Laparoscopic Management of Abdominal Pregnancy with Local Injection of Vasopressin Solution: A Case Report

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Patient: Female, 32
Final Diagnosis: Abdominal pregnancy
Symptoms: Severe abdominal pain
Medication: —
Clinical Procedure: Laparoscopic treatment
Specialty: Obstetrics and Gynecology

Objective: Unusual or unexpected effect of treatment
Background: Laparoscopic treatments of abdominal pregnancy have been reported; however, resection of an implanted gestational sac could lead to massive bleeding and treatment failure. Hemostasis of the resected stump is critical for the success of laparoscopic treatment.

Case Report: A 32-year-old woman presented to the emergency department with severe abdominal pain. We suspected a ruptured ectopic pregnancy and performed urgent diagnostic laparoscopy. The gestational sac was implanted in the posterior wall of the uterus near the left uterosacral ligament, and bleeding from the gestational sac was noticed. We injected 3 ml of diluted vasopressin solution (0.4 U/ml) directly into the gestational sac and into the posterior uterine wall around the gestational sac. Thereafter, we could resect the gestational product using an ultrasonically activated scalpel. Additional hemostasis in the resected stump was not required.

Conclusions: We believe that a local injection of a diluted vasopressin solution helps in maintaining the hemostasis after the laparoscopic resection of the implanted gestational sac in cases of abdominal pregnancy.

MeSH Keywords: Laparoscopy • Operative Blood Salvage • Pregnancy, Ectopic • Vasopressins

Full-text PDF: http://www.amjcaserep.com/abstract/index/idArt/898554
Background

Abdominal pregnancy is a rare type of ectopic pregnancy that implants in the peritoneal cavity but does not include tubal, ovarian, and intraligamentous pregnancies. The incidence of abdominal pregnancy is estimated at 9.2 per 1000 ectopic pregnancies [1]. The mortality rate of abdominal pregnancy is high. A recent systematic review reported a maternal death rate of 3.0% in early abdominal ectopic pregnancy [2]. Improvements of diagnosis have enabled the laparoscopic treatment of ectopic pregnancy in early gestation. Although abdominal pregnancy cases treated using laparoscopy have been recently reported [3–9], resection of an implanted gestational product could lead to massive bleeding and treatment failure. Therefore, hemostasis of the resected stump is critical for the success of laparoscopic treatment.

Case Report

A 32-year-old Japanese woman (gravida 3, para 1, miscarriages 2) presented to the emergency department with severe abdominal pain. She had no history of abdominal surgery, use of an intrauterine device, or any other chronic disease. She had an irregular menstrual cycle and did not remember the date of her last menstrual period. She presented with signs of shock (blood pressure: 93/67 mmHg; heart rate: 127 beats/min) and had severe abdominal tenderness without vaginal bleeding. Sonography revealed an empty uterus and free echogenic fluid around the liver. Her serum β-human chorionic gonadotropin level was 120.6 mIU/ml, and her blood hemoglobin level was 10.9 g/dl. We suspected a ruptured ectopic pregnancy.

Urgent diagnostic laparoscopy was performed under general anesthesia. Massive hemoperitoneum was observed. We aspirated 1530 ml of intraperitoneal blood and re-infused 570 ml of concentrated red blood cell solution using an autologous blood salvage device. The bilateral adnexa were intact. The gestational sac was implanted in the posterior wall of the uterus near the left uterosacral ligament, and bleeding from the gestational sac was noticed (Figure 1A). We injected 3 ml of a diluted vasopressin solution (0.4 U/ml) directly into the gestational sac (Figure 1B) and posterior uterine wall around the implantation site. We postulate two mechanical reasons for the efficacy of using a local injection of a diluted vasopressin solution in abdominal pregnancy. First is constriction of the feeding vessels and interruption of blood flow to the implanted gestational sac. Control of bleeding is the most important factor for successful laparoscopic treatment of abdominal pregnancy. However, the interruption of blood flow could lead to necrosis, and thus, may be inappropriate for an abdominal pregnancy involving the intestine. Second is hydrodissection of the implanted site, which facilitates relatively easy resection of the implanted gestational sac. In tubal ectopic pregnancy, hydrodissection enables precise removal of the ectopic pregnancy.

Vasopressin solution was diluted at various levels for use in gynecological surgery (0.02–1 U/ml) [10,12,14,16–18]. The maximum safe dose of locally injected vasopressin solution in uterus is unknown. In our clinical experience, we have safely used a maximum dose of 50-ml diluted vasopressin solution (0.4 U/ml) in myomectomy. Hypertension, coronary artery spasm, and pulmonary edema are cited as potential adverse effects of vasopressin injection. Care is required to avoid injecting the diluted vasopressin solution directly into blood vessels and to check vital signs repeatedly. In the present case, we did not encounter these adverse effects.

Conclusions

We successfully managed a case of abdominal pregnancy laparoscopic treatment by using a local injection of a diluted vasopressin solution. Vasopressin is an endogenous antidiuretic hormone released by the posterior lobe of the pituitary gland. Because of its vasoconstrictive effect, local injection of a diluted vasopressin solution is widely used to control bleeding in gynecological surgery, particularly for myomectomy [10,11] and during salpingectomy for surgical treatment of tubal ectopic pregnancy [12,13]. The use of local injections of a diluted vasopressin solution in cervical or cesarean scar pregnancies has also been reported [14,15]. However, we found no reports regarding the use of a local injection of a diluted vasopressin solution for treating abdominal pregnancy.

We experienced a case of successful laparoscopic treatment of abdominal pregnancy using a local injection of a vasopressin solution. We believe that a local injection of a diluted vasopressin solution helps in maintaining the hemostasis after the laparoscopic resection of the implanted gestational sac in abdominal pregnancy.
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Statement

All authors declare they have no conflicts of interest.

Figure 1. Laparoscopic views. (A) The gestational sac was implanted in the posterior wall of the uterus near the left uterosacral ligament, and bleeding from the gestational sac was noticed (white arrow). (B) A diluted vasopressin solution was injected into the gestational sac. (C) The gestational sac was resected with an ultrasonically activated scalpel. (D) The resected stump (white arrowhead) was hemostatic.
References:

1. Atrash HK, Friede A, Hogue CJ: Abdominal pregnancy in the United States: Frequency and maternal mortality. Obstet Gynecol, 1987; 69(3 Pt 1): 333–37

2. Poole A, Haas D, Magann EF: Early abdominal ectopic pregnancies: A systematic review of the literature. Gynecol Obstet Invest, 2012; 74(4): 249–60

3. Shaw SW, Hsu JJ, Chuah HY et al: Management of primary abdominal pregnancy: Twelve years of experience in a medical centre. Acta Obstet Gynecol Scand, 2007; 86(9): 1058–62

4. Abossolo T, Sommer JC, Danoisine P et al: [First trimester abdominal pregnancy and laparoscopic surgical treatment. 2 case reports of evolving abdominal pregnancy treated with laparoscopy at 10 and 12 weeks]. J Gynecol Obstet Biol Reprod (Paris), 1994; 23(6): 676–80 [in French]

5. Tsudo T, Harada T, Yoshioka H, Terakawa N: Laparoscopic management of early primary abdominal pregnancy. Obstet Gynecol, 1997; 90(4 Pt 2): 687–88

6. Bae SU, Kim CN, Kim KH et al: Laparoscopic treatment of early retroperitoneal abdominal pregnancy implanted on inferior vena cava. Surg Laparosc Endosc Percutan Tech, 2009; 19(4): e156–58

7. Gundabattula SR, Pochiraju M: Primary abdominal pregnancy in the uterosacral ligament with haemoperitoneum: A near miss. J Clin Diagn Res, 2014; 8(5): OD08–9

8. Morita Y, Tsutsumi O, Kuramochi K et al: Successful laparoscopic management of primary abdominal pregnancy. Hum Reprod, 1996; 11(1): 2546–47

9. Gerli S, Rossetti D, Baiocchi G et al: Early ultrasonographic diagnosis and laparoscopic treatment of abdominal pregnancy. Eur J Obstet Gynecol Reprod Biol, 2004; 113(1): 103–5

10. Frederick J, Fletcher H, Simeon D et al: Intramyometrial vasopressin as a haemostatic agent during myomectomy. Br J Obstet Gynaecol, 1994; 101(5): 435–37

11. Breech LL, Rock JA: Leiomyomata uteri and myomectomy. Te Linde’s Operative Gynecology 10th edition. Philadelphia: Lippincott Williams & Wilkins, 2008; 687–726

12. Ugur M, Yesilyurt H, Soysal S, Gokmen O: Prophylactic vasopressin during laparoscopic salpingotomy for ectopic pregnancy. J Am Assoc Gynecol Laparosc, 1996; 3(3): 365–68

13. Damario MA, Rock JA: Ectopic pregnancy. Te Linde’s Operative Gynecology 10th edition. Philadelphia: Lippincott Williams & Wilkins, 2008; 798–824

14. Chang Y, Kay N, Chen YH et al: Resectoscopic treatment of ectopic pregnancy in previous cesarean delivery scar defect with vasopressin injection. Fertil Steril, 2011; 96(2): e80–82

15. Yang MJ, Tseng JY, Hsu WL: Conservative surgical management of cesarean scar pregnancy with vasopressin. Int J Gynaecol Obstet, 2007; 97(2): 154–55

16. Moon HS, Kim SG, Park GS et al: Efficacy of bleeding control using a large amount of highly diluted vasopressin in laparoscopic treatment for interstitial pregnancy. Am J Obstet Gynecol, 2010; 203(1): 30.e1–6

17. Choi YS, Eun DS, Choi J et al: Laparoscopic cornuotomy using a temporary tourniquet suture and diluted vasopressin injection in interstitial pregnancy. Fertil Steril, 2009; 91(5): 1933–37

18. Hwang JL, Hsieh BC, Huang LW et al: Successful treatment of a cervical pregnancy by intracervical vasopressin. BJOG, 2004; 111(4): 387–88