

## CASE REPORT

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# Cesarean scar pregnancy mimicking a pseudo-gestational sac: A case report with magnetic resonance imaging findings

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## ABSTRACT

**Introduction:** A corpus luteal cyst may reportedly be misidentified as an ectopic gestational sac. We report a case of cesarean scar pregnancy mimicking a pseudo-gestational sac, to differentiate between the two entities and diagnose correctly.

**Case Report:** A 42-year-old woman with four previous cesarean sections, at 7 weeks of gestation, was suspected of an unknown site pregnancy. Transvaginal Doppler ultrasonography showed a small cystic structure accompanied by neither a yolk sac nor surrounding marginal flow, adjacent to the uterine scar, and a 16-mm-large low-echo area with a white ring in the left adnexa. Pelvic magnetic resonance imaging also demonstrated a small cystic structure without contrast enhancement resembling a pseudo-gestational sac adjacent to the cesarean scar. Moreover, a cystic structure with ring-enhancement beside the left ovary, which mimicked an ectopic gestational sac, was also detected. Given these imaging findings and slightly elevated serum  $\beta$ -human chorionic gonadotropin ( $\beta$ -hCG) levels, ectopic

pregnancy in the left fallopian tube could not be ruled out. She underwent laparoscopic surgery and uterine content removal, which resulted in intrauterine miscarriage. The cystic structure partially resected from a marginal area in the ovary appeared to be a luteal cyst.

**Conclusion:** For correct diagnosis and appropriate treatment, the clinical circumstances should be fully considered without excessive reliance on imaging findings.

**Keywords:** Cesarean scar pregnancy, Ectopic pregnancy, Gestational sac, Miscarriage

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## INTRODUCTION

Ectopic pregnancy (EP) should be carefully managed because it can result in maternal death. The incidence of EP has also increased with the advancement in assisted-reproductive technology, occurring in approximately 1.5–2.1% of patients undergoing in vitro fertilization [1–3]. Cesarean scar pregnancy is an extremely rare type of EP: there is the implantation of the gestational sac onto the anterior wall of the uterus at the site of at least one previous cesarean section. Due to the rise in

cesarean delivery rates, the incidence of cesarean scar pregnancies has steadily increased over the years [4]. Joshi et al. [5] described the case of a previous cesarean section delivery in a woman with a viable gestational sac in the lower uterine segment and elevated  $\beta$ -human chorionic gonadotropin ( $\beta$ -hCG) levels. They indicated that the possibility of a scar ectopic pregnancy should be considered. However, diagnosis can be difficult in cases where these clinical findings are inconclusive. Herein, we report a case of cesarean scar pregnancy in which it was difficult to make a correct diagnosis due to several confusing clinical and imaging findings.

## CASE REPORT

A 42-year-old woman at 7 weeks of gestation in her sixth pregnancy was referred to our clinic on the suspicion of a pregnancy at an unknown location. She had a history of four cesarean deliveries and one spontaneous abortion. The patient's medical history was unremarkable. At presentation, her vital signs were within normal limits and stable. Physical examination was notable only for minor genital bleeding. The patient's hemoglobin and hematocrit levels were within normal limits. The  $\beta$ -hCG level was 2194 IU/L. Transvaginal ultrasonography revealed a 10-mm-large cystic structure without a yolk sac and blood flow adjacent to the scar of the uterus (Figure 1A) and a 16-mm-large low-echo area accompanied by a white ring in the left adnexa (Figure 1B). Pelvic magnetic resonance imaging (MRI) demonstrated a cystic structure lacking contrast enhancement on the lower uterine segment adjacent to the cesarean scar while demonstrating a cystic structure with ring enhancement beside the left ovary (Figure 2). Because of the clinical suspicion of left-tube EP, the patient underwent diagnostic and therapeutic laparoscopy and endometrial curettage. Both ovaries were normal (Figure 3A), and a structure that appeared to be a luteal cyst was found in the left ovary, which was partially resected (Figure 3B). Surgical management included left salpingectomy, wedge dissection of the ovary, and endometrial curettage. Chorionic villi were macroscopically found in the intrauterine specimens, and histological findings confirmed an early abortion in the uterus. The postoperative course was uneventful. The  $\beta$ -hCG level decreased to 61 IU/L on postoperative day 4, confirming normalization on an outpatient basis.

## DISCUSSION

The commonest site of EP is the fallopian tube, accounting for 96% of all EPs [6]. Other sites of EP include the ovary, abdomen, myometrium, cervix, and previous cesarean scar. In some cases, the site of pregnancy cannot be determined even after close examination. Cesarean scar pregnancy is one of the rarest types of EPs, occurring in 1 in 2000 pregnancies [7]. However, with the increase

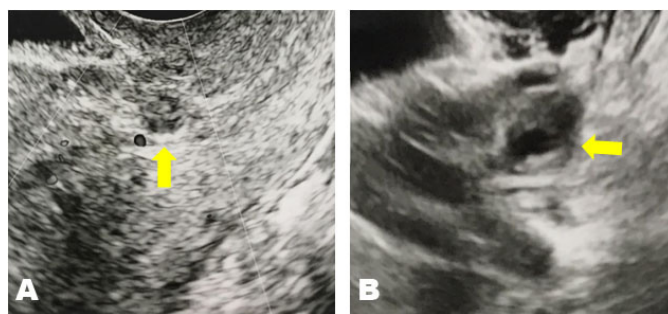


Figure 1: Transvaginal Doppler ultrasonography images. (A) A 10-mm-large cystic structure without a yolk sac and blood flow adjacent to the scar of the uterus. (B) A 16-mm-large low echo area is accompanied by a white ring in the left adnexa.

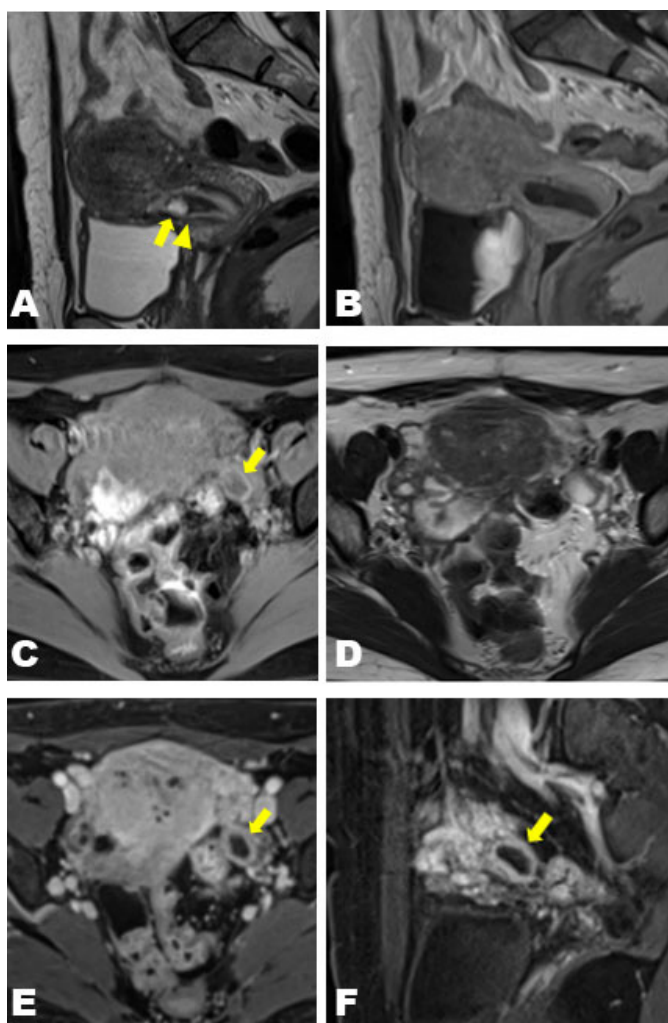


Figure 2: Magnetic resonance imaging of the pelvis. (A) Sagittal T2-weighted image showing a cystic structure (arrow) on the anterior wall of the lower uterine segment in the region of the previous cesarean section scar. The adjacent linear low-signal area suggests a clot (arrowhead). The uterine cavity was empty. (B) The intrauterine cystic lesion lacks contrast enhancement after Gd-DTPA administration on a dynamic T1-weighted image (arrow). (C) Axial fat-suppressed T1-weighted image shows another cystic left adnexal lesion with a highly intense thick wall (arrow) close to the left ovary. (D) The mass is close to the left ovary on axial T2-weighted images. (E, F) Ring-like enhancement of the lesion is found on both axial (E) and sagittal (F) fat-suppressed dynamic T1-weighted images (arrow).

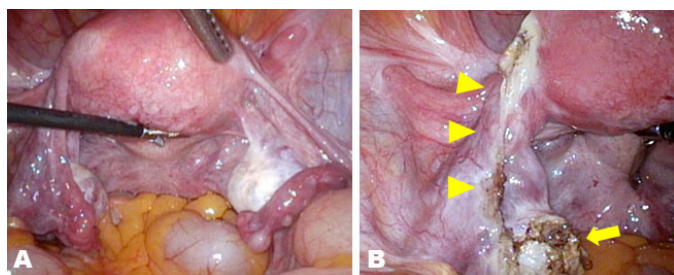


Figure 3: Laparoscopic view. (A) The appearances of bilateral adnexa and pelvic peritoneum are normal. (B) After the laparoscopic left oophorectomy (arrowheads) and partial resection of the left ovary (arrow). The resected part looks like a luteal cyst.

in cesarean sections in recent years, cesarean scar pregnancies have also risen substantially. The diagnostic criteria for EP in the scar are as follows: (1) an empty uterine cavity and cervical canal, (2) a gestational sac in the anterior part of the uterine isthmus, (3) the absence of healthy myometrium between the bladder and gestational sac, (4) and the circular blood flow surrounding the sac must be clearly visible [8–10]. In the present case, transvaginal ultrasonography identified a sac-like structure without marginal blood flow in the anterior part of the lower uterine segment with an empty uterine cavity and a low echo area accompanied by a white ring in the left adnexa. Magnetic resonance imaging also revealed similar findings. However, the findings of this case were inconsistent with the above criteria; an adnexal structure mimicking a gestational sac and slightly elevated serum  $\beta$ -hCG levels were also noted. This explains why we diagnosed the uterine sac-like structure as a pseudo-gestational sac. However, we could not rule out EP of the fallopian tube, and we eventually performed laparoscopic surgery.

The current sac-like structure on the cesarean scar was not proven to have vascularity with either ultrasonography or MRI, hence mimicking a pseudo-gestational sac. Thus, the diagnosis of scar EP was not made confidently, partly because of its rarity. In addition, the adnexal cystic structure with hypervascularity resembled a gestational sac, which further confirmed the diagnosis. Given that tubal EP frequently appears as a thick-walled cystic lesion in the adnexa, care must be taken to differentiate normal corpus luteum cysts from EP [11]. To definitively differentiate a corpus luteum cyst from a tubal EP, it must be demonstrated that the thick-walled cystic lesion originates from the ovary because EPs in the ovary are exceedingly rare [12]. In addition, another distinguishing factor is that corpus luteum cysts typically demonstrate high T1 signal intensity in their walls [13]. It was difficult to identify whether the current adnexal cystic structure, with a thick wall and hypervascularity, was in or out of the ovary. However, it demonstrated a high T1 signal intensity in the wall on MRI, which could have been the key to a correct diagnosis.

Trends in  $\beta$ -hCG are instrumental to diagnosis of pregnancy. With early normal progressing intrauterine pregnancies (IUPs),  $\beta$ -hCG levels increase by at least 53% within 48 h. With a failing IUP, the  $\beta$ -hCG levels decline by 21–35% within 48 h [14]. Ectopic pregnancy is suspected in pregnancies without expected increases or decreases in  $\beta$ -hCG levels. No single pattern characterizes EPs, and approximately half of the EP would show decreasing  $\beta$ -hCG levels, whereas the other half would show an increase [15]. In the initial examination of the present case,  $\beta$ -hCG was 2194 mIU/mL, and it declined by only 17% within 48 h. This mild decrease in  $\beta$ -hCG levels supports the diagnosis of EP in the fallopian tube. The process of diagnosis and treatment of EP remains controversial. While the most common treatment for fallopian tube pregnancy is surgery because of its curative and immediate effects [16], some institutions recommend that dilation and curettage could be performed in all cases except for those that have ruptured to avoid extra laparoscopic surgery because guessing the site of pregnancy by  $\beta$ -hCG, transvaginal ultrasonography, or MRI may sometimes be incorrect. In this case, the most suspicious pregnancy site was the left adnexa. Therefore, the patient underwent laparoscopic surgery first. However, since there was also the possibility of a cesarean scar area pregnancy, we should have considered performing dilation and curettage first to avoid additional laparoscopic surgery. In contrast, dilation and curettage carry the risk of intrauterine adhesions and uterine perforation, particularly in patients who have undergone multiple cesarean sections, as in this case. Therefore, it may have been reasonable to perform dilation and curettage in the surgical theater instead of a treatment room.

## CONCLUSION

In patients with EP, to diagnose correctly and perform an appropriate treatment, full consideration of the clinical circumstances and assessment of changes over time is important without excessive reliance on imaging findings. In addition, if the risk of uterine perforation is high, as in this case, performing dilation and curettage in a surgical theater is preferable.

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Hitomi Futaki – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the

version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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## Guarantor of Submission

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## Consent Statement

Written informed consent was obtained from the patient for publication of this article.

## Conflict of Interest

Authors declare no conflict of interest.

## Data Availability

All relevant data are within the paper and its Supporting Information files.

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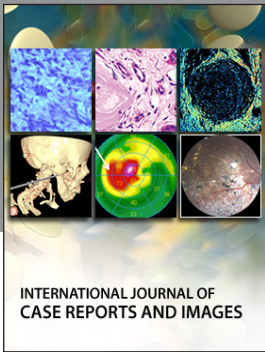
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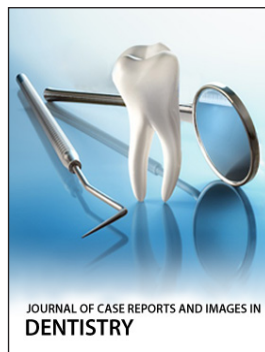
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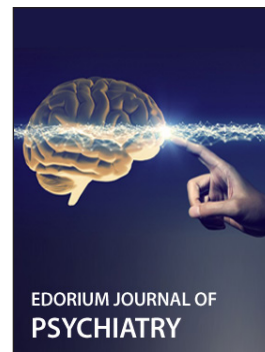
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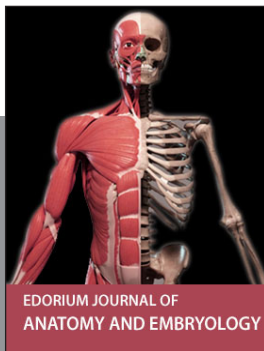
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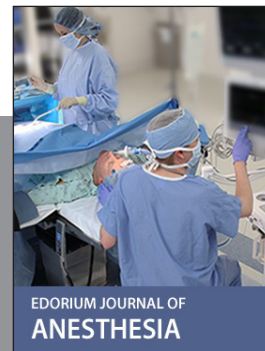
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