

**Case report****Unruptured Left Cornual Pregnancy with a High Serum  $\beta$ -hCG: A Case Report**

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**Abstract**

Ectopic pregnancy in the interstitial part of the fallopian tube (cornual pregnancy) is a rare condition but can be fatal. Traditionally, the treatment had been cornual resection or hysterectomy. More conservative approaches had been advocated recently. There is no consensus on the dose or number of methotrexate injections that should be used in the treatment of interstitial pregnancies. Single dose intramuscular methotrexate is one of the treatment options. However, the failure rate is higher if the serum  $\beta$ -hCG (beta-human chorionic gonadotrophin) level is more than 5000 IU/L. We report a case of cornual ectopic pregnancy with high initial serum  $\beta$ -hCG level being successfully treated with multiple doses of systemic methotrexate. MRI was used to assess clinical resolution of cornual ectopic pregnancy.

**Keywords:** Pregnancy, cornual, ectopic, methotrexate, hCG, MRI.

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Date of submission: 16 Dec 2010. Date of acceptance: 3 Mar 2011. Date of publication: 6 Apr 2011.

**Introduction**

Ectopic pregnancy in the interstitial part of the fallopian tube (cornual pregnancy) is a rare condition which can be fatal. Traditionally, the treatment had been cornual resection or hysterectomy. More conservative approaches had been advocated recently. We report a case of cornual ectopic pregnancy with high initial serum  $\beta$ -hCG level being successfully treated with multiple doses of systemic methotrexate.

**Case Report**

A 26-year-old primigravida presented at 7 weeks gestation. She had left-sided lower abdominal pain that resolved upon admission. She was haemodynamically stable. Pelvic examination was unremarkable except for cervical tenderness on motion. Urine pregnancy test was positive.

Transvaginal ultrasonography revealed an empty uterus with a 25 mm x 20 mm gestational sac located eccentrically left to the uterine fundus. The gestational sac was surrounded by thin stripes of myometrial layer with no foetal pole identified. No free fluid was seen in the pouch of Douglas. Cornual (interstitial) pregnancy was confirmed (Fig 1).

The serum beta-human chorionic gonadotrophin ( $\beta$ -hCG) level on admission was 35,140 IU/L. It increased to 39,440 IU/L at 48 hours. The decision of medical management option was made after full discussion with the patient. The patient was then treated conservatively with systemic injection of methotrexate. The dosing regimen consisted of 50 mg/m<sup>2</sup> of methotrexate administered intramuscularly on day 1, 3, 5 and 7 alternating with folinic acid. She remained asymptomatic and the serum  $\beta$ -hCG level was at a decreasing trend with reduction in the size of

the ectopic gestational sac. Serum  $\beta$ -hCG level became undetectable by day 24 following the diagnosis. Magnetic resonance imaging (MRI) was done to determine complete resolution of the ectopic pregnancy as cornual ectopic pregnancies can rupture, despite falling levels of  $\beta$ -hCG. MRI revealed a normal uterus with a 8 x 5 mm collapsed and receding left-sided cornual gestational sac.



Fig 1: Ultrasound showing interstitial pregnancy

## Discussion

Ectopic pregnancy in the interstitial part of the fallopian tube (cornual pregnancy) is a rare condition. It accounts for 2-4% of all ectopic pregnancies but carries a greater maternal mortality risk than ampullary ectopic pregnancy (1,2,3).

Cornual pregnancies tend to present relatively late at 7 to 12 weeks of gestation due to myometrial distensibility (3). It is difficult to diagnose, both clinically and sonographically. The diagnosis can be made using transabdominal or transvaginal ultrasound scan with identification of an empty uterus, a gestational sac of less than 1cm from the lateral edge of uterine cavity, a thin myometrial layer surrounding the sac, and presence of the interstitial line sign (1,3,4,5).

The treatment modalities range from conservative medical management to more invasive surgical techniques. Traditionally, cornual resection via laparotomy or hysterectomy were the sole management options (1-3). This was often attributed by delay in diagnosis and as a result it is often being diagnosed when ruptured. Recent advances in transvaginal ultrasonography and sensitive  $\beta$ -hCG assays allowed earlier diagnosis of cornual ectopic pregnancy prior to rupture. Therefore conservative

surgical treatments ie. laparoscopic could be advocated. Laparoscopic surgery carries the benefit of lower surgical morbidity and faster recovery time. However persistent ectopic, recurrence and uterine rupture in subsequent pregnancy remained the two major concerns for laparoscopic approach (6,7,8,9,10). The usage of methotrexate in interstitial ectopic pregnancy has been reported way back in 1991 and a review of large case series on conservative medical modality was published in 1999 (1,11). The most important selection criteria for medical management are the absence of pain and the prediction that the pregnancy would not rupture before its resolution.

Early diagnosis of the cornual pregnancy in this patient by transvaginal ultrasound scan allowed for a conservative medical approach (1,3). There is no consensus on the dose or number of methotrexate injections that should be used in the treatment of interstitial pregnancies. Single dose intramuscular methotrexate is one of the treatment options. However, the failure rate is higher if the serum  $\beta$ -hCG (beta-human chorionic gonadotrophin) level is more than 5000 IU/L (3). It has been recorded that interstitial pregnancies with serum  $\beta$ -hCG levels > 1000 IU/L should be treated with multidose methotrexate (12). Local injection of methotrexate had been used successfully in cases of cornual pregnancies at serum  $\beta$ -hCG levels above 20,000 mIU/L with  $\beta$ -hCG level resolution period that was three times faster as compared to systemic approach. The success of local injection of methotrexate may possibly be due to a higher drug concentration at the gestational site (3,11). However, this modality was declined by this patient. Local injection of methotrexate is also not without risk, as puncturing an ectopic sac or the surrounding blood vessels might lead to haemorrhage or even cornual rupture (13).

The use of systemic methotrexate had been proven to be a safe and effective treatment in cornual pregnancy (11). This patient had been successfully treated using systemic methotrexate, despite the high level of initial serum  $\beta$ -hCG level. Multiple doses of methotrexate were administered as the initial serum  $\beta$ -hCG level was high. Earlier researchers first reported a successful interstitial pregnancy with multiple doses of methotrexate. Treatment with a single dose of methotrexate was associated with lower side-effects. However, this requires a longer time for resolution which may take up to 70 to 120 days (14). This might not be appropriate in this patient due to the initial high serum  $\beta$ -hCG level. Furthermore, the risk of cornual rupture would increase with longer resolution period.

This patient did not experience any side-effect from repeated systemic methotrexate. Contrary, the use of intramuscular methotrexate even with high levels of serum  $\beta$ -hCG level might be a safer option than previously thought.

MRI scan may be a useful tool to aid the diagnosis of cornual ectopic pregnancy in doubtful cases. This may render more confidence in conservative management and allow avoidance of surgical approach in suitable cases. MRI scan is an emerging modality to assess clinical resolution of cornual ectopic pregnancy (15). Such a valuable tool is very much underutilized. It should be used more frequently when circumstances permit with its cost and availability taken into consideration.

Currently there is still insufficient evidence to recommend any single treatment modality for cornual ectopic pregnancy. The decision of treatment should be based on a combination of factors such as clinical presentation, surgeons' expertise, side-effects of treatment rendered, patients' preference and overall cost. Administration of repeated systemic methotrexate appears to be a promising approach in managing cornual ectopic pregnancy. Although it cannot be used for every patient, it offers a safe and effective non-surgical method of treatment in selected cases.

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