VIDEO ARTICLE

DOI: 10.52054/FVVO.2024.13678
Facts Views Vis Obgyn 2025;17(1):90-93

Conservative management of caesarean scar pregnancy: tissue removal device hysteroscopic treatment after uterine artery embolisation

Emma Bonetti[1], Eleonora La Fera[2], Maria Vittoria Alesi[2], Silvia D'Ippolito[2,3], Antonio Lanzone[2,4], Giovanni Scambia[2,4], Ursula Catena[2]

[1]Department of Clinical and Experimental Sciences, University of Brescia, ASST Spedali Civili, Brescia, Italy
[2]Department of Woman and Child Health and Public Health, Fondazione Policlinico Universitario A Gemelli, IRCCS, Rome, Italy
[3]Dipartimento di Medicina e Scienze della Salute "Vincenzo Tiberio", University of Molise, Campobasso, Italy
[4]Università Cattolica del Sacro Cuore, Rome, Italy

ABSTRACT

Background: Caesarean scar pregnancy (CSP) is an uncommon complication in women with prior caesarean deliveries. Treatment options include both medical and surgical approaches, but there is no consensus on definitive management.

Objectives: We propose a step-by-step video demonstration of a conservative approach for CSP, using hysteroscopic treatment with tissue removal device (TRD) after uterine artery embolisation (UAE).

Participant: A 34-year-old woman with two previous caesarean deliveries was diagnosed with a CSP involving an 8-week embryo implanted in the isthmocele. Initial management consisted of UAE performed at another hospital. The patient was then referred to the Digital Hysteroscopic Clinic, CLASS Hysteroscopy of Policlinico Gemelli in Rome, for hysteroscopic removal of residual trophoblastic tissue.

Intervention: Safety and effectiveness of a novel conservative CSP management, involving TRD following UAE. Preoperative assessment, combining transvaginal ultrasound and diagnostic hysteroscopy, revealed trophoblastic remnants inside the uterine niche with an extremely thin myometrial margin. The procedure was performed under general anaesthesia, according to an ambulatory model of care. A TRD with a soft tissue blade was used for the complete removal of the lesion.

Conclusions: This video article suggests that TRD hysteroscopic treatment after UAE is a safe and effective approach for CSP. This conservative management minimises the risk of complications such as bleeding and uterine perforation. Additionally, the TRD avoids the use of electrosurgery, potentially reducing the incidence of subsequent intrauterine adhesions. Further studies are needed to confirm these results in the long term.

What is New? This is the first reported case of conservative CSP management combining UAE with hysteroscopic resection using a TRD.

Keywords: Caesarean scar pregnancy (CSP), uterine artery embolisation (UAE), tissue removal device (TRD), hysteroscopy

Introduction

Caesarean scar pregnancy (CSP) is a rare but potentially severe complication arising when an embryo is implanted within the uterine scar from previous caesarean deliveries. Its incidence ranges between 1/1008 and 1/2500 of all caesarean deliveries, with a higher risk among women with multiple caesarean births.[1] Left untreated, CSP can lead to severe

Corresponding Author: Emma Bonetti, MD, Department of Clinical and Experimental Sciences, University of Brescia, ASST Spedali Civili, Brescia, Italy
E-mail: emmabonetti@outlook.it **ORCID ID:** orcid.org/0009-0005-0836-5260
Received: 22.08.2024 **Accepted:** 14.12.2024 **Publication Date:** 28.03.2025

Cite this article as: Bonetti E, La Fera E, Alesi MV, D'Ippolito S, Lanzone A, Scambia G, et al. Conservative management of caesarean scar pregnancy: tissue removal device hysteroscopic treatment after uterine artery embolisation. Facts Views Vis Obgyn. 2025;17(1):90-93

complications such as placenta accreta, haemorrhage, uterine rupture, and even maternal death.[2] Currently, there is no consensus on a definitive management strategy for CSP. However, various medical and surgical approaches have been proposed. Hysteroscopy has emerged as a safe and effective treatment option. The first case of hysteroscopic resection of CSP was reported by Wang et al.[3] Following studies have confirmed the effectiveness of this procedure, often combined with complementary techniques such as methotrexate (MTX) injection, intrauterine balloon catheters, or uterine artery embolisation (UAE).[4] Recent advancements in hysteroscopic technology, including the tissue removal device (TRD), have shown promise in treating intrauterine pathologies.[5] Additionally, preoperative UAE has demonstrated efficacy in facilitating subsequent hysteroscopic resection.[6] This video article aims to describe a novel conservative CSP management involving TRD-assisted hysteroscopic resection of residual trophoblastic tissue after UAE. We present a step-by-step video demonstration with narrated video footage of this treatment strategy. We explore the potential advantages of this approach and highlight the need for further research to confirm its long-term impact on fertility.

Methods

A 34-year-old woman with a history of two previous caesarean deliveries was diagnosed with a CSP involving an 8-week embryo implanted in the anterior isthmic region of the scar site. First, the patient underwent UAE at another institution for termination of pregnancy. Bilateral selective catheterisation of the anterior branches of the hypogastric arteries and superselective catheterisation of the uterine arteries were performed. Then, the patient was referred to our Gynecology Department, at Policlinico Gemelli in Rome, to complete the treatment with the removal of residual trophoblastic tissue. The serum human chorionic gonadotropin (hCG) levels were monitored weekly until negative. The patient was scheduled for a conservative approach consisting of hysteroscopic surgery with TRD, performed by an expert surgeon. The procedure was planned four months after the UAE to allow for hCG levels to normalise and to coordinate the preoperative workup. Informed consent was obtained.

Results

We performed the procedure at our Digital Hysteroscopic Clinic, CLASS Hysteroscopy of Policlinico Gemelli of Rome. The procedure was conducted under general anaesthesia with a laryngeal mask, according to an ambulatory model of care.[7] A combined preoperative evaluation, including transvaginal ultrasound (TV-US) and diagnostic hysteroscopy, revealed a 26x29x30 mm avascular trophoblastic remnant within the isthmocele. Both the tissue and the isthmocele predominantly involved the right side of the anterior isthmic region. The free myometrial margin measured 1.9 mm. The uterine cavity was significantly left laterodeviated and retroflexed, despite the cervical canal and the isthmic region. Furthermore, minimal residual trophoblastic tissue was also detected in the uterine cavity. The TRD (Truclear Elite Mini, Medtronic) equipped with a soft tissue blade, was used for hysteroscopic resection of the tissue. The removal of the tissue in the niche was carefully performed. The blunt tip of the shaver prevented damage to the apex of the niche, where the myometrial scar thickness was very thin. Using TRD, the intrauterine residual tissue was completely removed as well. The entire procedure lasted 15 minutes and achieved complete removal of the tissue without requiring cervical dilation. The TV-US assessment, performed immediately after hysteroscopy, using saline solution as contrast agent, confirmed the myometrial residual margin of 1.9 mm. The patient was discharged in optimal condition three hours later. No complications occurred during or after the procedure. A follow-up outpatient hysteroscopy, performed three months after the hysteroscopic treatment, revealed no trophoblastic remnants. Six months later, a TV-US demonstrated a normal uterine cavity with an empty isthmocele. The patient reported regular menstrual cycles and no further pregnancy-related symptoms.

Discussion

CSP is a rare but potentially life-threatening obstetric complication requiring prompt and effective intervention. The treatment goal is to manage this condition while preserving fertility. Non-surgical options may include local and systemic MTX or UAE. Surgical treatment options may involve laparoscopy, laparotomy, hysteroscopy, curettage or gestational sac suction evacuation.[8] MTX provides a non-invasive, relatively low-cost treatment for patients who wish to preserve fertility, but it has been associated with a 57% failure rate and a complication rate of 62.1%.[9] UAE in combination with other treatment modalities, such as hysteroscopy, has been found to be efficacious with high success rates and low complication rates.[10,11] Preoperative selective UAE induces ischemic necrosis

by hindering blood supply to the gestational sac and surrounding tissue, facilitating subsequent hysteroscopic resection and reducing the bleeding risk during surgery.[6] Notably, successful pregnancies after this procedure have been well documented, without significant morbidity or mortality.[12,13] In 2021, Sorrentino et al.[14] proposed a new combined UAE - hysteroscopic diode laser surgery for CSP treatment in an office setting, with minimal patient discomfort and optimal recovery time. Our hysteroscopic procedure employed TRD, a mechanical instrument enabling simultaneous cutting and removal of tissue from the uterine cavity. To our knowledge, this is the first reported case of TRD hysteroscopic treatment following UAE for conservative CSP management. TRD allows for precise visualisation and targeted removal of trophoblastic remnants without damaging the healthy endometrium, thereby reducing the risk of subsequent intrauterine adhesions. Performing the procedure under direct vision with a blunt shaver helps to prevent potential complications such as perforation and intra- or post-operative bleeding. The absence of electrosurgery, used with traditional resectoscopes, avoids thermal injuries. Indeed, electrocoagulation should be used cautiously in this condition to prevent bladder trauma and subsequent dehiscence. Additionally, TRD reduces the risk of intrauterine adhesions, preserving potential future fertility.[5] Moreover, this hysteroscopic procedure offers short recovery times. Casadio et al.[15] proposed a conservative CSP management strategy involving TRD hysteroscopic resection. In their approach, the procedure, following a hysteroscopic MTX injection into the gestational sac and surrounding myometrial tissue, was performed in an outpatient setting without reported complications. This video article suggests that TRD hysteroscopic treatment following UAE is a safe and effective approach for conservative CSP management, reduces the risk of early complications, such as bleeding and uterine perforation, and late complications, such as intrauterine adhesions. Our combined approach can significantly improve long-term fertility outcomes for women with CSP who desire subsequent pregnancies. By reducing the risk of intrauterine adhesions and other complications, our technique may enhance the likelihood of successful pregnancies. Our study limitations include its single-case design, hindering generalisation of findings, and the absence of long-term follow-up data. Another limitation of our procedure could be the risk of recurrent CSP, as the isthmocele was not excised.

Conclusion

The use of TRD for precise removal of trophoblastic remnants after UAE offers an effective strategy for conservative CSP management, preserving the uterine structure and the woman reproductive potential. Further research is warranted to confirm the long-term safety and efficacy of this technique and to establish its place in the management of CSP.

Ethics

Informed Consent: Informed consent was obtained.

Acknowledgments: None.

Footnotes

Authorship Contributions

Surgical and Medical Practices: U.C., Concept: U.C., G.S., A.L., Design: U.C., G.S., A.L., Data Collection or Processing: E.B., E.L.F., M.V.A., S.D., Analysis or Interpretation: E.B., Literature Search: E.B., E.L.F., M.V.A., S.D., Writing: E.B., U.C.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Giampaolino P, De Rosa N, Morra I, Bertrando A, Di Spiezio Sardo A, Zizolfi B, et al. Management of Cesarean scar pregnancy: a single-institution retrospective review. Biomed Res Int. 2018;2018:6486407.
2. Gonzalez N, Tulandi T. Cesarean scar pregnancy: a systematic review. J Minim Invasive Gynecol. 2017;24:731-8.
3. Wang CJ, Yuen LT, Chao AS, Lee CL, Yen CF, Soong YK. Caesarean scar pregnancy successfully treated by operative hysteroscopy and suction curettage. BJOG. 2005;112:839-40.
4. Diakosavvas M, Kathopoulis N, Angelou K, Chatzipapas I, Zacharakis D, Kypriotis K, et al. Hysteroscopic treatment of cesarean scar pregnancy: a systematic review. Eur J Obstet Gynecol Reprod Biol. 2022;270:42-9.
5. Franchini M, Ceci O, Casadio P, Carugno J, Giarrè G, Gubbini G, et al. Mechanical hysteroscopic tissue removal or hysteroscopic morcellator: understanding the past to predict the future. A narrative review. Facts Views Vis Obgyn. 2021;13:193-201.
6. Marchand GJ, Masoud AT, Coriell C, Ulibarri H, Parise J, Arroyo A, et al. Treatment of cesarean scar ectopic pregnancy in China with uterine artery embolization-a systematic review and meta-analysis. J Clin Med. 2022;11:7393.
7. Carugno J, Grimbizis G, Franchini M, Alonso L, Bradley L, Campo R, et al. International Consensus Statement for recommended terminology describing hysteroscopic procedures. Facts Views Vis Obgyn. 2021;13:287-94.
8. Alameddine S, Lucidi A, Jurkovic D, Timor Tritsch I, Coutinho CM, Ranucci L, et al. Treatments for cesarean scar pregnancy: a systematic review and meta-analysis. J Matern Fetal Neonatal Med. 2024;37:2327569.
9. Hameed MSS, Wright A, Chern BSM. Cesarean scar pregnancy: current understanding and treatment including role of minimally invasive surgical techniques. Gynecol Minim Invasive Ther. 2023;12:64-71.

10. Birch Petersen K, Hoffmann E, Rifbjerg Larsen C, Svarre Nielsen H. Cesarean scar pregnancy: a systematic review of treatment studies. Fertil Steril. 2016;105:958-67.

11. Cao L, Qian Z, Huang L. Comparison of D&C and hysteroscopy after UAE in the treatment of cesarean scar pregnancy: a case-control study. Medicine (Baltimore). 2022;101:28607.

12. Bonduki CE, Feldner PC Jr, Silva Jd, Castro RA, Sartori MG, Girão MJ. Pregnancy after uterine arterial embolization. Clinics (Sao Paulo). 2011;66:807-10.

13. Keung JJ, Spies JB, Caridi TM. Uterine artery embolization: a review of current concepts. Best Pract Res Clin Obstet Gynaecol. 2018;46:66-73.

14. Sorrentino F, De Feo V, Stabile G, Tinelli R, D'Alterio MN, Ricci G, et al. Cesarean scar pregnancy treated by artery embolization combined with diode laser: a novel approach for a rare disease. Medicina (Kaunas). 2021;57:411.

15. Casadio P, Ambrosio M, Verrelli L, Salucci P, Arena A, Seracchioli R. Conservative cesarean scar pregnancy treatment: local methotrexate injection followed by hysteroscopic removal with hysteroscopic tissue removal system. Fertil Steril. 2021;116:1417-9.

Video 1. https://vimeo.com/1020989980/850d0d60ef?share=copy