

# From Diagnosis to Delivery: Navigating Pregnancy With an Isthmocele

Sonali Hargunani <sup>1</sup>, Nikita Bhattacharjee <sup>1</sup>, Himadri Bal <sup>1</sup>, Dipak Kolate <sup>1</sup>, Varshini Vadithala <sup>1</sup>

1. Obstetrics and Gynaecology, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Pune, IND

**Corresponding author:** Nikita Bhattacharjee, niki.kitu29@gmail.com

Review began 07/27/2024

Review ended 07/30/2024

Published 08/05/2024

© Copyright 2024

Hargunani et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DOI: 10.7759/cureus.66182

## Abstract

Isthmocele is a myometrial defect in the uterine isthmus, often resulting from previous caesarean sections. With rising cesarean rates globally, including a significant increase in India, the prevalence of isthmocele has become a noteworthy clinical concern. Isthmocele can lead to symptoms such as abnormal uterine bleeding, dysmenorrhea, and secondary infertility, often detected through transvaginal ultrasound or MRI. Additionally, it can lead to caesarean scar pregnancy, a serious complication. The condition necessitates treatment, particularly in symptomatic cases or those planning future pregnancies. Early diagnosis and appropriate management are crucial for preventing complications and ensuring positive pregnancy outcomes. Here, we report a case that underscores the potential for successful pregnancy outcomes despite the presence of isthmocele, highlighting the need for tailored management strategies in such high-risk cases.

**Categories:** Obstetrics/Gynecology, Radiology

**Keywords:** management strategies, abnormal uterine bleeding, cesarean scar defect, high-risk pregnancy, isthmocele

## Introduction

An isthmocele is a myometrial abnormality due to a localized thinning and outpouching of the anterior wall of the uterine isthmus. It is generally seen above a prior Caesarean scar. The incidence of Caesarean scar defect rises with several prior Caesarean deliveries. Current statistics suggest that around 60% of individuals develop an isthmocele after their first Caesarean section (C-section), increasing up to 100% after three C-sections [1]. According to the National Family Health Survey (NFHS-4), 17% of live births in the Indian subcontinent in the five years preceding the survey were delivered via C-section. Additionally, 45% of these C-sections were planned after the onset of labor pains. The prevalence of C-section deliveries in India was 8.5% in NFHS-3, but data from NFHS-4 indicate that this rate has increased to 17.2%, marking an increase of almost 9% over 10 years [2].

While an isthmocele may remain asymptomatic, it has the potential to lead to unfavorable symptoms such as dysmenorrhea and abnormal uterine bleeding. Typically, at the time of the menstrual phase, a minimal quantity of blood accumulates within the pouch-like defect, inciting an inflammatory response. The accumulation and subsequent reaction can be taken into consideration, in some ways, as the main basis of abnormal uterine bleeding (particularly post-menstrual spotting), and dysmenorrhea (because of the effect of inflammatory cytokines on perilesional nerve fibers). Secondary infertility resulting from disrupted embryo implantation triggered by an immune shift toward inflammation at the maternal-embryonal interface has also been reported [3]. Additionally, an isthmocele can heighten the risk of Caesarean scar pregnancy, a possibly fatal condition necessitating precise treatment to prevent severe uterine bleeding.

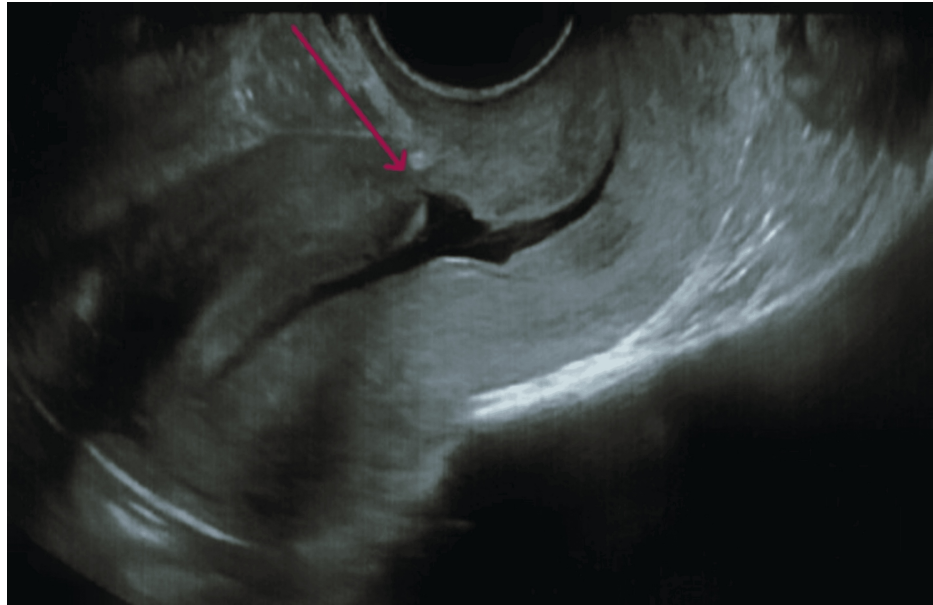
In this report, we present a case of pregnancy that was effectively managed despite the patient's diagnosis of an isthmocele.

## Case Presentation

A 28-year-old woman (para 2, living two, abortion one) presented to the outpatient department with complaints of spotting per vaginam persisting since her recent C-section delivery, which was performed two months prior. Her first child was also delivered via C-section five years ago. The patient was hemodynamically stable on examination (pulse of 86/minute, BP of 120/80 mmHg, SpO<sub>2</sub> of 100% on room air, respiratory rate of 14/minute). Abdominal palpation was unremarkable. Initial ultrasound examination showed no abnormalities. Symptomatic management was done with tranexamic acid given orally as and when the patient presented with spotting per vaginam. The patient was also started on prophylactic antibiotics - T. doxycycline 100 mg twice a day (BD) and T. metronidazole 500 mg three times a day (TDS) for 14 days as a measure to prevent pelvic inflammatory disease. Despite the initial treatment, the patient continued to experience the same complaints over the subsequent months. After four months without relief, a repeat ultrasound revealed an isthmocele at the Caesarean scar site, measuring 24 x 6 x 6 mm with a myometrial thickness of 2 mm (Figure 1). The patient was counseled regarding the defect and potential complications. Surgical correction was recommended, but the patient deferred treatment.

### How to cite this article

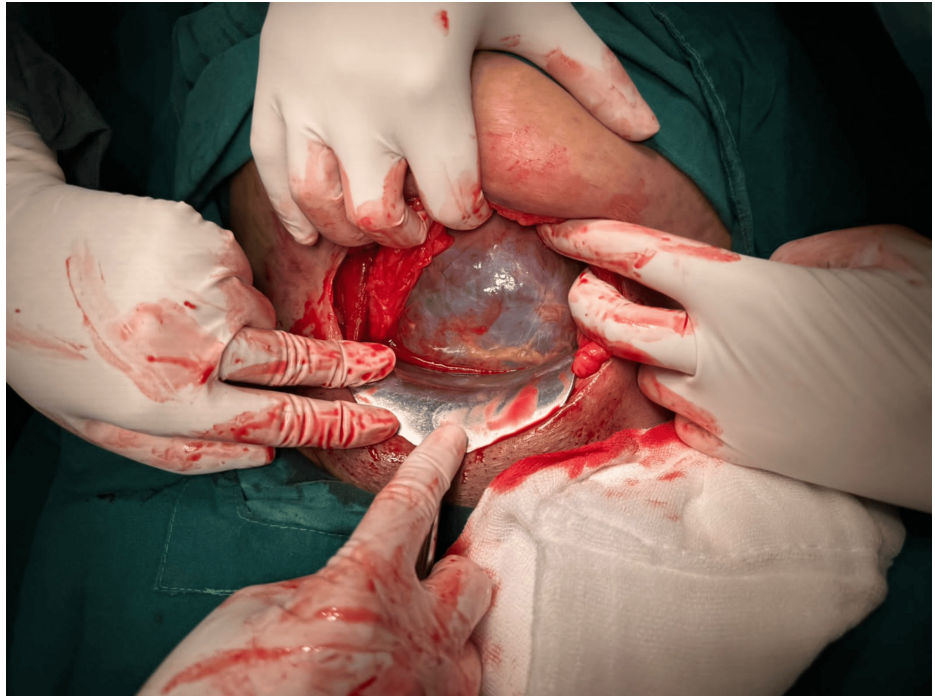
Hargunani S, Bhattacharjee N, Bal H, et al. (August 05, 2024) From Diagnosis to Delivery: Navigating Pregnancy With an Isthmocele. Cureus 16(8): e66182. DOI 10.7759/cureus.66182



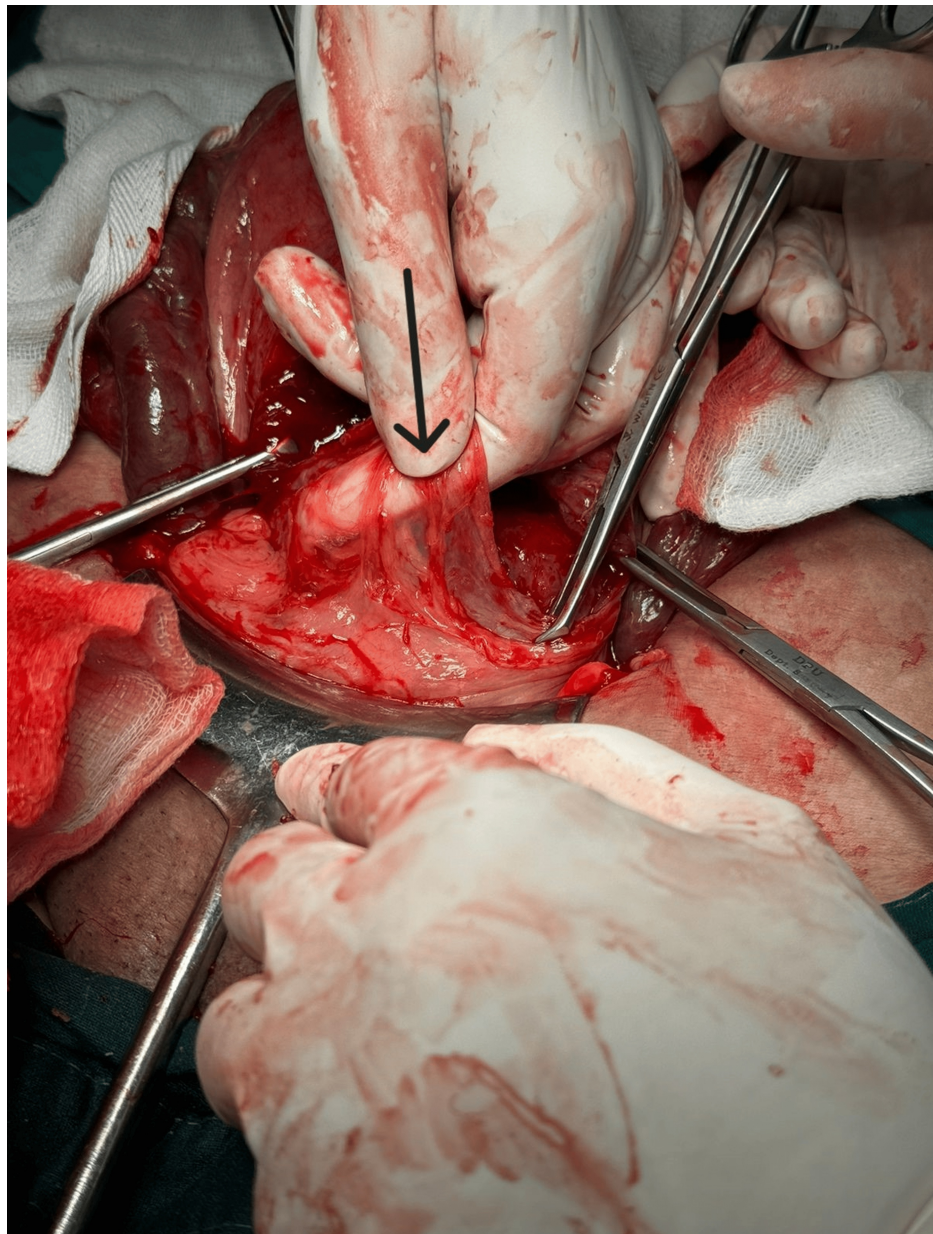
**FIGURE 1: Ultrasonography showed a V-shaped defect noted at the site of the prior caesarean scar, measuring 24 x 6 x 6 mm, with a myometrial thickness of 2 mm, with the base at the endometrial cavity and apex towards the anterior wall of the isthmus, suggestive of an isthmocoele.**

Four months later, the patient presented with amenorrhea for two months. Repeat ultrasound showed a single live intrauterine gestation of eight weeks, distant from the isthmocoele site. Despite counseling about possible complications, the patient opted to continue the pregnancy. Close monitoring was maintained throughout the pregnancy with repeated scans to ensure fetal safety and monitor for isthmocoele-related complications.

At 37 weeks of gestation, the patient was posted for an elective C-section due to her history of two previous lower-segment C-sections and the presence of an isthmocoele to minimize the risk of uterine rupture. As the parietal peritoneum layer was opened, the lower uterine segment was visualized. The lower uterine segment was remarkably thinned out and almost translucent with the baby's head visible, so much so that it appeared as the thin amniotic membrane, which is usually seen after the transverse incision taken on the lower uterine segment (Figure 2). During the procedure, a male infant weighing 2.5 kg was safely delivered. As the lower uterine segment was notably thinned out (Figure 3), meticulous single-layer suturing was performed on the uterus. The abdomen was closed in layers, and hemostasis was achieved. The patient received postoperative care according to protocol and was discharged on postoperative day seven.



**FIGURE 2: Thinned-out lower uterine segment with the baby's head visible.**



**FIGURE 3: Thinned-out lower uterine segment.**

## Discussion

In recent times, with the surge in the incidence of C-sections worldwide, there has been an increased emergence of post-Caesarean complications, both obstetric and gynecological. Isthmocele or “Caesarean scar defect” is one such complication.

Isthmocele was first explained by Hugh Morris in the year 1995, after studying cases of 51 hysterectomy specimens to describe the pathological changes of the Caesarean scar [4]. Vervoort et al. presented four distinct hypotheses regarding the formation of a uterine isthmocele. These include (1) an incision at the lower cervix when cervical dilation exceeds 5 cm, (2) deficient surgical closure, (3) the formation of adhesions between the anterior abdominal wall and the incision site, and (4) patient-dependent factors impacting the wound healing and hemostasis [5].

The detection of a uterine isthmocele is typically achieved through transvaginal ultrasound. These defects appear as anechoic triangular lesions that either communicate with the endometrial cavity or manifest as deformities in the anterior wall of the uterus. Sonohysterography can be utilized, although it can lead to an overestimation of the defect size due to increased intrauterine pressure while the procedure is ongoing. The anterior myometrium of the lower uterine segment appears weakened, with a defect covered by a thin serosal layer forming a pouch or niche. This niche typically communicates with the endometrial cavity and



may appear to contain blood products. Occasionally, an isthmocele can be observed by coincidence during hysterosalpingography as contrast outpouchings at the level of the isthmus, although accurate evaluation is challenging. MRI demonstrates similar findings, particularly well-depicted on T2-weighted images. Measurements of the isthmocele's width, depth, and length are crucial for pre-surgical planning and are accurately obtained through MRI in three planes; additionally, MRI aids in ruling out other pathologies potentially related to the patient's symptoms. While a uterine isthmocele is readily identifiable via ultrasound, MRI may be employed when necessary [6].

Treatment of an isthmocele is necessary for symptomatic patients and may also be considered for asymptomatic individuals planning future pregnancies. Minimally invasive procedures are preferred for closing the isthmocele, which can be performed via hysteroscopy and laparoscopy. Research indicates that conservative management is generally ineffective, and the primary approach to managing isthmocele is minimally invasive resection, yielding optimal therapeutic outcomes [7]. Smaller defects are typically addressed through hysteroscopic repair, which are minimally invasive and less troublesome procedure. However, large defects with thin myometrium require laparoscopic repair, involving resection of the isthmocele and closure of the pouch in multiple layers. Combined hysteroscopic and laparoscopic repair offers the benefits of both approaches, reducing complications and achieving optimal repair outcomes [8,9].

It can also be hypothesized that, in late pregnancy, an undiagnosed isthmocele can be a reason for scar dehiscence. The incidence of scar dehiscence ranges between 0.2% and 4.3% of all pregnancies with a previous C-section [10].

In this unique case, opting for surgical repair of the defect was avoided due to concerns about its potential impact on the pregnancy outcome. Close monitoring with ultrasonography was done to assess the isthmocele status. Ultimately, a successful pregnancy was achieved despite the presence of the Cesarean scar defect.

## Conclusions

An isthmocele represents a significant challenge in the landscape of post-Cesarean complications, particularly as rates of Cesarean deliveries continue to rise globally. This condition, characterized by a defect in the uterine isthmus, can lead to a range of symptoms, including abnormal uterine bleeding, dysmenorrhea, and secondary infertility. Furthermore, it may elevate the risk of complications such as Cesarean scar pregnancy and uterine rupture, which necessitate vigilant management and monitoring. The case presented underscores the feasibility of achieving a successful pregnancy despite the presence of an isthmocele, especially when careful management and close monitoring are employed. The patient's decision to defer surgical correction and opt for close observation highlights the potential for positive outcomes even in high-risk scenarios. This case emphasizes the importance of individualized patient care, particularly in balancing the risks and benefits of surgical intervention versus conservative management. Future research and clinical practice should focus on refining diagnostic techniques and treatment protocols for an isthmocele to optimize patient outcomes. As the prevalence of Cesarean deliveries continues to rise, ongoing evaluation of management strategies for an isthmocele will be crucial in mitigating its impact on reproductive health and pregnancy outcomes.

## Additional Information

### Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

**Concept and design:** Nikita Bhattacharjee, Sonali Hargunani, Himadri Bal, Dipak Kolate

**Acquisition, analysis, or interpretation of data:** Nikita Bhattacharjee, Sonali Hargunani, Varshini Vadithala

**Drafting of the manuscript:** Nikita Bhattacharjee, Sonali Hargunani, Himadri Bal

**Critical review of the manuscript for important intellectual content:** Nikita Bhattacharjee, Sonali Hargunani, Himadri Bal, Varshini Vadithala, Dipak Kolate

### Disclosures

**Human subjects:** Consent was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other

relationships or activities that could appear to have influenced the submitted work.

## References

1. Laganà AS, Garzon S, Alkatout I, Hortu Í, Gitas G, Vitale SG, Gubbini G: Isthmoele: when surgery is both the problem and the solution. *J Invest Surg.* 2022, 35:231-2. [10.1080/08941939.2020.1836692](https://doi.org/10.1080/08941939.2020.1836692)
2. Roy N, Mishra PK, Mishra VK, Chattu VK, Varandani S, Batham SK: Changing scenario of C-section delivery in India: understanding the maternal health concern and its associated predictors. *J Family Med Prim Care.* 2021, 10:4182-8. [10.4103/jfmprc.jfmprc\\_585\\_21](https://doi.org/10.4103/jfmprc.jfmprc_585_21)
3. Gubbini G, Centini G, Nascetti D, et al.: Surgical hysteroscopic treatment of cesarean-induced isthmoele in restoring fertility: prospective study. *J Minim Invasive Gynecol.* 2011, 18:234-7. [10.1016/j.jmig.2010.10.011](https://doi.org/10.1016/j.jmig.2010.10.011)
4. Morris H: Surgical pathology of the lower uterine segment caesarean section scar: is the scar a source of clinical symptoms?. *Int J Gynecol Pathol.* 1995, 14:16-20. [10.1097/00004347-199501000-00004](https://doi.org/10.1097/00004347-199501000-00004)
5. Vervoort A, Vissers J, Hehenkamp W, Brölmann H, Huirne J: The effect of laparoscopic resection of large niches in the uterine caesarean scar on symptoms, ultrasound findings and quality of life: a prospective cohort study. *BJOG.* 2018, 125:317-25. [10.1111/1471-0528.14822](https://doi.org/10.1111/1471-0528.14822)
6. Rupa R, Kushvaha S, Venkatesh K: Uterine isthmoele-a frequently overlooked complication of cesarean sections. *Indian J Radiol Imaging.* 2021, 31:601-4. [10.1055/s-0041-1736393](https://doi.org/10.1055/s-0041-1736393)
7. Tahara M, Shimizu T, Shimoura H: Preliminary report of treatment with oral contraceptive pills for intermenstrual vaginal bleeding secondary to a cesarean section scar. *Fertil Steril.* 2006, 86:477-9. [10.1016/j.fertnstert.2006.01.020](https://doi.org/10.1016/j.fertnstert.2006.01.020)
8. Abacjew-Chmylko A, Wydra DG, Olszewska H: Hysteroscopy in the treatment of uterine cesarean section scar diverticulum: a systematic review. *Adv Med Sci.* 2017, 62:230-9. [10.1016/j.advms.2017.01.004](https://doi.org/10.1016/j.advms.2017.01.004)
9. Marotta ML, Donnez J, Squifflet J, Jadoul P, Darii N, Donnez O: Laparoscopic repair of post-caesarean section uterine scar defects diagnosed in nonpregnant women. *J Minim Invasive Gynecol.* 2013, 20:386-91. [10.1016/j.jmig.2012.12.006](https://doi.org/10.1016/j.jmig.2012.12.006)
10. Tyagi N, Prabhakar M, Tyagi S: Retrospective study to find predictive factors of scar dehiscence in previous caesarean section to prevent maternal and perinatal morbidity and mortality. *Int J Reprod Contracept Obstet Gynecol.* 2019, 8:531-5. [10.18203/2320-1770.ijrcog20190279](https://doi.org/10.18203/2320-1770.ijrcog20190279)