

Cornual ectopics – two case studies

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Case 1 Figure 1 Thickened, irregular endometrium suggesting a decidual reaction, however no intrauterine pregnancy is identified



Case 1 Figure 2 The interstitial line sign



Case 1 Figure 3 Thinning of the myometrial mantle surrounding the interstitial gestation

Introduction

Cornual or interstitial ectopic pregnancies are extremely rare, accounting for 1.8 % of all ectopias, and < 0.01% of pregnancies. If not diagnosed, the condition can be fatal – causing uterine rupture. The mortality rate is more than twice that of other tubal pregnancies. The diagnosis of interstitial ectopic pregnancy can be difficult. However, there are specific sonographic features enabling the diagnosis of this rare condition. We present two cases presenting to our institution over the last six months.

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Case 1

A 35-year-old G2P1 woman was referred from her obstetrician following confirmed pregnancy secondary to IVF treatment. Two fertilised ova had been transferred into the endometrial cavity. By dates the patient should have been 6 weeks pregnant, however scanning performed by her obstetrician showed only blood products within the endometrial cavity. The patient was referred for clarification of site of gestation and viability. Although having had a child many years prior she had suffered infertility for the last 5 years. Previous assessments showed bilateral hydrosalpinx and for this reason bilateral salpingectomy had been performed.

Scanning was performed on an ATL 5000 ultrasound machine (Philips Medical Systems, Eindhoven, The Netherlands) with both transabdominal and endovaginal scanning.

On endovaginal scanning, there appeared to be 2 cystic areas in the myometrium within the right cornual section of the uterus. These areas were felt to most likely represent early, ectopic gestational sacs. Pregnancy however, at this stage, appeared to be just < 6 weeks and this information was discussed with the referring obstetrician. Given this was an extremely wanted pregnancy early follow-up was recommended.

Repeat examination 3 days later showed that one of the presumed gestational sacs now contained a small, viable fetal pole, whilst the other sac was now difficult to discern. The gestation was in the right horn of the uterus and considered to be a right cornual ectopic pregnancy. There was approximately 4 mm of myometrium surrounding the sac.

At this stage, termination of pregnancy was not an option for the patient, particularly psychologically, and given she desperately wanted to keep the pregnancy, she returned on two further occasions for ultrasound follow-up. On the final occasion, the myometrium surrounding the gestational sac had thinned significantly, and the decidual vessels almost reached the serosa. The patient was by now 9



Case 2 Figure 1 Right hydrosalpinx.



Case 2 Figure 3 Crown rump length measurement of the viable fetal pole in the left cornua

weeks gestation. After extensive counselling the pregnancy was terminated. The patient was admitted to hospital and intrasac/intraplacental methotrexate mixed with adrenalin was administered with no response. Five days following her BhCG was 106,000. For this reason she was further treated with 100 mg intravenous methotrexate stat, followed by 200 mg of intravenous infusion over 12 hours. The fetal heart motion was observed to have ceased and progressive BhCG levels returned to normal.

Case 2

A G1P0, 26-year-old patient presented for a routine early pregnancy examination. This was her first pregnancy after several years of infertility. She had a history of bilateral hydrosalpinx. Examination was performed on a Voluson 750 Expert (GE Medical Systems, Milwaukee, Wisconsin, USA.) with initial transabdominal scan followed by endovaginal scanning. On transvaginal scanning it was evident that a viable pregnancy was present, however, implanted in the in the left cornua of the uterus. The patient was counselled about the findings and was sent back to her general practitioner. From here she was referred to the local maternity hospital where medical termination was recommended. An initial dose of methotrexate was administered. She elected to stay in hospital overnight, and began to experience pain and haemorrhaging. She was taken to theatre and was found to have a ruptured cornual ectopic pregnancy. She had an emergency cornual excision.

Discussion

The diagnosis of interstitial ectopic pregnancy can be difficult. Eccentric positioning of the gestational sac and thinning of the myometrial mantle have been described as sonographic features¹ and more recently the interstitial



Case 2 Figure 2 A 3D image reconstructed in the coronal plane demonstrating the gestation sac in the left cornua. The endometrial cavity is seen to the right of the gestational sac



Case 2 Figure 4 Gestational sac ectopically sited in the left cornua. The thickened endometrium is visible to the right of the gestation sac

line sign². Ectopic pregnancy is increased in patients with hydrosalpinx and, interestingly, both of these patients had a history of bilateral hydrosalpinx. The first patient had already had bilateral salpingectomy performed and was an IVF patient. The second patient, although she had already had a hysterosalpingogram (HSG) showing hydrosalpinx, but had not sought further medical intervention prior to pregnancy or was unaware of the possible complications to pregnancy.

It has been established that hydrosalpinx has a deleterious effect on the implantation of transferred embryos, for a number of reasons. Distension of the uterine cavity is usually present, disturbing the contact between the embryo and endometrial surface³. There is also disturbance of the intrauterine secretory products and the endometrial glands may be dilated. The tubes are often inflamed which may result in the release of cytokines into the tubal fluid and these are believed to inhibit embryo implantation. Finally, the hydrosalpinx fluid may cause a mechanical flushing of embryos transcervically⁴.

It has been suggested that the treatment of patients with hydrosalpinx should be unilateral or bilateral salpingectomy prior to IVF⁴. Concerns, however, have been raised that salpingectomy in itself may lead to an increase in the rate of ectopic pregnancies and may even have a detrimental affect on ovarian function by affecting the ovarian blood supply⁴. A study by Strandell et al⁵ concluded that salpingectomy is the method of choice for treatment of infertility in patients with hydrosalpinx. Although these trials showed no increase in the rate of ectopias, it has been shown that those patients undergoing salpingectomies are at a higher risk of cornual ectopic pregnancies⁶, which is a more serious condition. In 20% of cases that progress beyond 12 weeks of amenorrhoea, potentially life-threatening rupture occurs, with a maternal

mortality rate of 2.5%⁵.

In patients with IVF assisted pregnancy, an increase in cornual ectopic pregnancies may be for a number of reasons. Infertility patients having undergone prior salpingectomy or having some form of tubal dysfunction are considered to be at a higher risk. Misplacement of the embryos in the cornua either by catheter misplacement or indirectly secondary to retrograde reflux of the embryo have also been found to be causes. Finally, the number of transferred embryos can be a predisposing factor⁶.

Ultrasound features of interstitial pregnancies

The usual indicators of an ectopic pregnancy obviously play a role, these are:

- A beta-hCG level of 500–1000 mUI/ml and no gestation sac seen transvaginally.
- A decidual cast or pseudo gestational sac in the endometrial cavity, which is a fluid collection in the cavity surrounded by a single decidual layer.
- A mass outside of the endometrial cavity, which demonstrates either a live foetus, or a high velocity (21cm/sec) and a low resistive pattern that is indicative of peri trophoblastic flow.

Interstitial ectopic pregnancies also have distinct appearances to suggest their location, which are:

- The 'interstitial line' sign, which is an echogenic, line extending from the endometrial canal up to the cornual sac or haemorrhagic mass^{2,8}.
- Thinning of the surrounding myometrial mantle surrounding the gestation to less than 5 mm⁸.

The treatment for this condition is often surgery, with conservative cornual resection replacing hysterectomy. Methotrexate is another form of treatment administered systemically via intramuscular injection, or locally into the gestational sac under laparoscopic control. Methotrexate is usually the method of choice if the patient cannot have anaesthesia, or has multiple adhesions, if the beta-hCG is low (5–10,000 mUI/mL), the gestation is less than 4 cm in diameter, the patient is not in pain or the pregnancy is not visible on ultrasound. Surgery will be the method of choice if the patient is haemo-dynamically unstable, the BhCG is over 10,000 mUI/mL or the pregnancy is greater than 4 cm in diameter⁹. Even ruptured cornual ectopias have been treated with cornual excision successfully.

Conclusion

Cornual or interstitial ectopic pregnancies are quite rare, accounting for 3% of all ectopias. It is defined as implantation of the trophoblast in the interstitial part of the tube. By appropriate imaging techniques the diagnosis can be made accurately with avoidance of catastrophic outcomes. Any patient presenting to the Department with a history of hydrosalpinx, unilateral or bilateral salpingectomies, or IVF treatment with embryo transfer should be considered at an increased risk for this condition and should be examined very carefully for any signs of an interstitial pregnancy.

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