

Isthmocele: A Caesarean Scar Defect

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ABSTRACT

Due to increasing rate of caesarean scar defect worldwide, incidence of Isthmocele is increasing day by day. It is a caesarean scar defect or uterine niche, can be defined as an indentation representing myometrial discontinuity. The method of diagnostic procedures for Isthmocele, states it's prevalence. Mainly incomplete closure of the uterine wall and low location of the scar during caesarean section are the risk factors. AUB, postmenstrual spotting, dysmenorrhoea are its main features. Abnormal placental localisation, uterine rupture, rarely ectopic pregnancy are the obstetrical complications of Isthmocele. TVUS, SHG, Hysteroscopy are the main diagnostic procedures for identification of Isthmocele. Hysteroscopic resection of the Isthmocele and Laparoscopic repair can be done for its management.

Keywords- Isthmocele, caesarean scar, indentation, niche, AUB, TVUS, SHG, Hysteroscopy, Laparoscopy

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I. Introduction

Caesarean section deliveries are increasing day by day due to different pregnancy complications for which, Isthmocele is becoming a growing concern worldwide. According to WHO, 10 to 15% of the total deliveries are undergoing caesarean section deliveries.¹ According to epidemiological data based on transvaginal ultrasound (TVUS) or Sonohysterography (SHG) examination, the Caesarean scar defects are very frequent - between 24% and 84% of women will develop it. Caesarean scar defect is described in literature as Isthmocele or niche but also as diverticulum, pouch or hernia.²

DEFINITION

An isthmocele, a caesarean scar defect or uterine niche, can be defined as an indentation representing myometrial discontinuity or a triangular anechoic defect in the anterior uterine wall, with the base communicating to the uterine cavity, at the site of a previous caesarean section scar. It can be classified as a small or large defect, depending on the wall thickness of the myometrial deficiency.²

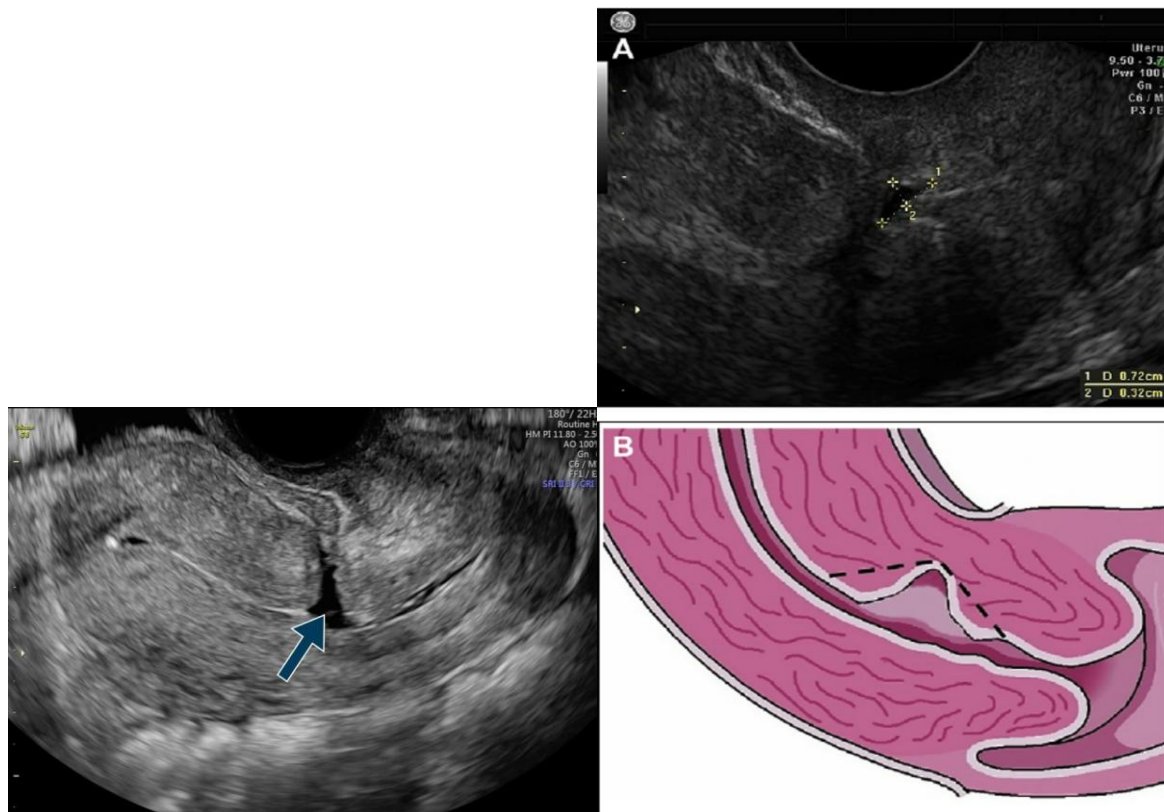


Fig: Isthmocele representation

PREVALENCE

The exact prevalence of isthmocele is unknown. It is related to the method used to assess the defect.³ In a recent systematic review, Tulandi and Cohen have found that the prevalence of isthmocele ranges from 24% to 70% in TVUS examination and from 56% to 84% in SHG in women with 1 or more previous CS. When compared with asymptomatic patients, the prevalence is higher in those with symptoms, ranging according to the literature, from 19.4% to 84%, with postmenstrual spotting as the main symptom.⁴

RISK FACTORS FOR DEVELOPING NICHES -Various factors may contribute to develop niches, they are-

- Low location of the uterine incision during CS
- Incomplete closure of the uterine wall (due to single-layer, use of locking sutures)
- Surgical activities that may induce adhesion formation (nonclosure of peritoneum, inadequate haemostasis, applied sutures, use of adhesion barriers)
- Impaired wound healing Retroflexed uterus⁵

SYMPTOMS- The symptoms of Isthmocele are-

- abnormal uterine bleeding,
- postmenstrual spotting,
- dysmenorrhea, pelvic pain
- infertility have now been associated with isthmocele⁶.

OBSTETRICAL COMPLICATIONS-Obstetric complications of isthmocele are-

- placenta accrete,
- placenta praevia,
- scar dehiscence,
- uterine rupture, and
- ectopic pregnancy in caesarean scar(rarest complication)²

DIAGNOSTIC PROCEDURES TO IDENTIFY ISTHMOCELE-

There are no definitive criteria for the diagnostic of isthmocele. Various imaging methods including ultrasonography, Sonohysterography, hystero-graphy, hysteroscopy, and magnetic resonance imaging can be used to assess the anterior uterine wall and diagnose isthmocele.

Transvaginal ultrasound (TVUS) is the initial and most usual method described to assess the integrity of the uterus wall in non-pregnant patients.⁷

The saline infusion Sonohysterography (SIS) is more sensitive and specific for the identification of isthmocele by filling the defect and providing contrast.⁸

Hysterothography (HSG) can also assess the isthmocele; however, it cannot measure the myometrial thickness, which is a limitation of this method.⁹

Using magnetic resonance imaging (MRI) allows determining the thickness of the isthmocele.

Hysteroscopy enables direct visualization and confirmation of the isthmocele. Usually described as a pouch or a discontinuity of the anterior uterine wall, hysteroscopy allows for visualization and potential treatment; however, it may not assess thickness.¹⁰

TVUS and SHG can both be performed, are more affordable than MRI, less invasive than hysteroscopy and produce reliable measurements.

TREATMENT

The treatment of isthmocele ranges from clinical management with expectant or pharmacological treatment, surgical treatment, and hysterectomy to sparing techniques including hysteroscopic, laparoscopic, laparotomic, or transvaginal procedures limited to the defect site. The decision to treat takes into consideration the size of the defect, presence of symptoms, secondary infertility and plans of pregnancy.¹¹

In the case of incidental diagnosis of asymptomatic isthmocele and no plans for future childbearing, clinical observation and no surgical intervention are usually recommended. In symptomatic women with either AUB, pelvic pain, or secondary infertility, the course of treatment depends upon the size of their defect. There are a number of studies proposing different surgical approaches and techniques for the correction of the caesarean scar defect.¹¹

CLINICAL MANAGEMENT

Women with small defects ($\geq 3\text{mm}$) can be managed by expectant treatment or hysteroscopic resection, achieving a decrease in the number of postmenstrual spotting and spotting-related discomfort.¹²

The first choice of treatment for symptomatic isthmocele is the resection of the defect due to its minimally invasive approach and good therapeutic results.

HYSTEROSCOPY

Hysteroscopic resection of isthmocele is a minimally invasive, non-time-consuming and low morbidity procedure, allowing visualization and repair of the defect. Despite the great variety of technique, the surgical technique overall consists of the resection of fibrotic tissue from the defect, presented like a flap underneath the triangular pouch. The resection of the niche edges setting the wall in continuity to the cervical canal improves the flow drainage and prevent the retention of menstrual blood.

Abacjew-Chmylko et al. presented favourable outcome rates of hysteroscopic resection of 85.5%, ranging from 59.6% to 100%, completely solving AUB symptoms in 72.4% of the cases. Uterine perforation and bladder injuries are the major risks of the hysteroscopic procedure. Therefore, in order to reduce this risk, the resectoscope treatment by hysteroscopy is recommended to be performed if the remaining myometrial thickness is $> 3\text{mm}$.¹⁰

LAPAROSCOPY

A laparoscopic approach has been advocated for large defects (RM $< 3\text{mm}$), in the presence of symptoms and desire to maintain fertility. Laparoscopic isthmocele repair consists in the resection of the isthmocele edges, in order to excise the scar tissue, closing the defect in two-layer sutures. Laparoscopy enables a better visualization to identify the defect, allowing repair and thus increasing the myometrial thickness.

Vervoort et al. recently published a large prospective study with 101 women with symptomatic isthmocele $< 3\text{mm}$ submitted to laparoscopic repair under hysteroscopic control. The defect was resected by monopolar hook and the fibrotic tissue excised with a cold scissor, guided by hysteroscopy. The defect was then closed in two-layered suture in full-thickness including endometrium. Hyaluronic acid adhesion barrier was then added. In cases with an extreme retroflexed uterus, the round ligaments were also shortened. Hysteroscopy was performed to evaluate the anatomic result repair. In this study, 80 women had symptoms improved or resolved, and the RM significantly increased in follow up. Of the women with presence of fluid in the uterine cavity, this was solved in 86.9% after the repair, and, in the overall, 83.3% of women were (very) satisfied with the results.¹³

HYSTERECTOMY

It is the curative management for large symptomatic isthmocele in women who do not wish to conceive anymore.¹²

ISTHMOCELE AND PREGNANCY

When menstrual blood gets trapped inside a uterine isthmocele, it leads to significant inflammation of the uterine lining. This inflammation can cause infertility by killing sperm as they travel through the uterus to the egg and by creating an inhospitable environment for embryo implantation. If a pregnancy does occur in the presence of an untreated uterine isthmocele, there is a higher risk of miscarriage and even uterine scar rupture, due to the abnormally thin muscle wall at the location of the C-section scar.¹⁴

NON-INVASIVE ISTHMOCELE TREATMENT(NIIT)

Ali Sami Gurbuz, Funda Gode, and Necati Ozcimen conducted a research study in which the infertile patients with symptomatic isthmocele who received non-invasive isthmocele treatment (NIIT) before *in vitro* fertilization (IVF) treatment cycles. Isthmocele volumes were measured before and after NIIT. The IVF results and isthmocele-related complaints were also analyzed. The patients were treated with a depot gonadotropin-releasing hormone agonist for 3 months before frozen-thawed embryo transfer cycles. They concluded that NIIT can serve as an alternative pretreatment option for patients with isthmocele during IVF cycles¹⁵

DR. NIKITA TREHAN'S MESSAGE FROM THE SUNRISE HOSPITAL, NEW DELHI

According to Dr. Nikita Trehan, Sunrise Hospital, New Delhi, she has been treating approximately two-three cases of Isthmocele every month. Women with multiple Caesarean are at a higher risk of having Isthmocele in comparison to those who only had one c-section.

"We have treated around 30 cases in last one year. Most of the cases are from North India and prevalence is reported up to 15-20 percent but could be even higher since all cases are not reported or remain undiagnosed," she said.

Dr Trehan added that it's due to the position of the fluid-filled, pouch-like abnormality at the uterine isthmus, that the condition is commonly known as Isthmocele. It is also called caesarean scar defect as the problem can occur at the endocervical canal or in the area in the lower uterine section. According to her, laparoscopic repair of uterine Isthmocele is definitely a successful way of improving symptoms and thereby will be improving the fertility. The thickness of Isthmocele also determines the surgical approach towards it.⁵

II. Conclusion

All the caesarean cases should be followed-up properly. Clients should be told about the symptoms related to Isthmocele so that they become more cautious. Proper surgical methods, closing of incisions, haemostasis should be done properly to overcome this problem.

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