Laparoscopic treatment of cornual pregnancy: a series of 20 consecutive cases

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Objective: To determine the outcome of laparoscopic management of cornual pregnancy.
Design: Retrospective cohort study (Canadian Task Force classification II-3).
Setting: A tertiary referral hospital in Israel.
Patient(s): Twenty-seven consecutive women with cornual pregnancy who were diagnosed and treated at our institute.
Intervention(s): Laparoscopy was undertaken in 20 (74%) of the patients. Resection of the cornua and/or a Vicryl loop placement was performed. In 6 cases, laparoscopy was converted to laparotomy. In addition, laparotomy was performed in 2 other cases. Five cases were managed conservatively: 3 with systemic methotrexate (MTX) and leucovorin, 1 with transvaginal sonography-guided KCl injection to the amniotic sac, and 1 with hysteroscopic-guided MTX injection to the amniotic sac. Further treatment after surgery was required in 4 cases: transvaginal sonography–guided KCl injection, MTX or KCl + MTX (1 case each) injection to the amniotic sac, and systemic MTX injection.
Main Outcome Measure(s): Successful laparoscopy, determined as not needing follow-up treatment.
Result(s): The mean gestational age was 56 days. The average and median serum hCG levels were 31,199 and 6,653 IU/mL, respectively. Six of the women (22%) were admitted in hypovolemic shock. Nine patients (33.3%) were asymptomatic upon admission, 14 (52%) had abdominal pain, and 8 (29.6%) were evaluated for vaginal bleeding. One woman developed hypovolemic shock after admission. Only 15 (55.6%) of the 27 pregnancies were diagnosed as a cornual pregnancy by transvaginal sonography before the therapeutic procedure. Blood transfusion was given in seven cases (26%) during surgery. The mean number of days of hospitalization was 5.7 days for patients who underwent surgery and was 7.1 days for all patients. A comparison was made between the first 11 and the last 11 cases treated surgically. Although the two groups were similar in all parameters, conversion from laparoscopy to laparotomy was higher in the first group, although not at a statistically significant level.
Conclusion(s): Improved laparoscopic technique, accumulated experience, and possibly earlier diagnosis have led to fewer operative failures or need to convert to laparotomy during treatment of cornual pregnancy. Conservative treatment, when possible, should be considered. If surgery is indicated, and as more laparoscopic skill is gained, laparoscopy should be considered the preferred method of treating cornual pregnancy. In experienced hands, laparoscopy is a safe and effective treatment for cornual pregnancy. (Fertil Steril® 2008;90:839–43. ©2008 by American Society for Reproductive Medicine.)

Key Words: Cornual pregnancy, interstitial pregnancy, laparoscopy, MTX

The interstitial portion of the fallopian tube is the proximal portion that is within the muscular wall of the uterus. It is 0.7 mm wide and 1 to 2 cm long. Cornual (interstitial) pregnancy represents about 1% of the ectopic pregnancies (1). Risk factors for cornual pregnancy include past pelvic inflammatory disease, previous pelvic surgery, uterine anomalies, the use of assisted reproductive techniques, and ipsilateral salpingectomy. Ipsilateral salpingectomy is a risk factor that is unique to cornual pregnancy (2). Cornual pregnancy is associated with major diagnostic pitfalls, because it is diagnosed relatively late and presents a diagnostic challenge. Rupture of the uterus may occur in 20% of the cases that progress beyond 12 weeks of amenorrhea (3). It is believed that rupture of cornual pregnancies occurs later, usually after the 12th week of gestation, because of the thickness of the uterine wall (4).

The traditional treatment of cornual pregnancy was hysterectomy or cornual resection by laparotomy. Several investigators have advocated conservative management with methotrexate (MTX) (5, 6). Hysteroscopic removal of cornual pregnancy also has been reported (7). We have also advocated elsewhere the use of hysteroscopy for local MTX treatment (8). A combination of dilatation and curettage and MTX recently was suggested (9).

Laparoscopic techniques that involve cornual resection, cornuostomy, salpingostomy, or salpingectomy have improved greatly over the last decade and currently are in wide use (5). The aim of this study was to assess the modern

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laparoscopic management of cornual pregnancy and to examine how advances in laparoscopy may have influenced treatment during the last 2 decades in a large series from one tertiary-care medical center.

MATERIALS AND METHODS

Twenty-seven women with cornual pregnancy were treated at our department from September 1991 to January 2006. We performed a retrospective search through our computerized database, which includes all admissions and has several codes regarding extrauterine pregnancies. We manually reviewed all of the files catalogued under the codes "ectopic pregnancy—non tubal" and "ectopic pregnancy—other." We identified 24 historic cases of cornual pregnancy, and three additional women were treated during the preparation of this article. Demographic features, clinical symptoms, transvaginal sonography (TVS) examinations, type of management, and outcome were reviewed by using archived medical files. Because the data collected present a summary of our routine surgical protocol and this is not an interventional study, approval was not obtained from the institutional review board.

All women were evaluated by physical examination and TVS and by assessing complete blood count (CBC), liver function tests (LFTs), and serum hCG levels. Choice of treatment was made by the attending physician, considering the hemodynamic status of the patient, the status of the pregnancy (heterotropic or not, sonographic appearance, and hCG level), the patient's history, desire for fertility preservation, and the laparoscopic capabilities of the staff present. After surgery, all patients were hospitalized for ≥ 2 days.

Absolute indications for operative treatment of ectopic pregnancy in our department are unstable hemodynamic state, sonographically detectable fetal heart beat, serum hCG of >10,000 IU/L, and second MTX failure. A relative indication for operative treatment is hCG of >5,000 IU/L. These indications were assigned to cornual pregnancy.

Statistical Analysis

Statistical analysis was performed by using Student's *t*-test, Fisher's exact test, or χ^2 test, as appropriate. A P value of $<.05$ was considered significant. P values in the range of .05 to .12 are shown in Tables 2 and 3 to indicate a significant trend.

Conservative Treatment

When used systemically, MTX was given IM, either as a one-time dose (50 mg per m^2 of body area) or in multiple doses (four doses, with leucovorin, on sequential days: an IM dose of 1 mg of MTX per kg of body weight was given on days 1, 3, 5, and 7, and 3 injections of 0.1 mg of leucovorin per kg of body weight [folinic acid] were given, on days 2, 4, and 6). CBC and LFT were sampled every other day. Leucovorin was administered with MTX, even though its administration is no longer advocated. Although several medical protocols for ectopic pregnancy have been used over the years, in our department, the protocol did not change during the years of this study.

Guided injection of MTX was performed either under TVS guidance or by hysteroscopy, as described elsewhere (8).

Operating Procedures

All of the operations were performed by experienced surgeons under endotracheal intubation and general anesthesia, in a modified dorsolithotomy position. Patients were monitored continually for blood pressure, electrocardiogram, transcutaneous oxygen saturation, and end tidal carbon dioxide pressure.

In all cases of laparoscopic surgery, a Veress needle was inserted through the umbilicus, and the abdomen was inflated with CO_2. Blunt and sharp dissection of the uterus and cornua was performed with either a unipolar probe, a bipolar probe, or scissors. Bipolar forceps were used for hemostasis. In some of the cases, a Vicryl loop (Endoloop; Ethicon, Cincinnati, OH) was used to tie the area of the cornua, either before or after dissection of the cornua. During laparotomy, the cornua was dissected with scissors, the pregnancy was expelled, and the cornua was stitched with Vicryl sutures. Strict hemostasis and hemoperitoneal evacuation were performed in all operations.

RESULTS

The study group consisted of 27 women who had cornual pregnancy.

The median (range) gravidity and parity were 3 (1–6) and 1 (0–4), respectively. Nineteen pregnancies (70.3%) were conceived spontaneously, and 8 (29.7%), through IVF. Thirteen women (48.1%) had a previous ectopic pregnancy (Table 1).

Previous pelvic operation was noted in 18 (75%) patients. The type of surgery performed is detailed in Table 1. In two of the six patients who did not have a previous operation, bilateral tubal occlusion was noted during infertility workup.

The mean (±SD) gestational age (by last menstrual period) was 8.2 ± 2.1 weeks. The median hCG at admission was 7,200 IU/mL, but the range was wide, between 740 and 360,000 IU/mL. The mean hemoglobin at admission was 12.3 g/dL, with a range between 6.8 and 14.3 g/dL.

Nine (33.3%) of the 27 women were asymptomatic at admission, 8 (29.6%) had vaginal bleeding, and 13 (48.1%) had abdominal pain. Six patients (22.2%) were admitted with hypovolemic shock and therefore were rushed to the operation room while receiving intravenous fluids. All 6 of those women were treated by laparoscopy. One of these patients was treated with systemic MTX later in hospitalization because of plateauing hCG. All 6 were treated with blood