

A 37-year-old woman, gravida 2, para 1, presented to the emergency department with low abdominal pain. She had previously undergone an intrauterine insemination (IUI) with controlled ovarian stimulation 29 days before this presentation. Past history revealed no history of sexually transmitted disease, pelvic inflammatory disease, or previous gynecological surgery. Hysterosalpingography had revealed a normal uterine cavity and patent tubes. Serum  $\beta$ -human chorionic gonadotropin ( $\beta$ -hCG) levels were 29 mIU/mL on day 15 after IUI, 1516 mIU/mL on day 23, and 4699 mIU/mL on day 27.

Abdominal examination revealed left iliac fossa pain without signs of peritonitis. A transvaginal ultrasound demonstrated a normal endometrial thickness (10 mm) without an intrauterine gestational sac, normal ovaries, and moderate amount of fluid in the pouch of Douglas. A 2.1-cm complex mass containing a gestational sac with vitelline vesicle was identified behind the left ovary. The  $\beta$ -hCG serum concentration was 7787 mIU/mL. Due to the diagnosis of suspected tubal ectopic pregnancy, laparoscopy was performed.

*My management:*

- a.
- b.
- c.

The implantation of a fertilized ovum outside the endometrial cavity is estimated to occur in 1.5–2% of spontaneously conceived pregnancies [1] and in 2–5% of clinical pregnancies after in vitro fertilization (IVF) [2]. Pregnancies after egg donation have a similar risk of ectopic pregnancy as those by autologous IVF [2]. The associated maternal mortality rate is 0.5 per 1000 cases [3]. Actually, ectopic pregnancy is the main cause of death in the first trimester of pregnancy [4].

The location of ectopic pregnancies in naturally conceived pregnancies and after IVF or other assisted reproductive technologies (ARTs) seems to differ. In spontaneously conceived pregnancies, more than 95% of ectopic pregnancies implant in the fallopian tube, particularly in the ampullary region (75–80%). The ovary (<1%) as well as the uterine cervix (<1%) are less common sites of ectopic implantation. The ectopic pregnancy is infrequently located in the peritoneal cavity, which is called abdominal pregnancy (1.4%). After ARTs, 82.2% of ectopic pregnancies are tubal pregnancies and most commonly in the ampulla (92.7%), whereas 1.5% of ectopic pregnancies are cervical and 4.6% are ovarian or abdominal pregnancies. Interestingly, 11.7% are heterotopic pregnancies [5]. In both natural conception and conception after ARTs, the retroperitoneal space is a rare location of ectopic pregnancies [6].

The physiopathology of retroperitoneal ectopic pregnancy is not fully understood. It has been suggested that the fertilized ovum in spontaneously conceived pregnancies reaches the retroperitoneal space via the lymphatic system or the embryo implants firstly on the posterior peritoneal surface and, by trophoblastic invasion through the peritoneum, reaches the retroperitoneal cavity [6–8]. In IVF pregnancies, either a retrograde migration of the embryo after intrauterine transfer [6, 8–10], a uterine perforation with retroperitoneal embryo placement at the time of transfer [6–9, 11], or a retroperitoneal implantation through a fistulous tract have been proposed [8, 9].

Due to the difficult early diagnosis, retroperitoneal ectopic pregnancies are associated with significant morbidity and mortality [1, 3, 6, 12, 13]. The possibility should be considered in women with elevated serum  $\beta$ -hCG levels and normal uterus and adnexa by transvaginal ultrasonography [12]. Besides the serum hCG level and transvaginal ultrasound, the progesterone level can be utilized to differentiate between normal and abnormal pregnancies but not necessarily retroperitoneal pregnancies [14].

The diagnosis of a retroperitoneal pregnancy in the absence of massive hemorrhage or without operation is usually arduous [7, 12], especially when it is located outside the pelvic cavity [12]. An abdominal ultrasound or magnetic resonance imaging may be helpful [15]. Nevertheless, definitive diagnosis of retroperitoneal ectopic pregnancy is usually made only at the time of surgical intervention [13].

## Management

In our case, we encountered about 50 mL of hemoperitoneum at laparoscopy. The uterus, the fallopian tubes, and the ovaries were normal looking. A nodular lesion was seen adjacent to the left uterosacral ligament, suggesting the presence of the ectopic pregnancy in the retroperitoneal space (Fig. 18.1). We performed a wide excision and removed a 3 × 2 × 2 cm hemorrhagic mass from the retroperitoneal space (Fig. 18.2). The pathology revealed hemorrhagic and decidual tissue next to chorionic villi with involutive changes confirming the diagnosis of a retroperitoneal ectopic pregnancy.

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### Fig. 18.1

Nodular lesion adjacent to the left uterosacral ligament: ectopic pregnancy in the retroperitoneal space

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### Fig. 18.2

**a** and **b** Mass containing the ectopic pregnancy in the retroperitoneal space

The optimal management of retroperitoneal pregnancy remains unclear [12]. To date, there have been less than 20 cases reported in the literature [3]. Nevertheless, their treatment options may be similar to those of the more frequent abdominal pregnancy. Compared to laparotomy, laparoscopic approach is associated with shorter operative time, reduced blood loss [4, 8, 16], less adhesion formation [4], less pain, and faster recovery [8]. Although laparoscopic approach is cost-effective and is the preferable approach to the treatment of abdominal and retroperitoneal pregnancies [3, 4, 7], laparotomy should be considered in patients with extensive intraperitoneal bleeding, intravascular compromise, or poor pelvic visualization at the time of laparoscopy [3]. It is important to have an early diagnosis [12, 17]. The possible risk of uncontrolled bleeding from the placental bed associated with the removal of the products of conception can be reduced with preoperative administration of methotrexate [13, 16] or selective arterial embolization [4, 16]. No mortality associated with this type of pregnancy has been reported.

Medical treatment with systemic methotrexate has also been reported without the need for further surgery [4, 16]. In fact, a few pregnancies of unknown location could be retroperitoneal pregnancies. Yet, none of the reported cases of retroperitoneal ectopic pregnancy has been successfully treated by systemic methotrexate alone [12] and an immediate surgical treatment on presentation seems to be the preferred approach [17]. Recent data suggest that a combination of methotrexate and gefitinib, a small-molecule tyrosin kinase inhibitor that blocks epidermal growth factor (EGF) receptor signaling, might lead to a rapid decline in hCG levels compared with methotrexate alone. However, this treatment should not be used until its efficacy and safety is confirmed [19].

## Outcome of the Case

The patient was discharged 48 h after surgery. The serum  $\beta$ -hCG levels declined rapidly after surgery. Expecting management to wait for a spontaneous resolution would not be appropriate due to the gestational weeks of the patient, the progressive increase in the  $\beta$ -hCG levels, and the risk of gestational sac rupture and massive hemorrhage.

If both the uterus and adnexa are normal during laparoscopic exploration, unusual location of ectopic pregnancy should be considered. Through examination of the entire abdominal cavity including the retroperitoneum should be performed [3]. The increasing number of pregnancies after ARTs increases the risk of ectopic pregnancies including implantation at unusual sites, with a more difficult diagnosis and a high risk of life-threatening complications [3].

## Clinical Pearls/Pitfalls

- Retroperitoneal ectopic pregnancy is a rare condition, but must be considered in pregnancies of unknown location.
- Laparoscopic approach is preferable than laparotomy.
- Medical management with methotrexate could be considered in retroperitoneal pregnancies after an early diagnosis in a stable patient.
- Methotrexate use for ectopic pregnancies does not seem to affect future ovarian reserve and pregnancy.

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