Caesarean Scar Ectopic Pregnancy: Discussion of 7 Cases with Literature Reviews

Yedi Olgu ile Sezaryen Skar Yeri Gebeliklerinin Literatür Eşliğinde Tartışılması

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ABSTRACT Objective: The aim of this study is to emphasize the importance of unsuspended treatment of the caesarean scar ectopic pregnancies diagnosed in early trimester and to remind once again that hysteroscopy can be the first option in such cases. It is intended to provide guidance in the selection of treatment method for the caesarean scar pregnancies terminated in early weeks. **Material and Methods:** Treatment options for seven patients who were admitted to "İstanbul Civilization University Obstetrics and Gynecology Department of Göztepe Training and Research Hospital" and diagnosed with caesarean scar pregnancies are discussed. **Results:** The duration of the pregnancies were 6 weeks, 8 weeks and 3 days. All of them were diagnosed by ultrasound examination. Due to diagnosis in early weeks, 5 patients' pregnancy materials were removed by hysteroscopy and being in late weeks of her pregnancy one patients' pregnancy materials were removed by laparotomy. Because of the hemorrhage ensuing the Dilatation/Curettage (D/C) procedure accompanied with ultrasound examination, one patients' scar tissue was removed by laparotomy. Then bilateral uterine and hypogastric artery ligation were performed on this patient due to severe hemorrhage. **Conclusion:** In caesarean scar pregnancies, terminating the pregnancy immediately by informing the patient will reduce the risk of maternal mortality and morbidity. As a result of diagnosis and treatment in the first trimester, none of the 7 patients mentioned here required hysterectomy.

Key Words: Pregnancy, ectopic; reproductive history; cesarean section

ÖZET Amaç: Bu çalışmada erken haftada sonlandırılan skar yeri gebeliklerinde uygulanacak tedavi seçiminde yol göstermesi planlanmıştır. Amacımız erken ilk trimestrda tanı konulmuş skar yeri gebeliklerinin tedavisinin geciktirilmeden yapılmasının önemini vurgulamak ve histereskopik tedavinin bu noktada ilk tercih olabileceğini bir kez daha hatırlatmaktır. **Gereç ve Yöntemler:** İstanbul Medeniyet Üniversitesi Göztepe Eğitim ve Araştırma Hastanesi Kadın Hastalıkları ve Doğum Kliniği'ne başvuran skar yeri gebeliği tanısı konulan 7 hastanın tedavi seçenekleri tartışıldı. **Bulgular:** Başvuran hastalar 6 hafta ve 8 hafta 3 günlük gestasyonel yaş arasındaydı. Yedi hastada da tanı ultrason muayenesinde konuldu. Erken haftalarda tanı konulması nedeniyle 5 hastanın tedavisi histeroskopi ile yapılırken, 1 hastanın ilk başvuru anındaki gebelik haftası ileri olması nedeniyle laparatomi ile gebelik materyalleri boşaltıldı. Bir hastada da ultrason eşliğinde Dilatasyon/Küretaj (D/C) ardından kanama olması nedeniyle laparatomi yapılarak sezaryen skar yeri çıkarıldı. Kanamanın devam etmesi üzerine bilateral uterin arter ve hipogastrik arter ligasyonu yapıldı. **Sonuç:** Sezaryen Skar yeri gebeliklerinde tanı konulur konulmaz hasta ile durum paylaşılarak gebeliğin sonlandırılması morbidite ve mortalitenin azaltılmasını sağlayacaktır. Burada sunulan 7 hastanın da ilk trimestrda tanıları konularak tedavi edilmeleri nedeniyle hiçbir hastada histerektomiye ihtiyaç duyulmadı.

Anahtar Kelimeler: Gebelik, ektopik; üreme öyküsü; sezaryen

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Caesarean scar pregnancy is an ectopic pregnancy embedded in the myometrium at the site of a previous caesarean section. Pathophysiologically the pregnancy material is implanted on the caesarean scar

through a microscopic canal in the myometrium. Other than this, the embryo's penetration to the microscopic dehiscent of the scar is responsible for the pathophysiology as well.[1] Reported incidence has increased over the last decade because of incresead rate of caeserean section ranging between 1:1800 and 1:2216 of all pregnancies.[2] Primarily ultrasonography (USG) with Doppler features is used for diagnosis. Especially color Doppler sonography provides an opportunity for evaluating the uteroplacental vascularization.[3] There is a severe risk of maternal mortality and morbidity in cases of late diagnosis due to severe hemorrhage. Bleeding is most likely a result of inability for efficient contraction of the myometrium and fibromuscular layer. With this study, it is intended to provide guidance on the timing and the course of treatment without increasing the risk of maternal mortality and morbidity.

MATERIAL AND METHODS

For easy understanding, all cases were presented in a table. Demographics of the patients, initial findings on application, operation throughout treatment, duration of hospitalization after treatment were presented comparatively (Table 1).

RESULTS

In this study seven patients who were diagnosed with ceasarean scar pregnancy were investigated. They were all diagnosed during the first trimester examination by anamnesis and USG. Also Doppler USG was used to support the diagnosis. Due to the size of intrauterine bleeding area magnetic resonance imaging (MRI) was used for one of the patients to confirm the diagnosis (Figures 1a,b).

As a result of diagnosis in the early first trimester, the patients were treated by minimally invasive methods. But laparotomy was preferred for the first patient due to diagnosis in the late first trimester and by reaching the uterus via the former incision line, the pregnancy materials of this patient were removed (Figure 1c). D/C procedure was performed on the 2nd patient. As a result of 800 cc hemorrhage in one hour ensuing the D/C procedure, laparotomy was performed on this patient. Then bilateral uterine and hypogastric artery ligation were performed due to severe hemorrhage. The operation was concluded successfully by suppressing the hemorrhage. Visual hysteroscopic resection was performed for the other patients. No serious complications were experienced during this process except the hemorrhage in one patient which was suppressed by an intrauterine tamponade.

Patients treated with laparotomy were discharged from the hospital at the second day while the patients treated with hysteroscopy were discharged at the first day.

DISCUSSION

During the last 20 years the increase in caesarean rates revealed a series of complications including caesarean scar pregnancy which has not been so common in the past. The approximately incidence is 1 out of 1800-2216 cesarean operations.[3] Caesarean scar pregnancy's ethiopathogenesis, incidence and prevalence are not clear yet.[4]

Lower segment expansion seen on the midline sagittal sonography is helpful for diagnosis on patients with a history of ceasarean delivery. The sensitivity of USG for diagnosing the defect after ceasarean is 86.4%.[5] We used ultrasonography in our cases primarily for diagnosis. In the first case the old hemorrhage regions complicated the screening with sonography, therefore we used MRI to confirm the diagnosis (Table 1, Figure 1). The irregular lesions were large in size, and the decision was that it was too late for a medical treatment and the lesion was too big for laparoscopy. Thus the decision to perform a laparotomy was made.

Five criteria should be shown by sonography:[6]

1. Empty uterus and empty cervical canal

2. The sac developing on the isthmic portion's anterior wall

3. Irregularity on the uterus anterior wall continuity shown by the sagittal plane of the uterus above the amniotic sac

4. Loss of normal myometrium between the bladder and the sac

TABLE 1: This table includes seven patient's demographic parameters, initial findings on application, operation throughout treatment and duration of hospitalization after treatment.

Case	Demographics	Presenting symptoms	Diagnosis	Surgical Prosedure	Post-op
1	40 y/o G4P2R/C1	11w4d referred to us	Abdominal USG: 8w gestational sac (GS) in the lower segment Doppler: increased blood flow on the anterior wall (Figure 1a) MRI: 6*5*4,5 cm lesion at the level of cesarean incision, bladder border were normal, endometrial and endocervical cavity were normal (Figure 1b)	Laparatomy was made, the part where the trophoblastic tissue invasion was excised (Figure 1c)	The patient was discharged on postoperative (PO) day 2
2	38 y/o G4P2A1	Referred to us for routine controlled	USG: 8 weeks of gestational age with fetal cardiac activity (Figure 2)	Dilatation & Curettage (D/C) under ultrasonographic screening was performed. A foley catheter was placed in the uterine cavity. 800 cc blood loss in an hour. Decided to laparotomy and the pregnancy material was evacuated. Because the hemorrhage continued, first bilateral uterine artery, then bilateral hypogastric artery ligations were performed.	The patient was discharged on PO day 2
3	33 y/o G3P2	β-Hcg: 11500 mIU/ml	USG: 6 weeks of GS expanding to the old scar (Figure 3a) Doppler: Showed an increase in blood flow on the lower segment compatible with old incision scar	The uterine cavity was explorated by hysteroscopy. The cervical canal was seen empty (Figure 3b). GS was explored on the lower segment anterior wall and that was resected and removed (Figure 3c)	The patient was discharged on PO day 1. Her first week follow up screening revealed that the endometrial cavity was thin, lineer and regular (Figure 3d).
4	31 y/o G3P1A1	β-Hcg: 11757 mIU/ml	USG: GS was observed on the uterine lower segment with increased vascularization on the anterior wall with doppler sonography (Figure 4). There was a 6 weeks old fetus with fetal cardiac activity.	When the cavity was explorated with hysteroscopy GS was observed on the old incision scar and resected.	The patient was discharged on PO day 1 to come back for follow ups
5	33 y/o G3P2	β-Hcg: 15287 mIU/ml	USG:The endometrial cavity was empty, 6 weeks old fetus with fetal cardiac activity was seen on the old scar line (Figure 5a) Doppler: The region compatible with myometrial cesarean scar defect had increased vascularization (Figure 5b)	The uterin cavity was seen empty (Figure 5c) Exploration with the hysterescope revealed the GS on the old scar line (Figure 5d). Fetoplacental structures were resected with the resectoscope (Figure 5e).	The patient was discharged on PO day 1. PO day 10 follow up there was a 15.6x9.9mm hematoma on the scar line and the patient had no active bleeding and the β-hCG value was decreasing, Therefore no additional intervention was planned (Figure 5f).
6	35 y/o G2P1	Referred to us from an external medical center.	USG: 8w3d old pregnancy according to USG. The placenta was on the anterior wall lower segment (Figure 6a). Doppler: Showed increased vascularization due to placentation on the cesarean scar site (Figure 6b)	After the hysteroscopic procedure D&C was performed under sonographic guidance because the patient had a bleeding. A foley catheter inserted in the cavity for tamponade (Figure 6c).	The tamponade was kept in traction and removed after 24 hours. On PO day 2 the patient was discharged from the hospital.
7	30 y/o G4P1A2	Referred to us after a positive pregnancy test was done for menstrual delay. β-Hcg: 13500 mIU/ml.	USG: The GS was seen on the lower uterine segment at the old incision scar (Figure 7a). Doppler: Revealed increased vascularization on the anterior wall (Figure 7b)	Hysteroscopic resection was planned for the early diagnosed patient	The patient was discharged on PO day 1. PO day 2 β-hCG value was 2657 mIU/ml.

GS: Gestational sac; PO: Post-operation; β-HCG: Beta-human choriogonadotrophin.

5. Low resistant high flow peritrophoblastic vascular flow surrounding the sac by Doppler sonography

40% of all patients have no pain and no bleeding at the time of diagnosis and also they are only present for routine examination.[7] However, no universal treatment guidelines or treatment of choice have been established. The treatment policy should be personalized to the patient with consideration of the pregnancy viability, gestational age, and future

FIGURE 1: Pictures of the 1st case **(a)** Doppler ultrasonography showing increased blood flow around the irregular structure located on the anterior wall of the uterine lower segment, **(b)** The MRI sagittal plane of the lower abdomen is shown. The uterine lower segment is irregularity on the anterior wall with anterior contiguity to the bladder, **(c)** Increased vascularization is observed under the serosa on the lower uterine segment.

family planning. Decision of methotrexate, laparoscopic resection, laparotomy, hysterescopy on treatment only depends on the patients clinical condition at the time of diagnosis. The radical procedure includes hysterectomy if the bleeding is out of control or the uterus is ruptured. The conservative procedure includes evacuation of gestation and repairment of the uterine defect by laparotomy or laparoscopy.

In defiance of talk about the succesfull treatment of systemic or local methotrexat treat in the literature review, we don't choose the medical treatment in our clinical department.[7] Therefore we didn't discuss the medical treatment options in this review.

In case 2 the patient had no additional medical condition and she had fertility desire and admission at early gestation week (Table 1, Figure 2). Dilatation & Curettage under ultrasonographic screening was performed. After that the bleeding was out of control and we decided to perform a laparotomy. A hysterotomy was performed on the cesarean scar. Because of the continuing hemorrhage, first bilateral uterine artery, then bilateral hypogastric artery ligations were performed.

The hysterescopic resection is the other conservative treatment. Hysterescopic resection's advantages are; it is a less invasive treatment, the lesion is removed visually and instantly suppressing minor bleedings. We usually use hysterescopic resection for early gestation termination in our clinic (Table 1, Figure 3-5). If the hemorrhage is out of control with hysterescopy, then laparatomy is preferred. If the hemorrhage is to be suppressed with tamponade, the foley catheter is

FIGURE 2: 2nd case's ultrasonic view shows GS located on the old incision scar of the lower uterine segment, fetal pole and yolc sac are seen with the fetal cardiac activity. GS: Gestation sac.

applied in the uterin cavity after the operation (Table 1, Figure 6).

In our view 'caesarean scar pregnancy' should be explained to the patient as a 'ectopic pregnancy'. What the patient might face if the pregnancy continues must be shared in a detailed manner. This sharing will also protect the communication between the physician and patient while medicolegal problems are confronted very often in today's conditions.

What to expect if the pregnancy continues? A publication gives an idea considering the circumstances in unterminated pregnancies. According to this publication, covering the conditions of 21 patients, delaying the termination of pregnancy to the second trimester increases emergency laparatomy and hysterectomy rates. It also states that after histopathologic examination for sticking region of trophoblastic tissues, sticking anomaly (placenta acreat) was monitored in all plasentas.[7]

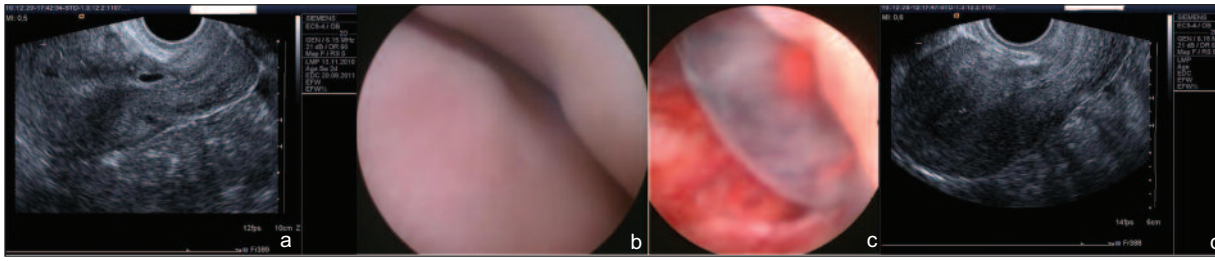

FIGURE 3: Ultrasonic and hysterescopic views of the 3rd case **(a)** 6 weeks old GS at the old cesarean scar line, **(b)** The cervical canal was seen empty at the beginnig of the surgery **(c)** The GS was seen with hysteroscopy in the lower segment of the entrance uterine cavity, **(d)** The endometrial cavity on the 7th day after hysteroscopy. GS: Gestation sac.

In a series of 11 patients, upon the arrival of last trimester of pregnancy is seen as; 7 of 11 patients diagnosed at the first trimester and the fetuses born after 30 weeks have elective caesarean section, also the other 4 have caesarean section cause of rupture and bleeding. After the caesarean sections total abdominal hysterectomy is implemented in all patients and acreat placenta monitored in all patients at histopathology.[8]

Termination of the pregnancy in the first trimester is complicated by substantial hemorrhage in 20% to 40% of cases, but the risk of hysterectomy is substantially lower. The hysterectomy rate in term pregnancy is 71% because of the increased risk of placenta previa/accreta and massive hemorrhage.[9,10]

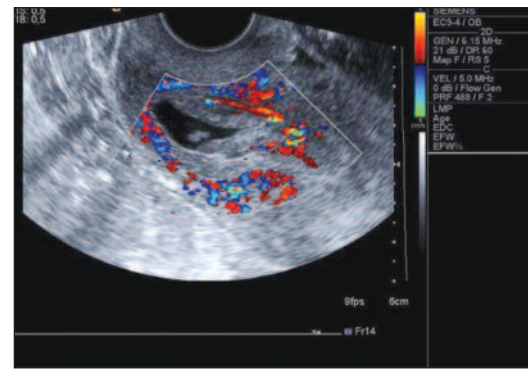

FIGURE 4: Fourth patient's initial ultrasonic view showed the lower segment of anterior wall has increased vascularization pattern that was compatible with placentation.

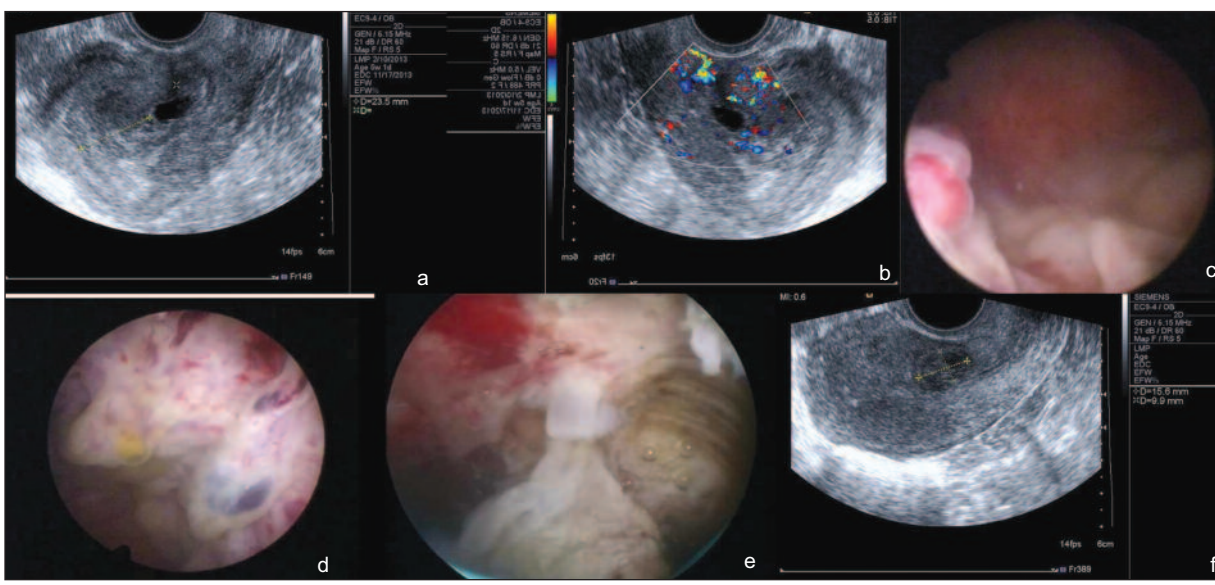

FIGURE 5: Ultrasonic and hysterescopic views of the 5th case; **a)** The endometrial cavity is empty whereas the fetoplacental unit was implanted on the cesarean scar, **b)** Doppler USG reveals increased vascularization on the placentation area, **c)** The cavity was seen empty with the hysteroscope, **d)** The increased vascularization on the old incision scar and GS was seen anterior wall **e)** Fetoplacental units resected with the hysteroscopic resectoscope, **f)** The endometrial line was 6.7mm and the hematoma that was 15.6x9.9 mm on the scar line at the PO 10th day follow up.
GS: Gestation sac; PO: Post-operation.

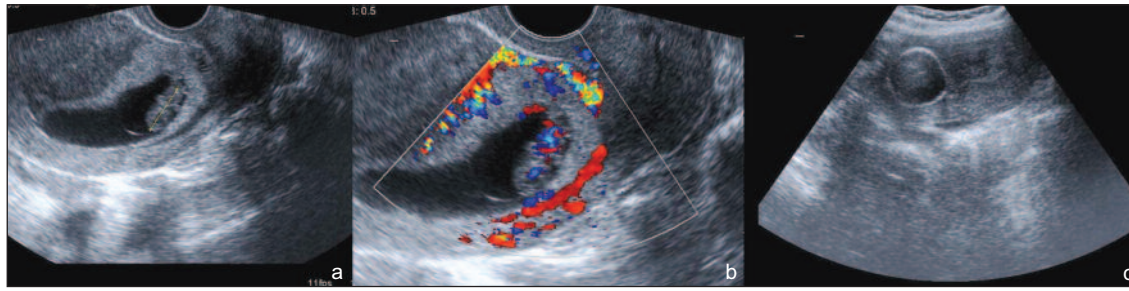

FIGURE 6: The initial and the post treatment ultrasonic views of the 6th case; **a)** The placenta was seen on the lower segment of the uterus, **b)** Increased vascularization on the placentation site, **c)** The tamponade inserted in the cavity was seen tamponading the scar region.

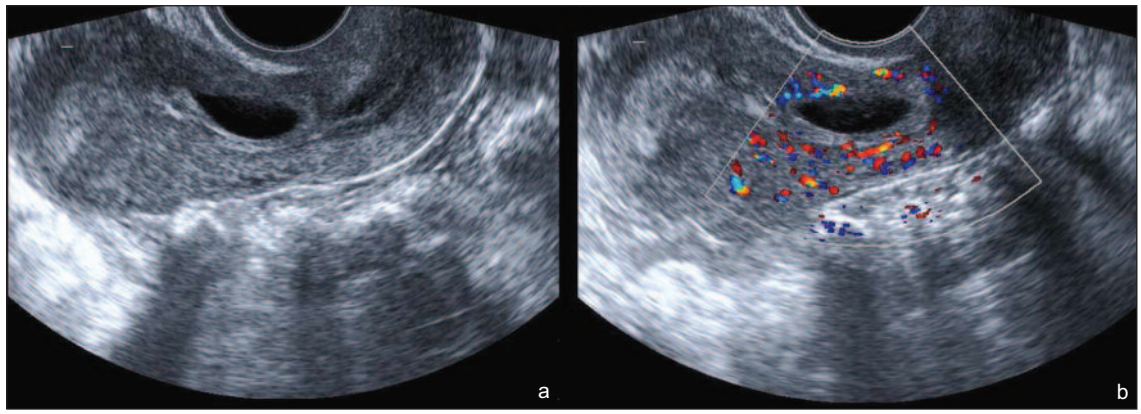

FIGURE 7: The ultrasonic views of the 7th case; **a)** GS was seen on the lower segment, **b)** Uterine lower segment of anterior wall's increased vascularization pattern. GS: Gestation sac.

CONCLUSION

In the light of these findings, detecting the actual place of pregnancy by USG at the first trimester examination is vital. When encountered with a low-lying GS, reproductive history of patient must be investigated. And for former caesarean patients detailed information must be supplied about caesarean scar pregnancy. And also termination choice should be offered. Executing the termination at the early weeks enhance the probability for achievement of minimally invasive methods. When it is executed at the later weeks, possibility of hysterectomy is increasing. Even a possible rupture also threatens pregnant's life when reaching to the end of the pregnancy. If the patient still insists to continue the pregnancy, monitoring the pregnancy should be performed in a tertiary care hospital which is open for 24-hours.

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