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CASE REPORT

MRI and methotrexate in the management of a cornual ectopic pregnancy

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Abstract Cornual ectopic pregnancies are rare but can be fatal. Use of a magnetic resonance imaging (MRI) scan has been reported in the diagnosis of a cornual ectopic pregnancy, but this is not commonplace. Intramuscular methotrexate is commonly used to treat cornual ectopic pregnancies; however, this is not recommended if the human chorionic gonadotropin (HCG) level is greater than 3,000 IU/l. We describe a case where MRI was used to make a diagnosis and intramuscular methotrexate was successfully administered at an HCG level greater than 3,000 IU/l.

Keywords Pregnancy · Cornual · Ectopic · MRI · Methotrexate · HCG

Case Report

A 34-year-old primigravida presented to the emergency department at 5 weeks gestational age with slight vaginal bleeding and colicky right iliac fossa pain. She had a history of treated *Chlamydia* infection 13 years ago. Serum human chorionic gonadotropin (HCG) levels done 48 h apart were 944 IU/l and 1,459 IU/l. A transvaginal ultrasound scan showed a tiny cystic region within the uterus but no yolk sac was seen. She was haemodynamically stable and managed conservatively. Serial HCG levels were checked (Table 1). Due to a suboptimal rise in HCG level and a repeat transvaginal ultrasound scan which showed only a small cystic area within the uterine cavity, a differential diagnosis of a failing intrauterine pregnancy or a pregnancy of unknown location was made. We performed a dilatation and curettage first. As no chorionic villi were identified in the curetting on visual inspection, we proceeded to perform a diagnostic laparoscopy. This revealed normal fallopian tubes, ovaries and serosal surface of the uterus. We sent endometrial curettings for histological examination which revealed focal Arias-Stella reaction with decidua. Postoperatively, her HCG level rose to 5,751 IU/l. A possibility of a bicornuate uterus with only one horn being curettaged arose. We therefore performed a magnetic resonance imaging (MRI) scan. This showed a 1.5 cm diameter left-sided cornual gestational sac. No fetal cardiac activity was seen (Fig. 1). Our patient was treated with a single dose of intramuscular methotrexate 96.25 mg (50 mg/m^2).

She was followed up clinically and with serial HCG levels and showed complete resolution by day 35.

Five months later, she has conceived again and an intrauterine pregnancy has been confirmed.

Discussion

A cornual ectopic pregnancy is a pregnancy that develops in the myometrial portion of the fallopian tube. This is a rare complication of pregnancy. Cornual ectopic pregnancies occur in 2–4% of all ectopic pregnancies. They can be life-threatening, leading to a maternal mortality rate of 2.5% because of the risk of cornual rupture [1].

An ectopic pregnancy is usually diagnosed by laparoscopy when an ectopic gestation is seen, usually in the isthmic or ampullary portion of the fallopian tube. A laparoscopy is usually carried out in a patient who has clinical features of an ectopic pregnancy but is haemodynamically stable. This is, in most cases, preceded by a transvaginal ultrasound scan that shows a uterine cavity

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Table 1 Series of events with corresponding levels of HCG

Day	Event	HCG level (IU/l)
0	Presentation	944
2		1,459
4		1,903
6		2,342
8	D&C, laparoscopy	2,791
9	Day 1 after D&C, laparoscopy	2,706
16	Day 7 after D&C, laparoscopy	5,751
18	MRI scan, methotrexate administered	
53	Day 35 after methotrexate	10

devoid of a gestational sac. If an ectopic pregnancy is seen, it is removed. What happens if an ectopic pregnancy is not seen ('negative laparoscopy')? If serial HCG levels drop, the patient is observed clinically for signs of haemodynamic instability. If serial HCG levels rise, a pregnancy of unknown location may be diagnosed and methotrexate is given. A 'negative laparoscopy' may also be a feature of a cornual ectopic pregnancy.

In our case, after a 'negative laparoscopy' we carried out an MRI scan when HCG levels continued to rise. The MRI scan confirmed a 1.5 cm diameter left-sided cornual gestational sac. No fetal cardiac activity was seen. Conversely, had an MRI scan been done after an ultrasound scan showed an empty uterus, a laparoscopy may have been avoided. MRI scans have been used in the diagnosis of ectopic pregnancies [1, 2]. Such a valuable tool is underutilised and could be used more frequently when circumstances permit.

The Green Top guidelines of the Royal College of Obstetricians and Gynaecologists (RCOG) state that women most suitable for methotrexate therapy are those with a serum HCG below 3,000 IU/l and based on quality of life data, methotrexate is only an attractive option for women with an HCG level below 3,000 IU/l [3]. This drug has been used successfully by local injection into the cornual pregnancy at serum HCG levels above 20,000 IU/l [4]. However, our patient was treated via the intramuscular route.

She remained asymptomatic, haemodynamically stable and within 5 weeks of administering methotrexate, her HCG level dropped to 10 IU/l. We therefore felt no need to administer a second injection of methotrexate, a drug with potential side effects. We could however be criticised for not repeating an MRI scan to determine resolution of the ectopic pregnancy as cornual ectopic pregnancies can rupture, despite falling levels of HCG. [4, 5].

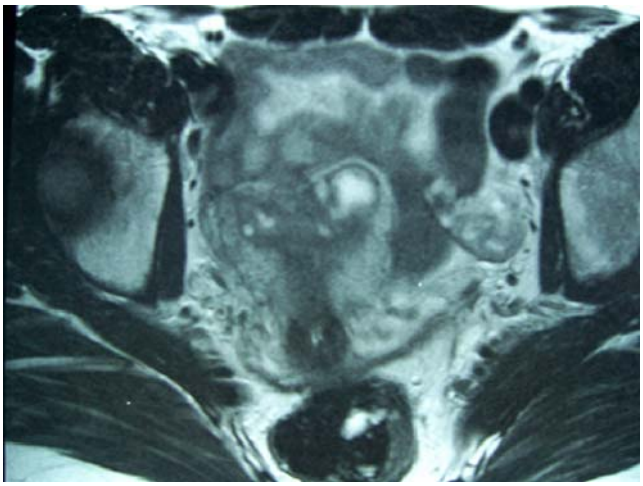

Fig. 1 MRI scan showing a left-sided cornual ectopic pregnancy

We have demonstrated the successful use of a single dose of intramuscular methotrexate in a woman whose HCG level was 5,751 IU/l. It appears that the use of intramuscular methotrexate at levels >3,000 IU/l may be an option more attractive than previously thought.

This case highlights the use of MRI in the diagnosis of cornual ectopic pregnancy and the successful use of methotrexate at high serum HCG levels.

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