

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20231578>

## Case Report

# Role of imaging modalities in diagnosis of silent caesarean scar ectopic pregnancy after ovulation induction: a case report

Prerna Priya, Yashaswi Pandey\*, Madhu Jain, Lavanya Anuranjani, Vanita Mhaske, Yashi Srivastava, Anita Thakur, Gopika Ambat

Department of Obstetrics and Gynaecology, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India

**Received:** 04 April 2023

**Revised:** 04 May 2023

**Accepted:** 05 May 2023

### \*Correspondence:

Dr. Yashaswi Pandey,

E-mail: [dryashaswijnp@gmail.com](mailto:dryashaswijnp@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

There has been an increased prevalence of ectopic pregnancies in the present scenario attributing to 1.5-2% of all pregnancies. Caesarean scar pregnancies are rare, occurring in approximately 1 in 2000 pregnancies, although the incidence is increasing. The increasing rate of caesarean scar ectopic pregnancies mirrors the increasing rate of caesarean delivery. Disruption of the endometrium and myometrium after caesarean delivery predisposes to improper implantation at the site of the prior hysterotomy. Without normal surrounding myometrium, untreated caesarean scar ectopic pregnancies can result in uterine rupture with severe maternal hemorrhage and death. Although ultrasound remains the primary imaging modality for this diagnosis, MRI may be useful in the setting of equivocal cases and also may aid in the detection of possible placental implantation or bladder wall invasion. An MRI may provide additional confirmation of the ultrasound findings and characterize the myometrial interface if the pregnancy is difficult to distinguish from other pregnancy complications such as a cervical ectopic pregnancy or consideration for expectant management of pregnancy is considered.

**Keywords:** Caesarean scar ectopic pregnancy, Ovulation induction, Fertility preservation

## INTRODUCTION

Ectopic pregnancy accounts for 6% of all pregnancy-related deaths and is the highest contributor to hemorrhage-related deaths during the first trimester.<sup>1,2</sup> There has been an increased prevalence of ectopic pregnancies in the present scenario attributing to 1.5-2% of all pregnancies.<sup>3-5</sup> The recurrence rate being 10-15% after one ectopic gestation and 30% after two ectopic pregnancies. Other risk factors being prior pelvic surgeries, tubal surgery, infection, contraception failure, infertility, treatment taken for infertility, congenital uterine anomalies and many other causes.<sup>3,5</sup> Various sites for ectopic includes: tubal, ovarian, abdominal and rudimentary horn among the extra-uterine types and cervical, intra-mural and scar ectopic pregnancies among the uterine type.

While the presentation of ectopic pregnancy can be variable, common signs includes a triad of amenorrhea, spotting or vaginal bleeding and acute abdominal pain.<sup>6</sup> Despite these known risk factors, however, many women may present asymptomatic.<sup>7</sup>

The most common location for an ectopic pregnancy is in the ampulla of the fallopian tube reason being the site for fertilization.<sup>1,7</sup> Caesarean scar pregnancies are rare, occurring in approximately 1 in 2000 pregnancies, although the incidence is increasing.<sup>5,7-9</sup> The increasing rate of caesarean scar ectopic pregnancies mirrors the increasing rate of caesarean delivery.<sup>5,7,8</sup> Despite more than half of these patients experiencing greater than 2 cesarean deliveries, the risk for a caesarean scar ectopic does not necessarily increase with the number of cesarean deliveries.<sup>10,11</sup> Disruption of the endometrium and

myometrium after cesarean delivery predisposes to improper implantation at the site of the prior hysterotomy.<sup>8</sup> Without normal surrounding myometrium, untreated cesarean scar ectopic pregnancies can result in uterine rupture with severe maternal hemorrhage and death.<sup>12,13</sup>

Here, we present the case of a cesarean scar pregnancy after ovulation induction with letrozole. Although there are varying guidelines in place for management of a cesarean scar ectopic pregnancy, this case study describes the imaging findings associated with cesarean scar ectopic pregnancy, which are necessary to allow prompt diagnosis and impact of ovulation induction on rate of scar ectopic pregnancies.<sup>3</sup>

### CASE REPORT

A 28-year-old G3P1L1A1 with history of previous cesarean delivery 5 years back presented with 1.5 month of amenorrhea and painless vaginal bleeding since 4 days and a positive urine pregnancy test. Her past medical, surgical and family history was unremarkable with normal 30 days ovulatory cycle. Patient was given ovulation induction with Letrozole 2.5 mg HS\*5 days; from day 3-7 in the previous cycle in view of polycystic ovaries. On presentation, her vitals were within normal limits and stable

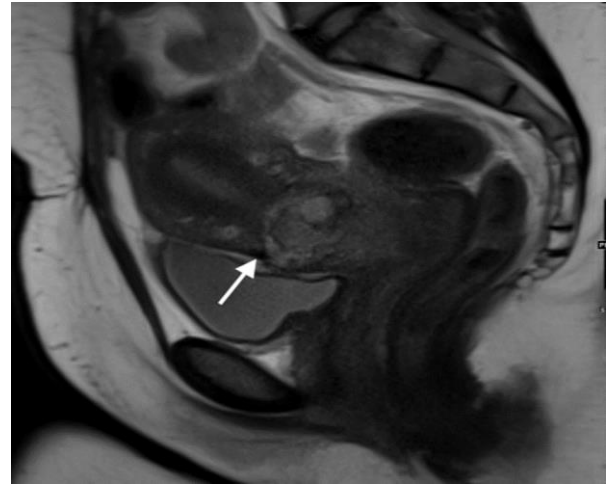
On examination, abdomen was soft, non-tender with no guarding or rigidity, supra-pubic transverse scar was present. Speculum examination revealed a healthy cervix and vagina; and on bimanual examination, uterus was anteverted, bulky with tenderness present on cervical motion, bilateral fornices free and non-tender.



**Figure 1: USG (Transvaginal ultrasound) showing empty uterine cavity with eccentrically located gestational sac near previous cesarean scar and thin layer of myometrium between gestational sac and urinary bladder.**

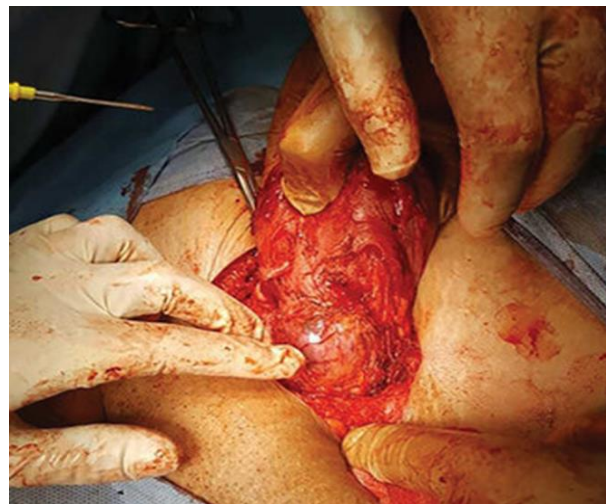
On transvaginal scan, uterus was anteverted with empty uterine cavity and peripheral echogenic trophoblastic reaction in the lower anterior myometrium at the scar site, measuring gestation sac-0.84CM (5WK+4D), negative

organ sliding sign, suggestive of scar ectopic. Endometrial thickness was 8mm and bilateral ovaries were normal in shape and echo texture (Figure 1). Serum beta HCG measured was 15270 mIU/ml. Other routine blood investigations were within normal limits.



**Figure 2: MRI (Pelvis) showing a well-defined T2 hyperintense cystic gestational sac like structure of size 7×11×18 mm, is seen in the lower uterine segment and bulging anteriorly at caesarean scar site with thinning of the overlying myometrium (2.3 Smm).**

MRI (pelvis) revealed a well-defined T2 hyperintense cystic gestational sac like structure of size 7×11×18 mm, is seen in the lower uterine segment and bulging anteriorly at caesarean scar site with thinning of the overlying myometrium (2.3 mm) (Figure 2).



**Figure 3: Intraoperative picture of caesarean scar ectopic pregnancy with 3×3 cm lesion localized in the right corner of previous uterine scar; same was excised and sent for histopathology.**

A provisional diagnosis of Cesarean scar ectopic pregnancy was made. Following appropriate counseling, the patient confirmed her desire for future fertility and after understanding the risk and benefits, she agreed for

resection by laparotomy. Patient underwent laparotomy and lesion was localized to right corner of previous cesarean scar measuring 3×3cm size. Bilateral tubes and ovaries were found to be normal (Figure 3). Lesion was excised and sent for histopathology. Remaining defect was repaired in layers. Histopathological examination confirmed products of conception in the lesion which was suggestive of cesarean scar ectopic as final diagnosis. Patient was followed up with beta HCG report which showed declining trend and came to non-pregnant levels within 6 weeks.

## DISCUSSION

Differential diagnosis for this case included cervical pregnancy incomplete abortion. The most accepted theory for cesarean scar ectopic pregnancy is that impaired wound healing following previous cesarean creates a myometrial defect on subsequent scar in which the blastocyst implants.

Types of scars ectopic includes: Type I- caused by implantation in the prior scar with progression towards the uterine cavity and Type-II- caused by deep implantation in to scar defect with infiltrating growth in to uterine myometrium to uterine serosal surface.

USG diagnostic criteria: an empty uterus and cervical canal; a gestational sac and placental tissue in the anterior wall of the uterine isthmus; discontinuity of the anterior uterine wall; absent or diminished myometrium between the gestational sac/placental tissue and bladder. Complications involve hemorrhage, shock, uterine rupture, disseminated intravascular coagulation and death.

In the present case scenario patient with 1 previous cesarean delivery who was given ovulation induction with Letrozole presented with a cesarean scar ectopic pregnancy. She was diagnosed with the help of imaging modalities such as transvaginal ultrasound and non-contrast pelvic MRI, and she underwent surgical management.

Although the incidence of cesarean scar ectopic pregnancy is uncommon, its incidence is indeed increasing given the rise of cesarean deliveries.<sup>5,7,14,15</sup>

These pregnancies are life-threatening as they pose a great risk for maternal hemorrhage.<sup>16</sup> Thus, it is important to identify and treat cesarean scar ectopic pregnancies to avoid significant morbidity and mortality.

Although there are no specific diagnostic criteria for cesarean scar ectopic pregnancies, ultrasound findings should indicate an enlarged lower uterine segment with thin myometrium at the implantation site.<sup>17</sup> Furthermore, the trophoblast must be located between the bladder and anterior uterine wall, fetal parts cannot be located within the uterine cavity, and there should discontinuity of the anterior uterine wall on a sagittal view.<sup>18</sup> Upon implantation on the uterine scar, cesarean scar ectopic can either extend into the cervico-isthmic space and into the

uterine cavity (as occurred in this case study) or extend deeper into the myometrium toward to serosal surface of the uterus.<sup>13,18</sup> Both forms can result in substantial hemorrhage, although the latter also precludes a viable pregnancy.<sup>13,18</sup>

Thus, suggested criteria for a cesarean scar ectopic pregnancy include: Gestational sac embedded eccentrically in the lower uterine segment. Implantation in the location of a prior cesarean delivery scar. Empty uterine cavity and cervical canal. Attenuated myometrium over the scar, and Extensive Doppler vascular flow in the area of the cesarean delivery scar.<sup>17</sup>

Additionally, Atgen et al distinguished implantation of the placenta “into” the prior cesarean scar compared to attachment “onto” the prior scar in the first trimester among continuing cesarean scar pregnancies.<sup>2</sup> Implantation of the placenta into the scar and myometrial thickness <4 mm in the first trimester all resulted in cesarean hysterectomy for morbidly adherent placenta, with lower birth weight and earlier gestational age at delivery among those with implantation into the prior scar.

An MRI may provide additional confirmation of the ultrasound findings and characterize the myometrial interface if the pregnancy is difficult to distinguish from other pregnancy complications such as a cervical ectopic pregnancy or consideration for expectant management of pregnancy is considered.

Although ultrasound remains the primary imaging modality for this diagnosis, MRI may be useful in the setting of equivocal cases and also may aid in the detection of possible placental implantation or bladder wall invasion.

Sagittal T2-weighted images are best for visualizing the cesarean section scar, which appears as low signal. Imaging features include thinning of the myometrium in the region of the scar next to a gestational sac with a correspondingly empty endometrial canal and cervix.<sup>4</sup>

Sagittal T2-weighted imaging can also be helpful in determining growth pattern of the gestational sac (i.e. whether it is primarily within the scar or within the isthmus). This may have implications in management and risk of rupture.<sup>14</sup> Additionally, T1 pre contrast imaging may be helpful in the detection of blood products in the canal and pelvis.

The case presented here highlights the importance of early diagnosis and management of a cesarean scar ectopic pregnancy. This patient's presentation was similar to other case reports found in the literature and no significant increase has been studied in the incidence of cesarean scar ectopic pregnancy with the use of ovulation induction agents like letrozole or clomiphene citrate.

In patients who desire fertility after treatment of an ectopic pregnancy, physicians can offer medical and more conservative surgical management uterine wedge

dissection.<sup>5,13</sup> Systemic methotrexate with or without intrasac methotrexate can be used in patients with a gestational age of less than 8 weeks without fetal cardiac activity.<sup>9,13</sup> However, medical treatment alone may leave the caesarean scar defect unrepaired and susceptible to complications in subsequent pregnancies.<sup>8,13</sup>

## CONCLUSION

There should remain a high clinical suspicion for a caesarean scar ectopic in a patient with a history of caesarean deliveries presenting with first trimester bleeding. These patients should be diagnosed with imaging modalities like transvaginal ultrasound or MRI. To prevent maternal hemorrhage, a patient presenting with a caesarean scar ectopic pregnancy should undergo prompt treatment depending on her clinical status and fertility preferences. Caesarean scar ectopic if diagnosed early can be managed promptly, avoiding complication like massive hemorrhage which may require hysterectomy; allowing fertility preservation and reducing maternal morbidity and mortality.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: Not required*

## REFERENCES

1. ACOG Committee on Practice Bulletins Tubal ectopic pregnancy: ACOG practice bulletin. Clin Manage Guidelines Obstet Gynecol. 2018;131(3):e91-103.
2. Kaelin Agten A, Cali G, Monteagudo A, Oviedo J, Ramos J, Timor-Tritsch I. The clinical outcome of cesarean scar pregnancies implanted “on the scar” versus “in the niche. Am J Obstet Gynecol. 2017;216(510):e1–e6.
3. Alkatout I, Honemeyer U, Strauss A, Tinelli A, Malvasi A, Jonat W. Clinical diagnosis and treatment of ectopic pregnancy. Obstet Gynecol Surv. 2013;68(8):571-81.
4. El-sayed El-badawy A, El-agwany SA, El-habashy MA, Elmansy A. Lower uterine segment pregnancy (Cesarean Scar Pregnancy and early placenta accreta: a rising complication from cesarean section with possible and similar early ultrasound diagnoses and management. Egypt J Radiol Nucl Med. 2015;46(4):977-80.
5. Cömert EH, Şal H, Ekici YS, Seda E, Guven G. Cesarean scar pregnancy: a case report. Turkiye Klinikleri Jinekoloji Obstetrik. 2018;26(1):37-9.
6. Deutchman M, Tubay AT, Turok DK. First trimester bleeding. Am Fam Phys. 2009;79(11):985-92.
7. Fylstra DL. Ectopic pregnancy not within the (distal) fallopian tube: etiology, diagnosis, and treatment. Am J Obstet Gynecol. 2012;206(4):289-99.
8. Fylstra DL, Pound-Chang T, Grant Miller M, Cooper A, Miller KM. Ectopic pregnancy within a cesarean delivery scar: a case report. Am J Obstet Gynecol. 2002;187:302-4.
9. Godin PA, Bassil S, Donnez J. An ectopic pregnancy developing in a previous caesarian section scar. Fertil Steril. 1997;67(2):398-400.
10. Hoover W, Tao G, Kent CK. Trends in the diagnosis and treatment of ectopic pregnancy in the United States. Am Coll Obstet Gynecol. 2010;115:495-502.
11. Jurkovic D, Wilkinson H. Diagnosis and management of ectopic pregnancy. BMJ. 2011;342(d3397):1353-7.
12. Marion LL, Meeks GR. Ectopic pregnancy: history, incidence, epidemiology, and risk factors. Clin Obstet Gynecol. 2012;55(2):376-86.
13. Patel MA. Scar ectopic pregnancy. J Med Biol Eng. 2015;65(6):372-5.
14. Peng KW, Lei Z, Xiao TH, Jia FG, Zhong WX, Gao Y. First trimester caesarean scar ectopic pregnancy evaluation using MRI. Clin Radiol. 2014;69(2):123-9.
15. Rosen T. Placenta accreta and cesarean scar pregnancy: overlooked costs of the rising cesarean section rate. Clin Perinatol. 2008;35:519-29.
16. Rotas MA, Haberman S, Levгур M. Cesarean scar ectopic pregnancies etiology. Am Coll Obstet Gynecol. 2006;107:1373-81.
17. Timor-Tritsch IE, Monteagudo A, Cali G, El Refaey H, Kaelin Agten A, Arslan AA. Easy sonographic differential diagnosis between intrauterine pregnancy and cesarean delivery scar pregnancy in the early first trimester. Am J Obstet Gynecol. 2016;215:225.e1–225.e7.
18. Vial Y, Petignat P, Hohlfeld P. Pregnancy in a cesarean scar. Ultrasound Obstet Gynecol. 2000;16(6):592-3.

**Cite this article as:** Priya P, Pandey Y, Jain M, Anuranjani L, Mhaske V, Srivastava Y, et al. Role of imaging modalities in diagnosis of silent caesarean scar ectopic pregnancy after ovulation induction: a case report. *Int J Reprod Contracept Obstet Gynecol* 2023;12:1947-50.