

# Successful transvaginal aspiration of interstitial pregnancy after failed methotrexate treatment

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## Summary

Interstitial pregnancy is an uncommon condition that is challenging, not only in making an accurate diagnosis, but also in the choice of treatment. Systemic methotrexate (MTX) treatment has been favored to prevent scarring of the uterus. Nevertheless, surgery is generally indicated when this treatment fails. Transvaginal aspiration of the gestational tissue has been proposed as an alternative to surgery. The authors present a case of interstitial pregnancy in which the patient failed to respond to multidose MTX treatment and was successfully treated with transvaginal sonography-guided transvaginal aspiration of the gestational tissue, thereby bypassing the risk associated with undergoing major surgery. Transvaginal aspiration of conceptive tissue may be a novel treatment for patients with unruptured interstitial pregnancy.

**Key words:** Transvaginal aspiration; Interstitial pregnancy.

## Introduction

Because of the trend of women postponing child-bearing until an advanced age and the increasing incidence of pelvic inflammatory disease, the need for artificial reproductive technology is inevitable [1]. Ectopic pregnancy is a complication of in vitro fertilization and embryo transfer [2]. The incidence of interstitial pregnancy, a rare and life-threatening condition, is rising, accounting for 2%–4% of tubal pregnancies [3]. Because of the rich vasculature of the implantation site, accentuated by anastomosis of the uterine and the ovarian arteries in this region [4], rupture can lead to a life-threatening hemorrhage. Recently, early use of transvaginal sonography prompted interstitial pregnancy to be diagnosed before a rupture occurred, enabling conservative treatment. Both surgical intervention and conservative treatment with methotrexate (MTX) are considered effective choices for treating interstitial pregnancy [5]. Although the success rate of systemic MTX therapy of interstitial pregnancy was reported at 94% (including cases with fetal heart beat activity) [6], interstitial pregnancy may be more difficult to treat with MTX secondary to deep implantation and protection by the myometrium [7] compared with other types of tubal gestation. If systemic MTX treatment fails, then surgical intervention is generally adopted as a rescue method.

Conservative treatment prevents surgical scarring of the uterus, which can compromise future fertility, and the risks associated with surgery. Interstitial pregnancy following failed systemic MTX treatment in infertile woman poses a

clinical dilemma because surgery may cause uterine scarring and disrupt the uterine architecture. The authors present a case of a 30-year-old nulliparous woman who became pregnant after embryo transfer. The woman presented with interstitial pregnancy and failed to respond to multidose MTX treatment. To preserve the entirety of the uterus, a needle was used to aspirate the contents of the gestational tissue under the guidance of transvaginal sonography. Early interstitial pregnancy was rescued after failed systemic MTX management. Based on the present authors' research, this is the first report of this approach to treatment of interstitial pregnancy.

## Case Report

The woman was a patient at the present infertility clinic with primary infertility for four years because of tubal factors. She received laparoscopic bilateral salpingectomy because of bilateral hydrosalpinx and was enrolled in the authors' in vitro fertilization program. Controlled ovarian stimulation was initiated with multidose gonadotropin releasing hormone antagonist protocol, and eight oocytes were retrieved. Three four-cell stage embryos were transferred into the uterine cavity two days after oocyte retrieval. A pregnancy test was positive 14 days after embryo transfer. At 5<sup>+</sup>4 weeks' gestation, transvaginal sonography revealed an absence of an intrauterine gestational sac, while the serum  $\beta$ -human chorionic gonadotropin (hCG) level was 2,008 mIU/ml. One week later, transvaginal ultrasound revealed an empty uterine cavity and an eccentric gestational sac located at the interstitial site. The  $\beta$ -hCG level was 10,825 mIU/ml. The patient reported no discomfort such as lower abdominal pain or vaginal bleeding. A tentative diagnosis of interstitial pregnancy was made. Because of the he-

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Figure 1. — Empty uterine cavity with a six-mm live fetus over the interstitial site.

modynamically stable status of the patient, conservative multi-dose systemic MTX treatment was applied. After three doses of MTX, transvaginal ultrasound revealed a live fetus with a crown-rump length of six mm (Figure 1). The  $\beta$ -hCG level was 19,714 mIU/ml. Furthermore, the patient experienced MTX-related side effects including nausea, vomiting, and dizziness.

The patient and her partner were informed that MTX treatment of the interstitial pregnancy had failed, and they were counseled regarding other options for this pregnancy, including surgical cornual resection and needle aspiration. To preserve the uterine architecture, the patient chose to undergo needle aspiration. Under the guidance of transvaginal ultrasound, a 16-gauge needle was introduced into the interstitial gestational sac through the vaginal fornix. The tissue was aspirated and the sac disrupted. The patient tolerated the procedure well and was discharged on the same day.

One week after the procedure, the serum  $\beta$ -hCG level dropped to 8,997 mIU/ml, and ultrasound revealed an echocomplex mass measuring approximately  $2.4 \times 3.0$  cm over the interstitial site. The  $\beta$ -hCG level reduced to 4.76 mIU/ml 63 days after needle aspiration of the interstitial gestational sac, and the echocomplex mass gradually decreased in size and completely resolved five months later. The patient's recovery course was uneventful during the follow-up period.

## Discussion

Previous studies have described successful systemic medical treatment for interstitial pregnancy with extremely elevated  $\beta$ -hCG [6, 8]. Various regimens of systemic MTX have been proposed with an equivalent success rate. Dilbaz *et al.* reported three cases of cornual pregnancy successfully treated with a single-dose MTX injection [9]. However, Barnhart *et al.* showed that although a single-dose protocol is simpler than a multidose regimen, it is associated with a higher failure rate and is less effective [10]. Because of the possibility of catastrophic outcomes

associated with failed medical management, surgery remains the standard treatment [11], and for patients who fail to respond to conservative management, surgery is generally performed for rescue.

Local injection of MTX or KCl under transvaginal sonogram guidance in cases of interstitial pregnancy, including one case of failed systemic MTX treatment, have proven to be equally effective compared with traditional conservative management [5, 12]. Successful dilatation and evacuation under laparoscopy guidance with postoperative MTX rejection have also been reported [11]. Cai *et al.* proposed treating interstitial pregnancy with transcervical suction under laparoscopic and hysteroscopic guidance [13]. Hysteroscopic removal of cornual pregnancy has also been reported [14]. The transcervical approach appears to be promising, but the major drawback is the potential for uterine perforation.

Oyawoye *et al.* described the successful aspiration of a gestational sac under transvaginal ultrasound guidance and instillation of a small dose (12.5 mg) of MTX in managing a cornual heterotopic pregnancy [15]. Prorocic *et al.* also treated a cornual heterotopic pregnancy by transvaginal ultrasound-guided aspiration and instillation of a NaCl solution into the cornual sac. The cornual pregnancy was aborted and the intrauterine pregnancy resulted in a full-term healthy newborn [16]. Wang *et al.* successfully managed five cases of interstitial heterotopic pregnancy by transvaginal ultrasound-guided local aspiration and instillation of hyperosmolar glucose [17]. Without additional local injection of MTX or other hyperosmolar solutions, our case was managed solely by transvaginal ultrasound-guided aspiration.

Interstitial pregnancy warrants accurate diagnosis and immediate treatment. Transvaginal aspiration could be an option for patients who wish to bypass major surgery and the side effects of MTX treatment.

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