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Levonorgestrel intrauterine device as a non-invasive approach of abnormal uterine bleeding caused by cesarean scar defect

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ABSTRACT

Cesarean scar defect, niche or isthmocele represents a poor healing in the anterior uterine wall after performing a cesarean section. The cesarean scar defect can be asymptomatic, or the patient could present abnormal uterine bleeding, chronic pelvic pain, dysmenorrhea, dyspareunia, cesarean scar pregnancy or abnormal placenta. Abnormal uterine bleeding caused by cesarean scar defect presents as a postmenstrual spotting and has become more and more common among women with a history of minimum one cesarean section delivery. The most studied risk factors are: multiple cesarean section deliveries, single layer suture, locked suture, retroflexed uterus and cesarean section delivery performed during active labor with a cervical dilatation of 5 cm. There have been described several surgical approaches: hysteroscopic, laparoscopic or vaginal. From our experience, we have treated successfully symptomatic patients with cesarean scar defect with the levonorgestrel-releasing intrauterine system. Although the therapeutic indications do not include this specific use, we have obtained significant improvement of abnormal uterine bleeding due to cesarean scar defect in our patients. Our results sustain the necessity of extensive interventional studies.

Keywords: cesarean scar defect, isthmocele, levonorgestrel, postmenstrual spotting, niche, abnormal uterine bleeding

INTRODUCTION

The number of newborns delivered by cesarean section (CS) has risen in the last years, currently being performed approximately 1.5 million CS every year around the world (1). Thus, the morbidity caused by the poor healing of the cesarean scar affects more and more women and presents in a wide range of symptoms: from asymptomatic to chronic pelvic pain, dyspareunia, dysmenorrhea, postmenstrual spotting, postmenstrual bleeding or even infertility (2-4). Regarding the obstetric complications, there have been documented cesarean scar ectopic pregnancy, abnormal placenta (accrete and praevia) and scar dehiscence (5,6). The cesarean scar defect is described as a dome located in the anterior uterine wall after a cesarean section, which occurs as a result of an impaired healing of the uterine scar after CS (Fig. 1). The cesarean scar defect is also known as isthmocele, pouch, sacculation, uterine scar defect, cesarean scar dehiscence or uterine diverticulum niche (7-10). The isthmocele presents an incidence between 24-84% in women with previous cesarean section; 30% of women presenting a cesar-

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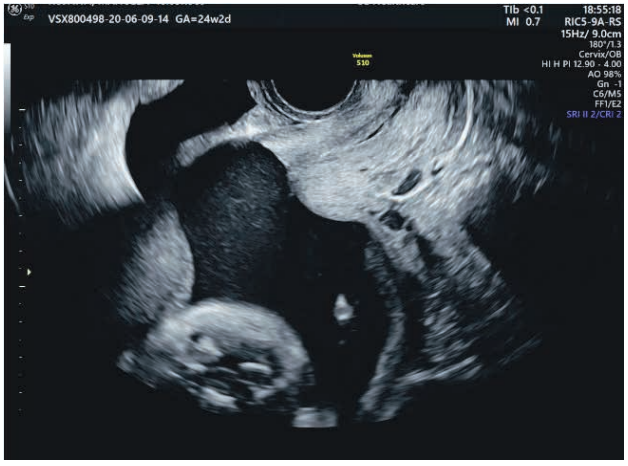

FIGURE 1. Cesarean scar defect during pregnancy: amniotic diverticulum protruding into the uterine wall

ean scar defect suffer from abnormal uterine bleeding 6 months succeeding the cesarean section (11,12).

The diagnosis of a cesarean scar defect is frequently realized using transvaginal sonography or sonohysterography in nonpregnant patients and is described as 1 mm depth wedge-shaped anechogenic area with a minimum 2 mm indentation of the myometrium in the uterine isthmus located at the cesarean section scar site. Transvaginal ultrasonography is very valuable in determine the depth and size measurement of the dehiscent scar (Fig. 2) as well as the residual myometrium thickness (13-15). Other useful tools in diagnosing the uterine niche are represented by magnetic resonance imaging, hysterosalpingography and hysteroscopy (16,17). Concerning the classification of the cesarean scar defect size, it has been characterized by the radio of the myometrial thickness at the scar (residual myometrium thickness) to the adjacent myometrium on transvaginal ultrasonography; the radio ≤50% has been used to describe severe deficiency (14). Another study has described a large defect if the residual myometrium thickness is 2.2 mm (18). Dehiscence has been described by Regnard et al. (19) on saline infusion sonohysterography as at least 80% of myometrial thinning.

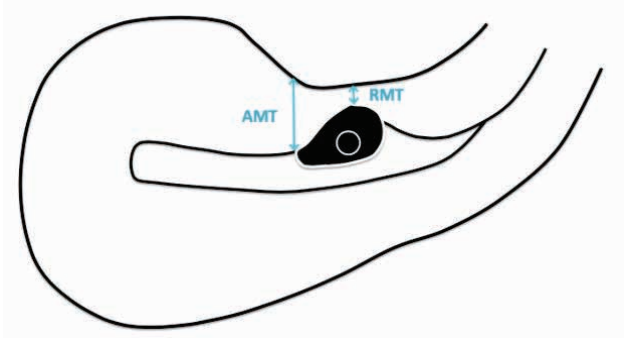

FIGURE 2. Evaluation of residual and adjacent myometrium thickness (AMT = adjacent myometrium thickness; RMT = residual myometrium thickness)

In regard to risk factors for cesarean scar defect, many studies have concluded that multiple cesarean deliveries represent the essential risk factor for the uterine scar defect development (14,20). In addition, cesarean section performed during active labor with over 5 cm cervical dilatation has been correlated with a larger niche, that could be caused by the thin myometrium and defective healing capacity (11,21). Single layer myometrial closure compared to double layer has a tendency to increase the prevalence of isthmocele, but it was not associated to a larger defect (21). Roberge et al. (22) compared three techniques of uterine closure after a cesarean section: locked single layer, double layer with unlocked first layer and double layer with locked first layer; the conclusion was that double layer with unlocked first layer technique was correlated with enhanced uterine scar healing and firmer residual myometrium thickness. Locked sutures are linked to thinner myometrium and extended scar defects compared to unlocked sutures possibly due to elevated tissue hypoxia damaging the healing mechanism. Certain studies (14,20,21) have associated the retroflexed uterus with a defective uterine scar that can be explained by the mechanical tension intruding the uterine scar that diminishes blood perfusion and interferes with tissues regeneration.

ABNORMAL UTERINE BLEEDING

The correspondence between abnormal uterine bleeding and a patient's history of cesarean section has been reported and well investigated; an isthmocele is the most likely cause of typically postmenstrual spotting (10,23). Postmenstrual spotting presents as a persistent light vaginal bleeding after the menses has finished and has duration from 2 to 12 days (3). Fabres et al. (16) have conducted a retrospective study regarding sonohysterographic diagnosis of cesarean scar defect: 76% of women presented postmenstrual bleeding, 16% presented mid-cycle abnormal uterine bleeding, and 8% presented both. Uppal et al. (23) have concluded that the larger the uterine scar defect was, it was more likely for women to present prolonged menses or postmenstrual bleeding. The suggested mechanism of the abnormal uterine bleeding associated with cesarean scar defects is the delayed menstrual bleeding due to accumulation of blood in the lower uterine segment, in the isthmocele, which acts as a pouch (10,16,23). Due to defective drainage of normal menstrual blood, decreased contractility and in situ production, it has been implied the fact that blood accumulates in this pouch and slowly drains in the next days after the menses (3,16).

On the other hand, in some patients with asymptomatic cesarean scar defect, the accumulation of

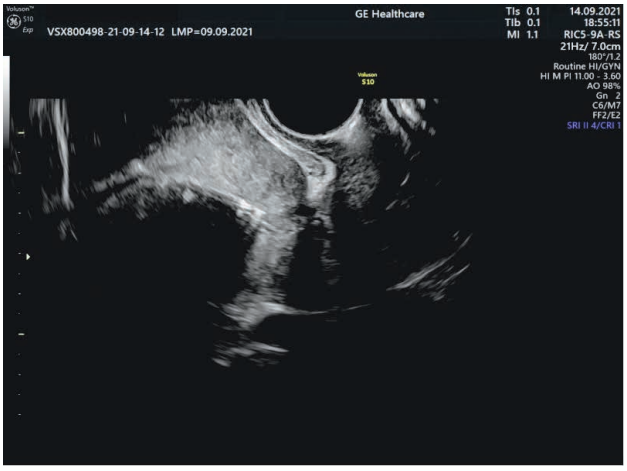

FIGURE 3. Levonorgestrel-releasing intrauterine system insert in uterine cavity with niche

blood within the isthmocele may not cause abnormal uterine bleeding, but the presence of isthmoceles may support other determinants of abnormal uterine bleeding like chronic inflammation (16,23).

CURRENT APPROACHES

The management of abnormal uterine bleeding due to cesarean scar defect varies between hormonal treatment and hysterectomy. Some studies reported deficiency in the results of hormonal therapy regarding abnormal uterine bleeding caused by the niche and the patients required surgical therapy (3,24,25). Hysteroscopic repair is the most used approach for the cesarean scar defect revision and the results are promising, improving abnormal uterine bleeding and fertility (24,26,27). The hysteroscopic treatment consists in the scar resection surrounding the defect (27). The hysteroscopic approach imports the risk of uterine perforation with consecutive bladder injury; thus, it has been recommended to perform a hysteroscopic resection if the overlying myometrium is thicker than 2 mm (24). Another surgical approach is by using laparoscopy, either conventional or robotic-assisted, which consists in fibrotic tissue resection, followed by the laparoscopically closing of the defect with the help of a Hegar dilator placed in the cervix to assure continuity maintenance between the uterine cavity and cervical canal (28). Finally, the cesarean scar defect may be repaired using a transvaginal approach. The technique requires the dissecting of the bladder off the cervix and the uterus in order to open the vesicovaginal space until the cesarean scar defect could be recognized. Further, the scar tissue is excised and the defect is closed using interrupted sutures (29).

Abnormal uterine bleeding is becoming more and more frequent in the current practice, as the number of cesarean sections increases worldwide. There are various methods of surgical treatment of the cesarean scar defect, which present benefits, along with the risks of any invasive procedure, for example the risk of uterine perforation that comes along with the hysteroscopic repair.

We propose the medical treatment of the cesarean scar defect symptomatology, the use of levonorgestrel-releasing intrauterine system, as we have had very good results in managing the abnormal uterine bleeding due to cesarean scar defect (Fig. 3).

CONCLUSIONS

After excluding other causes of abnormal uterine bleeding, our patients have presented a significant decrease and even disappearance of postmenstrual bleeding as well as intermenstrual bleeding caused by the uterine niche, starting with the second month after correctly placing the levonorgestrel intrauterine device. Although in the device's therapeutic indications the producer does not specify this intent to treat use, our patients have had only benefits after this hormonal therapy. The primary benefit for the patient is the avoidance of an invasive surgery such as laparoscopic or vaginal isthmoplasty or invasive procedure including hysteroscopic repair of the defect.

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