Successful Treatment of Cesarean Scar Pregnancy With Suction Curettage: Our Experiences in Early Pregnancy

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Background: Cesarean scar pregnancy is an ectopic pregnancy embedded in the myometrium of a cesarean scar. Several types of conservative treatment have been used to treat cesarean scar pregnancy, but no management protocol has been established for this rare, life-threatening condition. The purpose of this study was to evaluate the feasibility of suction curettage as a first-line treatment in early cesarean scar pregnancy.

Methods: During a 4-year period, 19 cases of cesarean scar pregnancy were diagnosed at Süleymaniye Maternity Hospital in Istanbul, Turkey. Suction curettage and Foley balloon tamponade were performed as a first-line treatment in 13 patients. Medical records and treatment results of the patients were evaluated.

Results: The mean maternal age was 32.5 years (range, 24-39 years). The mean gestational sac diameter was 13.65 mm (range, 7.6-27 mm), and mean endometrial thickness was 10.7 mm (range, 6.7-14.6 mm). A measurable fetal pole for crown-rump length was available for 6 (46.1%) patients. None of the fetuses had cardiac activity. Suction curettage under ultrasound guidance and Foley balloon tamponade were successful as the primary treatment in 13 of 13 patients. No major complications occurred during or after the procedure.

Conclusion: Our data suggest that surgical evacuation under ultrasound guidance with Foley balloon tamponade is a safe and successful treatment modality in carefully selected patients with early cesarean scar pregnancy.

Keywords: Cesarean section, pregnancy–ectopic, vacuum curettage

INTRODUCTION
Cesarean scar pregnancy is an ectopic pregnancy embedded in the myometrium of a cesarean scar. Ultrasound permits early and accurate diagnosis of cesarean scar pregnancy, allowing successful preservation of the uterus without causing maternal complications. The women at risk for cesarean scar pregnancy appear to be those with a history of placental pathology, ectopic pregnancy, multiple cesarean sections, and cesarean breech delivery. The incidence of cesarean scar pregnancy is estimated to be 1 in 800-2,500 women who have had a cesarean delivery. Because no management protocol has been accepted for this rare, life-threatening condition, each patient should be evaluated individually. Several types of conservative treatment have been used to treat cesarean scar pregnancy: dilation and curettage (D&C), excision of trophoblastic tissues, local or systemic administration of methotrexate, bilateral hypogastric artery ligation, and selective uterine artery embolization with curettage and/or methotrexate administration. We present our experience with 13 patients with early diagnosed cesarean scar pregnancy who were treated by suction curettage and Foley balloon tamponade.

METHODS
After receiving ethical approval, we evaluated the patients who had been diagnosed with early (<8 weeks) cesarean scar pregnancy between January 2009 and January 2013. The diagnosis of cesarean scar pregnancy was based on the following sonographic criteria: (1) empty uterus (Figure 1); (2) empty cervical canal; (3) anteriorly located gestational sac with a diminished myometrium layer between the bladder and the sac (Figure 1); and (4) discontinuity in the anterior uterine wall of the uterus on a sagittal view of the uterus after gestational sac (Figure 2).

Patients who were treated by suction curettage and Foley balloon tamponade primarily were included in the evaluation. Patients who received other local or systemic treatment modalities were excluded from the study. Informed consent was obtained from all patients before treatment. Transabdominal ultrasound-guided evacuations...
with a standard suction cannula (6-8 mm) were performed under general anesthesia. At the end of the curettage, the bladder was filled by 0.9% sodium chloride, a 16-22 Fr Foley balloon catheter was inserted into the cavity at the level of the implantation site, and the balloon was inflated with 50 mL of saline to decrease the chance of hematoma formation. The Foley catheter remained in the uterus for at least 24 hours. Successful treatment was defined as complete primary evacuation of the cesarean scar pregnancy.

Reproductive outcomes, menstrual periods, and recurrence of cesarean scar pregnancy were evaluated.

RESULTS
A total of 19 patients with cesarean scar pregnancy were conservatively treated between January 2009 and January 2013. The 13 patients who were treated by suction curettage and Foley balloon tamponade primarily were included in the study. Six patients who were treated with methotrexate therapy were excluded.

The mean maternal age was 32.5 years (range, 24-39 years). Four patients (30.8%) had undergone one cesarean section, 7 patients (53.8%) had undergone 2 cesarean sections, and 2 patients (15.4%) had undergone 3 or more cesarean sections. The gestational age according to the patients’ last menstrual period at diagnosis was 4 weeks and 5 days to 7 weeks and 6 days. The mean gestational sac diameter was 13.65 mm (range, 7.6-27 mm). The mean endometrial thickness was 10.7 mm (range, 6.7-14.6 mm). A measurable fetal pole for crown-rump length measurement was available in 6 (46.1%) patients. None of the fetuses had cardiac activity.

Clinical presentations were vaginal bleeding in 6 patients (46.1%), pain in 1 patient (7.7%), and asymptomatic with delay in menstrual bleeding in 6 patients (46.1%). Asymptomatic patients were diagnosed during the routine first trimester sonographic screening. Patient characteristics are provided in the Table.

Suction curettage under ultrasound guidance and Foley balloon tamponade were successful as the primary treatment in 13 of 13 patients. No major complications occurred during or after the curettage.

Ten of 13 patients were followed for 2 years after suction curettage. The remaining 3 patients were not available for follow-up. None of the 10 patients had any complaints or menstrual irregularity after suction curettage. Five of 10 (50%) patients became pregnant again. Two patients had term pregnancies, 1 patient had a 28-week preterm delivery, and 2 patients had abortions during the first trimester. None of the patients had a recurrent cesarean scar pregnancy during the follow-up period.

DISCUSSION
Larsen and Solomon reported the first patient with cesarean scar pregnancy in 1978.11 The number of patients with cesarean scar pregnancy reported in the literature has since increased from 18 in 2002 to 161 in 2007.12,13 Possible reasons for the increase are the rising rate of cesarean delivery and early diagnosis of cesarean scar pregnancy. Although the exact cause of cesarean scar pregnancy is still unknown, its occurrence may be linked to an existing scar defect or microscopic dehiscent tract generated between the cesarean scar and the endometrial canal.7

Sonography is the first-line diagnostic tool for cesarean scar pregnancy. Doppler imaging may serve as an additional technique to augment the diagnostic capabilities of transvaginal ultrasound. Doppler examination may reveal high-velocity, prominent, low-impedance blood flow surrounding an ectopic gestational sac, consistent with normal early pregnancy.14,15 In our study, all patients were diagnosed by the combination of transvaginal ultrasound and Doppler sonography.

As stated earlier, because of the rarity of cesarean scar pregnancy, no optimal therapy has been established. Published reports consist of a few cases with no agreement on a preferred treatment modality.16 A systematic review published in 2016 reported that D&C was a successful treatment for cesarean scar pregnancy in 62% of cases, but 7% of the patients who had a D&C required a hysterectomy.17 Therefore, the authors recommend avoiding D&C as a
first-line approach to treating cesarean scar pregnancy because D&C can be associated with bleeding and treatment procedures requiring general anesthesia, blood transfusion, and laparotomy. In addition, the authors noted that D&C as a first-line approach is associated with infertility and poor obstetric outcome, regardless of whether it is successful or not.17

Jurkovic et al performed D&C in 8 patients with cesarean scar pregnancy, but 3 patients had significant intraoperative hemorrhage.13 Of these 3 patients, one was initially misdiagnosed as an incomplete miscarriage, and a blind D&C was performed. Seow et al reported a similar experience in 1 of 2 patients treated with D&C for cesarean scar pregnancy.18 In some reports, massive bleeding with suction curettage in accurately diagnosed cases was associated with a bulging sac at the ultrasound examination.19,20 Sac bulging is the protrusion of the gestational sac that changes the outer uterine contour. Sac bulging may be a sign of deep sac implantation and may be a contraindication for suction curettage.

Successful results with suction curettage have been reported.21–23 In our study, 13 patients were primarily treated by suction curettage under ultrasound guidance and Foley balloon tamponade without any serious complications. The high success rate in our cases may be attributed to the careful selection of the patients and operative technique. Our patients were all at less than 8 weeks of gestation and had a 13.65-mm mean gestational sac diameter. None of the patients had bulging sac or cardiac activity. Recommending suction curettage as a first-line treatment in selected patients after careful ultrasound examination seems logical.

A metaanalysis published in 2018 reported that expectant management may be a reasonable option for cesarean scar pregnancy without cardiac activity, although in almost 30% of these cases, prompt treatment was required.24 We conclude that expectant management with a 70% success rate is not safe enough to make a recommendation.

CONCLUSION
Our data suggest that surgical evacuation under ultrasound guidance with Foley balloon tamponade is a safe and successful treatment modality in carefully selected patients with early cesarean scar pregnancy. Patients with cesarean scar pregnancy less than 8 weeks of gestation and without cardiac activity or a bulging sac may be good candidates for suction curettage. Noninvasive approaches are likely more appropriate for patients with cesarean scar pregnancies that are more than 8 weeks of gestation and have cardiac activity and a bulging sac. Prospective trials are needed to determine the optimal treatment of cesarean scar pregnancy.

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REFERENCES
1. Lai YM, Lee JD, Lee CL, Chen TC, Soong YK. An ectopic pregnancy embedded in the myometrium of a previous cesarean section scar. Acta Obstet Gynecol Scand. 1995 Aug; 74(7):573–576.
2. Herman A, Weinraub Z, Avrech O, Maymon R, Ron-El R, Bukovsky Y. Follow up and outcome of isthmic pregnancy located in a previous caesarean section scar. Br J Obstet Gynaecol. 1995 Oct;102(10):839–841.
3. Padovan P, Lauri F, Marchetti M. Intrauterine ectopic pregnancy. A case report. Clin Exp Obstet Gynecol. 1998;25(3):79–80.
4. Seow KM, Cheng WC, Chuang J, Lee C, Tsai YL, Hwang JL. Methotrexate for cesarean scar pregnancy after in vitro fertilization and embryo transfer. A case report. J Reprod Med. 2000 Sep;45(9):754–757.

### Table. Baseline Characteristics and Pregnancy Outcomes for Patients with Cesarean Scar Pregnancy Who Underwent Successful Suction Curettage

| Patient No. | Age | Gravidity and Parity | Gestational Age | Crown-Rump Length | Gestational Sac Diameter | Number of Prior Cesarean Deliveries | Future Pregnancy |
|-------------|-----|----------------------|-----------------|-------------------|--------------------------|------------------------------------|------------------|
| 1           | 27  | G4P2                 | 6W4D            | 17.0 mm           | 15.0 mm                  | 2                                  | Abortus          |
| 2           | 31  | G4P1                 | 6W5D            | 2.2 mm            | 8.3 mm                   | 1                                  | Term pregnancy  |
| 3           | 26  | G2P1                 | 7W6D            | 8.0 mm            | 7.8 mm                   | 1                                  | Term pregnancy  |
| 4           | 38  | G4P2                 | 5W4D            | Absent            | 14.0 mm                  | 2                                  | Abortus          |
| 5           | 24  | G3P1                 | 7W2D            | 11.5 mm           | 13.0 mm                  | 1                                  | No pregnancy    |
| 6           | 34  | G2P1                 | 7W2D            | 3.3 mm            | 11.7 mm                  | 1                                  | 28-week preterm delivery |
| 7           | 34  | G5P3                 | 6W6D            | NA                | 16.9 mm                  | 3                                  | No pregnancy    |
| 8           | 39  | G6P2                 | 7W4D            | NA                | 13.0 mm                  | 2                                  | Lost to follow-up |
| 9           | 32  | G3P2                 | 6W3D            | 6.0 mm            | 27.0 mm                  | 2                                  | Lost to follow-up |
| 10          | 35  | G3P2                 | 6W3D            | NA                | 10.2 mm                  | 2                                  | Lost to follow-up |
| 11          | 33  | G5P3                 | 7W1D            | NA                | 7.6 mm                   | 3                                  | No pregnancy    |
| 12          | 38  | G5P2                 | 7W6D            | NA                | 21.0 mm                  | 2                                  | No pregnancy    |
| 13          | 31  | G3P2                 | 4W5D            | NA                | 12.0 mm                  | 2                                  | No pregnancy    |

D, days; G, gravida; NA, not available; P, para; W, weeks.
5. Maymon R, Halperin R, Mendlovic S, Schneider D, Herman A. Ectopic pregnancies in a Caesarean scar: review of the medical approach to an iatrogenic complication. *Hum Reprod Update*. 2004 Nov-Dec;10(6):515-523.

6. Rotas MA, Haberman S, Levgor M. Cesarean scar ectopic pregnancies: etiology, diagnosis and management. *Obstet Gynecol*. 2006 Jun;107(6):1373-1381.

7. Godin PA, Bassil S, Donnez J. An ectopic pregnancy developing in a previous caesarian section scar. *Fertil Steril*. 1997 Feb;67(2):398-400.

8. Persadie RJ, Fortier A, Stopps RG. Ectopic pregnancy in a caesarean scar: a case report. *J Obstet Gynaecol Can*. 2005 Dec;27(12):1102-1106.

9. Sugawara J, Senoo M, Chisaka H, Yaegashi N, Okamura K. Successful conservative treatment of a cesarean scar pregnancy with uterine artery embolization. *Tohoku J Exp Med*. 2005 Jul;206(3):261-265.

10. Yang MJ, Jeng MH. Combination of transcervical embolization of uterine arteries and conservative surgical treatment for pregnancy in a cesarean section scar: A report of 3 cases. *J Reprod Med*. 2003 Mar;48(3):213-216.

11. Larsen JV, Solomon MH. Pregnancy in a uterine scar sacculus—an unusual cause of postabortal haemorrhage. A case report. *S Afr Med J*. 1978 Jan 28;53(4):142-143.

12. Jurkovic D, Hillaby K, Woelfer B, Lawrence A, Salim R, Elson CJ. First-trimester diagnosis and management of pregnancies implanted into the lower uterine segment cesarean section scar. *Ultrasound Obstet Gynecol*. 2003 Mar;21(3):220-227.

13. Jurkovic D. Caesarean section scar ectopic pregnancy: a new problem or new name for an old one? *Australas J Ultrasound Med*. 2009 Feb;12(1):22-23. doi: 10.1002/j.2205-0140.2009.tb0002.x.

14. Chen HY, Chen SJ, Hsieh FJ. Observation of cesarean section scar by transvaginal ultrasonography. *Ultrasound Med Biol*. 1990;16(5):443-447.

15. Vial Y, Petignat P, Hohlfeld P. Pregnancy in a cesarean scar. *Ultrasound Obstet Gynecol*. 2000 Nov;16(6):592-593.

16. Sadeghi H, Rutherford T, Rackow BW, et al. Cesarean scar ectopic pregnancy: case series and review of the literature. *Am J Perinatol*. 2010 Feb;27(2):111-120. doi: 10.1055/s-0029-1224874.

17. Kanat-Pektas M, Bodur S, Dundar O, Bakir VL. Systematic review: what is the best first-line approach for cesarean section ectopic pregnancy? *Taiwan J Obstet Gynecol*. 2016 Apr;55(2):263-269. doi: 10.1016/j.tjog.2015.03.009.

18. Seow KM, Huang LW, Lin YH, Lin MY, Tsai YL, Hwang JL. Cesarean scar pregnancy: issues in management. *Ultrasound Obstet Gynecol*. 2004 Mar;23(3):247-253.

19. Wang CB, Tseng CJ. Primary evacuation therapy for cesarean scar pregnancy: three new cases and review. *Ultrasound Obstet Gynecol*. 2006 Feb;27(2):222-226.

20. Ayoubi JM, Fanchin R, Meddoun M, Fernandez H, Pons JC. Conservative treatment of complicated cesarean scar pregnancy. *Acta Obstet Gynecol Scand*. 2001 May;80(5):469-470.

21. Fadhlaoui A, Khrouf M, Khémiri K, Nouira K, Chaker A, Zhioua F. Successful conservative treatment of a cesarean scar pregnancy with systemically administered methotrexate and subsequent dilatation and curettage: a case report. *Case Rep Obstet Gynecol*. 2012;2012:248564. doi: 10.1155/2012/248564.

22. Arslan M, Pata O, Dilek TU, Aktas A, Aban M, Dilek S. Treatment of viable cesarean scar ectopic pregnancy with suction curettage. *Int J Gynaecol Obstet*. 2005 May;89(2):163-166.

23. Bignardi T, Condous G. Transrectal ultrasound-guided surgical evacuation of cesarean scar ectopic pregnancy. *Ultrasound Obstet Gynecol*. 2010 Apr;35(4):481-485. doi: 10.1002/uog.7596.

24. Cali G, Timor-Tritsch IE, Palacios-Jaraquemada J, et al. Outcome of cesarean scar pregnancy managed expectantly: systematic review and meta-analysis. *Ultrasound Obstet Gynecol*. 2018 Feb;51(2):169-175. doi:10.1002/uog.17568.

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