CME Article

Clinics in diagnostic imaging (106)

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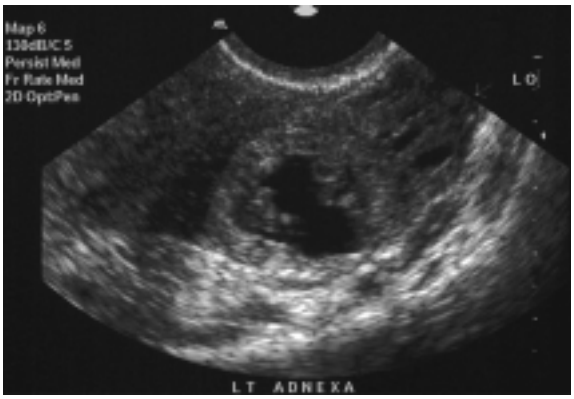

Fig. 1 Sagittal TVUS image of the left adnexa.

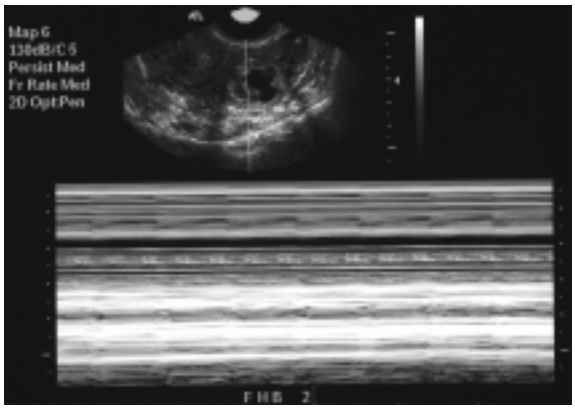

Fig. 2 M-mode Doppler US trace of the echogenic component in the left adnexal mass.

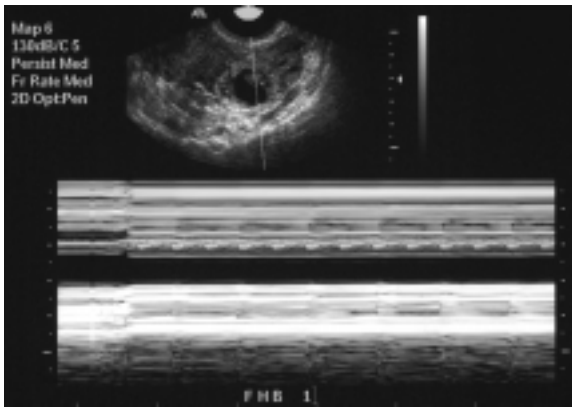

Fig. 3 M-mode Doppler US trace of the other echogenic component in the left adnexal mass.

CASE PRESENTATION

A 32-year-old Thai-Chinese woman was referred to our hospital from the primary care centre with a complaint of left iliac fossa pain for three to four days. There was no vaginal bleeding. She was unsure of dates but was estimated to be about 10-11 weeks amenorrhoeic. The pain was increasing in intensity and preliminary ultrasonography (US) revealed no intrauterine gestational sac in the uterus. She also had a significant past history of primary subfertility with therapeutic laparoscopy, dilatation and curettage done five years ago. She then had severe pelvic inflammatory disease and bilateral blocked tubes. After her operation, the left tube was patent.

Physical examination revealed that her vital signs were: blood pressure of 109/60 mmHg and pulse rate of 90/minute. Systemic review was unremarkable except for mild left iliac fossa tenderness. No rebound or guarding was elicited. She had a haemoglobin level of 13.3 g/dL. and a β-human chorionic gonadotropin (β-hCG) level of 44,043 IU/L. Other blood chemistry levels were normal. Transvaginal ultrasonography (TVUS) was performed on the same day. What do these images show (Figs. 1-3)? What is the diagnosis?

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IMAGE INTERPRETATION

TVUS of the left adnexa (Fig.1) showed a ring echogenic mass, separate from the left ovary. It contained two live foetuses with foetal poles measuring 9mm and 8mm, respectively. These correspond to seven weeks gestation. Foetal heart beats are demonstrated within both foetal poles (Figs. 2 & 3). No significant fluid is noted in the pouch of Douglas. US also showed an empty uterus, with no intrauterine gestational sac detected (not shown).

DIAGNOSIS

Viable left tubal twin ectopic pregnancy.

CLINICAL COURSE

The patient underwent minimally invasive surgery with adhesiolysis, wedge resection of the left cornu as well as evacuation of the uterus. Intraoperatively, a 4 cm left tubal mass was seen, confirming the diagnosis. Right hydrosalpinx was noted with peritubal adhesions between tube and left cornua (Fig. 4). Intramuscular methotrexate was administered to the patient post-surgery. Histopathology confirmed the diagnosis established on US.

The β-hCG was 44,043 IU/L before surgery, and fell to 5,256 IU/L after surgery. The patient was discharged two days after surgery and the follow-up outpatient β-hCG five days later was 547 IU/L. The patient was offered assisted reproduction but she was not keen and was discharged from further follow-up.

DISCUSSION

Ectopic pregnancies represent a major health risk for women of child-bearing capacity. It results from the abnormal implantation and maturation of the conceptus outside of the endometrial cavity. If not treated properly, they can result in life-threatening complications. The incidence of ectopic pregnancies has been increasing steadily since the 1970s, and now accounts for up to 2% of all pregnancies[1]. Twins occur in one in 80 spontaneous pregnancies and 30% of these are monozygotic[2]. Most twin pregnancies are heterotopic, i.e., an intrauterine pregnancy exists alongside an ectopic one. The incidence of such a pregnancy is one in 7,000[3]. Twin ectopic pregnancies are rarer. Unilateral twin pregnancies occur in about one in 200 ectopic pregnancies, making the incidence of twin ectopic pregnancies around one in 125,000 spontaneous pregnancies. Most cases of unilateral twin tubal pregnancies are monochorionic and monozygotic[4].

De Ott[5] first reported unilateral twin ectopic gestation in 1891 but it was only in 1994 that live twin ectopic pregnancy was described[6]. Parker et al described a case of live twin tubal ectopic pregnancy in 1999. At that time of review, there have been more than 100 case reports of twin tubal ectopic pregnancies but only four previous reports where two foetal heart motions have been visualised[7]. Another case was reported by Goker et al in 2001 following in-vitro fertilisation[8]. In 2002, Hanchate et al reported another case of live twin ectopic pregnancy but here there was no known predisposing factor[9].

Multiple factors are known to contribute to the relative risk of ectopic pregnancy. The basic concept underlying all of them is the hampering of migration of the embryo to the endometrial cavity[10]. These include:

Pelvic inflammatory disease (PID)

There is a direct correlation between the incidence of PID and ectopic pregnancy. A history of salpingitis increases the risk by four-fold. This is related to tubal damage and the greater the number of episodes of PID a patient has increases the degree of damage correspondingly.

History of prior ectopic pregnancy

It is a documented fact that a previous ectopic pregnancy predisposes a patient to another by as much as 7- to 13-fold.

History of tubal surgery and conception after tubal ligation

It is logical to assume that such instrumentation of the fallopian tubes leads to trauma to them, and hence can result in any number of problems whose end result is the hampering of embryonic migration. This in turn results in an ectopic pregnancy.

Use of fertility drugs or assisted reproductive technology

It is unclear as to the reason why ectopic pregnancy incidence increases several fold with such treatment but postulations include the high hormone levels and multiple eggs in such treatment result in higher risks.

Other risk factors include use of an intrauterine contraceptive device, increasing age, smoking, previous abdominal surgery and variant anatomy of the uterus (such as a T-shaped uterus). However, it should be noted that most patients who present with an ectopic pregnancy do not have any such risk factors.

Diagnosis of ectopic pregnancy is usually achieved through a combination of a good clinical history, a low or slowly-rising serum level of β-hCG and ultrasonographical findings. The classic clinical triad of ectopic pregnancy is pain, amenorrhoea and per vaginal bleeding. However, only around 45% of

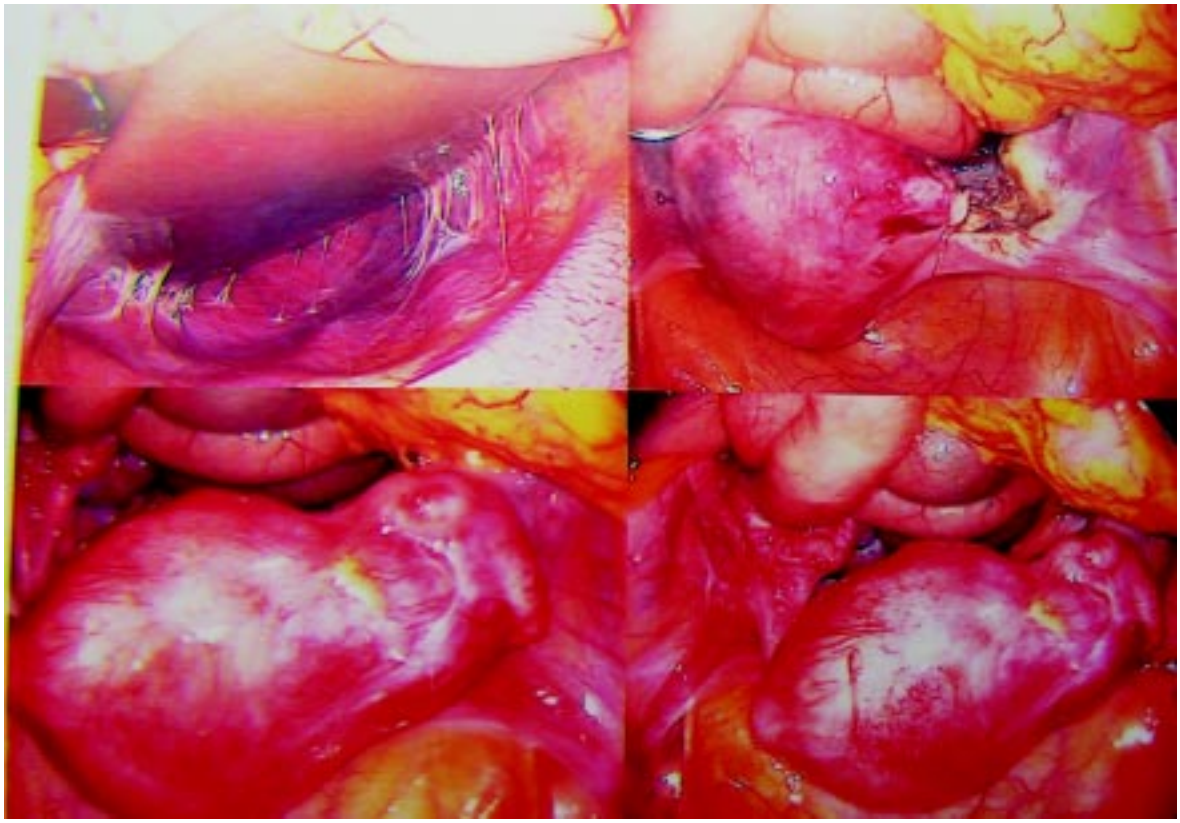

Fig. 4 Series of intraoperative photographs show peritubal adhesions adjacent to the ectopic gestational mass.

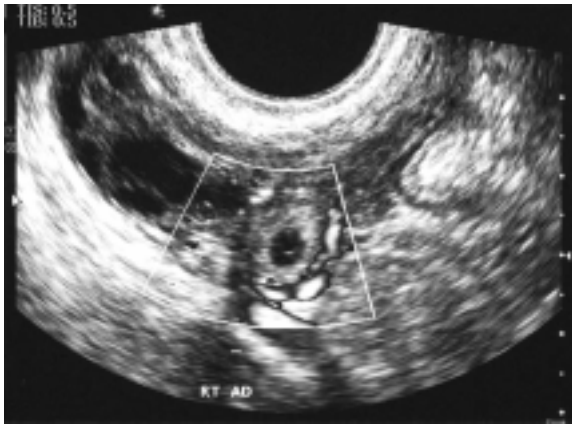

Fig. 5 TVUS image shows an ectopic tubal ring with the concentric ring created by the trophoblast surrounding the chorionic sac of the ectopic pregnancy.

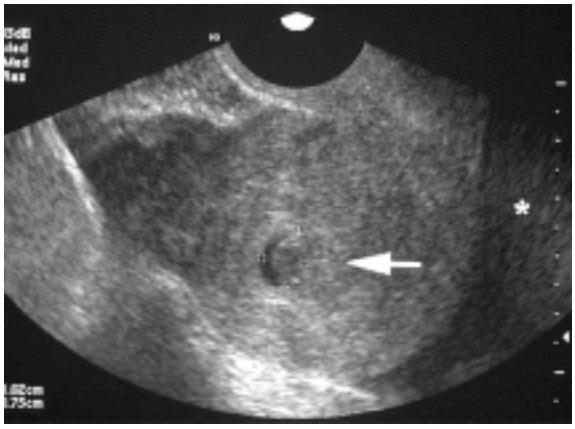

Fig. 6 TVUS shows echogenic free pelvic fluid suggestive of haemoperitoneum (asterisk). The arrow points to the decidual cast in the endometrial cavity.

patients present with such features[11]. Ultrasonography, particularly use of TVUS, is both sensitive and specific in the detection of ectopic pregnancies. It is generally regarded that amenorrhoea of at least six weeks and/or a β-hCG level of at least 1,500 IU/L is necessary and discriminatory for any ultrasonographical findings to be validated.

Such US findings include demonstration of an ectopic tubal ring which is a concentric ring created by the trophoblast surrounding the chorionic sac of the ectopic pregnancy (Fig. 5) as well as the detection of a live embryo within the adnexa, a finding which holds a 100% specificity for the diagnosis of an ectopic pregnancy, as in our patient. Other findings which may suggest an ectopic pregnancy include demonstration of an adnexal mass separate from the ovary, lack of an intra-uterine gestational sac (which requires correlation with β-hCG levels), as well as the presence of echogenic free pelvic fluid which is highly suggestive of pelvic haemoperitoneum (Fig. 6). The presence of haemoperitoneum with the appropriate clinical setting is also indicative of a high probability of an ectopic pregnancy[12]. Transvaginal colour Doppler

ultrasonography can also demonstrate trophoblastic flow signals (high peak systolic velocity of >20 cm/s as well as low impedance with a pulsatility index of <1.00)[13].

Treatment of ectopic pregnancies can be classified as either conservative or surgical. Surgical treatment generally involves resection of the ectopic pregnancy with or without removal of the viscera it is encased in. Modern conservative treatments generally require the use of chemotherapeutic agents such as methotrexate. Over the years, the treatment for ectopic pregnancy has progressed from salpingectomy by laparotomy to conservative surgery by laparoscopy and more recently, by medical therapy. This transition from surgical emergency to medical management has been attributed to early diagnosis through the use of sensitive assays for β-hCG and high-resolution TVUS, and these have been shown in several reports and studies[14,15]. With these diagnostic tools, patients that are likely to respond to medical management are selected versus those at high risk of rupture and require surgery.

Medical management is less invasive, has significantly lower risk with cost savings. There is also an increased chance of subsequent intrauterine pregnancy with no increase incidence of repeat ectopic pregnancy[15]. Success rates with methroxate vary from 70-100%[14]. Timely and early diagnosis has made this disorder amenable to medical therapy. Surgery is preferred when there is tubal rupture, hypotension, anaemia or ectopic pregnancy which is larger than 3 centimeter in diameter[16]. Ectopic pregnancies remain a significant threat to women of child-bearing age and TVUS is the radiological modality of choice in diagnosing them.

ACKNOWLEDGEMENT

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ABSTRACT

Live twin ectopic gestations are extremely rare. There are more than 100 reported twin tubal pregnancies but less than ten have foetal cardiac motions demonstrated in both embryos. We describe an additional patient with live twin ectopic gestation. A 32-year-old woman presented with increasing left-sided abdominal pains. She had a high beta-hCG level and a significant history of subfertility with previous surgical intervention. Transvaginal ultrasonography showed viable left tubal twin ectopic pregnancy. The diagnosis was confirmed at surgery. Factors that contribute to the risk of ectopic pregnancy, diagnosis and the management of this condition are described.

Keywords: adnexal tubal ring, foetal heart beat, live twin ectopic pregnancy, subfertility, transvaginal ultrasonography.

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SINGAPORE MEDICAL COUNCIL CATEGORY 3B CME PROGRAMME
Multiple Choice Questions (Code SMJ 200511A)

	True	False
Question 1. Ectopic pregnancies:		
(a) Are due to chromosomal abnormalities with migrational impediment.	❑	❑
(b) Implantations are common in the fallopian tubes.	❑	❑
(c) Are usually symptomatic and hence are diagnosed early.	❑	❑
(d) Many have predisposing causes.	❑	❑
Question 2. In ectopic twin pregnancies:		
(a) Most of these are heterotopic.	❑	❑
(b) Bilateral ectopic pregnancy is one of the permutations seen.	❑	❑
(c) Unilateral twin ectopic pregnancy is slightly less common than heterotopic gestation.	❑	❑
(d) To date, there are less than ten reported unilateral live twin ectopic gestations.	❑	❑
Question 3. Risk factors in ectopic pregnancy include:		
(a) Use of oral contraceptive pills.	❑	❑
(b) Diabetes and obesity.	❑	❑
(c) Prior ectopic gestation.	❑	❑
(d) Assisted reproduction.	❑	❑
Question 4. Diagnosis of ectopic gestation:		
(a) Triad of pain, amenorrhoea and pelvic bleeding, and these are present in more than 50% of patients.	❑	❑
(b) A slowly rising serum β-hCG is suggestive.	❑	❑
(c) The threshold discriminatory value of β-hCG to see an intrauterine gestational sac depends on the type of ultrasound equipment used.	❑	❑
(d) An intrauterine gestational sac excludes an ectopic gestation.	❑	❑
Question 5. In ectopic gestation:		
(a) Adnexal ring mass and pelvic fluid can be seen on ultrasound.	❑	❑
(b) A live embryo in the adnexa is 100% specific.	❑	❑
(c) Treatment involves use of chemotherapeutic agents.	❑	❑
(d) An ectopic pregnancy of less than 5cm without rupture is favourable for conservative treatment.	❑	❑

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