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Long-term Outcome After Laparoscopic Treatment of Heterotopic Pregnancy: 19 Cases

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ABSTRACT **Study Objective:** To determine the long-term outcome of intrauterine pregnancies after treatment of heterotopic pregnancies.
Design: Retrospective cohort study (Canadian Task Force classification II-3).
Setting: Tertiary center university hospital.
Patients: All women who underwent surgery because of heterotopic pregnancy over 12 years.
Intervention: Laparoscopic surgery.
Measurements and Main Results: Infant development and future pregnancy. Extrauterine pregnancies were located in the tube (n = 13), uterine cornua (n = 3), ovary (n = 1), and tubal stump (n = 2). During laparoscopy, a ruptured tube was found in 6 tubal pregnancies (46%), blood transfusion was needed in 7 heterotopic pregnancies (37%), and salpingectomy was performed in 12 women with tubal pregnancies (91.7%). The pregnancy outcome consisted of 13 babies (term and preterm) taken home and 5 miscarriages. Long-term follow up demonstrated that 10 of 13 infants (76.9%) exhibited normal development. Three infants, all from 1 triplet pregnancy, exhibited borderline to normal development. Ten of 15 women achieved additional pregnancies, with 10 deliveries and only 1 extrauterine pregnancy in the tubal stump.
Conclusions: Women with a heterotopic pregnancy are at high risk for late diagnosis and at risk for hypovolemic shock at diagnosis, and may require blood transfusion. The outcome of intrauterine pregnancy in association with heterotopic pregnancy requiring surgical intervention is good, and most complications were associated with multifetal pregnancy and preterm delivery. Journal of Minimally Invasive Gynecology (2010) 17, 321–324 © 2010 AAGL. All rights reserved.

Keywords: Heterotopic pregnancy; Laparoscopy; Neonatal outcome

Heterotopic pregnancy occurs when there are coexisting intrauterine and ectopic pregnancies. The reported incidence varies widely, from 1 in 100 to 1 in 30 000 pregnancies [1]. The incidence of heterotopic pregnancy is much higher in women who have undergone ovulation induction; therefore, it is no longer considered a rarity after treatment with assisted reproductive technology (ART) [2,3]. Heterotopic pregnancy is often associated with major diagnostic difficulties. Serial human chorionic gonadotropin (hCG) measurements are often difficult to interpret because intrauterine pregnancy may cause the hCG concentration to increase appropriately [4]. Early transvaginal sonographic examination is commonly performed in women with ART pregnancy. Identification of heterotopic pregnancy, however, is still difficult because of an associated intrauterine pregnancy, which often leads to late detection of an extrauterine sac. The diagnosis of heterotopic pregnancy, therefore, remains a diagnostic challenge [5].

The goal of management of heterotopic pregnancy is to terminate the extrauterine pregnancy while taking precautions to minimize the possible threat to the intrauterine gestation. Yet, the need to surgically remove the extrauterine pregnancy may pose harm to the intrauterine pregnancy. Luo et al [6] reported a success rate of 66.7% for preterm and term deliveries after treatment of heterotopic pregnancy. Currently, no data exist to enable prediction of the expected risk of developmental complications involving neonates of heterotopic pregnancies. The objective of the present study was to describe our experience and obtain long-term follow-up data for women and neonates after surgical treatment of heterotopic pregnancy.

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Materials and Methods

The study population consisted of all women with combined intrauterine and extrauterine pregnancies, which were diagnosed and treated in our department from January 1992 through April 2004. Clinical symptoms, ultrasonographic examinations, and outcomes of surgery were documented. Data about patient characteristics and immediate postoperative outcome were available from a retrospective review of the hospital and outpatient medical records. Long-term follow-up was performed using a 2-part telephone questionnaire. The first part contained questions about the mothers' future fertility, that is, the number of pregnancies attained after the heterotopic pregnancy and their outcome (i.e., delivery, extrauterine pregnancy, miscarriage, term or preterm delivery, and cesarean section). The second part of the questionnaire included additional questions focused on the long-term outcome of the neonates including their need for special medical care (e.g., surgery to treat undescended testi), their psychomotor development, and need for special developmental care (e.g., speech therapy).

Approval was not requested from the human investigation review board because the study did not represent an experimental protocol but a summary of outcomes of what is considered routine management at our institution.

Operative Procedure

All laparoscopic procedures and laparotomies were performed by experienced senior surgeons. Patients were under endotracheal general anesthesia and placed in a modified dorsolithotomy position. Anesthesia was induced with pentobarbital and succinylcholine, and inhalation anesthesia was administered with isoflurane and fentanyl. Blood pressure, electrocardiograms, transcutaneous oxygen saturation, and end-tidal carbon dioxide (CO_2) pressure were monitored continuously.

In all laparoscopic surgeries, a Veress needle was inserted through the umbilicus, and the abdomen was inflated with CO_2. After induction of pneumoperitoneum, CO_2 pressure was maintained at less than 12 mm Hg. A videolaparoscope was inserted, and right and left lower-quadrant ancillary ports were introduced for instruments. The tubal gestational sac was treated with blunt and sharp dissection using a unipolar or bipolar probe, or scissors. A bipolar forceps was used to achieve hemostasis. In all cases, the abdomen was rinsed and bloodless at the end of the procedure.

Results

From January 1992 through April 2004, 19 women were admitted to our department with a heterotopic pregnancy. Patient characteristics are given in Table 1, and their clinical manifestations and treatment in Table 2. Of the women included in our series, all but 1 conceived via ovulation induction or in vitro fertilization. Among them, 89.5% had pain or vaginal bleeding at diagnosis. Median gestational age was 7 weeks 4 days (53 days), and 41% of extrauterine fetuses had a positive heart beat observed at ultrasonography at diagnosis. All but 2 patients underwent laparoscopy, and 2 were converted later to laparotomy. Nine extrauterine pregnancies (47%) were ruptured at admission, and 41% of patients needed blood transfusion. The surgical interventions used are given in Table 2.

Table 1
Characteristics of 19 women with heterotopic pregnancies

Variable	Value
Age, Median (range), yr	27 (20–44)
Gravidity, median (range)	1 (1–5)
Parity, median (range)	0 (0–2)
Spontaneous pregnancy	1
In vitro fertilization	16
Clomiphen citrate	2
Previous extrauterine pregnancy, No. (%)	2 (10.5)
Previous pelvic surgery, No. (%)	9 (50)

Long-term follow-up was performed in 15 patients who had an ongoing intrauterine pregnancy. In this group 13.3% and 20% had first- and second-trimester abortions, respectively. Furthermore, 26.7% and 40.0% had preterm and term deliveries, respectively. The take-home baby rate was 86% (i.e., 13 babies for the 15 women because of 1 triplet and 1 twin pregnancy (Table 3). Four preterm neonates were small for gestational age. One mother had severe preeclampsia. All term neonates had appropriate weight for gestational age.

Duration of long-term follow-up of the infants and mothers was 2 to 12.5 years (Table 4). Follow-up included

Table 2
Clinical, and preoperative and intraoperative manifestations in women with heterotopic pregnancies[a]

Clinical manifestation	
No symptoms	2/18 (11.1)
Vaginal bleeding	6/18 (33.3)
Abdominal pain	13/18 (72.2)
Hypovolemic shock	7 (38.9)
Ultrasonographic diagnosis	8/18 (44.4)
Gestational age per last menstrual period, median (range), d	53/18 (39–98)
Fetal pulse	7/17 (41)
Hemoglobin at admission, mean, g/dL	14/19, 9.7
Ruptured extrauterine pregnancy	9/16 (47)
Hemoperitoneum	11 (57.9)
Blood transfusion	7/17 (36.9)
Surgical intervention	
Laparoscopy	17 (89.8)
Primary laparotomy	2 (10.5)
Conversion to laparotomy	2 (10.5)
Salpingectomy	12
Salpingostomy	1
Ovarian wedge	1
Cornuectomy	2
Endo-loop to tubular stump	2
Suction of cornual pregnancy + potassium chloride injection	1

[a] Unless otherwise indicated, values are given as number of women (%).