

# Primary Ovarian Pregnancy and Its Management

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## ABSTRACT

Primary ovarian ectopic pregnancy, i.e., the implantation of the gestational sac in the ovary, is one of the rarest forms of ectopic pregnancy. Its incidence after natural conception ranges from 1 in 2000 to 1 in 60 000 deliveries and accounts for 3% of all ectopic pregnancies. The diagnosis is intricate and based on surgical and histopathological observations. The management is, in spite of medical improvement, based on surgery.

We present a case of a 10-wk ectopic ovarian pregnancy managed laparoscopically, and we describe, through a review of the literature, the specific symptomatology, diagnostic criteria, and treatment of this particular pathology.

**Key Words:** Ectopic pregnancy, Extrauterine pregnancy, Ovarian pregnancy, Laparoscopy.

## INTRODUCTION

An ectopic pregnancy is characterized by implantation and development of an embryo outside of the uterine cavity. Ectopic pregnancies can occur in the interstitial (2.4%), isthmic (12.0%), ampullary (70.0%), or fimbrial (11.1%) portion of the fallopian tube or in the ovary (3.2%), or abdomen (1.3%).<sup>1</sup>

Primary ovarian pregnancy is a rare entity. The first case was reported by St. Maurice in 1689<sup>2</sup>; Hertig estimated that ovarian pregnancy occurs in one in 25 000 to 40 000 pregnancies.<sup>3</sup>

The preoperative diagnosis of this type of pregnancy is not easy. It is characterized by a poor clinical symptomatology and a difficult ultrasound diagnosis. The surgical criteria remain hard to prove.<sup>4</sup>

The aim of this article is to describe a case of ovarian pregnancy and to study, through a review of the literature, the specific symptoms, diagnostic criteria, and treatment of this particular pathology.

## CASE REPORT

A 28-y-old primigravida patient was admitted with right lower abdominal pain for 1 wk, for 10 wk after her last menses. Her previous menstrual cycles were regular, with average flow and no dysmenorrhea. Her medical history was negative. On examination, she had no pallor, a pulse of 85/min, and blood pressure of 105/70mm Hg. The left adnexal region was not palpable, whereas there was tenderness in the right iliac fossa. Vaginal examination showed normal uterine size and no cervical motion tenderness, whereas pain at deep palpation of the right fornix was revealed. On investigation, serum  $\beta$ hCG was 11368 mU/L, Hb% was 10.6g%. Transvaginal ultrasonography showed an empty uterine cavity and a hyperechoic shadow in the right adnexa like for a yolk sac. Free fluid was observed in the pouch of Douglas.

Laparoscopic exploration revealed a normal uterus with both fallopian tubes regular. The left ovary was normal, while the right ovary was enlarged with oozing of blood from the surface of an orange-red mass. Blood in the pouch of Douglas was observed.

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Ovarian wedge resection was carried out using scissors and bipolar diathermy set at 35W for the coagulation of the bed of the ovarian pregnancy. The postoperative period was uneventful, and the patient was discharged 2 d after the operation. On histopathological examination, a villous structure embedded in the ovarian tissue were seen, which was confirmatory of primary ovarian pregnancy.<sup>5</sup>

## **DISCUSSION**

Primary ovarian pregnancy is one of the rarest types of extrauterine pregnancy. The cause of primary ovarian pregnancy remains obscure, and it would seem to be secondary to reflux of the fertilized oocyte to the ovary.<sup>6</sup> The cases of ovarian pregnancy after IVF reported in the literature support the theory of reflux.<sup>4</sup> Other hypotheses have suggested interference in the release of the ovum from the ruptured follicle, malfunction of the tubes and inflammatory thickening of the tunica albuginea. Intra-uterine contraceptive devices may also be a cause.<sup>7</sup> As a matter of fact, an intrauterine contraceptive device is found in 14% to 30% of patients with a nonovarian extra-uterine pregnancy,<sup>8-11</sup> while it is found in proportions ranging from 57% to 90% of patients with a primary ovarian pregnancy.<sup>12-16</sup> Its action could be explained by altered tubal motility, thereby facilitating the implantation in the ovary.<sup>4</sup>

The signs and symptoms of ovarian pregnancy are similar to tubal pregnancy. Therefore, a differential diagnosis must be considered with tubal pregnancy, ruptured hemorrhagic corpus luteum, or chocolate cyst. With the improvement in ultrasonographic skills and instrumentation, especially with the use of the vaginal probe, a proportion of ovarian pregnancies can be diagnosed preoperatively.<sup>17</sup> We can highlight a gestational sac adjacent to the ovary or, as has been described, a double echogenic ring within a hypoechoic latero-uterine mass.<sup>4</sup> Several ultrasound images according to gestational age have been described in the literature.<sup>13</sup>

Some criteria are very suggestive for sonographic localization of ovarian pregnancy: a wide echogenic ring with an internal echolucent area on the ovarian surface; the presence of ovarian cortex, including corpus luteum or follicles around the mass; and the echogenicity of the ring usually greater than that of the ovary itself.<sup>13</sup> Three-dimensional ultrasound (3D) seems to make a difference in the differential diagnosis with corpus luteum cyst or hemorrhagic cyst.<sup>13,18</sup>

Spigelberg criteria are historically used for intraoperative diagnosis: intact fallopian tube on the affected side, fetal sac must occupy the position of the ovary on the affected side, ovary connected to the uterus by ovarian ligament, ovarian tissue must be located in the sac wall, which is confirmed by histopathology.<sup>5</sup>

Little evidence is available in the literature about medical treatment with methotrexate, probably because ovarian pregnancy is diagnosed in emergency settings when surgical treatment represents the gold standard. Laparoscopy with conservative treatment is increasingly indicated.<sup>4,19</sup>

Several surgical techniques have been described: ovarian wedge resection for ovarian pregnancy, ovarian pregnancy enucleation, corpus luteum cystectomy for the trophoblast, trophoblast curettage with coagulation or hemostatic suture of the bed of ovarian pregnancy<sup>20</sup> with total conservation of the ovary.<sup>21</sup> In rare cases, due to the advanced development of pregnancy, ovariectomy and oophorectomy may be necessary.<sup>21</sup>

A single case of recurrence of ovarian pregnancy has been described in the literature and involved the contralateral ovary<sup>20</sup> in contrast to approximately 15% recurrent tubal pregnancies.<sup>7</sup>

## **CONCLUSION**

Ovarian pregnancy is a rare condition that has some peculiarities. Its diagnosis is difficult and relies on criteria based on intraoperative findings. Its management remains surgical therapy despite the progress in medical treatment. Now, with ultrasonographic advances, it can be diagnosed early, leading to conservative treatment and preservative surgery.

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