no one treatment has emerged as the standard of care to prevent adhesion formation.

In conclusion, we describe the formation of an intra-uterine adhesion following cesarean section. This case illustrates the importance of appropriate surgical technique as well as proper evaluation of the uterus in patients seeking fertility care.

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Top

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