

Laparoscopic Management of Ovarian Pregnancy

Andrea Tinelli, MD, Gernot Hudelist, MD, Antonio Malvasi, MD, Raffaele Tinelli, MD

ABSTRACT

Background: Ovarian pregnancy (OP) comprises 0.15% of all pregnancies and 1% to 3% of ectopic gestations.

Case Report: Two cases of OP detected and treated during laparoscopy for suspected ectopic pregnancy are described. We used clinical examination, serum β -hCG levels, and transvaginal ultrasonography (TVS) preoperatively to confirm the suspected diagnosis of extrauterine pregnancy. In the first patient, oophorectomy was performed, whereas the second patient was treated by an ovarian wedge resection to restore and preserve ovarian integrity. Postoperative recovery periods were normal in both patients, with no further therapeutic intervention in the follow-up course.

Conclusion: Primary OP may occasionally occur in patients with a suspected ectopic pregnancy. Signs and symptoms suggestive of extrauterine pregnancy, TVS, and serum β -hCG dynamics can be a useful adjunct to allow the preoperative diagnosis of OP prior to the use of the diagnostic gold standard, diagnostic laparoscopy. Preservation of ovarian tissue should be the therapeutic goal to maintain ovarian reserve and preserve fertility in young women with OP.

Key Words: Ovarian pregnancy, Transvaginal ultrasonography, In vitro fertilization.

INTRODUCTION

Ovarian pregnancy (OP) is a rare form of ectopic pregnancy occurring in 0.15% of all pregnancies, ie, 1 in 7000 deliveries.¹

Within this, 3.2% of all extrauterine pregnancies² have been demonstrated to be of ovarian origin with a higher occurrence rate in patients following in vitro fertilization (IVF).¹

Diagnostic criteria for diagnosis of OP are highlighted by criteria defined by Spiegelberg et al³ and are described as follows¹: intact ipsilateral tube, clearly separate from the ovary²; gestational sac occupying the position of the ovary³; sac connected to the uterus by the ovarian ligament; and⁴ histologically proven ovarian tissue located in the sac wall.

Several lines of evidence suggest that traditional risk factors, such as a history of pelvic inflammatory disease (PID) and prior pelvic and/or tubal surgery, may not play a significant role in the etiology of OP. However, the association of ovarian pregnancy with the use of an intrauterine device (IUD) remains controversial.⁴

In a series of 19 women with ovarian pregnancy, 13 (68%) were using an IUD.⁵

This strongly supports the theory that IUD use could be an influential factor involved in the pathogenesis of ovarian pregnancies.

Studies, based on statistical calculations, hypothesize that IUDs reduce intrauterine implantation by 99.5%, and tubal implantation by 95%, but have no protective effect against the development of ovarian pregnancy.^{5,6}

Primary OP should be suspected in cases of ectopic pregnancy lacking characteristic ultrasonographical features of tubal pregnancy; however, final confirmation can only be achieved via laparotomy or laparoscopy.

Diagnostic difficulties may arise in cases where OP does imitate macroscopic features of a hemorrhagic corpus luteum at surgical pelvic-abdominal inspection.

As a consequence, a correct diagnosis of OP during surgical inspection of the female pelvis could only be

Department of Obstetrics and Gynaecology, Vito Fazzi Hospital, Lecce, Italy (Drs A. Tinelli, R. Tinelli).

Department of Obstetrics and Gynaecology, LKH Villach, Austria.

Department of Obstetrics and Gynaecology, Division of Spezial Gynaecology, University of Vienna, Austria (Dr Hudelist).

Department of Obstetrics and Gynaecology, Santa Maria Hospital, Bari, Italy (Dr Malvasi).

Address reprint requests to: Andrea Tinelli, MD, U.O. Ginecologia e Ostetricia, Ospedale Vito Fazzi, 73100 Lecce, Italy. Telephone: +39 0832 661511, Fax: +39 0832 661511, E-mail: andreatinelli@gmail.com

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achieved in 28% of cases with final histological proof of OP.⁷

Rare cases of nonsurgical diagnosis and treatment of OP have been described by the use of 3-dimensional ultrasonography (US) for diagnosis of OP⁸ and subsequent medical management with methotrexate (MTX).⁸⁻¹¹

In general, surgical diagnosis and management are mandatory in symptomatic patients with signs of ectopic pregnancy, especially in cases of hemodynamic instability, sonographic evidence of viable extrauterine fetal structures and beta-HCG levels exceeding 5000 IU/L.¹²

CASE REPORT

A 39-year-old woman, para 2 (vacuum extractor operative delivery and a caesarean delivery) with an uneventful past gynecological history and regular menses was admitted for increasing pelvic pain, guarding, and rebound tenderness. Clinical examination revealed a positive urine pregnancy test and a palpable adnexal mass during examination per vaginam (PV). Transvaginal ultrasound (TVS) examination revealed a sonomorphologically normal uterus, a left ovary 4 cm in diameter with a multifollicular hypoechogenic structure. No evidence was present of an intrauterine gestational sac and free fluid in the pouch of Douglas. Serum β -hCG concentrations at the time of presentation were 21 500 μ IU/mL.

Based on the patient's clinical symptoms and the results of preoperative examinations, diagnostic laparoscopy was performed following signed informed consent.

The second patient was a 34-year-old, para 1, female with a past gynecological and obstetric history nil of note. The patient was admitted to our hospitals with abdominal discomfort. PV examination revealed lower abdominal discomfort but was otherwise uneventful. TVS demonstrated an adnexal hypoechogenic mass 2.2 cm in diameter, a normal contralateral ovary and a sonomorphologically normal uterus exhibiting a secretive endometrium of 14mm in thickness, lacking evidence of an intrauterine pregnancy.

The serum β -hCG concentration amounted to 8670 μ IU/mL. As a consequence, diagnostic laparoscopy was performed for suspected extrauterine pregnancy. Both patients were usually placed in the dorsolithotomy position before general endotracheal anaesthesia.

Laparoscopic access was performed by a Direct Visual Access method, at the level of the umbilicus, by using a

10-mm diameter optical trocar (Endopath Xcel Bladeless, Ethicon Endo-Surgery, Johnson & Johnson Company, USA) inserted through an intraumbilical vertical incision. Following the application of a carbon dioxide pneumoperitoneum, by an intraabdominal pressure maintained at 15 mm Hg, inspection of the abdominal cavity was made by a zero-degree laparoscope (Karl Storz, Tuttlingen, Germany), connected to a video monitor; 3 suprapubic ancillary trocars were placed in the following way: one trocar 5 mm in diameter inserted in the midline, 3 cm under the umbilicus, and one in each iliac fossa (5 mm in diameter on the left side and 5 mm in diameter on the right size), laterally to inferior epigastric vessels. Before both operative procedures, all the pelvic structures were inspected and the abdomen explored through the laparoscope in a clockwise fashion.

In the first patient, the pelvic-abdominal inspection showed a left ovary with an increased volume and an irregular surface, some filmy adhesions in the pouch of Douglas and between the posterior uterine wall and left ovary and tube. In agreement with the woman's decision not to preserve her fertility (previously signed informed consent), a left ovariectomy and peritubal adhesiolysis were performed. In detail, the lysis of peritubal adhesions was performed by aqua-dissection with an irrigating probe. Following this, ovariectomy was accomplished by a bipolar forceps that coagulated the meso-ovarian vessels and ligaments, while the ovary was sustained by 2 Manhes forceps; the ligaments were cut by monopolar endoscissors, followed by removal of the ovary (cut in strips), via one of the lateral trocars. Finally, the tubal wound was irrigated and hemostasis was reobtained by using fine bipolar scissors.

In the second case, a red tumescence on the right ovary surface and a normal uterine body was confirmed by laparoscopic inspection.

Enucleation of the suspected extrauterine pregnancy was accomplished by endoscissors and bipolar coagulation combined with an ovarian wedge resection to restore the ovarian integrity for an eventual successive pregnancy. The ovarian surface was grasped by a Manhes forceps seized near the extrauterine pregnancy and stabilized by another pair of grasping forceps. Resection of trophoblastic tissue was performed with monopolar scissors. Hemostasis on the remaining basis on the ovarian surface was achieved by fine bipolar forceps. Excised tissue was removed via one of the trocars. Following laparoscopy, a D&C was performed due to a history of menorrhagia.

The mean amount of both intralaparoscopic blood loss was less than 100 mL; the clinical diagnosis of ovarian ectopic pregnancy was confirmed by histology: histological report of the 2 specimens showed trophoblastic tissue within the ovarian tissue, an intraovarian hematoma, and cystic follicles in the remaining ovarian tissue.

Both postoperative recoveries were normal, and the patients were regularly discharged the day after laparoscopy, with no additive therapy in the follow-up course; the serum β -hCG concentration were negative after 10 days.

DISCUSSION

In the past, OP has been treated by laparotomy and ovariectomy. However, conservative surgery, such as cystectomy or wedge resection, has also proven to be a safe and beneficial alternative.

Due to technical advances in laparoscopic surgery, laparoscopic treatment of OP as described above can be viewed as the treatment of choice in select and hemodynamically stable patients.

In both our patients, we excluded the MTX treatment for suspected ectopic pregnancy due to the patient's choice to obtain a laparoscopic diagnosis and treatment if possible. Symptoms and signs of OP are similar to those associated with tubal pregnancy: due to the blood supply of the ovary, these patients are at a high risk of suffering severe hemorrhage in case of ovarian surface rupture and may present with signs of hypovolemic shock.⁵

Laparoscopic treatment as described by several studies appears to result in similar tubal patency and future fertility rates compared with medical treatment in case of extrauterine pregnancy.¹¹ In addition, laparoscopic treatment of ectopic pregnancy is associated with lower cost, shorter hospital stay, less operative time, less blood loss, less analgesic requirement, and faster recovery. Patients randomly assigned to laparoscopy also develop fewer adhesions compared with patients treated with laparotomy.¹³⁻¹⁶ Thus, we support the use of laparoscopy and ovarian wedge resection as the procedure of choice for treatment of unruptured OP.

CONCLUSION

Primary OP may occasionally occur in patients with a suspected ectopic pregnancy.

TVS and serum β -hCG concentration can be useful adjuncts to allow the preoperative diagnostic suspicion of extrauterine pregnancy. However, for establishment of a final diagnosis of OP, it is mandatory to perform a surgical pelvic-abdominal inspection, possibly by an endoscopic operation. Fertility preserving surgery should be the goal in young patients without signs and symptoms of rupture associated with hemodynamic instability.

References:

1. Grimes HG, Nosal RA, Gallagher JC. Ovarian pregnancy: a series of 24 cases. *Obstet Gynecol.* 1983;61:174-180.
2. Bouyer J, Coste J, Fernandez H, Pouly JL, Job-Spira N. Sites of ectopic pregnancy: a 10 year population-based study of 1800 cases. *Hum Reprod.* 2002;17:3224-3230.
3. Spiegelberg O. Zur Casuistic der Ovarialschwangerschaft. *Arch Gynaekol.* 1878;13:73.
4. Ercal T, Cinar O, Mumcu A, Lacin S, Ozer E. Ovarian pregnancy; relationship to an intrauterine device. *Aust N Z J Obstet Gynaecol.* 1997;37:362-364.
5. Raziell A, Schachter M, Mordechai E, Friedler S, Panski M, Ron-El R. Ovarian pregnancy-a 12-year experience of 19 cases in one institution. *Eur J Obstet Gynecol Reprod Biol.* 2004;114:92-96.
6. Lehfeldt H, Tietze C, Gorstein F. Ovarian pregnancy and the intrauterine device. *Am J Obstet Gynecol.* 1970;108:1005-1009.
7. Hallatt JG. Primary ovarian pregnancy: a report of twenty-five cases. *Am J Obstet Gynecol.* 1982;143:55-60.
8. Ghi T, Banfi A, Marconi R. Three-dimensional sonographic diagnosis of ovarian pregnancy. *Ultrasound Obstet Gynecol.* 2005;26:102-104.
9. Kudo M, Tanaka T, Fujimoto S. A successful treatment of left ovarian pregnancy with methotrexate. *Nippon-Sanka-Fujinka-Gakkai-Zasshi.* 1988;40:811-813.
10. Shamma FN, Schwartz LB. Primary ovarian pregnancy successfully treated with methotrexate. *Am J Obstet Gynecol.* 1992;167:1307-1308.
11. Chelmow D, Gates E, Penzias AS. Laparoscopic diagnosis and methotrexate treatment of an ovarian pregnancy: a case report. *Fertil Steril.* 1994;62:879-881.
12. Royal College of Obstetricians and Gynaecologists. Management of Tubal Pregnancy. *Green Top Guidelines.* London: RCOG; Guideline No. 21; May 2004.
13. Mittal S, Dadhwal V, Baurasi P. Successful medical manage-

ment of ovarian pregnancy. *Int J Gynecol Obstet.* 2003;80:309–310.

14. Hajenius PJ, Mol BW, Bossuyt PM, Ankum WM, Van der Veen F. Interventions for tubal ectopic pregnancy. *Cochrane Database Syst Rev* 2000;(1):CD00324.

15. Lunderoff P, Hahlin M, Kallfelt B, Thorburn J, Lindblom B. Adhesion formation after laparoscopic surgery in tubal preg-

nancy: a randomized trial versus laparotomy. *Fertil Steril.* 1991; 55:911–915.

16. Murphy AA, Nager CW, Wujek JJ, Kettel LM, Torp VA, Chin HG. Operative laparoscopy versus laparotomy for the management of ectopic pregnancy: a prospective trial. *Fertil Steril.* 1992; 57:1180–1185.