

Cervical ectopic pregnancy: clinical review

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Summary

Cervical pregnancy is a rare kind of intrauterine ectopic pregnancy. Diagnosis and treatment of cervical pregnancy have enormously changed in the last 15 years. Before 1980, diagnosis was made when dilation and curettage for presumed incomplete abortion resulted in sudden and uncontrollable hemorrhage. Hysterectomy was practiced in order to save the patient's life. Today, cervical pregnancy is diagnosed by ultrasound (US) during the Ist trimester of pregnancy, so that the patient's fertility can be preserved. Therefore any physician should consider the possibility of a cervical pregnancy in a woman with abdominal pain and vaginal bleeding during the first trimester of pregnancy. In this study we reviewed the literature on the epidemiology, etiology, diagnosis and treatments of cervical pregnancy.

Key words: Ectopic pregnancy; Cervical pregnancy; Methotrescate hysterectomy.

Introduction

Cervical ectopic pregnancy is the implantation of a pregnancy in the endocervical canal. Diagnosis and treatment of cervical ectopic pregnancy has changed dramatically in the last 15 years. Cervical ectopic pregnancy is now commonly diagnosed on a first-trimester ultrasound (US) examination. The literature on the epidemiology, causes, diagnosis, and treatment of cervical ectopic pregnancy is reviewed.

Historical overview of cervical pregnancy

Cervical pregnancy was first described in 1817. In a 1911 case report, Rubin [1] established diagnostic criteria for cervical pregnancy. Prior to the late 1980s, clinical diagnosis of cervical pregnancy was usually made when curettage for presumed incomplete spontaneous abortion resulted in uncontrollable hemorrhage. Most women required emergent hysterectomy and transfusion of large volumes of blood. The advent of real-time transvaginal ultrasound examination and readily available beta human chorionic gonadotropin (β -hCG) assay has allowed earlier diagnosis [2].

Causes of cervical ectopic pregnancy

The causes of cervical ectopic pregnancies remain unknown. The incidence has been calculated as between one in 1,000 to one in 18,000 live births [3, 4], or less than 1% of ectopic pregnancies [5]. The rarity of the condition has prevented any retrospective study with adequate numbers to determine potential risk factors. Accelerated migration of the fertilized ovum through the

uterus, change in the ability of the endometrial lining to accept implantation, and damage to the endocervical canal may all be contributing factors. Curettage may damage the endometrial lining and prevent implantation of the fertilized ovum. Endometrial inflammation from use of an intrauterine device and pelvic inflammatory disease may explain an apparent increased incidence of cervical ectopic pregnancy in patients with these risk factors [6]. Although any of these factors may increase the relative risk of cervical pregnancy, the absolute risk remains small as intrauterine devices, pelvic inflammatory disease, and sharp curettage are all common, while cervical ectopic pregnancies remain rare. Several recent case reports have also suggested an increased incidence of cervical ectopic pregnancies in women undergoing in vitro fertilization [7, 8]. An actual increase in the incidence of cervical ectopic pregnancy may be attributable to an increased prevalence of women with a history of uterine curettage and the use of interventional treatments for infertility [2]. Alternatively, the incidence of cervical ectopic pregnancy may seem to be increased owing to the early diagnosis by endovaginal ultrasound examination of cervical pregnancies, some of which would have spontaneously aborted. Clarification of the roles of various risk factors will require a large retrospective study with an appropriately watched control population (Table 1).

Clinical diagnosis

Women with cervical pregnancy classically present with painless first-trimester vaginal bleeding, although several case reports describe patients with cramping pain [2]. Clinical signs that should suggest cervical pregnancy include a soft cervix that is disproportionately enlarged compared with the uterus, a partially open external os, and profuse hemorrhage on manipulation of the cervix (Table 2).

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Table 1. — *Predisposing factors for cervical pregnancy.*

1. Induced abortion with sharp curettage
2. Intrauterine devices
3. Asherman's syndrome
4. History of cesarean section
5. Structural uterine and cervical anomalies
6. Uterine fibroids and malformation
7. Endometrial atrophy and chronic endometriosis
8. Abnormal transport and secondary attachment of the fertilized ovum
9. In vitro fertilization
10. Increased maternal age

Table 2. — *Diagnostic criteria for cervical pregnancy.*

1. Cervical glands must be present opposite the placental attachment.
2. The attachment of the placenta to the cervix must be intimate.
3. The placenta must be below the peritoneal reflection of the anterior and posterior surfaces of the uterus.
4. Fetal elements must not be present within the uterine cavity.

Radiological diagnosis

The widespread use of endovaginal US in the last decade has facilitated the detection of cervical pregnancy at an early gestational age. Accurate diagnosis of cervical pregnancy requires that the sonographer be familiar with the distinctions between cervical pregnancy, cervical abortion, and early intrauterine pregnancy. Ultrasonographic criteria include the following intracervical sites of ectopic gestation [9-11]; closed internal os, trophoblastic invasion of the endocervical tissue, empty uterine cavity, hourglass-shaped uterus, intracervical peritrophoblastic blood flow, and diffuse amorphous intrauterine echoes. Diagnosis can be difficult in early pregnancies without fetal cardiac activity. These cervical pregnancies must be distinguished from a cervical abortion, which has been defined as a "spontaneous abortion of an intrauterine pregnancy into the cervical canal where the abortus is retained by a resistant external os, thereby ballooning out the cervical canal" [12]. Various findings may help to differentiate the latter from a cervical pregnancy. The larger or globular uterus compared to the hourglass configuration in cervical pregnancy is particularly helpful [13]. The "sliding sign" described on transvaginal scanning by Jurkovic *et al.* which occurs when the gestational sac of an abortus slides against the endocervical canal following gentle pressure by the sonographer and which will not be seen in an implanted cervical pregnancy [14] may also assist in the differentiation (Table 3).

Treatment options for cervical pregnancy

The management of cervical pregnancies depends on the clinical presentation. Hemodynamic stability and actual ongoing blood loss are the features that guide initial actions and definitive treatment. Along with the physical examination, initial evaluation should include a CBC count, blood type and screen, and quantitative β -hCG measurement [25]. This, together with ultrasono-

Table 3. — *Findings differentiating the cervical stage of a miscarriage from a cervical pregnancy.*

	Cervical pregnancy	Cervical abortion	Reference
Fetal heart beat	Often present	Absent	[15-17]
Uterine fundus	Small "hourglass shaped uterus"	Enlarged globular uterus	[3, 16, 18]
Endometrium	Regular echogenic decidual reaction, or pseudosac	Mixed echogenic mass	[19-21]
Internal os	Closed	Open	[16, 17]
Intact cervical canal between endometrium and sac	Present	Absent	[16, 22, 23]
Sac appearance with repeated scanning	Round and unchanged appearance	Increased crenulation and distortion of sac	[15, 24]

graphic evaluation, can help determine approximate gestational age and helps guide the physician in choosing appropriate therapy. Conservative management is the therapy of choice if the diagnosis can be made early before any complications. The main goal of conservative therapy is to preserve the patient's reproductive capability [26]. Methotrexate (MTX) and potassium chloride (KCL) may be used to cause fetal death and allow non surgical elimination of the pregnancy. Reduction in blood supply to the cervical pregnancy may be used in preparation for surgical therapy such as curettage, or in combination with chemotherapy. Methods include cervical cerclage, vaginal ligation of the cervical arteries, uterine artery ligation, internal iliac artery ligation, and angiographic embolization of the cervical, uterine, or internal iliac arteries (Table 4).

Table 4. — *Conservative treatment.*

1. Chemotherapy
MTX systemic or intraamniotic
KCL intraamniotic
2. Angiographic embolization
Selected uterine artery
Anterior branches of internal iliac arteries
3. Surgical excision of trophoblast
Hysterosuction and/or curettage
Hysterectomy (prior attempted cervical artery ligation)

Conservative treatment is often not successful for two main reasons: advanced gestational age and, more significantly, the anatomy of the cervix. The cervix itself is mostly fibrous connective tissue and composed of only 15% smooth muscle. It is thus unable to respond to mechanical hemostasis or uterotonic medications [27, 28]. Hysterectomy is performed if conservative treatment fails. Cases of hysterectomy after dilatation and curettage (D&C) are reported to be between 15% and 40% of cervical pregnancies [14, 29]. Other patients for whom hysterectomy should be considered are those older than 45 year and those who have completed their family or have associated uterine pathology [9, 30].

Conclusions

In summary, cervical pregnancy is a rare form of ectopic pregnancy, which usually presents with excessive first-trimester vaginal bleeding. Clinical diagnosis is difficult, although a softened and disproportionately enlarged cervix in the appropriate clinical setting should increase suspicion. Past history of uterine manipulation (e.g., D&C) or structural abnormalities increases the risk of cervical pregnancy. Ultrasonography is the most important diagnostic tool in cervical pregnancy. Management depends on clinical presentation. Hemodynamically stable patients may be treated conservatively, particularly with MTX administration or local excision and curettage. More aggressive surgical intervention may be required, with hysterectomy still occasionally necessary if more conservative measures fail.

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