Pre-treatment human chorionic gonadotrophin (hCG) ratio in the management of non-tubal ectopic pregnancy

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Case report

A 35-year old P 0+3 woman presented to the Acute Gynaecology Unit (AGU) at Nepean Hospital at 5+3 weeks' gestation for an early pregnancy location scan as she had previously been diagnosed with a right interstitial pregnancy in 2007. Her past obstetric history included a missed miscarriage at 7 weeks' gestation in 2007, an interstitial pregnancy managed expectantly in 2007 and a recent empty sac miscarriage managed expectantly. Past gynaecological history included two laparoscopic surgeries for endometriosis. She had no other risk factors for ectopic pregnancy.

Transvaginal ultrasound (TVS) at 5+3 weeks gestation demonstrated a pregnancy of unknown location (PUL), i.e. no signs of an intra- or extra-uterine pregnancy. The endometrial thickness (ET) measured 2.6 mm; the right ovary was enlarged measuring 63 × 46 mm with a bilocular cyst, each locule measuring 28 × 36 mm and 33 × 42 mm, respectively; the left ovary was normal in size and appearance. There was no free fluid in the pouch of Douglas. Serum hCG at presentation and at 48 hours were 199 IU/l and 250 IU/l respectively, i.e. hCG ratio (hCG 48 hrs/hCG 0 hrs) was 1.25. This equated to a rise of serum hCG of 25% in 48 hrs.

She was rescanned the following week to ascertain the location of the pregnancy. Her serum hCG levels continued to rise sub-optimally measuring 328 IU/l. Repeat TVS demonstrated an empty uterus with an ET of 3.5 mm and a persistent right ovarian cyst that was now unilocular and haemorrhagic, measuring 22 × 23 × 22 mm. There was no obvious tubal ectopic pregnancy. The left ovary was normal in size, measuring 30 × 15 mm; however this contained a cystic structure with a double hyperechoic ring measuring 9.4 × 7.0 mm. This represented the gestational sac and within this was a yolk sac measuring 4.5 × 5.1 mm. The colour Doppler score was 1, i.e. no vascularity was demonstrated. There was no haemoperitoneum. A diagnosis of left ovarian ectopic pregnancy was confirmed. She was eligible for conservative management. In accordance with the unit's protocol, we arranged the pre-treatment hCG ratio. If the hCG ratio at 48 hours was < 1, i.e. the serum hCG levels were falling, then she was to be managed expectantly; if the hCG ratio at 48 hours was > 1, i.e. the serum hCG levels were increasing, then she was to be managed medically with methotrexate (MTX) 50 mg/m^2. Serum hCG measurements at 0 hours and 48 hours were 328 IU/l and 341 IU/l respectively, i.e. the hCG ratio was >1. She was therefore given 75 mg MTX intramuscularly. The serum hCG fall was 33% (292 IU/l to 196 IU/l) between days 4 and 7, i.e. > 15%. One weekly serum hCG levels were arranged thereafter until the hCG levels were < 5 IU/l.

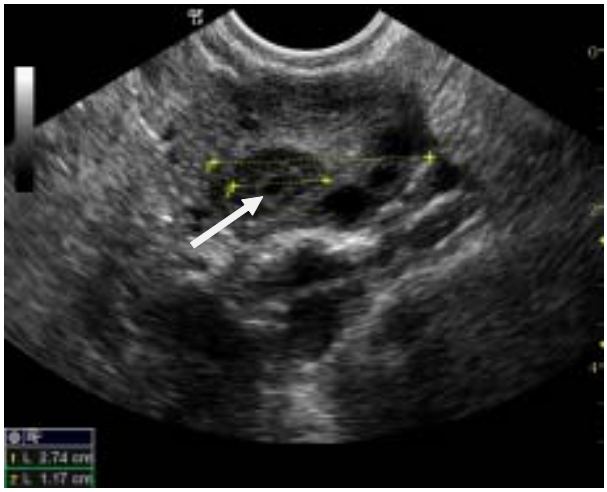

Figure 1. **Transvaginal sonogram shows the left ovary, within is the gestational sac and Yolk sac (arrow).**

Discussion

Ovarian pregnancy is an extremely rare type of ectopic pregnancy, occurring only in 1 in 25,000 to 40,000 pregnancies which accounts for 0.5-3% of all ectopic pregnancies [1]. The incidence of interstitial pregnancy is around the same. The diagnosis of ovarian ectopic pregnancy can be a difficult one, but with the help of high-resolution transvaginal ultrasound, specific ultrasonographic criteria do exist. These include an empty uterus, the presence of an ovarian cystic mass lesion within the ovary itself with or without internal echoes or a characteristic double hyperechoic ring surrounding a visible yolk sac.

In women with an ectopic pregnancy who are clinically stable, calculation of the pre-treatment hCG ratio

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(hCG 48 h/hCG 0 h), allows evaluation of the trophoblast activity or 'trophoblastic load' (2-4). An hCG ratio <1 which equates to falling serum hCG levels at 48 hours, suggests that the ectopic trophoblast is resolving spontaneously and it may be possible to avoid MTX administration in this sub-group. Women with an hCG ratio >1 which equates to increasing serum hCG levels at 48 hours, indicating still active trophoblasts should be targeted for MTX. This approach does not compromise the outcome of these women and it has the potential to reduce the blind administration of cytotoxic drug MTX at presentation in an ectopic pregnancy which would have resolved spontaneously anyway [5].

In conclusion, this case highlights the importance of the pre-treatment hCG ratio in decision making regarding the appropriateness of MTX for women with non-tubal ectopic pregnancy.

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