

# Laparoscopic management of ovarian pregnancies: three cases

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## Abstract

Primary ovarian pregnancy is rarely seen. The definitive diagnosis of ovarian pregnancy is difficult before operation and based on Spiegelberg's four criteria. However, destroyed ovarian tissue around the gestational sac in laparoscopic surgery or ruptured ovary at the time of operation can not fulfill Spiegelberg's criteria in some cases. The treatment of choice is laparoscopy, to preserve the reproductive functions of ovary. We suggest that Spiegelberg's criteria require modification for the histopathologic diagnosis of ovarian pregnancy after performed ovarian tissue sparing surgery to preserve fertility.

**Keywords:** laparoscopy, ovarian pregnancy, surgery, fertility

## Introduction

Ovarian pregnancy is an uncommon variant of ectopic pregnancy and diagnosis is a clinical challenge. Its frequency has been reported as 1 in 2100 to 1 in 7000 pregnancies<sup>(1)</sup>. Among women who use IntraUterine Device (IUD), 4.3% of all pregnancies are ectopic pregnancies and of these, one tenth is ovarian pregnancies<sup>(2,3)</sup>. Here we report three cases of spontaneous ovarian pregnancy successfully treated by operative laparoscopy which preserved the ovary.

## Case 1

A 19 years old pregnant 2 and para 1 patient with lower abdominal pain, history of 6 weeks menstrual irregularity and mild vaginal bleeding was referred to our clinic. Her previous history was uneventful. In physical examination, pulse 86/min, arterial blood pressure 120/80 mmHg were observed. In vaginal examination, uterus was at normal size, with no cervical motion tenderness, but pain was present in right iliac fossa. B-human chorionic gonadotropin ( $\beta$ -hCG) level was 2732 mIU/mL.

On transvaginal ultrasonography no gestational sac was seen inside uterus, IUD was detected in the endometrial cavity. Left adnexal region was seen normal, but a hypoechogenic image at the size of 15x10 mm in the right adnexal region and free fluid were identified. Ectopic pregnancy was suspected and laparoscopy was performed.

In the laparoscopic observation, uterus, bilateral fallopian tubes and the left ovary were observed to be normal. Over the surface of the right ovary, hemorrhagic mass approximately 1.5 cm was obser-

ved, evaluated as ovarian pregnancy. The mass was dissected and excised using a bipolar cautery device with a minimally invasive intervention, to preserve the residual ovarian tissue.

Final histopathological examination revealed the presence of ovarian tissue around the chorionic villi, which were confirmatory of primary ovarian pregnancy (Figure 1).

## Case 2

A 28 years old primi-pregnant women with severe lower abdominal pain was referred to our clinic. There was no vaginal bleeding, nausea-vomitting and dysuria. She did not know when her last menstrual period was, but her previous reproductive history was uneventful. In physical examination, pulse 80/min, arterial blood pressure 100/70 mmHg were observed. In vaginal examination, left adnexal tenderness was detected.  $\beta$ -hCG level was 687 mIU/ml on admission and subsequently rise to 723 mIU/ml following day. Patient underwent transvaginal ultrasonography. Pregnancy was not established in uterine cavity, right ovary was normal, in left adnexal region there was a complex mass of 20x15 mm diameter and free fluid within cul de sac was identified. Patient underwent operative laparoscopy with the presumptive diagnosis of ectopic pregnancy.

In the laparoscopic observation, uterus, bilateral fallopian tubes and the right ovary were observed to be normal. Over the surface of the left ovary, hemorrhagic mass approximately 2 cm was observed, evaluated as ruptured of ovarian pregnancy. The mass was dissected and excised using a bipolar cautery

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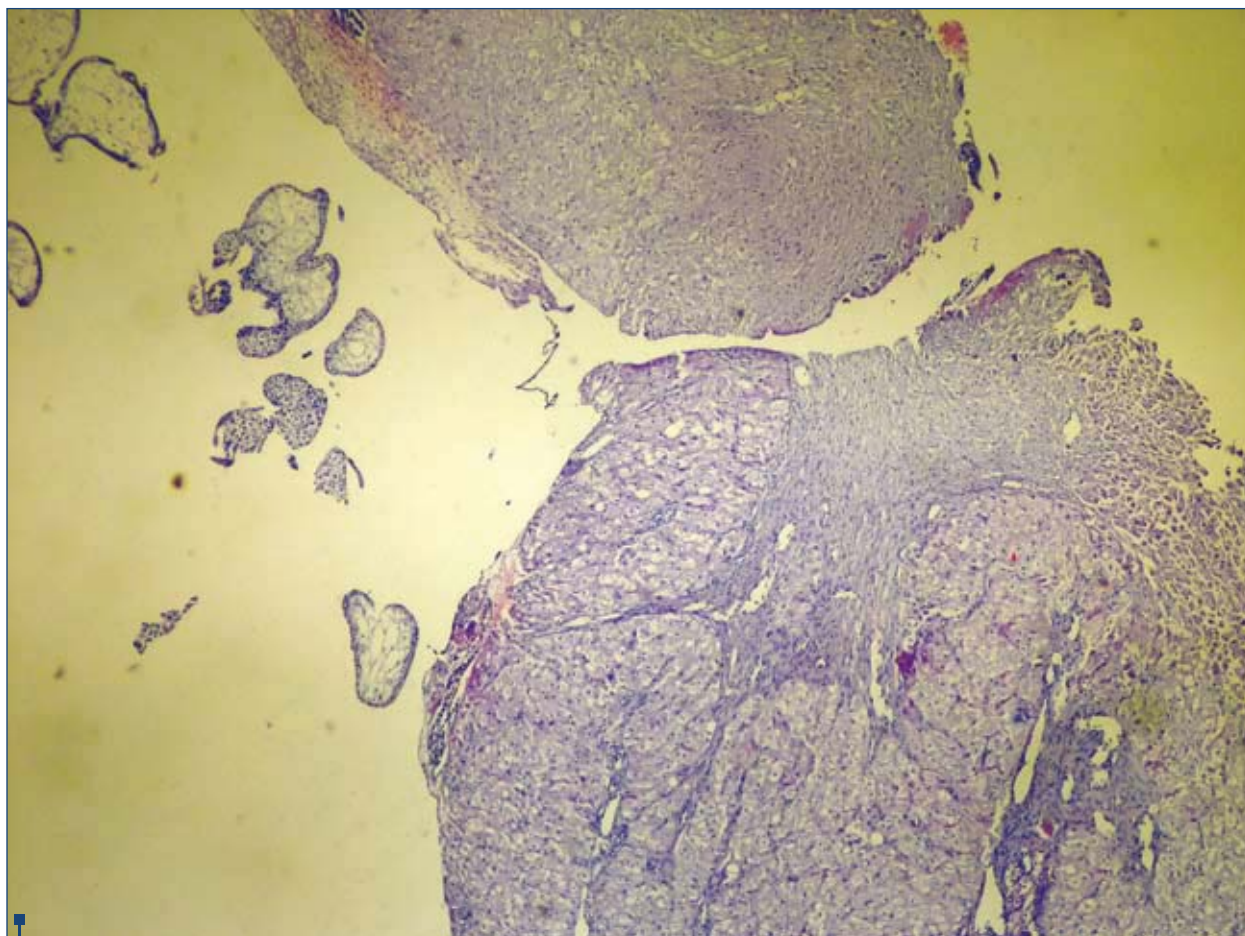


Figure 1. Chorionic villi next to corpus luteum into ovary

device with a minimally invasive intervention to preserve the residual ovarian tissue (Figure 2).

Final histopathological examination revealed the presence of immature chorion villi in blood and fibrin.

### Case 3

A 30 years old multiparous patient with pelvic pain, history of 6 weeks of amenorrhea was referred to our clinic. In physical examination, pulse 80/min, arterial blood pressure 110/80 mmHg were observed. In vaginal examination, uterus was at normal size and pain was present in right iliac fossa.  $\beta$ -hCG level was 17984 mIU/mL. On transvaginal ultrasonography no gestational sac was seen inside uterus, but a hypoechogenic image at the size of 22x27 mm in the right adnexal region and free fluid within cul de sac were identified. Ectopic pregnancy was suspected and laparoscopy was performed.

In the laparoscopic observation, over the surface of the right ovary, a hemorrhagic mass approximately 2.5 cm was observed, evaluated as ruptured ovarian pregnancy. The mass was dissected and

excised using a bipolar cautery device with a minimally invasive intervention to preserve the residual ovarian tissue.

Final histopathological examination revealed the presence of immature chorion villi in blood and fibrin.

### Discussion

Ovarian pregnancy is a rare form of ectopic pregnancy which constitute approximately 3% of all ectopic pregnancies<sup>(4)</sup>. Pelvic inflammatory disease, the use of IUD, pelvic surgery, infertility treatment, and endometriosis are predisposing conditions to primary ovarian gestation. However, ovarian pregnancy may occur without any classical risk factors<sup>(1,5)</sup>. Causes of ovarian pregnancies are due to failure of ovum separation during ovulation or secondary implantation after fertilization in the peritoneal cavity over the ovary<sup>(6,7)</sup>.

The definitive diagnosis of ovarian pregnancy is difficult before operation. Presence of symptoms like abdominal pain and vaginal bleeding, history of amenorrhea, elevated  $\beta$ -hCG levels are suspicious for ectopic pregnancy. Ultrasonographically,



Figure 2. Laparoscopic view of the ruptured ovarian ectopic pregnancy located in the left ovary

the appearance of ovarian pregnancies varies as seen in tubal pregnancies; discrimination is made by detecting suspicious echo structures or a more echogenic ring relative to ovary. However, visualization of gestational sac with a yolk sac and fetal parts is the key of ultrasonographic diagnostic feature<sup>(1,8,9)</sup>.

Spiegelberg has described four criteria for the diagnosis of primary ovarian pregnancy: fallopian tube must be intact with its fimbriae and separated from ovary; gestational sac must occupy the normal position of the ovary; ovary must be attached to the uterus through the ovarian ligament; ovarian tissue must be present in the specimen attached to gestation sac wall<sup>(10)</sup>.

Thermal coagulation for homeostasis on ovary may destroy ovarian tissue around the gestational sac in laparoscopic surgery or ovary may have already ruptured at the time of operation. For these reasons it may be difficult to find ovarian tissue around the gestational sac microscopically. Ovarian tissue spa-

ring surgery to preserve fertility may be related with the possibility of not capturing the ovarian tissue in the sac wall. Hence, Spiegelberg's fourth criterion cannot be fulfilled in some cases.

Our first histopathological examination case has fulfilled criteria, but in our second and third case ovary was already ruptured at the time of operation and the gestational sac was not detected. Histopathological diagnosis of primary ovarian pregnancy in second and third case was made by existence of chorionic villi only within the ovary.

The therapy of ovarian pregnancy is usually surgical: either the entire ovary with ectopic pregnancy has to be removed, or a wedge resection of the ovary is necessary. Also, medical treatment such as methotrexate<sup>(11)</sup> or etoposide<sup>(12)</sup> administration was suggested in literature. To preserve the reproductive capacity, conservation of ovarian tissue is essential. Therefore, we excised only the ectopic tissue with a minimum invasive approach to preserve fertility.



Seinera et al.<sup>(13)</sup> reported in their series that 2 of 8 cases failed to fulfill the Spiegelberg's criteria due to minimal invasive surgical techniques instead of wedge resection. Also, Abidi et al.<sup>(14)</sup> reported a case of ovarian pregnancy without definitive pathologic confirmation. They proposed a revision in Spiegelberg's criteria to allow a less invasive diagnosis of ovarian pregnancy.

In conclusion, laparoscopy is invaluable and laparoscopic minimally invasive interventions which preserve the reproductive functions of ovary should be considered as the first choice of treatment. We suggest that Spiegelberg's criteria require modification for the histopathologic diagnosis of ovarian pregnancy after performed ovarian tissue sparing surgery to preserve fertility. ■

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