

Heterotopic Pregnancy

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OBJECTIVE – To study the incidence, diagnosis and management of heterotopic pregnancy (HTP). **METHODS** – Six HTPs treated by us were analysed. **RESULTS** – Of 135 ectopics (4500 deliveries from 1994 to 2001) six were HTP. None were diagnosed at initial checkup or by USG outside till they presented with severe pain in abdomen at our hospital. Main predisposing factor was pelvic/ tubal pathology, and five out of six were conceptions by ART. HTP was suspected by clinical findings, TVS and HCG and was confirmed by laparoscopy and later by histopathology. All were managed by laparoscopy taking care not to disturb viable intrauterine gestation, with minimum pneumoperitoneum and safe antibiotics. There were no complications. Two patients delivered at term and one aborted at 28 weeks. **CONCLUSION** – High index of suspicion is necessary to diagnose this life threatening condition whose incidence is increasing. Laparoscopic management is safe and prognosis for intrauterine gestation is good.

Key words : heterotopic pregnancy, ectopic pregnancy, operative laparoscopy, assisted reproductive techniques

Introduction

Heterotopic pregnancy (HTP) refers to the simultaneous occurrence of two or more implantation sites¹. A gradual increase in its incidence has been documented in the literature. The increased use of assisted reproductive technology and the rise in the incidence of tubal and pelvic diseases have contributed to the high rate of multiple and ectopic pregnancies in the last decade. We present six cases of heterotopic pregnancy and analyze their incidence, presentation, mode of management and outcome. The setting is a solo private practice in an obstetric and gynecological hospital with special provisions for high risk pregnancies and endoscopic surgeries.

Material, Methods and Results

Incidence : A total of 135 women were treated for ectopic pregnancy, 130 by laparoscopy and five by laparotomy from November 1994 to May 2001. Out of these 135, six were HTP (4.44% of all ectopics). During the same period there were 4500 deliveries, the incidence of ectopic pregnancy being 30/1000 deliveries. Therefore HTP has an incidence of 1.3/1000 in our hospital.

Presenting symptom : Five of the six women presented with severe abdominal pain. Two of them had evacuation for missed abortion few days before presenting with pain. The other three were diagnosed outside as having an intrauterine pregnancy by serum/ urinary β hCG and transvaginal sonography.

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Table I shows the relevant characteristics of patients. The mean age at the time of diagnosis was 31.1 years, ranging from 26 years to 38 years. Average married life was 9.4 years. None of them had a previous term delivery. Three of them had history of previous abortion. Tubal/ pelvic pathology was one of the main predisposing factors (66.7%) for HTP. Out of the six HTPs, only one was a spontaneous conception, and the rest had conceived by ovulation induction followed by IUI, IVF or ICSI (Table I).

Diagnosis : HTP was suspected by clinical findings, TVS (Photograph 1) and urine/ serum β hCG test (Table II).

Diagnosis was confirmed in all cases at laparoscopy and later by the demonstration of chorionic villi in the fallopian tube on histopathological examination.

Management : All the six cases were treated by laparoscopic surgery. Four cases with ruptured tube and one with unruptured pregnancy in a damaged tube were treated by salpingectomy. Salpingostomy was done for the patient with bilateral unruptured ampullary pregnancy (Table III).

In those three patients with live intrauterine pregnancies care was taken not to manipulate the uterus with elevator or a probe. Minimum possible pneumoperitoneum was used and safe antibiotics were given. HCG or progesterone was given to support the pregnancy. TVS was repeated after 48 hours to confirm the well being of the intrauterine pregnancies.

Follow up and outcome : The contents of the fallopian tube were sent for histopathology which confirmed the presence of chorionic villi. There were no intraoperative or postoperative complications in any of the patients.

Table I: Patient Characteristic

Patient No.	Age (years)	Married life (years)	Obstetric history	Medical / Surgical problems	Mode of conception	Other pelvic pathology at laparoscopy
1	26	3 ½	G2P0A1	Male-bilateral varicocele and oligoasthenospermia. Female- appendectomy	IUI	Pelvic adhesions
2	29	6	G2P0A1	--	Spontaneous	-
3	31	10	G1P0A0	Family history of tuberculosis	ICSI	Unhealthy tubes
4	38	12	G2P0A1	Herpes simplex I and II +ve. Left tubal block	ICSI	Unhealthy thickened tubes, left tubal block
5	32	15	G1P0A0	Laparoscopic ovarian drilling, hypothyroidism	IVF	Hyperstimulated ovary
6	33	10	G1P0A0	Left tubal block	IUI	Left tubal block

Table II: Transvaginal Sonographic (TVS) findings

Patient No.	Uterus	Adenexal mass	Free fluid in POD	Suspicion of HTP
1	No gestation sac (recently evacuated)	Right TO mass	+	Yes
2	No gestation sac (recently evacuated)	Thickened left tube	+	Yes
3	Twin intrauterine pregnancy of 6 weeks	Right ectopic pregnancy	+	Yes
4	Single intrauterine pregnancy of 8 weeks	Right ectopic pregnancy	+	Yes
5	Single intrauterine pregnancy of 6 weeks	Right adenexal pregnancy	+	Yes
6	No gestation sac	Right ectopic pregnancy Left corpus luteal cyst	+	No

Table III: Findings at Laparoscopy

Patient No.	Site	Ruptured	Unruptured peritoneum	Haemo-	Treatment pelvic	Other pathology
1.	Ampullary	Yes	-	+	Salpingectomy	Pelvic adhesions
2.	Ampullary	Yes	-	+	Salpingectomy	-
3.	Isthmic	Yes	-	+	Salpingectomy	Unhealthy tubes
4.	Ampullary	Yes	-	+	Salpingectomy	Left tubal block, unhealthy tubes
5.	Ampullary	-	Yes	+	Salpingectomy	Hyperstimulated ovary
6.	Bilateral ampullary	-	Yes	+	Bilateral salpingostomy	Left tubal block

Of the three with intrauterine live pregnancies, one with twins aborted at 28 weeks due to hydramnios and premature rupture of membranes. The other two carried their pregnancies to full term and delivered healthy babies.

Discussion

Of six HTPs only one resulted from a natural cycle (16.7%). Of the other five, two resulted from ICSI, two from IUI and one from IVF-ET, after ovarian stimulation (83.3%). (Table -I).

The incidence of ectopic pregnancies in our hospital was 30/1000 deliveries. This is much higher than the reported incidence in the general population. The availability of operative laparoscopy might be the reason for this high incidence of ectopic pregnancies in our hospital. This incidence is midway between that in the general populations and that in ART clinics^{2,3,4}. (Table -IV).

Table IV : The incidence of ectopic pregnancies and HTPs

Study reported by	Incidence of ectopic pregnancies (percent)	HTP as percentage of ectopic pregnancies
Marcus and Brinsden(1995) ³	4.5	14.8
Cunningham et al (1997) ⁴	1	-
Hulvert et al (1992) ²	3.7	30.5
Present series, 2002	3	4.4

From Table I it is evident that tubal/ pelvic pathology is one of the main predisposing factors for heterotopic pregnancy (4/6 = 66.7%). That could have been the reason for all of them to be elderly and nulliparous, with assistance needed for conception.

Habana et al¹ reported previous history of ectopic pregnancy in 43.3% and previous history of tubal surgery in 86.7% out of 30 cases of cornual HTP.

Another significant contributing factor for HTPs is found to be assisted reproductive technology. In our study only one patient had spontaneous conception. The other five had stimulated cycles with some form of assistance for conception (83.3%). (Table -I).

In an extensive review of literature on cornual heterotopic pregnancy and contemporary management options done by Habana et al¹, the following mechanisms have been

proposed for the greater incidence of HTP in IVF-ET conceptions - positioning the tip of the ET catheter towards the tubal ostia at the time of expulsion of the embryo, retrograde delivery of the embryos because of the reflux of uterine secretions, uterine contractions, endometrial bleeding due to traumatic ET, extrusion of the embryo into the cornual or tubal areas by hydrostatic forces involved in the transfer, greater volume of fluid loaded in the ET catheter and head down tilted position facilitating the embryo migration in the fallopian tube. HTP is a diagnostic masquerader. It is known to present with a variety of symptoms and signs leading to a delay in establishing correct diagnosis. Johnson et al⁵ reported five cases of HTP among 173 clinical pregnancies in an IVF-ET program and in four of them unequivocal diagnosis of HTP was not made on the initial sonography, thus delaying treatment in one for more than five months. Habana et al¹ reported the gestational age at diagnosis of cornual heterotopic pregnancy as 6 to 26 weeks and 48.6% had cornual rupture before diagnosis.

In our six patients, five were not diagnosed at initial checkup or USG outside till they presented with severe pain in the abdomen at our hospital. One with bilateral tubal pregnancy was diagnosed as only right tubal pregnancy and left corpus luteal cyst.

Four of our six HTPs were found ruptured at the time of diagnosis (66.6%) (Table - III) compared to our own series of single ectopic pregnancies where 69.23% were diagnosed unruptured⁶.

All of the six cases of HTP were managed by laparoscopic surgery (Table - III) and there were no procedure related complications or damage to the intrauterine pregnancies. Trivedi et al⁷ reported laparoscopic surgery performed during pregnancy in five patients and had not observed any undue increase in the incidence of threatened abortion or preterm labor. Our experience also supports this view and the one patient who aborted several months later, had twins and hydramnios. Pschera and Gatterer⁸ reviewed the literature regarding laparoscopically managed cases of HTP and gave encouraging report on its safety and feasibility. We had one case of bilateral tubal pregnancy among the six HTPs and the pregnancy in the second tube was diagnosed as the tube was being lifted as a part of routine pelvic examination and dye test at laparoscopy. The same was the experience of Alice and David⁹ and this emphasizes the need for a thorough examination of the whole pelvis even if the pathology is already found in one tube.

Other options of management like medical treatment (potassium chloride, methotrexate and prostaglandins),

expectant line of management, and laparotomy and excision have been discussed in detail by Habana et al¹ in their extensive review of cornual heterotopic pregnancies. Their review suggests a better outcome for intrauterine pregnancy after surgical intervention than after medical treatment, (live birth rate of 60.9% v/s 50% and abortion rate of 13.0% v/s 50%). Neither methotrexate with its potential adverse effects on the developing intrauterine gestation nor prostaglandins with their effects on uterine contractility are advisable in HTP. When ultrasonography documented fetal death in the cornual gestation and the patient was asymptomatic, they reported its complete resolution of cornual pregnancy by expectant management and the intrauterine gestation continued to full term. Monitoring the resolution of HTP with β hCG levels is difficult where there is an ongoing intrauterine pregnancy making serial TVS the optimum modality.



Photograph 1: TVS of heterotopic pregnancy with a gestational sac in the uterine cavity and adnexal mass on the right side.

Two out of three of our patients with simultaneous intrauterine pregnancy delivered healthy infants (66.6%). Habana et al¹ report an over all live birth rate of 66.2%.

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