Laparoscopic Management of Interstitial Ectopic Using Simple and Safe Technique: Case Series and Review of Literature

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About the Author

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Abstract

Background and Objective To determine the safety and sustainability of operative laparoscopy in surgical management of cornual and interstitial ectopic pregnancy using a simple and practical method.

Design Case series of five consecutive cases.

Setting Endoscopy unit in Alexandria University Hospital and Alexandria New Medical Center.

Patients Between July 2013 and May 2015, five women with interstitial and cornual ectopic pregnancies were admitted for laparoscopic surgical treatment.

Methods Full medical and surgical histories were taken. We explained all alternatives for both partners before informed. Patients underwent laparoscopy for management of the corneal ectopic. All surgeries were done by the same surgeon (T.S.) with different assistants. We gave different uterotonic drugs to devascularize the uterus. Two or more devascularization sutures were done on each end of the corneal ectopic. We used monopolar and bipolar electrocoagulation when indicated. We did linear cut of the interstitial ectopic with evacuation of the fetus and placental tissues. Extraction of the conceptus was performed through 10 mm port. Follow-up of the beta-hCG was done weekly till negative results were obtained.

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Results The devascularization sutures together with uterotonics make the surgical treatment of interstitial ectopic easy and safe. This simple technique minimizes blood loss and decreases necrosis that follows excessive use of diathermy. This was demonstrated successfully in different types of interstitial ectopic. We did not remove any part of the uterus during surgery. Clinical criteria of the study cases were discussed. Type, size, blood loss and complications, and duration of the surgery were documented.

Conclusion Operative laparoscopy using sutures and uterotonics is safe and sustainable approach in treatment of interstitial ectopic pregnancy.

Keywords Laparoscopy · Interstitial ectopic pregnancy · Safety · Cornual

Introduction

Intramural ectopic pregnancy sometimes is used interchangeably with cornual and interstitial ectopic. The intramural ectopic is that pregnancy wherein the fetus is implanted within the myometrium, without a connection to the endometrial cavity, fallopian tubes, or round ligament. While cornual ectopic means that pregnancy occurred in a rudimentary horn which usually non-communicating with the uterine cavity. The interstitial ectopic is that pregnancy occurs in the interstitial part of the tube [1]. All of the three rare types of ectopic pregnancy share common criteria of late diagnosis, rupture of the ectopic, and traditionally treated by cornuostomy or even hysterectomy [2].

The possible risk factors for intramural pregnancy include a prior uterine trauma, adenomyosis, pelvic surgery and invitro fertilization. Uterine traumas result in a sinus tract within the endometrium, which may be the result of cesarean section, myomectomy [3], dilation and curettage [4, 5], and trauma during hysteroscopy [6].

To prevent these complications and preserve reproductive potential, diagnosis should be made early to allow for more conservative approaches. Furthermore, minimally invasive management has been widely accepted as having various benefits and become the trend for management [7–11].

Methods

All patients were thoroughly examined after full medical and surgical histories were collected. Our special interest was on previous gynecological or intestinal surgeries. Vaginal ultrasound was the mainstay of diagnosis. The most important notes during the examination were

gestational age, viability, site, and thickness of the myometrium over the gestational sac. The steps of the surgery were discussed with both partners in detail.

Thus, we performed 4 ports (1 port 10 mm and 3 ancillary ports of 5 mm). Under carbon dioxide pneumoperitoneum, two or more vicryl-0 sutures were done as devascularization method. Intravenous 0.2 mg methylergonovine maleate (Methergin; Novartis) and oxytocin 10 IU units (Syntocinon; Novartis) were given, and 2 cytotec 200 µg tablets (Cytotec; Pfizer) were inserted rectally before surgery. Opening of the ectopic between 2 sutures and extrusion of gestational tissue and removal of chorionic villous tissues were done. Minimal use of monopolar and bipolar diathermy was used to decrease necrosis of the myometrium and weakening the site of the ectopic. Intraperitoneal drain was inserted routinely in all cases. The specimen was placed in a bag and completely removed from the ancillary port. All patients were advised to take oral contraceptive pills for 6 months to give time for sound healing of the myometrium.

First case: The patient was a 23-year-old, nulliparous woman with unremarkable medical and surgical histories. This patient presented with true cornual ectopic (pregnancy was in rudimentary horn) was diagnosed, and assurance of the site of ectopic was done using 3D vaginal ultrasound. Injection of diluted ephedrine solution in the uterine attachment of the cornual ectopic was done. Laparoscopic management was done by dividing the round ligament, ovarian ligament, and removal of the left fallopian tube, and then, an intracorporeal suture was taken to devascularize the uterine attachment. The cornual ectopic was removed intact and then opened after separated from the uterine attachment and extracted from the abdomen. The duration of the surgery was 40 min, and estimated blood loss was 60 ml. Postoperative period was uneventful, and patient was discharged the second day (Figs. 1 and 2).

Second case: 30-year-old female G4P1A2 previous C-section and 2 previous salpingectomies for consecutive ectopic pregnancy in each tube. The patient had ICSI and got pregnant, and confirmation of an intrauterine gestational sac was seen. Positive cardiac pulsation confirmed viability, but the uterus was large, adenomyotic and retroverted retroflexed with multiple corpora lutei. This position of the uterus made the view of the cornual ends very far from the trans-vaginal ultrasound. The patient was on clexane 4000 IU subcutaneous as a prophylaxis of thrombophilia. The patient presented with repeated attacks of fainting and ultrasound showed only considerable amount of free intraperitoneal fluid. The patient was primarily diagnosed to have ruptured corpus hemorrhagicum not a slowly disturbed left interstitial ectopic (heterotopic pregnancy) and scheduled for immediate laparoscopy. After stabilization of the hemodynamic state of the patient,

Fig. 1 Pregnancy in a left rudimentary horn

Fig. 3 Left ruptured cornual ectopic pregnancy

Fig. 2 After removal of the rudimentary horn

Fig. 4 Suturing of the myometrium after removal of conceptus

removal of about 1 liter of intraperitoneal blood was enough to see the anatomical landmarks. The surgical technique was used as the other cases with 2 sutures at each end of the ruptured interstitial ectopic. The uterotonic step was omitted to preserve the intrauterine pregnancy. An intraperitoneal drain was left to remove the remaining blood and to avoid excessive uterine manipulations. Post-operative assurance of intrauterine fetal viability was confirmed. Thirty-three weeks later, elective C-section was done at 40 weeks of gestation, the site of the scar was noticed, and excellent healing and minimal adhesions around were observed (Figs. 3 and 4).

Third case: A referred case 25-year-old female presented with intact interstitial ectopic was assigned for laparoscopy. This case was the larger one in these cases as the CRL was 10 weeks 3 days at the time of the surgery. The uterine size was very large and was difficult to demarcate the line separating between the normal uterus and the site of ectopic. This demarcation was made more obvious after injection of oxytocin and methergine as blanching of the uterine wall occurred excluding the ectopic part. As with other cases, devascularization of the

ectopic was done by single intracorporeal suture with long end and the needle was attached to the right lateral umbilical ligament till the evacuation of the ectopic. Opening of the sac was done and removal of large placental parts with minimal use of bipolar cauterization for hemostasis. Then, taking through and through running suture of the pre-tied suture till complete obliteration of the site of ectopic was attained. An intraperitoneal drain was inserted for 24 h. Estimated blood loss was 150 ml, and no blood transfusion was needed. Postoperative period was uneventful (Figs. 5, 6, 7 and 8).

Fourth case: This patient was a 23-year-old, nulliparous woman whose medical and family histories were unremarkable. She had only dilatation and curettage for missed abortion 9 months before the current pregnancy. She had intact left interstitial ectopic pregnancy of about 7 weeks and 3 days at the time of surgery. In this patient, we administered uterotonic medications. Once blanching of the wall of the uterus appeared, two intracorporeal sutures were done at both ends of the ectopic before opening of the pregnancy sac. No intramyometrial vasopressor was injected. Opening of the sac and evacuation of the fetus and

Fig. 5 Removal of omental adhesions on right cornual ectopic

Fig. 8 After suturing of the uterus and hemostasis

Fig. 6 The uterus after systemic injection of uterotonics

Fig. 9 Hemostatic sutures in right cornual ectopic

Fig. 7 Removal of the fetus and placental tissues

Fig. 10 After suturing of the right cornual ectopic

placental tissues was done. Three interrupted vicryl-0 sutures were done to confirm hemostasis.

Fifth case: A 26-year-old primigravida presented with intact intramural ectopic pregnancy 7 weeks with positive cardiac pulsations. She was already received methotrexate

(50 mg im injection) 10 days before referral, but it failed. She was counseled for laparoscopy for surgical treatment of intramural ectopic. The same steps of uterotonic, hemostatic sutures, minimal use of diathermy, evacuation of the conceptus, and running sutures were done. The duration of surgery was 1 h, and blood loss was estimated to be 100 ml with unremarkable postoperative period (Figs. 9 and 10).

Discussion

Intramural pregnancy is a rare form of ectopic gestation. The diagnosis is seldom made before uterine rupture or surgery, which could result in life-threatening hemorrhage. In most cases, surgical intervention or even hysterectomy is required [12, 13]. Early diagnosis prevents complications and facilitates preservation of fertility. However, early diagnosis requires awareness of clinical presentation, possible risk factors, and use of imaging techniques [14].

In our cases, we tried hemostatic sutures and uterotonic medications as the mainstay of devascularization before opening of the ectopic pregnancy successfully. Most of authors used diluted vasopressin injection and bipolar cauterization as the main methods of devascularization [14].

Furthermore, minimally invasive management has been widely accepted as having various benefits and become the trend for management. The management of each case depended on the size of the lesion, patient status and the desire for future fertility [14].

The clinicians chose medical treatment, such as systemic/local methotrexate injection or local potassium chloride injection for preserving fertility [12]. Uterine artery embolization also has been tried with preservation of reproductive function but is associated with few adverse effects [15]. More recent trend for management tried robotic surgery successfully [16] and hysteroscopic removal of the ectopic under laparoscopic guidance [17].

In 1995, Tucker et al. [18] reported the first case of intramural pregnancy treated with laparoscopic resection, but the patient underwent hysterectomy 2 months later. Many cases were reported since then as treated successfully using minimal invasive techniques with very good outcomes as a fertility-preserving management of choice [9, 19–23]. The use of robotic surgery has been tried in many trials where authors followed the same principles of devascularization of the uterine wall and removal of the ectopic with part of the uterus then suturing the defect [24–26]. Another trial was done using double-impact devascularization technique where they used hemostatic suture as a compression method to decrease bleeding [27]. The main difference between our study and theirs is that we did not remove a part of the uterus, while they did remove a part of the uterus during surgery and did not use any uterotonics.

In conclusion, intramural pregnancy occurs rarely. Early diagnosis prevents potential life-threatening hemorrhage and allows fertility preservation with good reproductive potential after the laparoscopic treatment. Laparoscopy is safe approach for treatment of cornual ectopic.

Compliance with Ethical Standards

Conflict of interest None.

Ethical Approval This study included human subjects, and all participants signed informed consent. This study had been approved by the ethical committee of Alexandria University (as national IRB) which is in accord with ethical principles of Declaration of Helsinki 1948.

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