

# Cornual Ectopic Pregnancy

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## Abstract

Cornual ectopic pregnancy is a rare and life-threatening form of ectopic pregnancy. We present the case of a 37-year-old multiparous woman with three previous cesarean section deliveries who presented with right-sided lower abdominal pain and vaginal spotting for 1-week at 6 weeks and 2 days of gestation. Transvaginal ultrasound revealed a gestational sac of 2.5x 2 cm in size with a yolk sac and fetal pole, the fetal pole is measuring 5 mm in diameter with cardiac activity in the right cornua of the uterus. The patient was offered medical management with systemic methotrexate and intra-gestational sac potassium chloride injection. The procedure was complicated by acute pain, hypotension, tachycardia and hemoperitoneum and was taken for an urgent laparoscopy. Intraoperatively, a ruptured right cornual ectopic pregnancy was identified with active bleeding. A cornual wedge resection was performed with ipsilateral salpingectomy. The patient had an uneventful postoperative period and was discharged home on day 3 after surgery. The bhcg was negative on post op day 25 . Cornual ectopic pregnancy is a challenging diagnosis that requires prompt treatment. Laparoscopic resection and salpingectomy are viable surgical options that can minimize blood loss and reduce the risk of future complications.

**Keywords:** Beta-human Chorionic Gonadotropin; Cornual Laparoscopic Salpingectomy; KCl methotrexate

## Introduction

Cornual ectopic pregnancy is an infrequent and potentially life-threatening type of ectopic pregnancy. This report discusses the case of a 37-year-old woman who had previously undergone three cesarean section deliveries. She sought medical attention due to pain on the lower right side of her abdomen and light vaginal bleeding lasting for a week, occurring during the 6th week and 2nd day of gestation. Through transvaginal ultrasound, a gestational sac measuring 2.5 x 2 cm was identified, containing a yolk sac and fetal pole. The fetal pole had a diameter of 5 mm and exhibited cardiac activity. Notably, this was situated in the right cornua of the uterus.

Initially, the patient was offered a combination of systemic methotrexate and a potassium chloride injection directly into the gestational sac as a means of medical management. However, this procedure resulted in complications such as sudden pain, low blood pressure, rapid heart rate, and bleeding into the abdominal cavity (hemoperitoneum). Consequently, an urgent laparoscopy was performed. During the surgery, a ruptured right cornual ectopic pregnancy was identified, accompanied by active bleeding. To address this, a surgical procedure involving the removal of a wedge-shaped section of the cornua (cornual wedge resection) was performed. Additionally, the fallopian tube on the same side (ipsilateral) was excised (salpingectomy). The patient experienced an uncomplicated recovery after the surgery and was discharged on the third day post-operation. Subsequent testing on the 25th day following the surgery showed negative results for beta-human chorionic gonadotropin (bhCG).

The diagnosis of cornual ectopic pregnancy is intricate and necessitates swift intervention. Laparoscopic methods such as resection and salpingectomy are effective surgical choices that can minimize blood loss and mitigate the likelihood of future complications.

## **Case Report**

A 37-year-old woman, G6P3, presented to the emergency department with right-sided lower abdominal pain and vaginal spotting at 6 weeks and 2 days of gestation. She had history of three previous cesarean section deliveries without any complications and one previous cornual ectopic pregnancy that was managed by laparotomy myomectomy and cornuostomy. On examination, her vital signs were stable, and she had tenderness in the right lower quadrant. Transvaginal ultrasound showed a gestational sac with a yolk sac and fetal pole corresponding to 6 weeks of gestation, with positive cardiac activity in the right cornual region of the uterus.

Transvaginal ultrasound revealed a gestational sac of 2.5x2 cm in size, with a yolk sac and fetal pole of 5 mm in size in the right cornual region of the uterus, with a positive heartbeat. The uterus was bulky with heterogeneous echotexture, and the endometrium was thickened to 17 mm. There was no evidence of an intrauterine gestational sac. The left ovary was normal, but the right ovary was not visualized. There was no free fluid in the pelvis.

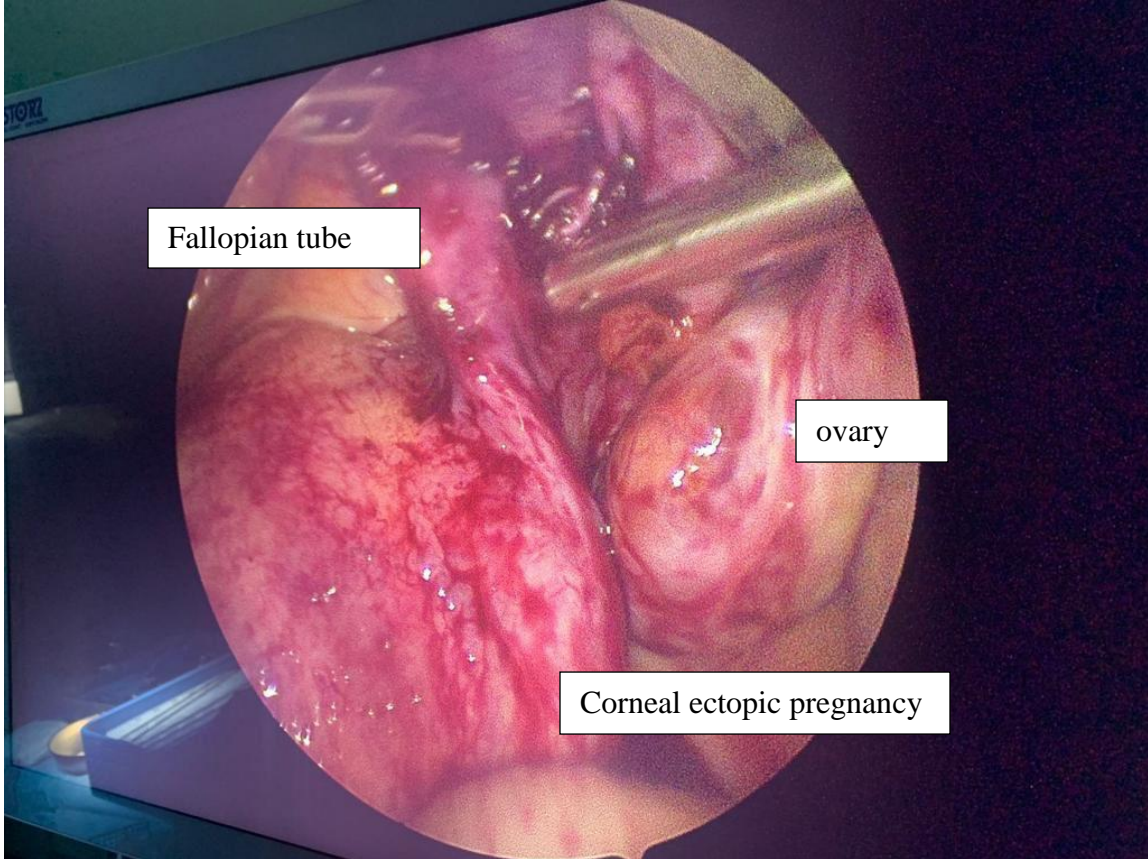
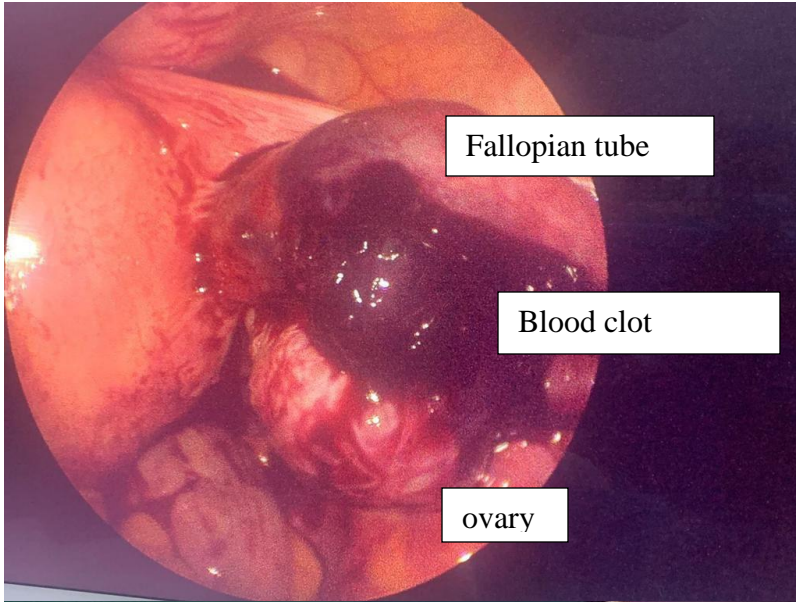
The patient was suspected to have a cornual ectopic pregnancy and given the option of medical intervention. She agreed for medical management with intramuscular methotrexate and intra-gestational sac potassium chloride injection. At the first injection the patient developed a vasovagal episode and the procedure was terminated, the fetal cardiac activity persisted following this procedure.

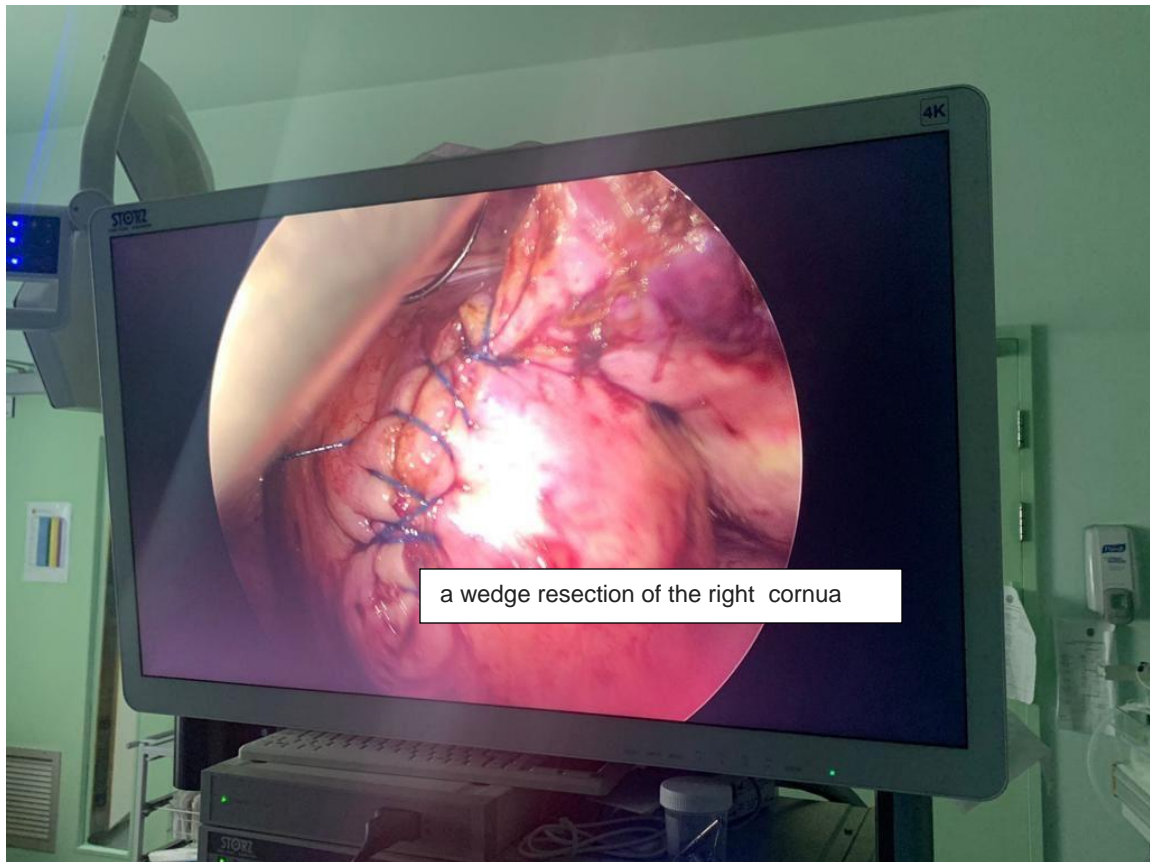
On the following day, the patient was offered a second attempt of KCl injection, and the fetal cardiac activity was successfully stopped.

Subsequently, the patient developed severe abdominal pain and unstable vital signs, her pulse rate was ranging between 100 to 116 beat/ min and the blood pressure reached 94/59 mmhg, with an ultrasound showing free fluid in the pouch of Douglas measuring 2.5 cm. She underwent an urgent laparoscopy where a ruptured right cornual ectopic pregnancy was identified with active bleeding. The cornual ectopic pregnancy was removed and a cornual wedge resection was performed.

During the operative procedure, the patient received intra operative blood transfusion. The surgery started with a diluted vasopressin injected into the uterus at the site of the cornual pregnancy. The next step involved performing a right salpingectomy, as well as a wedge resection of the right cornua using an energy device called the "harmonic scalpel". The cornual incision was then sutured laparoscopically using 2-0 V-Loc. Approximately 1000 ml of hemoperitoneum was suctioned from the abdominal cavity, while the left tube and ovary appeared normal. However, the uterus was bulky and measured around 10 weeks. The patient had a smooth postoperative period and was discharged on day 3 after surgery. Weekly monitoring of beta HCG levels showed that they were negative at day 25 post-operation, and the patient did not require any further treatment or medications.

**Below in the surgical findings and steps in pictures:**





## Discussion:

Cornual pregnancy presents as an uncommon and potentially dangerous situation that necessitates rapid identification and intervention. This scenario unfolds when the embryo embeds itself within the interstitial section of the fallopian tube, an area characterized by a diameter of 0.7 mm and a length of 1-2 cm. It's important to note that the terms "interstitial" and "cornual" ectopic pregnancy are sometimes used interchangeably, but they pertain to distinct conditions. Specifically, "cornual implantation" refers to pregnancies located in the upper and lateral regions of the uterine cavity, while "interstitial pregnancy" pertains to those implanted within the proximal intramural portion of the tube.<sup>1</sup>

The diagnosis can be challenging as the initial presentation can mimic a normal intrauterine pregnancy.<sup>2</sup> Hemorrhagic shock is found in about a quarter of patients.

Factors contributing to the elevated occurrence of cornual ectopic pregnancy encompass a range of elements. These include assisted reproductive technologies, a history of salpingectomy or other tubal surgical procedures, the presence of a rudimentary horn, a past reproductive tract infection, prior instances of tubal pregnancy, and the development of adhesions within the proximal intratubal area.<sup>3</sup> Other risk factors include advanced maternal age, endometriosis, and smoking.<sup>4</sup>

Transvaginal ultrasound is the mainstay of diagnosis.<sup>5</sup> Ultrasonographic indications for cornual ectopic pregnancy entail specific characteristics. These consist of a gestational sac that is distinct from the uterine cavity, coupled with an empty uterine cavity. Furthermore, a slender zone of endometrium (measuring less than 5 mm) encircling the gestational sac is observed. Notably, an echogenic line becomes apparent in the central endometrial cavity, extending towards the gestational sac. In addition to ultrasound findings, the levels of beta-human chorionic gonadotropin (beta-hCG) in the bloodstream are valuable for diagnosis. It's

noteworthy that the increase in beta-hCG levels might manifest at a comparatively slower pace compared to cases of intrauterine pregnancy.<sup>6</sup>

The Successful surgical management by laparoscopy of this condition includes early ultrasonographic diagnosis and laparoscopic resection. Treatment requires uterine expulsion of the pregnancy and hemostasis of the cornua. Two techniques are proposed: cornuotomy or cornual wedge resection, along with ipsilateral salpingectomy.

Data reported in the literature do not show any significant difference between the outcomes of cornuotomy and those of cornual wedge resection. The outcome appears to be equivalent for blood loss, postoperative complications, and alteration of postoperative fertility. In most cases, salpingectomy is technically unavoidable. Following surgical repair, there remains to be a risk of interstitial pregnancy and uterine rupture for subsequent pregnancies.<sup>7</sup>

Surgical approaches for addressing the ectopic pregnancy site encompass various techniques. These include cornuostomy, which involves making an incision in the cornua and extracting the pregnancy; cornual evacuation, where the contents of the cornual region are emptied; cornual area resection, entailing removal of a section of the cornual area; and cornual wedge resection, often conducted alongside an ipsilateral salpingectomy. To mitigate blood loss during the surgical procedure, one effective strategy involves injecting vasopressin around the location of the ectopic pregnancy.

After the surgical procedure, diligent postoperative care is essential. This involves closely monitoring subsequent pregnancies through early ultrasonography to ascertain their appropriate positioning and to ensure the integrity of the repaired surgical site. It's noteworthy that individuals who have undergone conservative surgical therapy are susceptible to the emergence of persistent ectopic pregnancies due to the persistence of deeply embedded viable trophoblastic tissue. Consequently, the monitoring of human chorionic gonadotropin (hCG) levels after the surgery is advisable, continuing until these levels become undetectable, particularly in such cases.<sup>8</sup>

Medical management with methotrexate can be attempted in selected cases. In a prospective observational study at St George's Hospital Medical School, London, 17 out of 20 women with cornual pregnancy were treated with single-dose intramuscular methotrexate, which was administered on day 0. A second dose of methotrexate was given if the  $\beta$ -hCG levels had not fallen by 15%. All women with cornual pregnancy presenting with initial hCG values of <5000 mIU were treated successfully with single-dose methotrexate, but almost all women with an initial hCG of >5000 mIU required two doses according to the Royal College of Obstetricians and Gynecologists, UK. Medical treatment is not free of complications; it can be associated with uterine rupture and catastrophic haemorrhage.

Medical decisions for managing cornual ectopic pregnancies involve several considerations. When dealing with a significant ectopic pregnancy and the presence of a fetal heartbeat, medical treatment may not be the optimal choice. While a number of experts recommend a multiple-dose methotrexate regimen for interstitial/cornual pregnancies, it's worth noting that the evidence supporting or refuting this approach isn't definitively established.

In a study by Monteagudo et al., a procedure involving ultrasound-guided local injection of methotrexate or potassium chloride is discussed. This intervention led to the immediate cessation of fetal heart activity. Interestingly, the time taken for the resolution of the ectopic pregnancy showed no variation whether potassium chloride or methotrexate was employed. Notably, this study reported a 100% success rate.

Several studies have also documented the utilization of laparoscopy for locally administering methotrexate into cornual pregnancies. This technique provides a potential avenue for intervention.<sup>9</sup>

Selective uterine artery embolization is an emerging minimally invasive technique that can be used as an alternative to surgery in the management of cornual ectopic pregnancy. It involves the injection of embolic

material into the uterine arteries, which leads to the occlusion of blood supply to the cornual area and the ectopic pregnancy, causing its resolution.<sup>10</sup>

In conclusion, cornual ectopic pregnancy is a rare but potentially life-threatening condition that requires prompt diagnosis and management. A high index of suspicion, early ultrasound, and proper selection of treatment modality are key to ensuring favorable outcomes. Mention something about the safety of laparoscopy in the management of ruptured cornual ectopic in selected cases.

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