

LETTER TO THE EDITOR

THREE-DIMENSIONAL ULTRASONOGRAPHIC
DIAGNOSIS OF A CERVICAL PREGNANCY

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Cervical pregnancy is a rare condition characterized by implantation of a fertilized ovum in the endocervical canal below the internal os level; its incidence is less than 0.1% of all ectopic pregnancies.¹ Although predisposing factors have been described, the cause of cervical pregnancy remains unknown.² Cervical pregnancy has a high morbidity potential due to massive hemorrhage that can be associated with it, but mortality is low due to early ultrasonographic diagnosis, using transvaginal examination.^{2,3} Making a differential diagnosis between cervical pregnancy and isthmic pregnancy is very important for prognostic reasons, since cervical pregnancy is not compatible with viable pregnancies, while an isthmic pregnancy can reach viability and term.² However, making the correct diagnosis using conventional 2-dimensional ultrasonography (2D-US) remains a challenge. Magnetic resonance imaging (MRI) has been used in few cases of cervical pregnancy to improve diagnostic accuracy.⁴⁻⁶ So far, to our knowledge, 3-dimensional ultrasound (3D-US) has not been described in this situation. The present article presents a case of cervical pregnancy diagnosed by transvaginal 3D-US examination.

CASE REPORT

A 37-year-old woman, gravida 4 para 2, was admitted to our obstetrical emergency unit with clinical signs of threatened abortion at 14 weeks of gestation. Regarding her obstetric history, the patient had 2 previous abortions in the first trimester, performed by curettage. Afterwards, she also had 2 lower-segment caesarean sections at 33 and 34 weeks, both because of severe preeclampsia.

She presented moderate vaginal bleeding associated with lower abdominal pain at the emergency room. Clinical examination of the maternal abdomen was difficult be-

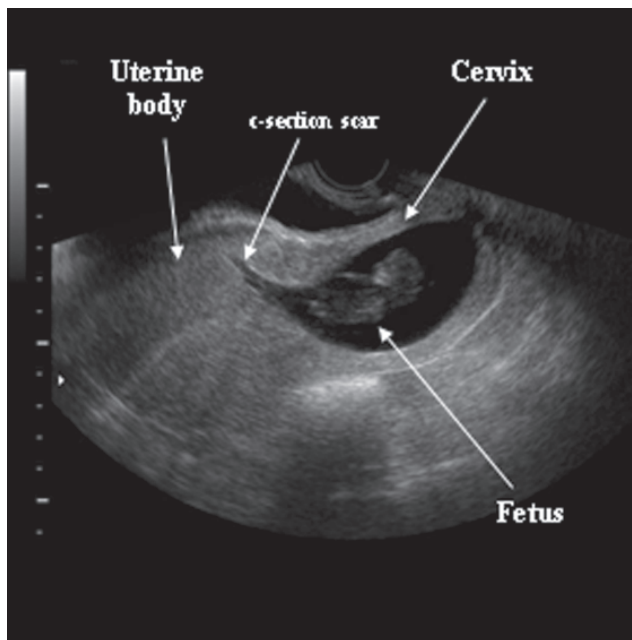


Figure 1. Transvaginal two-dimensional ultrasonography showing a fetus without heart activity, measuring 38.0mm of crown-rump length, located in the cervical portion of the uterus (abortion or cervical pregnancy?). Note the ultrasound image of the previous cesarean-section scar.

cause of maternal obesity. Vaginal examination revealed an anterior position of the cervix, which was extremely thin, with the external os closed. The uterus was retroverted, and speculum examination showed a small amount of cervical bleeding. Conventional transvaginal 2D-US (VOLUSON 730, General-Electric, Zipf, Austria, with a vaginal transducer 3-9 MHz) showed a fetus without heart activity, measuring 38.0 mm, crown-rump length (11 weeks), located in the cervical portion of the uterus (Figure 1). The cervix was dilated above the external os, and the gestational sac seemed to be attached to the lower scar segment of the previous cesarean sections. It was difficult to precisely identify the endometrial cavity due to the retroverted position of the uterus. At this time, 2 differential diagnoses were proposed: abortion or cervical pregnancy.

To confirm diagnosis, a transvaginal 3D-US (VOLUSON 730, General-Electric, Zipf, Austria, with a 3D vaginal transducer 3-9 MHz) was performed. Because the maternal blad-

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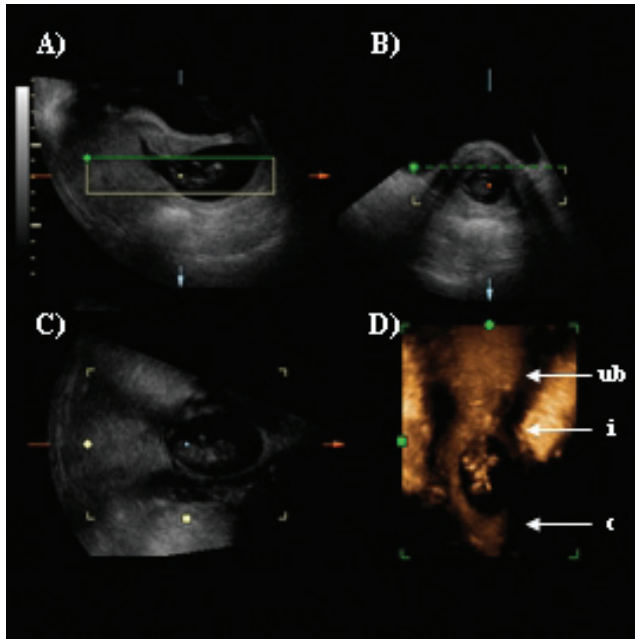


Figure 2. Multiplanar imaging with the three orthogonal sections: a) sagittal section, b) transversal section, c) coronal section, and d) reconstructed three-dimensional image. The depth of the sectional plane of the render box was adjusted on the A-plane (sagittal section) in order to evaluate the isthmus on the C-plane (coronal section). Note that, on coronal section and on the rendered 3D image, it is possible to delineate the upper limit of the cervical pregnancy at the constricted isthmus (i). ub: uterine body; i: isthmus; c: cervix.

der was partially full, the whole uterus was completely acquired, and the volumetric images were stored on a removable hard disk. By working on the multiplanar imaging, we were able to evaluate the endometrium and the uterine isthmus on the coronal section, confirming that the pregnancy was located inside the dilated cervix, which was separated from the uterus body by a constricted isthmus (Figure 2). By adjusting the depth of the volumetric box on the sagittal section (A-plane), it was possible to evaluate the endometrium and the isthmus on the coronal section (C-plane), revealing that the endometrial cavity was thin and that the upper limit of the gestational sac was attached to the isthmic region, which confirmed the diagnosis of cervical pregnancy. These findings could be clearly observed on rendered 3D sonographic images (Figure 3).

The patient was treated by intramuscular injections of methotrexate (60 mg/kg in 3 doses). After the third injection, uterine voiding occurred with light bleeding. The pre-medication plasma β -HCG level was 884 IU/mL, decreasing to less than 10 IU/mL 3 months after the procedure. No maternal complications occurred.

DISCUSSION

This paper presents a case of cervical pregnancy diagnosed by combining transvaginal 2D-US with 3D-US ex-

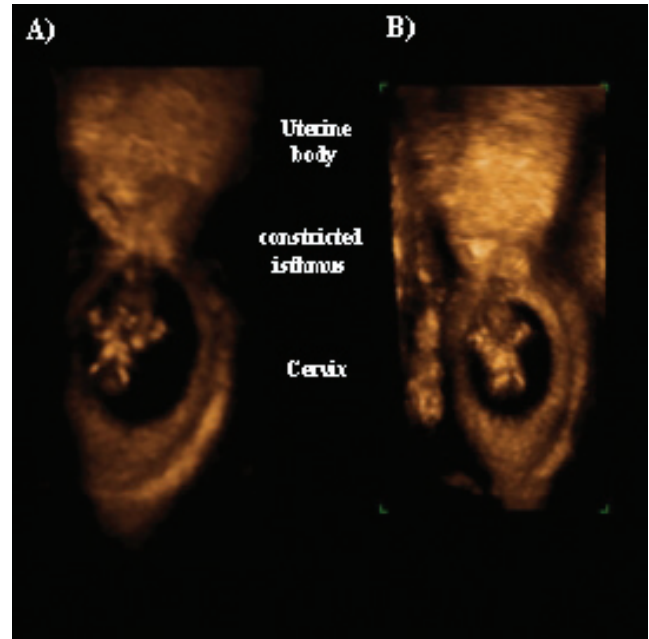


Figure 3. Three-dimensional sonogram (rendered images) showing the precise location of the pregnancy inside the cervix, with the constricted isthmus being the upper limit of the cervical pregnancy.

aminations. In this case, due to maternal obesity and the posterior position of the uterine body, it was difficult to make the correct diagnosis using only conventional transvaginal 2D-US.

The exact etiology of cervical pregnancy is unknown, although there are many predisposing factors, which include endometrial damage after curettage or chronic endometritis, leiomyoma, intrauterine devices, in-vitro fertilization, and primary embryo anomaly.²

Diagnosis of cervical pregnancy is based on clinical and ultrasonographic findings, but its differentiation from isthmic pregnancy remains a challenge. The main ultrasonographic criteria for diagnosis of cervical pregnancy are as follows: i) gestational sac in the cervix, ii) empty uterine cavity, iii) dilated cervix, and iv) normal uterine size.⁷ In the present case, two initial hypothetic diagnoses were made based on 2D-US: abortion or cervical pregnancy. The diagnosis of cervical pregnancy could be only confirmed on 3D-US, which gave clear and precise images of the location of the pregnancy.

The great advantage of transvaginal 3D-US over transvaginal 2D-US is the possibility of having a coronal section in the multiplanar imaging.⁸⁻⁹ In the present case, it was helpful to determine the limits of the gestational sac, allowing the correct diagnosis of cervical pregnancy. This imaging method also allowed a better analysis of the endometrial cavity using the coronal section in the multiplanar imaging.

Different therapeutic approaches have been proposed for cervical pregnancy, varying from radical methods to more

conservative treatments; the choice of approach depends on the clinical conditions such as blood loss, gestational age, viability of the cervical pregnancy, gestational sac location, and depth of trophoblast invasion. Total abdominal hysterectomy is the treatment of choice for cervical pregnancies diagnosed during the second trimester.⁷ The present widespread use of ultrasonography has allowed early diagnosis of cervical pregnancies (even before clinical manifestations), leading to more conservative management.¹⁰⁻¹² Conservative management techniques include the following: i) cervical curettage with balloon tamponade¹³⁻¹⁴; ii) ligation of the hypogastric or cervico-vaginal arteries¹⁵⁻¹⁶; iii) elective angiographic embolization of the uterine artery¹⁷⁻²⁰; and

iv) clinical use of methotrexate.²¹⁻²² In the present case, conservative management with methotrexate was chosen because the β -HCG level was less than 10,000 IU/mL and fetal heart activity was absent.²³ According to previous reports, medical management of cervical pregnancy with methotrexate can prevent the need for hysterectomy in 91% of the cases.²⁴

In conclusion, transvaginal 3D-US may be useful as a complementary imaging method for the correct diagnosis of cervical pregnancy by allowing the correct location of the gestational sac. It can also be useful in obese patients or in those cases with retroverted uterus, allowing a better analysis of the endometrial cavity on coronal planes.

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