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Cervical Pregnancy Diagnosis and Management

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Abstract

Cervical ectopic pregnancy is rare. Cervical implantation is a serious obstetric condition that can lead to mutilation if not promptly diagnosed and treated. The clinical diagnosis consists in physical examination, ballooned cervical canal, dilated cervix, and hourglass-shaped uterus detected by internal examination. Ultrasonography confirms the diagnosis by visually detecting cervical implantation below the internal orifice. Magnetic resonance imaging and three-dimensional ultrasonography validates the diagnosis. Conservative treatment proposed: cerclage, vasopressin, Foley catheter with hemostatic cervical ligation, cervical canal balloon, embolization of uterine artery, hysteroscopy, laparoscopic ligation of the uterine artery, and curettage by suction catheter. Shortcomings of conservative management are high, and a number of cases result in hysterectomy. Drug management is a therapeutic option to avoid mutilating surgery, and the most commonly used is systemic methotrexate (MTX). Local treatment with MTX and potassium chloride injection guided by transvaginal ultrasound is used when the embryo is alive.

Keywords: pregnancy, ectopic, cervical, methotrexate

1. Introduction

Ectopic pregnancy (EP) is a pregnancy in which the fertilized egg attaches itself and develops outside the uterus.

Cervical ectopic pregnancy (CEP) is considered to be exceptionally rare, and it accounts for less than 1% of ectopic pregnancies (EP) [1, 2]. Its exact incidence is not yet known; some authors report from 1:978 to 1:50,000 [1, 3–8], and other authors report 0.1% of all EP, estimating their incidence between 1:2500 and 1:98,000 pregnancies [9].

The first description of cervical pregnancy dates back to 1817 in England by Sir Everard Home [10], though the term was first used by Rokitansky in 1860 [11] (**Figure 1**).

The implantation represents a serious obstetric event [12, 13], to an extent that in 1953, Baptiste reflected: “Most great obstetricians have never seen a case of CEP; however, a minority who had this opportunity wish they had never seen it.”

Some risk factors have been considered for cervical nidation of the egg: anatomical abnormalities, uterine leiomyomas, synechia, previous cervical interventions leading to cervical mucosal changes, cervical stenosis, in vitro fertilization with embryo transfer, and obstetric uterine curettage [14].

Figure 1.
A case where hysterectomy was inevitable due to the hemorrhagic condition—The trophoblastic invasion in the endocervix can be seen (own source).

When the zygote attaches itself in the cervical canal, it is rapidly invaded by the trophoblast, reaching the conjunctival portion of the cervix, once there is no adequate decidualization. As the pregnancy develops in the cervix, bleeding could occur, initially in small amounts and later in greater volume when it reaches larger vessels. These pregnancies last, in average, 7–10 weeks [14].

2. Clinical diagnosis

The clinical diagnosis consists in the physical examination where a ballooned cervical canal and a dilated cervix can be detected [15] and hourglass-shaped uterus can be observed by internal examination [8] (**Figure 2**).

The differential clinical diagnosis between CEP and the ongoing miscarriage is that in the former, the body of the uterus tends to be larger, with dilation of the

Figure 2.
Clinical diagnosis: Physical examination—Arrow at the bottom shows external orifice of the cervix, and the arrow at the top shows development of cervical pregnancy in the anterior lip of the cervix.

external and internal orifice of the cervix, and it is possible to detect placental tissue above the internal orifice; in the latter, the internal orifice is virtually closed [16].

3. Imaging

More recently, ultrasonography has been confirming the diagnosis by visually detecting cervical implantation below the internal orifice (IO) [17, 18]. Transvaginal ultrasonography is the gold standard preliminary method for accurate diagnosis [19].

The ultrasound findings for the diagnosis of cervical pregnancy are empty uterine cavity, endometrial thickness due to decidual reaction, hourglass shape of the uterus, enlargement of cervical canal, gestational sac located in the cervix with or without embryo, placental tissue surrounding the gestational sac, and closed internal orifice of the cervix (**Figure 3**).

Three-dimensional ultrasonography is also useful in the diagnosis of GC [20, 21]. Magnetic resonance imaging validates the diagnosis [22, 23] (**Figure 4**).

Figure 3.
Diagnosis by imaging—Ultrasonography showing ovular implantation below internal orifice of the cervix.

Figure 4.
Diagnosis by imaging—MRI. Arrows show pregnancy developing in the cervical region, below the IO. Source: Bader-Armstrong et al. [22].

4. Management

The classical treatment used to be total hysterectomy due to profuse bleeding. However, some authors, eager to keep their nulliparous patients' fertility, tried the conservative treatment of uterine curettage or local suture [15, 16, 24].

Reviewing the literature CEP was only cited only in the ninth edition of Williams Obstetrics in 1945. The treatment proposed at that time was [25] blood transfusion, vaginal tamponade and hysterectomy [26].

5. Conservative surgical treatment

The conservative surgical treatment proposed in the literature are:

1. Cerclage [27]
2. Foley catheter with hemostatic cervical ligation [28, 29]
3. Uterine curettage by suction catheter [30–33]
4. Hysteroscopy [19, 34]
5. Laparoscopic ligation of the uterine artery [35]

However, the majority of the conservative surgical treatments fail and result in hysterectomy.

6. Medical treatment

The following drugs are used in the medical treatment:

1. Vasopressin [36]
2. Actinomycin D and cyclophosphamide [37]
3. etoposide [38]
4. Intra-amniotic and systemic methotrexate (MTX) and potassium chloride with live embryo [39, 40]
5. Intramuscular methotrexate with dead embryo [41]

Among the drugs mentioned above, methotrexate (MTX) is the most used in the current literature for the treatment of EP. It is an antimetabolic chemotherapeutic and folic-acid antagonist which operates through the competitive inhibition of the dihydrofolate reductase enzyme, which in turn reduces the dihydrofolic acid into folinic acid [42], interfering the DNA synthesis and, consequently, the cell division.

Our experience advocates the therapy using a single dose of MTX as first-line treatment for CEP if the embryo does not show cardiac activity.

In cases of embryos without heart beating with high β -hcg titers greater than 5000 mui/ml and often greater than 10,000 mui/ml, a systemic treatment with multiple doses of MTX is the preferred therapeutic.

When the embryo has cardiac activity, local treatment with MTX and potassium chloride is recommended [40]. Elito et al. published a series of eight cases of CEP where embryos are presenting cardiac activity treated with puncture of gestational sac guided by vaginal ultrasonography with MTX injection (1 mg/kg) and KCl injection [42].

7. Expectant management

We can rarely adopt the expectant management, monitoring throughout the development of the cervical pregnancy, as some cases can spontaneously solve itself. Patients with small-volume CEP and low and declining serum beta-hCG concentrations are candidates for this type of management. Titers of beta-hCG lower than 1500 mIU/ml and declining indicate a high possibility of spontaneous involution.

8. Conclusion

According to the historical evolution of CEP, the treatment was carried out with total abdominal hysterectomy in a heroic attempt to solve the hemorrhage after the rupture of the cervix. When the authors began to try a traditional treatment, it was usually a surgery. Early diagnosis of CEP is extremely important for choosing the appropriate treatment. Several treatment options can be used, such as surgical interventions, medical treatment, and expectant management. The treatment with MTX has a high rate of success, and it is the first choice. CEP with cardiac activity is treated with intra-aminiotic MTX and potassium chloride injection. In cases of CEP without heart beating, systemic treatment with MTX should be used in a single- or multiple-dose regimen depending on the levels of beta-hCG. When the levels of beta-hCG are low and declining, the expectant management may be chosen. The clinical treatment of CEP prevents mutilating surgeries, and the patient can preserve their original condition for an obstetric future.

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