

Management of interstitial (cornual) pregnancy

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ABSTRACT

Cornual pregnancy is an infrequent event. Goal of cornual pregnancy treatment is the expulsion of the pregnancy and haemostasis in case of haemorrhagic rupture. Treatment involves the removal of the pregnancy and hemostasis of the cornus if required by hemorrhagic rupture. New ultrasound techniques have brought an additional tool in the early diagnosis, which is vital in preserving fertility and enabling medical (methotrexate treatment).

Keywords: menopause, sexuality, hypoestrogenism, sexual dysfunction, quality of lifecornual pregnancy, hemostasis, fertility

INTRODUCTION

One of the most scarring and complicated type of ectopic pregnancy is cornual pregnancy. This is a difficult diagnosis even for experienced obstetricians. Management is also challenging especially when patients are envisaging future fertility. Cornual pregnancy accounts for 2-4% of ectopic pregnancy and has a mortality rate of 2-5%. Cornual pregnancies are those that are situated at the junction of the fallopian tube with the uterus body. This part, although called interstitial, is 0.7 mm wide and 1-2 cm long. Compared with ampullar ectopic pregnancy, they tend to present late at 7-12 weeks due to myometrial capacity to accommodate the pregnancy. Hypovolemia and shock can occur rapidly due to ectopic rupture and maternal haemorrhage [1].

DIAGNOSIS

From a clinical point of view, the risk factors for cornual pregnancy are the same that are involved

in other types of ectopic pregnancies such as contralateral salpingectomy, previous ectopic pregnancy, endometriosis and IVF pregnancy. Differentiation between eccentric intrauterine pregnancy and cornual pregnancy is difficult with a low positive predictive value. Applying abdominal, transvaginal and new ultrasound techniques, such as 3D rendering and multiplanar view, can increase the diagnostic rate and rule out suspicion. Timor-Trish et al. recommend three criteria when assessing a patient with suspicious of cornual pregnancy (table 1) [2,3].

TABLE 1. Criteria for assessing a patient with suspicious of cornual pregnancy [2,3]

An empty uterus
A gestational sac separately and < 1 cm from the lateral edge of uterine cavity
A thin myometrial layer surrounding the sac

At the beginning of the pregnancy, the gestational sac is located in the lateral portion of the uterus, but it can also be confused with an eccentric intrau-

terine pregnancy. A pseudo gestational sac can complicate things even more. Great care should be applied whenever an intrauterine pregnancy is situated aside the midline or has a bicornuate uterus. The 3D ultrasound can help evaluate a possible cornual pregnancy and also in differentiate between an angular intrauterine pregnancy and an actual cornual pregnancy [4,5].

Figures 1 and 2 present a case of a 29 years old, that underwent D&C for termination of pregnancy. The first attempt was unsuccessful and the obstetricians` assessment in a 2D scan raised the suspicion of a cornual pregnancy. As it can be seen, this is a bicornuate uterus with a pregnancy located in the right corner. The next day patient underwent hysteroscopy and aspiration of pregnancy.

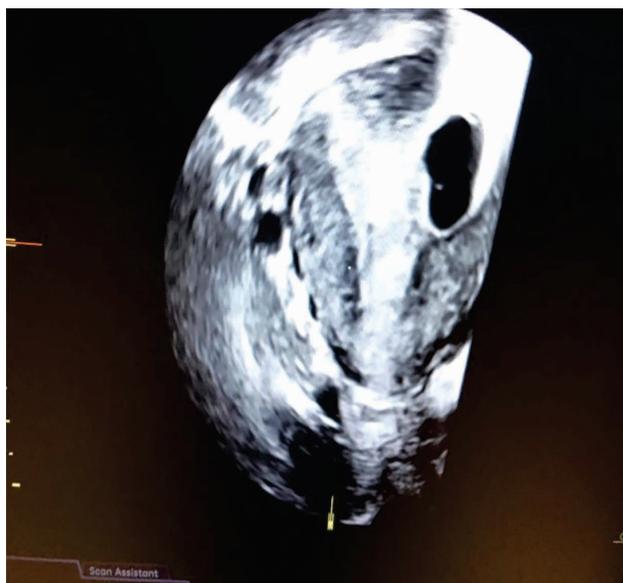


FIGURE 1. 3D Multiplanar view

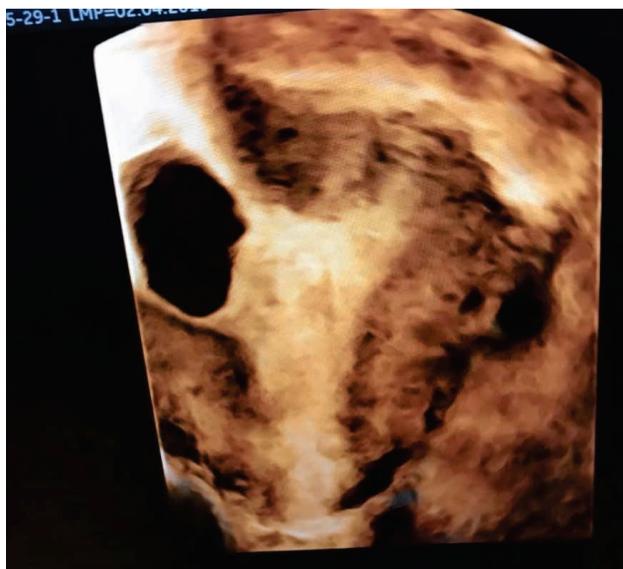


FIGURE 2. 3D rendering

In a study published by Tulandi et al., ultrasound scan showed an ectopic sac in cornual region in

40.6% and an in 25% a hyperechoic mass. It was the right diagnosis in 71.4% of cases. Early diagnosis of cornual pregnancy enables clinicians to use methotrexate as a first-line treatment. Otherwise, surgical management or even hysterectomy are necessary [6]. As a last resort, a diagnostic tool for cornual pregnancy is laparoscopy that has the advantage of both diagnosis and treatment.

TREATMENT

Historically, treatment for cornual pregnancy was cornual resection or hysterectomy. As both these techniques are associated with morbidity and infertility consequences, other methods have been developed such as minimally invasive techniques and methotrexate [7]. Laparotomy and radical surgery are used in severe, life-threatening cases. Cornual resection is associated with decreased fertility and increased uterine rupture in future pregnancies.

Medical treatment

Medical treatment is highly effective if administered at the beginning of the pregnancy. In a prospective study published in 2020, 16 out of 17 women were treated successfully with intramuscular injection of methotrexate. A second dose was needed in only 6 cases. A careful follow up of these patients is compulsory, as even patients with decreasing bHCG (beta human chorionic gonadotropin) can have ruptured ectopic pregnancy [8].

Multiple studies focused in direct injection in the ectopic sac, either transvaginal or laparoscopically [9]. One of the strong points of locally injected treatment is the better side effect profile, but the safety of systemic treatment was demonstrated by Stovall and Ling [10]. With the single-dose regime, the side effects were virtually eliminated [10]. For applying medical treatment, a patient must be hemodynamically stable with no signs of rupture and contraindications for methotrexate [11].

Laparoscopic techniques

Laparoscopic surgery was safely performed even in women with massive hemoperitoneum in expert hands, achieving haemostasis and even preserving fertility [12,13]. The procedure that can be performed laparoscopically includes: cornual resection, salpingostomy, Endo loop and encircling suture and laparoscopically injected methotrexate. There appears to be a common opinion that size of ectopic pregnancy determines the most suitable technique. Salpingostomy is appropriate at a diameter of gestational sac below 3.5 cm while cornual excision is recommended at a diameter of > 4 cm

[1,14]. Laparoscopy should be undertaken only by skilled surgeons, that have the ability to convert the operation to laparotomy. Having said that the advantages of laparoscopy over laparotomy are well known [15,16].

Hysteroscopy treatment

This is suitable for women that declines methotrexate or this treatment fails. In experienced hands, resection of the cornual endometrium including the tubal ostium can be safely performed without perforation of the uterus. This type of surgery is often performed under laparoscopic guidance, which increases its safety profile [17].

FUTURE PREGNANCY

The main concern after treatment of cornual pregnancy is the risk of uterine rupture in future pregnancies. In addition, there is expert opinion that suggest reinforcing the area of cornual pregnancy after its removal. However, term pregnancies have been reported following surgical cornual treatment without reinforcing stitches [18].

There is general agreement that suturing the uterine wall should be performed in cases where the cornual pregnancy sac extends into the endometrial cavity. Long-term studies might reveal the optimum way to treat patients [19]. Caesarean section should be the delivery way for patients that underwent surgery for cornual pregnancy.

A second caveat that should be bear in mind is the he risk of ectopic pregnancy is increased even after an anatomically good result [20].

CONCLUSIONS

Cornual pregnancy remains a redoubtable diagnosis and challenging issue to treat. Recent advances in imaging techniques have enabled us to perform an earlier diagnosis, which is an essential step for a successful outcome. For many years, cornual excision or hysterectomy was the key stone treatment for such cases. Recently, conservative management is gaining ground as more studies and cases report are being published. The pros and cons of each treatment should be discussed on an individual basis encompassing risk for future pregnancy and mode of delivery.

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REFERENCES

- Tulandi T, Al-Jaroudi D. Interstitial pregnancy: results generated from the Society of Reproductive Surgeons Registry. *Obstet Gynecol.* 2004;103(1):47-50.
- Timor-Tritsch IE, Monteagudo A, Matera C, Veit CR. Sonographic evolution of cornual pregnancies treated without surgery. *Obstet Gynecol.* 1992;79(6):1044-1049.
- Auslender R, Arodi J, Pascal B, Abramovici H. Interstitial pregnancy: early diagnosis by ultrasonography. *Am J Obstet Gynecol.* 1983; 46(6):717-718.
- Jermy K, Thomas J, Doo A, Bourne T. The conservative management of interstitial pregnancy. *BJOG.* 2004;111(11):1283-1288.
- Lee GS, Hur SY, Kwon I, Shin JC, Kim SP, Kim SJ. Diagnosis of early intramural ectopic pregnancy. *J Clin Ultrasound.* 2005;33(4):190-192.
- Tulandi T, Vilos G, Gomel V. Laparoscopic treatment of interstitial pregnancy. *Obstet Gynecol.* 1995;85(3):465-467.
- Ross R, Lindheim SR, Olive DL, Pritts EA. Cornual gestation: a systematic literature review and two case reports of a novel treatment regimen. *J Minim Invasive Gynecol.* 2006;13(1):74-78.
- Parker BM, Gupta AK, Lymperopoulos A, Parker J. Methotrexate for Cornual Ectopic Pregnancy. *Cureus.* 2020;12(8):9642.
- Timor-Tritsch IE, Monteagudo A, Lerner JP. A 'potentially safer' route for puncture and injection of cornual ectopic pregnancies. *Ultrasound Obstet Gynecol.* 1996;7(5):353-355.
- Stovall TG, Ling FW. Single-dose methotrexate: an expanded clinical trial. *Am J Obstet Gynecol.* 1993;168:1759-1762.
- Prenaud C, Scherier S, Malgras B. Management of a cornual ectopic pregnancy. *J Visc Surg.* 2017;154(6):467-468.
- Whynott RM, Mikhail E. Laparoscopic approach to cornual ectopic: a step-by-step demonstration. *Fertil Steril.* 2019;112(2):397-398.
- Takeda A, Manabe S, Mitsui T, Nakamura H. Management of patients with ectopic pregnancy with massive hemoperitoneum by laparoscopic surgery with intraoperative autologous blood transfusion. *J Minim Invasive Gynecol.* 2006;13(1):43-48.
- Grobman WA and Milad MP. Conservative laparoscopic management of a large cornual ectopic pregnancy. *Hum Reprod.* 1998; 13(7):2002-2004.
- Coric M, Barisic D, Strelec M. Laparoscopic approach to interstitial pregnancy. *Arch Gynecol Obstet.* 2004;270(4):287-289.
- Attia M, Karuppaswamy J, Griffith H. Management of interstitial (cornual) pregnancy at 17 weeks' gestation: conservation of a ruptured uterus. *J Obstet Gynaecol.* 2005;25(7):722-723.
- Minelli L, Landi S, Trivella G, Fiaccavento A, Barbieri F. Cornual pregnancy successfully treated by suction curettage and operative hysteroscopy. *BJOG.* 2003;110(12):1132-1134.
- Lau S, Tulandi T. Conservative medical and surgical management of interstitial ectopic pregnancy. *Fertil Steril.* 1999;72(2):207-215.
- Grimbizis GF, Tsalikis T, Mikos T, Zepiridis L, Athanasiadis A, Tarlatzis BC, Bontis JN. Case report: laparoscopic treatment of a ruptured interstitial pregnancy. *Reprod Biomed Online.* 2004;9(4):447-451.
- Hussain M, Yasmeen H, Noorani K. Ruptured cornual pregnancy. *J Coll Physicians Surg Pak.* 2003;13(11):665-666.