Case Report

# Successful Management of Cervical Ectopic Pregnancy: A Multidisciplinary Approach Utilising Uterine Artery Embolisation and Hysteroscopic Resection

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**Abstract**

Cervical ectopic pregnancy (CEP) is a rare and challenging condition that requires prompt management to prevent complications. We present a case of a 27-year-old woman with a history of prior uterine surgeries who presented with vaginal spotting. Ultrasonography revealed an empty uterine cavity and a growing gestational sac with a viable foetus in the cervical canal. Despite methotrexate therapy, her beta-human chorionic gonadotropin hCG levels continued to rise, necessitating an alternative treatment approach. Bilateral uterine artery embolisation (UAE) was performed to reduce the risk of haemorrhage before hysteroscopic resection of the pregnancy. The combined approach of UAE and hysteroscopic resection successfully managed the CEP, leading to a favourable outcome. This case highlights the importance of early detection, tailored interventions and multidisciplinary collaboration in the management of CEP. UAE, in conjunction with hysteroscopic resection, offers a promising treatment option for CEP, minimising complications and preserving reproductive health.

**Keywords:** *Ectopic cervical pregnancy, hysteroscopy, methotrexate therapy, uterine artery embolisation*

## Introduction

Cervical ectopic pregnancy (CEP) is characterised by the implantation of trophoblastic tissue along the lining of the endocervical canal, accounting for <1% of ectopic pregnancies.[1] The most common presentation is painless vaginal bleeding in early pregnancy.[2] Ultrasound is the tool of choice for diagnosing CEP. Ultrasound features diagnostic of cervical pregnancy are a dilated cervical canal containing the gestational sac and ample peripheral flow on Doppler, closed internal os with partially opened external os, empty endometrial cavity and absent sliding sign.[3] Early diagnosis and treatment are essential given the associated risk of severe haemorrhage. Although many treatment options are available, the most appropriate remains unclear. This case highlights the successful management of CEP after failed methotrexate therapy with combined uterine artery embolisation (UAE) and hysteroscopic removal of the products of conception.

## Case Report

A 27-year-old woman, G5 P2 + 0 + 2 + 2, sought medical attention at 7 weeks and 6 days of gestation due to two episodes of vaginal spotting. This patient's obstetric history included two induced abortions and one hysterotomy for congenital defects detected in the foetuses. In addition, she had undergone two lower uterine segment caesarean sections.

On conducting a speculum examination, it was observed that the external os was closed, and no active bleeding was evident. The further sonographic evaluation revealed

**Received:** 17-09-2023 **Revised:** 22-10-2023
**Accepted:** 26-11-2023 **Published:** 29-12-2023

Access this article online

Quick Response Code:

Website: www.jhrsonline.org

DOI: 10.4103/jhrs.jhrs_119_23

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**How to cite this article:** Jha S, Jafeesha B. Successful management of cervical ectopic pregnancy: A multidisciplinary approach utilising uterine artery embolisation and hysteroscopic resection. J Hum Reprod Sci 2023;16:358-61.

an empty uterine cavity, along with the presence of a gestational sac containing a growing foetus measuring 5.2 mm in crown–rump length (CRL), corresponding to 6 weeks and 1 day. Notably, the gestational sac was located within the cervical canal below the level of the internal os, and cardiac activity was visualised. The absence of the sliding sign raised suspicion of CEP, as depicted in Figure 1a.

The patient's initial beta-human chorionic gonadotropin (hCG) level was measured at 33,412 mIU/mL, while the remaining blood investigations yielded normal results. Considering the potential complications associated with cervical pregnancy, the patient opted for pregnancy termination. An alternate-day methotrexate regimen was initiated, with a subsequent beta-hCG level of 43,392 mIU/mL recorded on the 4th day. Repeat sonography on the 4th day revealed a growing foetus with a CRL of 6.5 mm, corresponding to 6 weeks and 6 days [Figure 1b]. Remarkably, the beta-hCG level further increased to 60,430 mIU/mL on the 8th day. A repeat sonographic examination on the following day indicated the presence of a live foetus with good peripheral vascularity.

In light of persistent foetal cardiac activity and an upward trend in beta-hCG levels, medical management was deemed ineffective. Given the high vascularity of the gestational sac, as determined by the Doppler study, we devised a plan to perform bilateral UAE before hysteroscopic removal of the products of conception. This strategy aimed to mitigate the risk of severe haemorrhage. The UAE procedure was successfully executed using a femoral artery approach, and complete devascularisation was achieved using a 20% lipiodol-n-butyl-2-cyanoacrylate mixture [Figure 2a and b]. Subsequently, hysteroscopic removal of the conceptus was performed, during which minimal bleeding was noted [Figure 3a and b]. The post-operative period transpired without any complications, and the patient was discharged on the 3rd post-operative day, with instructions for weekly beta-hCG follow-up. Notably, her beta-hCG levels returned to normal on the 21st post-operative day. During a follow-up visit 3 months after UAE, the patient remained asymptomatic and resumed her normal menstruation.

## Discussion

Accounting for a mere 0.1%–1% of all ectopic pregnancies, CEP occurs in approximately 1 in 10,000–1 in 18,000 pregnancies, making it an exceptionally rare occurrence within the obstetric realm.[1] Our understanding of the precise pathophysiological mechanisms underlying this condition remains limited. Nonetheless, a number of risk factors have been postulated, including prior uterine surgery, intrauterine device usage, anatomical uterine

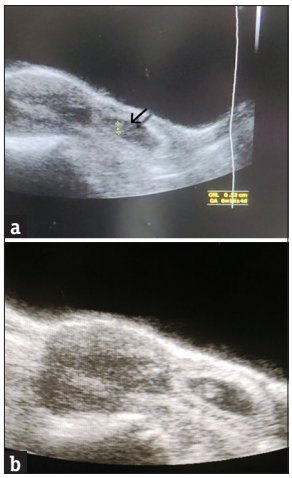


**Figure 1:** (a) Transabdominal ultrasound image showing hyperechoic ring of the gestational sac and foetal pole (marked with arrow). (b) Transabdominal ultrasound image on day 4 of methotrexate, showing the gestational sac and foetal pole

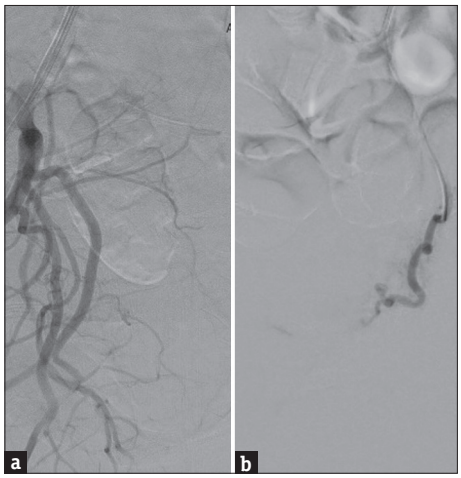


**Figure 2:** (a) Super selective angiography images showing the bilateral internal iliac arteries. (b) Angiographic image post-embolisation

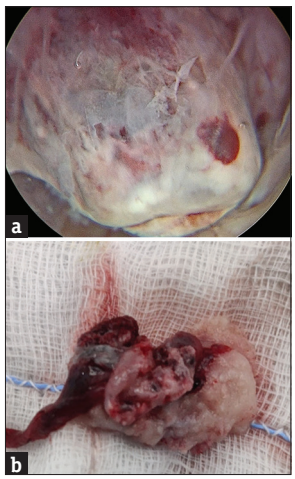


**Figure 3:** (a) Hysteroscopic image of the gestational sac. (b) Post-operative specimen showing the products of conception

anomalies, *in vitro* fertilisation (IVF) and smoking.[4] Recent studies have implicated IVF as a contributing factor to the increased risk of cervical pregnancy, with the aetiology potentially rooted in the rapid transportation of the fertilised ovum into the endocervical canal, facilitated by an unreceptive endometrium.[5] In the current case, it is noteworthy that previous uterine surgery emerged as the contributing factor leading to the development of CEP. The hallmark presentation of painless vaginal bleeding following a period of amenorrhoea aligns with the most common clinical manifestation of CEP.[6] Our patient similarly presented with vaginal spotting, raising suspicion for this rare condition.

Ultrasound imaging assumes a pivotal role in identifying and confirming CEP. Ushakov *et al*., in their comprehensive review encompassing 117 cases of cervical pregnancy, underscored the remarkable contribution of sonography, elevating the pre-treatment diagnostic accuracy to 81.8%.[7] The following sonographic features are suggestive of CEP: empty uterine cavity or thickened endometrium, distended and/or enlarged cervix, gestational sac or placental tissue below the level of the internal os, negative 'sliding organs sign (when pressure is applied to the cervix using the probe, the gestational sac does not slide against the endocervical canal if a pregnancy is implanted in the endocervix)' and high peritrophoblastic vascularity on Doppler examination (peak velocity >20 cm/s and pulsatility index <1.0).[6] However, it is imperative to discern CEP from other differential diagnoses, such as incomplete or inevitable abortion and caesarean scar ectopic pregnancy. In cases of inevitable abortion, the internal os typically remains open, and a positive sliding sign may be observed. Conversely, caesarean scar ectopic pregnancies manifest with gestational sac implantation above the internal os at the site of the scar. Precise differentiation between these conditions is crucial for guiding appropriate management decisions. In the present case, sonographic features were suggestive of CEP.

The management of CEP necessitates careful consideration of the patient's haemodynamic stability and future fertility desires. In cases, where the patient is haemodynamically stable and wishes to preserve fertility, medical management emerges as the preferred approach. However, in instances of uncontrolled haemorrhage, alternative interventions such as cervical cerclage, balloon tamponade, angiographic embolisation, uterine artery ligation or even hysterectomy may be necessary. Medical management options encompass a range of interventions tailored to the specific clinical scenario. These include systemic or local administration of methotrexate, potassium chloride, local vasopressin injection, local or systemic prostaglandins, systemic mifepristone and intrauterine irrigation with 3.5% $H_2O_2$.[3]

The presence of cardiac activity and higher serum beta-hCG levels serve as predictive factors for the failure of methotrexate therapy in CEP cases.[8] This observation underscores the importance of considering alternative interventions when managing such patients. Historically, UAE has been employed to control bleeding associated with caesarean scar pregnancies.[2,9] In the context of CEP, the combination of UAE with surgical evacuation assumes significance due to the potential risk of haemorrhage from retained gestational tissue if not adequately removed following UAE. While there are no established criteria for the use of UAE in CEP, Zakaria *et al*. proposed specific indications for its utilisation, including initial beta-hCG values exceeding 34,000 mIU/mL and failed methotrexate therapy.[8] In the present case, the patient exhibited an initial high beta-hCG level exceeding 34,000 mIU/mL, along with persistent peri-trophoblastic vascularity despite undergoing methotrexate therapy. These findings, taken together, warranted the consideration of UAE as part of her management plan. Hysteroscopic resection of the CEP emerged as a favourable alternative to dilation and evacuation procedures as this offers several advantages, including direct visualisation of the uterocervical cavity and minimal associated complications.[3] The incorporation of UAE in the treatment of CEP is particularly advantageous as this reduces blood loss during the subsequent evacuation procedure. Thus, the combined approach of UAE and hysteroscopic resection of the pregnancy proved successful in managing the present case.

To conclude, this case highlights the importance of early detection and timely intervention in managing cervical ectopic pregnancies with failed methotrexate therapy. Bilateral UAE before the surgical evacuation of pregnancy was a key element of the treatment strategy. The combined approach of UAE and hysteroscopic resection proved effective, highlighting the value of a multidisciplinary and individualised approach.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published, and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

## Author's contribution

Conceptualisation, data analysis and revision had been done by SJ. Data collection and manuscript drafting were done by JB. Both authors have read and approved the final version of the manuscript.


## Acknowledgement

we acknowledge the effort of our radiologist for performing uterine artery embolisation.

## Financial support and sponsorship

Nil.


## Conflicts of interest

There are no conflicts of interest.

## Data Availability Statement

Data will be available from corresponding author upon reasonable request.

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