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Ectopic pregnancy secondary to *in vitro* fertilisation-embryo transfer & pelvic inflammatory disease, a case report

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Abstract
Ectopic Pregnancy (EP) is a type of abnormal pregnancy where the blastocyst implants & develops at a site other than the endometrial lining of the uterine cavity. Patient classically presents with amenorrhoea, vaginal bleeding & pain abdomen & is the one of the leading causes for maternal morbidity & mortality in reproductive age group. Pelvic inflammatory disease (PID) is poly-microbial infection affecting the female genital system & fallopian tubes are the most commonly affected organ & increases the risk of ectopic. Even though there is a decline of genital tuberculosis cases worldwide, it is not uncommon to encounter such cases & there is an increased risk of ectopic due to tubal distortion and agglutination pockets formed due to peritubal adhesions. With rise of infertility cases worldwide, more women opt for assisted reproductive techniques (ART) & ectopic pregnancy is a known complication. Transvaginal Ultrasonography (TVS) plays a key role in establishing the diagnosis of ectopic pregnancy. Conservative & surgical management methods can be considered depending upon the condition of the patient & extent of the disease. Here is reporting a case of ectopic pregnancy secondary to *in vitro* fertilisation-embryo transfer & pelvic inflammatory disease which was treated by laparoscopic salpingectomy.

Keywords: Ectopic pregnancy, pelvic inflammatory disease, *in vitro* fertilisation-embryo transfer, salpingectomy

Introduction
Ectopic pregnancy is a form of abnormal pregnancy where the blastocyst implants & develops at a site other than the endometrial lining of uterine cavity & the ampullary region of the fallopian tube being the most common site of implantation [1]. It is one of the leading cause of maternal morbidity & mortality during the first trimester & the incidence increases exponentially with *in vitro* fertilisation & embryo transfer (IVF-ET) [1]. This dramatic rise is due to younger age group becoming sexually active at an earlier age predisposing them to STI, PID & it's sequelae [2]. Early diagnosis & management is vital in the management of ectopic pregnancy to prevent rupture & hemodynamic instability & with serum beta human chorionic gonadotropin (S.β-hCG) which can be detected in pregnancy as early as eight days after ovulation, it assists in rapid diagnosis & treatment [3]. Ultrasonography showing neither intrauterine nor ectopic pregnancy in a patient with a positive pregnancy test can be concluded as a pregnancy of unknown location [3]. Transvaginal Ultrasonography with Doppler (TVS) is considered as the gold standard for diagnosis of this condition & magnetic resonance imaging (MRI) for uterine anomalies [3]. Pelvic inflammatory disease (PID) is a polymicrobial infection associated with infection & inflammation of the upper female genital tract, including the uterus, fallopian tubes, & related pelvic organs & is the leading cause in developing countries for infertility, ectopic pregnancy & pre term labour [4]. Even though there is a decline of genital tuberculosis cases worldwide, it is not uncommon to encounter such cases & there is an increased risk of ectopic due to tubal distortion and agglutination pockets formed due to peritubal adhesions [3, 4]. With higher incidence of infertility cases, over last couple of decades due to lifestyle changes, there is an increase incidence of ectopic following embryo transfer as fully developed embryo is implanted into the uterine cavity & pre-existing conditions like prior uterine anomalies or surgeries, tubal surgeries, PID, sexually transmitted infections (STI'S) assisted reproductive techniques (ART'S) & prior ectopic increases risk of ectopic [5-6].

ART irrespective of the modality of treatment slightly increases the risk in a women with no prior history of EP & further increases the risk if any risk factors are present [7].

Case report

A 29 year old female, with history of prior 3 recurrent pregnancy losses in the first trimester between 6-9 weeks came for an early pregnancy scan following conception after IVF-ET. She also gives history of prior genital tuberculosis (GTB) 8 years back for which treatment was sought & was started on anti-tubercular therapy according to the Revised National TB Control Programme (RNTCP) & she recovered well. Following the completion of her treatment for GTB, she conceived twice & had miscarriages at 6-9 weeks respectively 1 year apart from each other. She complained of pain abdomen in the left iliac region on & off for 4-5 hours. Her Pulse Rate was -94 BPM, BP – 116/68 mm hg, Respiratory Rate–16 CPM, SPO2 on Room Air was – 99% & her intra axillary temperature was noted to be 98.2 F. Per abdomen examination showed guarding, with left iliac tenderness with no organomegaly or mass felt or any skin colour changes were noted. Per speculum examination revealed no bleeding. Per vaginal examination showed uterus to be 6 weeks size, anteverted, mobile, regular, left fornix appeared to be occupied and tenderness was present. Urine pregnancy test (UPT) done one week prior with a home test kit was positive & repeated at the hospital again & was positive. Cervical motion tenderness was present. S.β-hCG was 1,637 mlU /mL.TVS with Doppler was done to confirm the location of the gestational sac & revealed heterogeneously hyperechoic lesion measuring 2.5 cm in the left adnexa. Anoechoic area (gestational sac) measuring 1.5cm is seen within this lesion with yolk sac and foetal pole corresponding to 6 weeks+5days. There was no evidence of intrauterine gestation. Foetal cardiac activity was present- 127 BPM. Her blood investigations were sent immediately for surgery & all her parameters were well within normal limits with Hb- 12.1 g/dl & blood group-O+ve. Patient & attenders were counselled for the need of laparoscopy & proceed in view of left adnexal live unruptured ectopic gestation. After obtaining consent & anaesthetic fitness, she underwent laparoscopy & proceed under general anaesthesia. On laparoscopic visualisation following insertion of ports & creation of pneumoperitoneum, multiple dense & flimsy adhesions seen involving the left broad ligament, ovarian ligament, ovary & tube were noted. Perihepatic adhesions (Fitz Hugh Curtis Syndrome) between the liver & uterus noted & dissection & adhesiolysis was done using Harmonic scalpel. Left salpingectomy done. Blood noted in the left pouch of douglas. Similar adhesions noted in the right tube, released & was visualised well following dissection. Prophylactic endometrial curettage was done. Hemostasis was achieved throughout the procedure. Specimen was sent for histopathological examination & confirmed the clinical diagnosis. Intraoperative & postoperative period was uneventful. Prophylactic antibiotics & analgesics were given. Patient was discharged on postoperative day 2 & contraceptive advice was given & asked to return after 6 months for another cycle of IVF treatment.

Discussion

EP is a one of the few leading causes of maternal morbidity & mortality & early detection & treatment is vital in prevention of maternal deaths [1]. In a multicentric case-control study in India, conducted by ICMR Task Force Project, 1990, the incidence of ectopic pregnancy is 3.12 per 1000 pregnancies or 3.86 per 1000 live births & in a recent study conducted by ICMR 3 years ago, there were a total of 18,871 deliveries & 100 cases of ectopic pregnancies which were documented increasing the incidence of ectopic pregnancies to 5.2/1000 deliveries [2]. The rate of increase in S.β-hCG levels, typically measured every 48 hours, aids in distinguishing normal from an abnormal early pregnancy [3]. There is a steady increase in S.β- hCG levels every 48 hours & reaches a maximum level of 1,00,000 IU/ L at 10-12 weeks of pregnancy following it there is a steady decline & reaches a plateau phase & remains static till term [3]. TVS with Doppler is considered the gold standard in the diagnosis of EP, showing ring of fire appearance in an unruptured ectopic & assists in knowing the status of the tube in both ruptured & unruptured cases [3]. Medical management with intramuscular injection with methotrexate can be considered as a conservative modality of treatment with single dose & double dose regimen in unruptured ectopic cases however surgical management has a higher success rate than methotrexate & by performing salpingectomy, the risk of recurrence is decreased as remnant trophoblastic tissue is eliminated from the affected side of the tube, thus preventing recurrence [3]. With the advent of laparoscopic surgeries & the advantage of it being minimally invasive with decreased blood loss & it can be performed even when the patient is hemodynamically unstable depending upon the surgeon's expertise, laparoscopic salpingectomy is the preferred modality of treatment [3]. PID increases the risk of ectopic as it mostly commonly affects the fallopian tubes & causes distortion of tubal architecture due to formation of agglutination pockets or adhesions leading to implantation of blastocyst in the tubes followed by its development which can most commonly lead to rupture which could be life threatening if undetected [4]. Uterine anomalies or prior uterine surgeries, tubal surgeries, PID, STI'S, ART'S & previous ectopic increases the risk of EP [5, 6]. In developing nations, GTB is a cause of concern even though scarce when compared to earlier rates, it can be encountered in gynaecological practice and can predispose to risk of having an EP. EP is seen most commonly in women receiving ART or ovulation induction but a co –existing PID can increase the risk by 0.2-1% increasing the already existent risk [7].

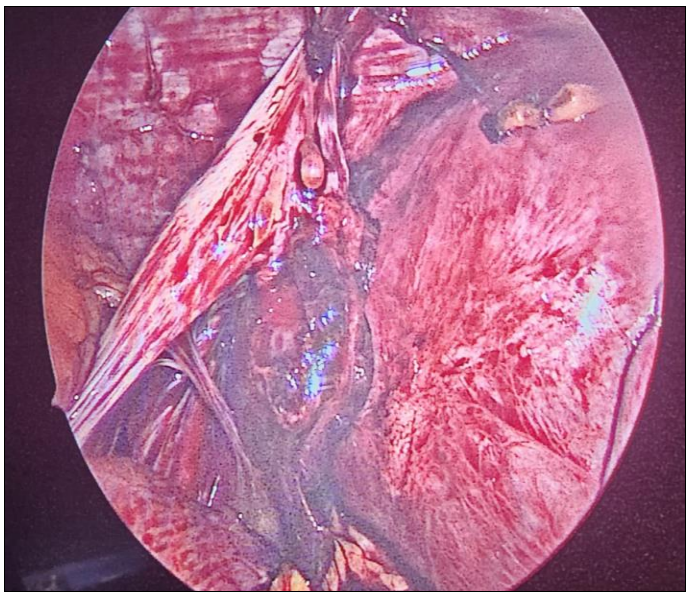

Fig 1: Laparoscopic intraoperative finding showing ectopic gestation in the left tube with adhesions between the left fallopian tube, broad ligament, ovarian ligament & uterus.

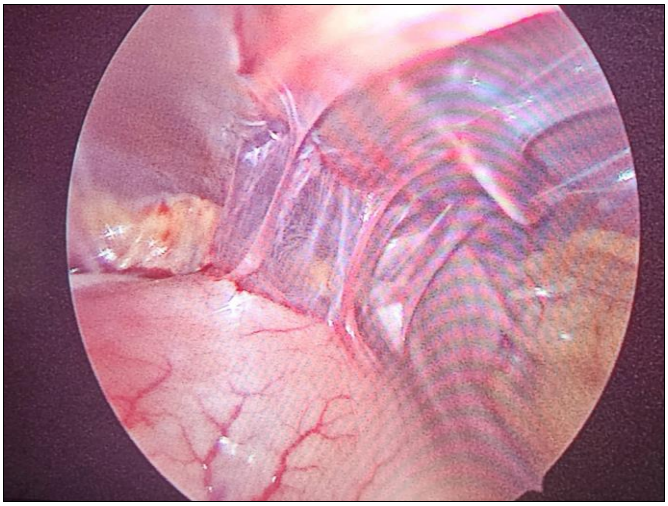

Fig 2: Laparoscopic intraoperative finding showing perihepatic adhesions between the uterus & the liver giving the classical violin string like appearance (FITZ HUGH CURTIS SYNDROME).

Conclusion

EP is a common problem encountered in reproductive age group & a common cause of maternal mortality & morbidity in developing countries. Associated factors like prior uterine anomalies or surgeries, tubal surgeries, PID, STI'S, ART & prior ectopic increases the risk of ectopic. Early diagnosis & treatment is very vital in saving the patient's life. A combined test with TVS & S.β-hCG establishes the diagnosis of the disease & provides a specificity of 95%. Patient with ectopic can be managed conservatively with methotrexate therapy provided there is no evidence of rupture and the tube is intact or surgically by salpingectomy either laparoscopically or open procedure depending on the hemodynamic stability of the patient & learning curve of the surgeon irrespective of the integrity of the tube. GTB is also an important predisposing factor for the development of ectopic due to destruction of tubal architecture & peritubal adhesions inhibiting the blastocyst to implant inside the uterus & promoting it's growth & development in the tubes making it prone to rupture. With an increasing number of infertility cases undergoing ART, the risk of developing ectopic following the procedure is not uncommon as it is a known complication.

Conflict of Interest

Not available

Financial Support

Not available

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