

Laparoscopic temporary clipping of uterine and ovarian arteries for the treatment of interstitial ectopic pregnancy

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Summary

Purpose of investigation: To assess the effect of laparoscopic temporary clipping of uterine and ovarian arteries for the treatment of interstitial ectopic pregnancy. **Materials and Methods:** A 29-year-old woman with vaginal bleeding and pelvic pain was admitted to the current clinic. She had secondary amenorrhea for nine weeks. Transvaginal ultrasonography revealed normal empty uterus and right interstitial ectopic pregnancy with viable embryo. Laparoscopic temporary clipping of uterine and ovarian arteries, interstitial pregnancy resection, and primary myometrial suturing was performed. **Results:** Following dissection Latzko pararectal space for the visualization of both uterine arteries, four vascular clips were placed (two to uterine arteries, two to infundibulopelvic ligaments). Excision of interstitial pregnancy and primary myometrial suturing was performed with minimal blood loss. The patient was discharged from the hospital after one day without any remarkable complications. **Conclusions:** To the best of the authors' knowledge, this is the first case of interstitial pregnancy that was successfully treated by temporary laparoscopic clipping of uterine and ovarian vessels prior to interstitial ectopic pregnancy resection.

Key words: Interstitial ectopic pregnancy; Laparoscopy; Clipping; Uterine artery; Ovarian artery.

Introduction

Interstitial pregnancy is an ectopic pregnancy that is implanted in the interstitial part of the fallopian tube, which is defined as proximal tubal segment within the muscular wall of the uterus. Interstitial pregnancy is a rare condition accounting for only 2-4% of tubal pregnancies [1]. However, because of diagnostic pitfalls and relatively late diagnosis, the maternal mortality rate was reported as 2.5% [2, 3]. Rupture of such rare pregnancies may cause dangerous bleeding and maternal mortality. Early diagnosis and interventions may give chance to treat such dangerous situation. Conventional treatments for interstitial pregnancy have ranged from cornuostomy to hysterectomy by laparotomy and rarely by laparoscopy. Surgical treatment also requires experienced endoscopist or surgeon, because of the risk of intractable hemorrhage [1].

To the best of the authors' knowledge, this is the first such report that a case of interstitial pregnancy was treated by temporary laparoscopic clipping of uterine arteries and infundibulopelvic vessels prior to gestational sac and the placental tissue removal, and the interstitial part of fallopian tube repaired.

Case Report

A 29-year-old, gravidity 3, parity 1, missed abortion 1 woman with pelvic pain and vaginal bleeding was admitted to current university hospital. Her obstetric history was unremarkable, except

one history of cesarean delivery. She had secondary amenorrhea for nine weeks and serum level of hCG was measured as 43.367 mIU/ml. Initial transvaginal sonography revealed normal empty uterine cavity and a gestational sac 30×35×30 mm in diameter having viable fetal pole (CRL 21.2 mm /eight weeks and two days) and yolk sac, located just adjacent to the fallopian tube interstitial region (Figure 1).

Patients's preoperative hemoglobin concentration was 12.8 g/dL (range 12–16), hematocrit was 33.8% (range 30–50), and platelet count was 257.000/μL (range 140.000–440.000). Following preoperative evaluation and suggestive diagnosis of interstitial ectopic pregnancy, the patient underwent laparoscopy. Gynecologic laparoscopy revealed an enlarged and prominent right interstitial region almost eight cm in diameter (Figure 2). Both ovaries and left tube were apparently normal.

The posterior broad ligament was opened via three-cm peritoneal incision and the ureter with surrounding periton was isolated and positioned away from the uterine artery. To minimize blood loss, Latzko pararectal spaces were entered to visualize uterine arteries. Following identification of internal iliac artery and ureter, a plastic atraumatic bulldog clip (Figures 3a-b) was applied across the associated uterine artery. Then, the same procedure was repeated on the contralateral side. Two additional plastic atraumatic bulldog clips were also applied to the infundibulopelvic ligaments lateral to the ovary on each side without any dissection (Figure 4). Following vascular clips application, an almost four-cm linear incision was made to uterine wall and gestational sac and placenta were removed. The minimal bleeding from the bed of interstitial pregnancy was controlled with the aid of bipolar forceps. The uterine defect was repaired with primary intracorporeal myometrial suturing using 2.0 polyglactin 910 suture (Figure 5). Finally all four plastic atraumatic bulldog clips were removed (Figures 6, 7). Total

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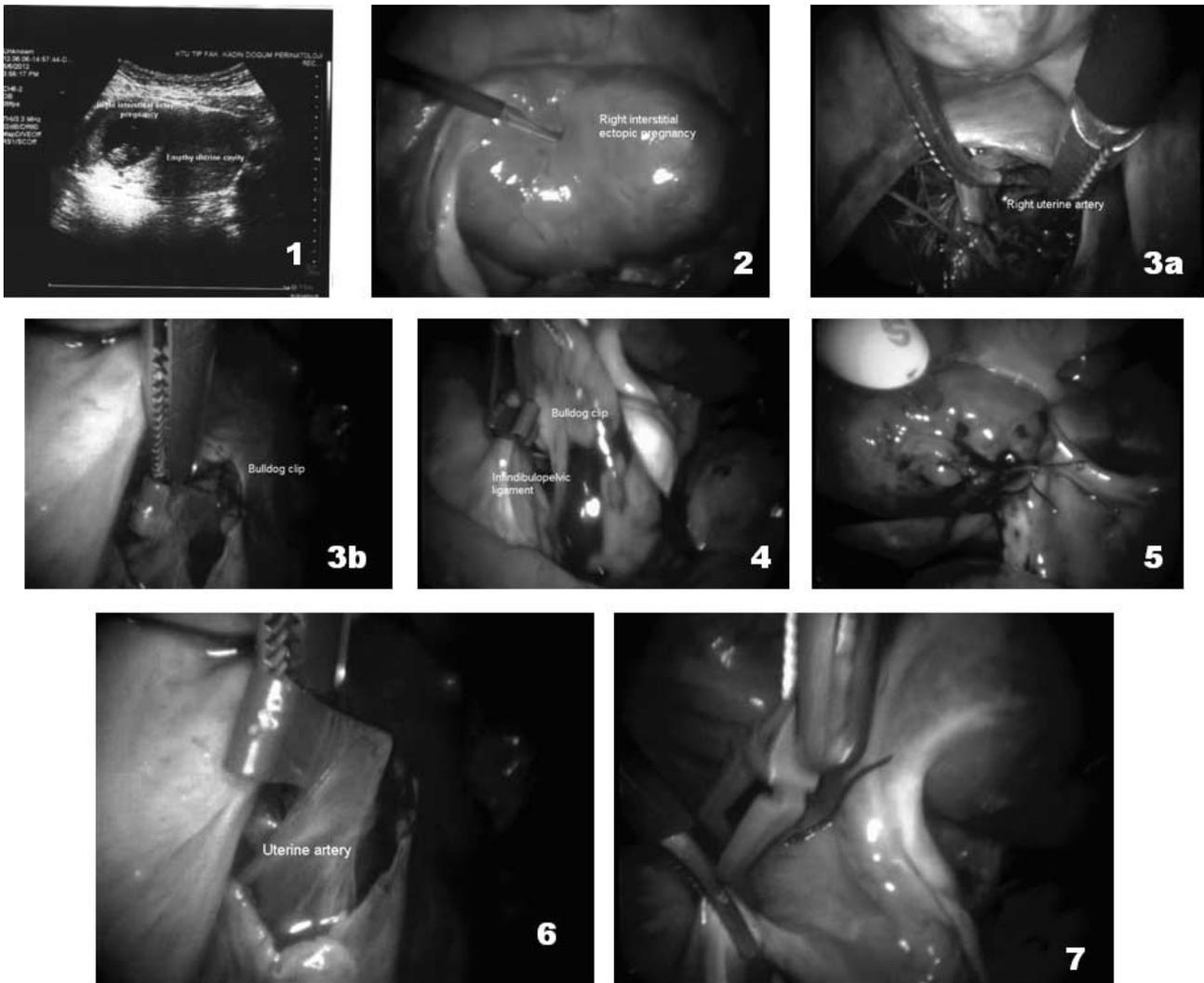


Figure 1. — Transvaginal ultrasonography appearance of right interstitial ectopic pregnancy with viable embryo and yolk sac.

Figure 2. — Laparoscopy appearance of right interstitial ectopic pregnancy.

Figure 3. — a) Dissection of uterine artery and b) application of plastic atraumatic bulldog clip via laparoscopy.

Figure 4. — Application of plastic atraumatic bulldog clip to infundibulopelvic vessels via laparoscopy.

Figure 5. — Laparoscopic repair of uterine defect.

Figure 6. — Removal of plastic atraumatic bulldog clip from uterine artery.

Figure 7. — Removal of plastic atraumatic bulldog clip from infundibulopelvic vessels.

measured operative blood loss was almost 50 ml. Postoperative patient's hemoglobin concentration was 12.2 g/dL (range 12–16), hematocrit was 33.5% (range 30–50), and platelet count was 244.000/ μ L (range 140.000–440.000).

The patient was discharged from the hospital after one day. Four weeks after discharge the woman was in good health status and the serum hCG level was measured and found below five mIU/ml.

Discussion

Here, the authors report a case of interstitial pregnancy which was successfully treated via laparoscopic temporary application clips to uterine and ovarian arteries, removal of

gestational sac and placenta, and primary myometrial suturing.

Temporary uterine and ovarian vascular clipping is a novel endoscopic treatment strategy that gives a change to reduce the intraoperative blood loss to minimal amount and to decrease the chance of hysterectomy because of intractable bleeding.

Interstitial ectopic pregnancy is a rare and sometimes misdiagnosed form of ectopic pregnancy. The diagnosis and also the surgical treatment of this condition are challenging. Clinicians almost always are afraid of intractable intra-abdominal bleeding because of sudden uterine rup-

ture and intraoperative uncontrollable bleeding. Because of this known complication, treatment of this rare condition requires experienced gynecologist and clinicians usually prefer open laparotomy techniques instead of laparoscopy. However, laparoscopy has the advantages of minimal invasive surgery such as early ambulation, early discharge from the hospital, and decreased postoperative pain.

The possible operative intractable bleeding risk of this form of ectopic pregnancy forces endoscopist to search for new endoscopy techniques. In the literature there have been some reported techniques to overcome such complication. Vasopressin injection into myometrium was proposed to limit the intraoperative blood loss. However, vasopressin associated vasoconstriction is limited by short half-life; hypertension and bradycardia are the possible maternal adverse effects that limit to use this strategy [4]. The second treatment strategy was occlusion of ascending branch of uterine artery. This technique may not fully control bleeding, may decrease the risk of subsequent, and include postoperative pain because of tissue ischemia [1, 5]. Suture placement below myometrial resection, purse-string suture technique [6], and suture loop placement [7] were used to decrease intraoperative blood loss, but these techniques may cause disruption of anatomy and possible tubal occlusion which may decrease the future risk spontaneous pregnancy [1].

Electrocoagulation may also be used to control the hemorrhage on the bed of interstitial ectopic pregnancy site [8]. However, electrocoagulation may damage the myometrium and increase risk of subsequent rupture in future pregnancies [1].

Interstitial ectopic pregnancy is a disease of reproductive aged woman. These women want to preserve their future fertility for planning future pregnancies. Based on this patient's desire, a new technique "laparoscopic permanent occlusion of unilateral ascending branch of uterine artery and the communication of the ovarian artery" was described by Cheng *et al.* They suggested that this technique may minimize blood loss and allow treating interstitial ectopic pregnancy conservatively [9]. The present authors believe that the permanent closure of uterine artery may interfere with the future fertility potential by decreasing the blood supply of uterus. Uterine artery embolisation (UAE) studies reported that women following UAE have increased risk of infertility, miscarriage, preterm delivery, placental problems, and malpresentation [10, 11]. Furthermore occlusion of communication of ovarian artery may also decrease the blood supply of ovary, decrease the ovarian reserve, and decrease the chance of future pregnancy. The permanent occlusion of uterine artery may also cause postoperative ischemia associated pelvic pain.

The present authors' new technique gives chance to the clinicians to control intraoperative intractable bleeding and to treat interstitial ectopic pregnancy. The temporary bilateral uterine and ovarian artery clippings decreased the intraoper-

ative bleeding to minimal amount and allowed the removal of interstitial ectopic pregnancy with the full chance of conserving interstitium and fallopian tube for future spontaneous pregnancy. Furthermore, preoperative and postoperative hemoglobin/hematocrit results also showed the reduced blood loss during the operation. Removing the vascular clips at the end of surgery increased patient postoperative comfort such as experiencing postoperative tissue ischemia associated to pelvic pain. This technique was successfully applied to myomectomy procedures and reported valuable results [12].

To the best of the authors' knowledge this is the first report using laparoscopic temporary uterine and ovarian artery clipping for the treatment of interstitial ectopic pregnancy. This case report suggests clinicians to use this technique for the endoscopic treatment of this rare clinical entity to overcome interstitial ectopic pregnancy associated complications.

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