

Successful Management of Tubal Ectopic Pregnancy with Transvaginal Sonography Guided Intracardiac KCl Injection and Systemic Methotrexate – A Case Report

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ABSTRACT

Background: Methotrexate (Mtx) is an accepted modality for conservative treatment of ectopic pregnancy. However, there is no consensus regarding its use in live ectopic pregnancy and high serum beta-human chorionic gonadotrophin (β -hCG) titres. Concurrent use of intra-sac hypertonic KCl, to produce cardiac asystole with systemic Mtx potentially improve outcome in live ectopic gestations with very high serum β -hCG titres. Here a successful management of live ectopic pregnancy in a 25-year-old nulliparous woman, with very high β -hCG titres (29502.04mIU/mL), using ultrasound-guided intra-cardiac potassium chloride (KCl) injection and systemic Mtx is reported. No treatment related complications were encountered. However, individualized treatment with a stringent follow-up regime is mandatory in such cases.

Keywords: Ectopic pregnancy, Choriogonadotropin, Sonography.

INTRODUCTION

Over the past 25 years, with the improvements in ultrasound equipment as well as the easy access to quantitative beta-human chorionic gonadotropin (β -hCG), the timing of diagnosis of ectopic pregnancy has moved to the early part of the first trimester and often it is made before the patient becomes symptomatic¹. Despite early diagnosis, ectopic pregnancy continues to pose a significant threat of morbidity and mortality to affected women. The classic approach to treatment of ectopic pregnancy involves surgical resection of the diseased tube, ovary or cornual region of the uterus². Recently, conservative or non-surgical approaches have been described, usually

involving the use of systemic methotrexate (MTX). This chemotherapeutic agent acts as a trophoblast growth inhibitor by inhibiting DNA synthesis³. Systemic MTX treatment has been shown to be particularly useful in cases of early, unruptured, tubal ectopic pregnancies, with a reported success rate of about 90%⁴. However, in cases of live tubal ectopic pregnancies, a failure rate of 30% has been reported using systemic MTX alone⁵. The use of high-resolution transvaginal sonographic probes enables earlier and more reliable diagnosis of ectopic pregnancy. Transvaginal ultrasound-guided local injection of tubal, cornual and cervical ectopic pregnancies has been described as an alternative therapy that may allow the practitioner to minimize the use of systemic chemotherapy⁶. In addition, local application may be more effective than systemic therapy with MTX in cases of more advanced



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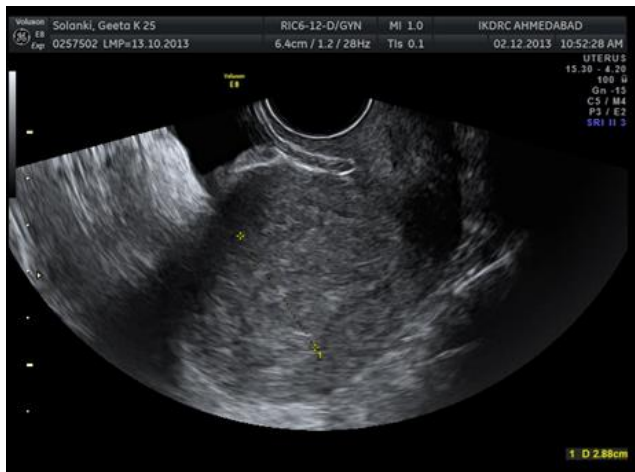


Fig 1: Showing empty uterus.



Fig 2: Presence of ectopic pregnancy.

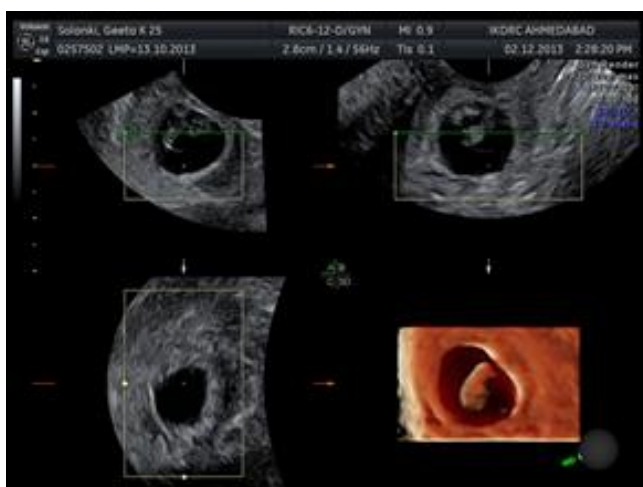


Fig 3: Showing three dimensional view of ectopic pregnancy.

ectopic gestations, especially if a live ectopic pregnancy is present. Local injection of potassium chloride (KCl) or MTX can be performed with a transvaginal puncturing and biopsy needle. This approach is advantageous for patients with cervical or cornual ectopic pregnancies for whom surgical management can be associated with excessive blood loss, morbidity and limitation of reproductive capacity. Some publications have suggested that the presence of fetal cardiac activity and greatly elevated β -hCG levels in patients make treatment with systemic methotrexate ineffective⁷. Therefore, we have used “intra cardiac injection of KCl,” as a method in live unruptured ectopic pregnancies, was used to enhance the efficacy of the local and systemic MTX administration.

CASE REPORT

A 25 year old patient with normal menstrual cycles married for 4 years reported to Department of Obstetrics and Gynecology, G.R. Doshi and K.M. Mehta Institute of Kidney Diseases and Research Center for treatment of primary infertility. The patient was investigated one year back with diagnostic hysterolaparoscopy and husband's semen analysis. Hysteroscopic examination revealed normal uterine cavity (Figure 1) whereas laparoscopic findings showed adhesions in the sub diaphragmatic regions with bilateral hydrosalpinx with free spill, suspicious of tuberculosis. She was further investigated and given anti-tubercular drugs for 9 months. Husband's semen analysis was within normal limits. She underwent 4 cycles of intrauterine insemination (IUI) and developed ectopic pregnancy in the last cycle (Figures 2 and 3).

The patient was reevaluated and planned for cycles of IUI with clomiphene citrate 50 mg once daily for 5 days. Patient conceived in second cycle of IUI and reported with positive pregnancy test. Her transvaginal sonography showed endometrial thickness of 14 mm with no evidence of gestational sac in endometrial cavity or adnexa. Patient was followed up after 1 week and was diagnosed as having left tubal ectopic pregnancy with CRL 7w1d with evidence of cardiac activity.

Patient was admitted in ward and her serum β -hCG was found to be 29502.04 mLU/ml. Patient was treated conservatively with systemic

methotrexate and intracardiac KCl administration. Systemic methotrexate 50 mg/day single dose was given on day 1.

On day 2, transvaginal ultrasound guided intracardiac instillation of KCl 2 mEq/ml was done till the cardiac activity ceased. On fifth day β -hCG was reported to 36000mIU/ml. Patient suffered pain for three days in post-operative period. After fifteenth day patient was symptom free and β -hCG started reducing. Patient recovered completely within one month.

DISCUSSION

Local treatment options in ectopic pregnancies have been used for more than 20 years. Timor-Tritsch et al⁸ reported one of the earliest cases in 1989, followed by Aboulghar et al⁹ in 1990. They injected potassium chloride (KCl) solution to arrest cardiac activity, terminating the ectopic pregnancy without surgical intervention and in 55 days, the patient's β -hCG levels returned to normal. Doubilet et al¹⁰ used local administration of KCl followed by dilatation and curettage for treatment of heterotopic tubal, cervical and interstitial pregnancies. This treatment was successful in 25 of 27 cases (in 20 of these cases, embryonic cardiac activity was present). For the single tubal heterotopic pregnancy, salpingectomy was performed 16 days after KCl injection because of continued pain.

In two other case reports, Dadhwal et al¹¹ reported successful management of live tubal ectopic pregnancy with local KCl and systemic MTX administration. In the case of Dadhwal et al the patient was a 27-year-old nulliparous woman with very high β -hCG titers (89,200mIU/mL). Successful resolution of the ectopic pregnancy with negative serum β -hCG (<1 mIU/mL) was achieved after three doses of MTX. Verma and Jacques¹² reported three cases treated using ultrasound-guided intrasac KCl injection and systemic MTX. In all three cases, the resolution of ectopic pregnancy was achieved and surgery was avoided.

In this case, patient was started on systemic methotrexate therapy followed by transvaginal sonography guided intracardiac instillation of KCl and finally aspiration of embryo was done.

Medical therapy when cardiac activity is present requires to be treated at the center where patient can be monitored closely so that if any complication arises during the procedure it can be managed immediately.

CONCLUSION

Transvaginal ultrasound-guided intracardiac instillation of KCl and systemic methotrexate administration can be safely used to treat unruptured tubal ectopic pregnancies with fetal cardiac activity present under close observation.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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