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Conceptual Paper

Uterine Isthmocele: Diagnosis and Management

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Definition

It is an anechoic area, generally triangular in shape, with the vertex directed towards the bladder and of different sizes, located at the level of the anterior wall of the isthmus or the uterine cervix and just in the area of the scar from a previous caesarean section [1,2] (Figure 1). Some authors consider that the depth of the defect must be at least 1 mm and indentation of the myometrium of at least 2 mm [24], but there are no clear criteria for diagnosing it.

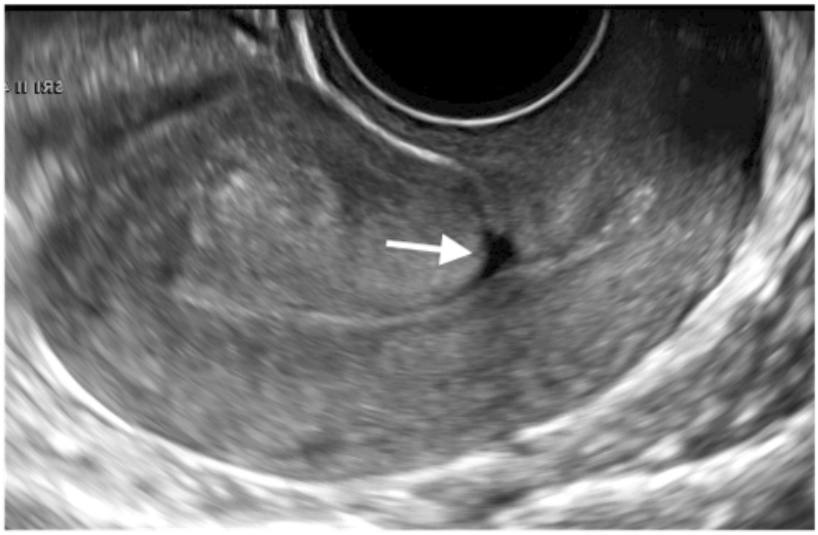

Figure 1

The term Isthmocele was introduced by Gubbini [3] in 2008 due to its location at the level of the uterine isthmus, however Morris [4] in 1995 was the first to describe it as a cesarean section scar defect, after studying 51 uteri of patients who went to hysterectomy with a history of one or more previous caesarean sections (Figure 2).

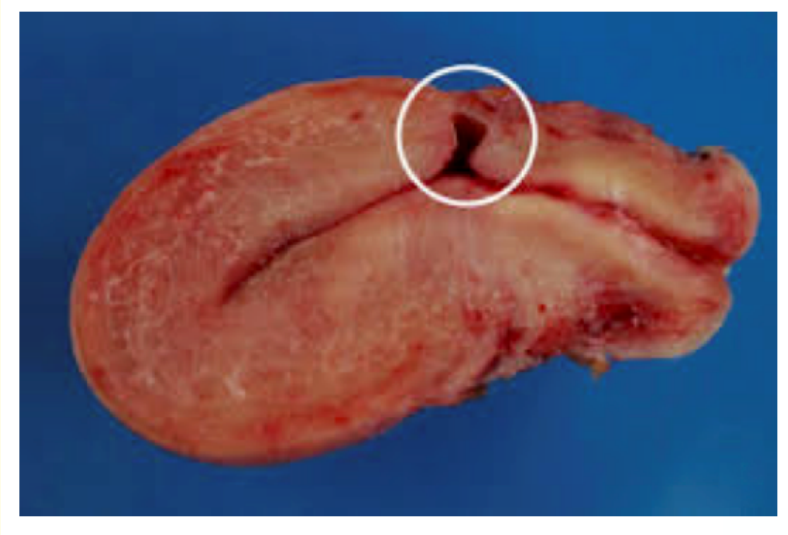

Figure 2

Synonymy

It is also known as:

- Cesarean Scar Defect
- Niche
- Uterine diverticulum
- Cesarean delivery scar pouch.

Epidemiology

The prevalence of isthmocele varies according to three factors:

1. The detection method
2. The criteria used to define isthmocele
3. The study population.

In previous asymptomatic cesarean sections, the prevalence varies from 6.9% [5] to 69% [6]. This marked difference is explained because it depends a lot on the method used for the diagnosis, that is, if it is only based on two-dimensional (2D) transvaginal ultrasound or if a sonohysterography is also performed, even in the latter, the prevalence varies according to the contrast method used, for example saline solution vs gel. Others claim that sonohysterography would raise isthmocele detection rate by up to 84% [7].

There are also reports of the use of hysterosalpingography for this purpose [8].

In previous cesarean deliveries with Abnormal Uterine Haemorrhage, the prevalence of isthmocele varies between 19% [9] and 100% [10] depending on whether transvaginal ultrasound or sonohysterography is used.

Hysteroscopy is also used in this group of patients for the diagnosis of isthmocele with a detection rate ranging from 41 - 88% [2,24].

Diagnosis

The diagnosis of isthmocele can be done by clinical suspicion, in a patient with Abnormal Uterine Haemorrhage, pelvic pain or secondary infertility [11] or in asymptomatic patients after a routine transvaginal ultrasound.

It is carried out by 5 methods fundamentally:

1. 2D Transvaginal Ultrasound
2. 3D Transvaginal Ultrasound [12]
3. Sonohysterography
4. Hysteroscopy
5. Magnetic Resonance.

Sonohysterography with saline contrast is the method of choice due to its low cost and diagnostic performance [6]. It is based on the finding of an anechoic area that can have different shapes: triangular, semi-circular, rectangular, circular, drop-shaped, or inclusion cysts (Figure 3).

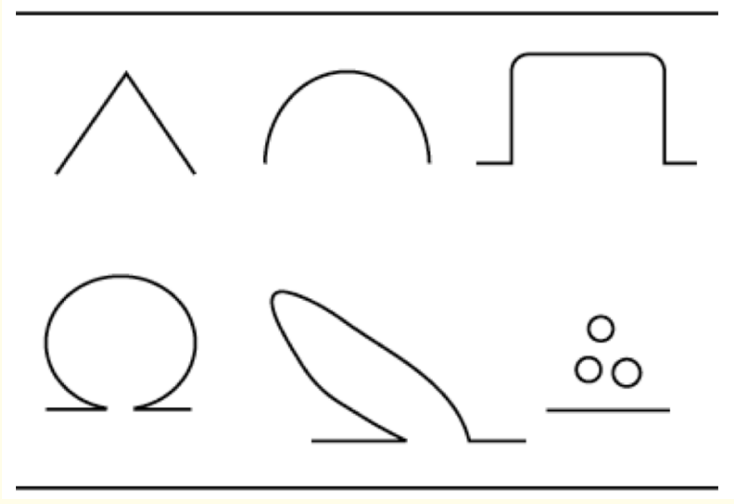

Figure 3

The best time to do an ultrasound exam, to optimize the diagnosis of isthmocele, is post-menstrual or early follicular phase, because the blood that accumulates in the niche facilitates its visualization [1,7].

Classification

Different authors have proposed different classifications of isthmocele based on different criteria, such as: size and area.

According to the size, isthmocele can be [12]:

- Small: Residual myometrium > 2.2 mm by TV-US
- Large: Residual myometrium < 2.2 mm by TV-US
- Total: Absence of residual myometrium.

According to area [1]:

- GRADE I: Area < 15 mm^2
- GRADE II: Area between 15 and 24 mm^2
- GRADE III: Area > 25 mm^2

However, other authors such as Ofili [9], consider the percentage of myometrium involved in the defect, resulting in:

- Small: Less than or equal to 50% of the endometrial thickness.
- Large: More than 50% of the endometrial thickness.
- Total: 100% of the endometrial thickness.

Risk factors

Bij de Vate [7] published a systematic review in which he classified the risk factors studied by different authors into 4 main categories:

1. Related to the closure technique: controversial results between single-plane suture vs. two planes suture.
2. Related to the development of the uterine segment or the location of the incision: controversial results between advanced dilation (> 5 cm) vs. less dilation.
3. Related to the healing process: There are studies that link uterine retroflexion, as well as the number of caesarean sections with a higher frequency of isthmocele.
4. Miscellaneous: controversial results between maternal age and also the existence of multiple pregnancies, however, the presence of maternal anaemia is not related to isthmocele.

Management

The management of isthmocele is also variable and depends on the patient's symptoms and fertility desires.

In general, there are two treatment groups- Medical and Surgical:

1. **Medical treatment:** Reserved only for patients who do not want the surgical alternative and have vaginal bleeding problems. It is based on the administration of combined oral contraceptives for 3 to 6 months, with which it is possible to stop bleeding in more than 90% of cases [13]. However, there are doubts about its long-term efficacy due to the recurrence of symptoms after stopping treatment [14].
2. **Surgical treatment:** Indicated in symptomatic patients [15]. Different surgical techniques have been reported, from the most radical (hysterectomy) to the least invasive (hysteroscopic resection) (Table 1).

There is a systematic review on therapeutics for isthmocele published in 2014 [15] which concluded that the most used therapy is hysteroscopic resection; that the success rates in relation to the disappearance of abnormal uterine bleeding are high (between 87 and 100%) and the complication rate is low, although it does not offer evidence that favours a particular form of therapy. However, the methodological quality of the studies is poor, so more evidence of better quality is necessary to implement or recommend a surgical technique in daily practice.

Technique	Author
Hysteroscopic Resection (Isthmoplasty)	Fernandez (1996) [16] Fabres (2005) [2] Gubbini (2008) [3] Wang (2011) [7]
Laparoscopic Repair	Donnez (2008) [18]
Transvaginal Repair (assisted by laparoscopy)	Luo (2012) [19]
Endometrial Ablation	Lin (2010) [20]
Hysterectomy	Erickson (1999) [21]

Table 1: *Different surgical techniques for Isthmocele.*

Dr. Sasaki [11] does not recommend hysteroscopic resection for patients who want future pregnancies because with this technique there is no reapproximation of the edges of the defect, so the possibility of caesarean scar pregnancy or even uterine dehiscence is greater. Hysteroscopic resection can be performed with cutting loop

Prognosis

There is a lack of information about the fertility prognosis in patients with isthmocele, as well as the probability of obstetric complications such as uterine rupture or caesarean scar pregnancy.

For this reason, some authors recommend that patients with isthmocele should be scheduled for elective caesarean section before labour [22].

After surgical correction, cases of abnormal uterine bleeding are resolved, as well as fertility is restored, achieving pregnancy in most cases [23], but the risk of uterine rupture remains high.

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Disclosures

None declared.

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