Interstitial Pregnancy with a Retained Intrauterine Device

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An interstitial pregnancy is a rare occurrence when an intrauterine device (IUD) is *in situ*. The incidence of interstitial pregnancies is approximately 1 per 2,500–5,000 live births [1], and the incidence is even lower for the patient wearing an IUD. Bouyer et al reported that the incidence of interstitial pregnancy is much lower than other types of ectopic pregnancies in IUD users [2]. Owing to the difficulty in the early diagnosis of interstitial pregnancy and the unusual anatomic site of implantation involved, interstitial pregnancies account for a disproportionately higher mortality rate than other ectopic pregnancies [1]. Treatment for interstitial pregnancies includes laparotomy, laparoscopy, and/or medical treatment with methotrexate. We report a case of an interstitial pregnancy in a woman with an IUD *in situ* and review the literature regarding this rare and interesting clinical finding.

A 30-year-old woman, gravida 2, para 1, presented to the obstetric clinic with a positive pregnancy test. The last menstrual period was 9 weeks previously. She had a normal vaginal delivery 6 months previously, at which time a copper-bearing IUD was inserted. A transvaginal ultrasonographic examination revealed an IUD in the uterine cavity (Figure 1); however, a gestational sac was also identified in the left lateral side of the myometrium, distinctly separated from the endometrium (Figure 2). In an effort to conserve operative blood loss and to preserve fertility, an explorative laparotomy was performed the following day. At the time of surgery, a bulging mass was visualized in the left cornual region of the uterus (Figure 3). The cornual region was incised, and the trophoblastic tissue and embryo were visible (Figure 4). The ectopic pregnancy was removed, and the cornual region was repaired with suture; the IUD was also removed in the operating room. The postoperative course was uneventful, and the patient was discharged 3 days after surgery.

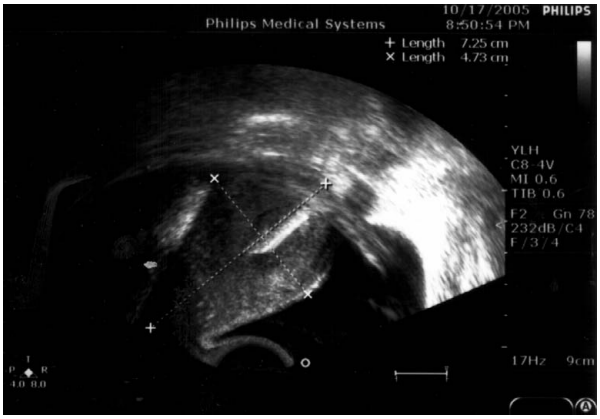

Figure 1. An intrauterine device is noted in the uterine cavity.

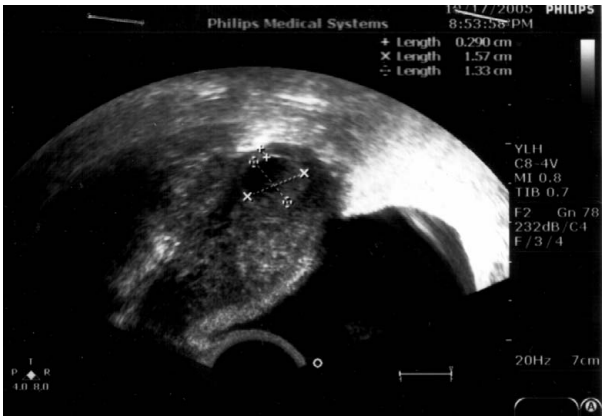

Figure 2. A gestational sac distinctly separated from the endometrium is identified in the left lateral side of the myometrium.

Interstitial pregnancy is a rare form of ectopic pregnancy in which implantation occurs in the interstitial part of the fallopian tube enveloped within the muscular layer of the uterine wall. The myometrial layer allows the gestational tissue to expand and protects it from rupture until 7–16 weeks. Rupture of the interstitial pregnancy usually causes catastrophic hemorrhage because of the rich blood supply in this area. Therefore, the mortality rate of interstitial pregnancy is much higher

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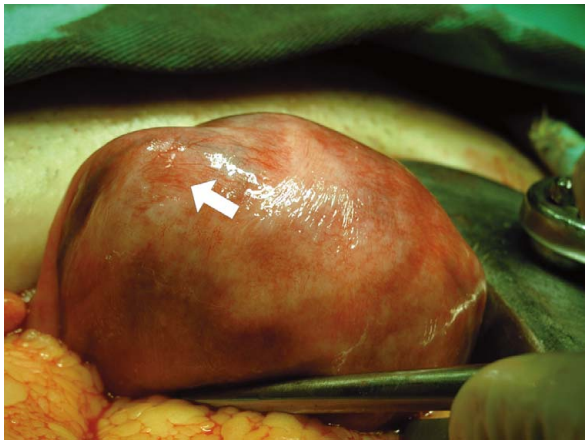

Figure 3. A bulging mass (arrow) is visualized in the left cornual region of the uterus.

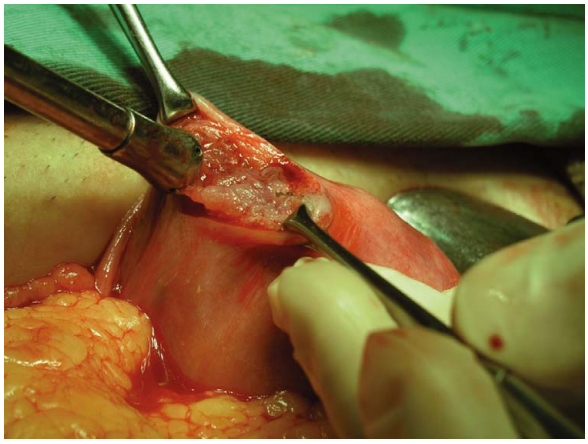

Figure 4. The cornual region is incised, and the trophoblastic tissue is visible.

than other types of ectopic pregnancy. While interstitial pregnancies account for 2–4% of all ectopic pregnancies [1], the maternal mortality rate of interstitial pregnancies is 2–2.5% [1], and the overall mortality rate of all ectopic pregnancies was reported to be 0.14% in 1990 [3].

The predisposing factors for interstitial pregnancy include pelvic inflammation, the use of assisted reproductive technology, and ipsilateral salpingectomy. A meta-analysis on the relationship between IUD use and risk of ectopic pregnancy showed that current IUD use does not increase the risk of an ectopic pregnancy. An IUD decreases the risk of both intrauterine and extrauterine pregnancy; however, a pregnancy with a retained IUD is more often an ectopic pregnancy than a pregnancy without an IUD [4].

In contrast to the case reported herein, Bouyer et al [2] reported that current IUD use protects against interstitial pregnancy. Because an IUD may cause mild inflammation which results in deciliation of the endosalpinx and delay of ovum transport, the site of ectopic pregnancy with a retained IUD is more frequently in the distal part of the reproductive tract (i.e. ovary and fallopian tube) rather than in the uterus [2].

The combination of a sensitive serum β-human chorionic gonadotropin (HCG) assay and transvaginal ultrasonography has facilitated the diagnosis of ectopic pregnancy. Nevertheless, the early diagnosis of interstitial pregnancy remains difficult. An interstitial pregnancy is diagnosed based on ultrasonographic criteria, a positive β-HCG pregnancy test, and clinical suspicion. The ultrasonographic criteria include the absence of a gestational sac in the uterine cavity, a gestational sac asymmetrically located within the uterus, and a thin myometrial layer surrounding the gestational sac [5].

Management of interstitial pregnancy depends largely on the patient's condition. Traditionally, interstitial pregnancy is treated with cornual resection or hysterectomy. Such is typically the result of delayed diagnosis and massive hemorrhage caused by rupture of the cornua. With sensitive serum β-HCG assays and the advancement of transvaginal ultrasonography, conservative treatment with laparoscopy or medical treatment with methotrexate can be used to treat unruptured interstitial pregnancy so as to preserve fertility. Many successful laparoscopic management options for interstitial pregnancy have been reported with cornual incision or resection and electrocauterization for hemostasis [6]. Methotrexate has been used in the treatment of tubal pregnancy and can be applied to the treatment of interstitial pregnancy, either systemically or via local injection. The most commonly used systemic regimen includes one or two courses of methotrexate (1 mg/kg/day) injected intramuscularly or intravenously on days 1, 3, 5, and 7, with a week of rest between courses.

In the case reported herein, we chose traditional laparotomy to decrease the risk of profound hemorrhage with a lesion known to be adjacent to the left cornua and to achieve the most favorable repair of the myometrial defect to prevent rupture in a subsequent pregnancy. Although an IUD has been reported to have a protective effect against interstitial pregnancy, our case has shown that interstitial pregnancy should be taken into consideration when ectopic pregnancy is suspected, even in the patient with an IUD.

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