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RIGHT ECTOPIC GESTATION FOLLOWING *IN VITRO* FERTILISATION: CASE REPORT
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SUMMARY

The management of ectopic gestation has in recent years transformed from the normally accepted laparotomy to the laparoscopic approach. The objective of this case report is to describe a rare occurrence of an ectopic gestation following *in vitro* fertilisation procedure. A 35-year-old para 0 + 0, presented with lower abdominal pain and per vaginal bleeding six weeks after an *in vitro* fertilisation was done in South Africa. The patient was admitted with severe lower abdominal pain and per vaginal bleeding at six weeks gestation following an *in vitro* fertilisation procedure. She had undergone an "evacuation" one-week prior to this episode due to an initial diagnosis of an incomplete abortion. No chorionic villi were reported on histology. The repeat serum BhCG was 777miμ/l and at laparoscopy a right unruptured ampullary ectopic gestation (4 cms in size) was evident. A right linear salpingostomy was subsequently performed laparoscopically. Histology confirmed the presence of tubal chorionic villi. The laparoscopic management of ectopic pregnancies is now regarded as the gold standard in many centres in the world. In this patient the ectopic pregnancy resulted following an intra-uterine zygote transfer, and was managed successfully.

INTRODUCTION

The management of ectopic pregnancy has undergone a significant revolution in the past decade (1). Although a few ectopic pregnancies can resolve spontaneously through regression or tubal abortion about 90% of women with ectopic pregnancies and serum BhCG levels greater than 2000 miu/l will require operative intervention owing to increased symptoms or tubal rupture (2). More recently the laparoscopic management of ectopic gestation is recommended, since there is less blood loss, shorter hospital stays and quicker recovery (3). Laparoscopic salpingostomy being the preferred option in patients with unruptured ectopics and who are haemodynamically stable (3).

The incidence of ectopic pregnancy has been rising, however, the associated mortality has decreased significantly. Goldner *et al* reported a four-fold increase in the incidence of ectopic pregnancy in the United States between 1970 and 1989, with a fall in mortality from 35.5 to 3.8 per 10,000 cases (4). More recently, Turner *et al* noted that ectopic pregnancy remains an important cause of maternal death, accounting for about 4% of approximately 20 pregnancy related deaths in Canada (5).

In the United Kingdom the incidence of ectopic pregnancies doubled from 4.9 to 9.6 per 1000 pregnancies between 1973 and 1993 whilst the mortality decreased from 16 to 3 per 10,000 cases (6,7). Bangsgaard *et al* reported that although the incidence of ectopic pregnancy in the general

population is 2%, the prevalence amongst pregnant patients presenting to an emergency department with first trimester bleeding, pain or both is 6% to 16% (8).

The risk of ectopic pregnancy and heterotopic pregnancy dramatically increases following assisted reproductive techniques to conceive, such as *in vitro* fertilisation (IVF) or gamete intrafallopian transfer (GIFT). In a study of 3000 clinical pregnancies achieved through *in vitro* fertilisation the ectopic pregnancy rate was 4.5%, which is more than double the background incidence. Studies have also demonstrated that upto 1% of pregnancies achieved through *in vitro* fetilisation or gamete intrafallopian transfer can result in a heterotopic gestation compared to an incidence of one in 30,000 pregnancies for spontaneous conception (9). Further more Goldman *et al* also noted that the risk of a heterotopic pregnancy is more likely and appears to be even greater after assisted reproductive technology, citing an overall risk of 100:10,000 and is higher following a transfer of a large number of embryos (10). More often so, the serum BhCG levels are normal, and early diagnosis requires a high index of suspicion particularly following gamete manipulation, previous pelvic surgery, and the presence of pelvic endometriosis or history of pelvic inflammatory disease (10). Molley *et al* (11) and Li *et al* (12) postulated that the risk of an ectopic or heterotopic pregnancy following *in vitro* fertilisation was increased in the presence of peritubal adhesions and also an excessive number of oocytes transferred.

Prospective randomised clinical trials have shown that the laparoscopic approach is far superior to laparotomy in a haemodynamically stable patient with linear salpingostomy using the laparoscopic approach, being the preferred option. There is less blood loss, less analgesic requirement, shorter hospital stays and significant cost savings (13-15).

CASE REPORT

A 35 year old, nulliparous lady, gravida 1 presented with a sudden onset of lower abdominal pain and per vaginal bleeding six weeks after intrauterine zygote transfer (*in vitro* fertilisation) was done at an infertility centre in South Africa.

There was no relevant past medical history of diabetes, hypertension or bronchial asthma. She had undergone an appendicectomy at 16 years of age, a laparotomy for pelvic endometriosis (left salpingo — oopherectomy done) in 1999, a diagnostic hysteroscopy and laparoscopy in 2003 and a second laparotomy for extensive pelvic endometriosis, the same year. The right fallopian tube was grossly distorted and buried in dense adhesions. Subsequently, she received six cycles of Zoladex injection, a Gn RH analogue, to suppress the endometriosis.

In September 2004, she underwent her first cycle of *in vitro* fertilisation, with three healthy embryos transferred transcervically. Six weeks later she presented with per vaginal bleeding and lower abdominal pain of increasing intensity. The serum BhCG was 3790 miu/l and a pelvic ultrasound reported "a bulky uterus with an irregular intrauterine gestational sac with no foetal nodule. There was a vague rounded mass within the right ovary most probably an old endometrioma, an ectopic pregnancy being highly unlikely."

An evacuation was done and histology reported "features consistent with those of a recent pregnancy with no chorionic villi seen." Subsequently, the lower abdominal pain became more severe. A repeat serum BhCG was 2,084 miu/l and 777.0 miu/l, the next day. The haemoglobin was 10.8gms/dl. A repeat ultrasound was not done since the patient was admitted at 14:00 hours.

On examination she was in stable general condition, with mild pallor, no cyanosis, icterus or any significant lymphadenopathy. There was no sacral or pedal oedema. The vital signs were stable and the blood pressure was 120/80mmHg.

Examination of the cardiovascular, respiratory and central nervous systems revealed no abnormalities.

Abdominal examination revealed multiple previous scars with moderate tenderness on deep palpation in the supra-pubic and right iliac fossa. There was no clinical evidence of any intra-abdominal free fluid. The bowel sounds were sluggish.

On internal examination, the external genitalia were normal and the vaginal mucosa was healthy. The cervix was soft, os admitted a tip of the finger. The uterus was bulky in size, anteverted, regular

and mobile. The left adnexia was free. On the right side tenderness was elicited on deep palpation and a vague mass was appreciated. Cervical excitation was positive and the pouch of Douglas appeared boggy. There was moderate blood stained discharge on the examining finger.

A diagnosis of a right ectopic gestation was entertained and the patient was subsequently prepared for a diagnostic laparoscopy.

In theatre under general anaesthesia, a routine pneumoperitoneum was created using a verres needle. A 11mm trochar and a 10mm 30° laparoscope were inserted through the umbilical port. A good view was obtained. There was no obvious haemoperitoneum. The upper abdomen was inspected and appeared normal.

The uterus was bulky and anteverted. There were moderate adhesions over the left and right adnexia and in the pouch of Douglas. Both the ovaries appeared normal and the left fallopian tube was obscured. There were scattered endometriotic seedlings in the pouch of Douglas, over the uteroscarral ligaments and both the ovarian fossae. The right fallopian tube was distended, and after separating the adhesions a linear salpingostomy was performed using a monopolar needle electrode. Abundant clots and chorionic villi were evacuated. Haemostasis was well achieved using a bipolar forceps. A good lavage with normal saline ensured adequate haemostasis. The postoperative recovery was remarkable and the patient was discharged on day two. The histology confirmed the presence of chorionic villi. The patient was reviewed six weeks later, and was in satisfactory condition, and the serum BhCG was negative.

DISCUSSION

The case presented underwent transcervical zygote transfer (*in vitro* fertilisation) and developed an ectopic pregnancy. Several case reports have been published regarding ectopic pregnancies following *in vitro* fertilisation ET (16-18). All have emphasised the importance of early diagnosis, so as to conserve the fallopian tubes, for further fertility, and to prevent potential maternal fatalities (18).

The newer options for the management of ectopic pregnancies have been well documented since Shapiro and Adler first reported a successful laparoscopic salpingectomy for an ectopic gestation (19). Bruhat *et al* in the mid 1980's popularised the laparoscopic approach, which has now become the standard treatment for ectopic pregnancy (20).

Early diagnosis of an ectopic pregnancy has become less reliant on the skills of individual clinicians and more on several diagnostic tools available. The triad of lower abdominal pain, vaginal bleeding and adnexal mass, being present in only 21.1% of ectopic pregnancy (21). Several diagnostic modalities may be used in conjunction with the clinical findings to confirm ectopic pregnancy. The combination of quantitative BhCG measurements and transvaginal ultrasounds has become a powerful diagnostic tool. However laparoscopy still remains the gold standard for diagnosis with a false negative rate of 3-4% and a false positive rate of 5% (22).

The use of quantitative BhCG has prompted the development of several management algorithms. Stovall *et al* (23) and Gross *et al* (24) noted that when the BhCG is greater than 2000miμ/l, and no intrauterine pregnancy has been visualised by ultrasound, an endometrial curettage should be undertaken. If no chorionic villi are reported on histological examination and the BhCG is still rising in 24 hours the diagnosis of an ectopic pregnancy is most likely.

In the patient presented, the first serum BhCG following the *in vitro* fertilisation was 3790miμ/l and the pelvic ultrasound reported an irregular intrauterine gestational sac with no foetal pole, with a vague mass on the right adnexa. An evacuation was done and the histology showed no chorionic villi. Subsequently the lower abdominal pain and per vaginal bleeding continued and the repeat BhCG were 2,084miμ/l and 777miμ/l. In view of the above a laparoscopy was performed. In the case presented the ectopic gestation resulted from an intrauterine embryo transfer, since the left fallopian tube was absent and the right was buried in dense adhesions.

The traditional treatment for ectopic pregnancy is a salpingectomy by laparotomy. With early diagnosis there is a trend towards a more conservative approach (25). These include excision of the affected segment, milking of the tube or a linear salpingostomy (25). A linear salpingostomy, along the antimesenteric border, is now the most commonly performed procedure where tubal

conservation is considered, and is indicated if the patient desires fertility, is haemodynamically stable, there is an unruptured ectopic pregnancy not more than 5cm and if the contralateral tube is absent or damaged (26,27). In the case under discussion, fertility was desired and due to a history of endometriosis and repeated previous surgery, the left fallopian tube was scarred, hence a linear salpingostomy was performed. Prospective randomised trials have shown definitely that the laparoscopic approach is superior to laparotomy, since there is less blood loss, less analgesic requirement, shorter hospital stays and significant cost saving to the patient (26,27).

The conservative surgical approach has a high success rate with a reported failure rate or rate of a persistent ectopic pregnancy ranging from 3 to 20% (26,27). In the patient presented the repeat serum BhCG was negative and she had marked improvement clinically.

In conclusion, the laparoscopic diagnosis and treatment of ectopic pregnancies offer major benefits over the traditional laparotomy approach, and therefore should be considered as an alternative modality of management and offered to all patients.

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