

## Prenatal Diagnosis of Vasa Previa by Routine Transvaginal Color Doppler

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The prenatal diagnosis of vasa previa is essential to achieving a safe delivery in patients who suffer from the condition. Transvaginal ultrasound with color Doppler performed at the time of a routine mid-trimester ultrasound is a valuable tool in terms of achieving a timely and accurate diagnosis of vasa previa. [*P R Health Sci J* 2021;40:90-92]

*Key words: Prenatal diagnosis, Ultrasonography, Vasa previa*

Vasa previa is a potentially catastrophic condition that occurs when fetal blood vessels that are unprotected by the placenta or umbilical cord either run through the amniotic membranes and transverse the cervix or lie within 2 cm of it. Its prevalence is reported at 2.95 per 1000 pregnancies (1). If not diagnosed prior to the rupture of the amniotic membranes and labor, the condition can cause fetal exsanguination leading to fetal death. We report on 3 cases of vasa previa that were prenatally diagnosed, each diagnosis taking place in the second trimester of each patient during a routine transabdominal/transvaginal ultrasound; all the diagnoses were confirmed with color Doppler imaging. The 3 cases were diagnosed within a 6-month period in a practice that performs an average of 300 routine mid-trimester ultrasounds; the incidence of vasa previa for this time and practice was 1:500. The cases were managed successfully before the rupture of the membranes with antepartum hospitalization and a cesarean section.

### Case 1

We present here the case of a 28-year-old woman (G6P4131) who underwent a routine transabdominal/transvaginal ultrasound at 20 weeks of gestation. Transvaginal sonography (TVS) with color Doppler revealed a velamentous insertion of the umbilical cord and vasa previa (Figure 1). Findings were confirmed at 28 weeks, at which time she was admitted to the hospital for observation and the administration of corticosteroids. At 30 5/7 weeks, she developed regular uterine contractions. A cesarean section was performed, and a female infant was delivered with a birth weight of 1500 grams; she

had Apgar scores of 5/8 at 1 and 5 minutes, respectively. The infant remained in the hospital for 3 weeks but did not develop major complications and was alive and well at 9 months of age. A placental examination confirmed the velamentous insertion of the umbilical cord and the presence of vasa previa.

### Case 2

Described herein is the case of a 27-year-old woman (primigravida) who had a routine transabdominal/transvaginal

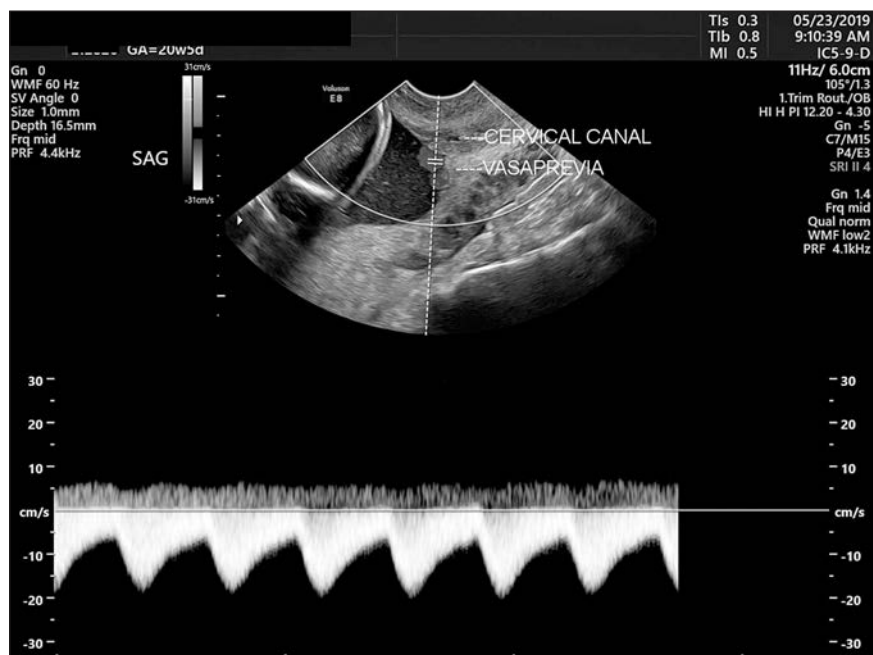


Figure 1. Vasa previa arterial waveform

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ultrasound with color Doppler performed at 21 weeks of gestation: the exam revealed a posterior marginal placenta previa with the velamentous insertion of the umbilical cord and vasa previa (Figure 2). The findings were confirmed at 25 and 32 weeks. The patient was admitted to the hospital at 32 weeks for observation and the antenatal administration of corticosteroids. At 33 3/7 weeks, the patient developed regular uterine contractions, and a cesarean section was performed. A male infant was delivered, weighing 2,200 grams and having an Apgar scores of 8/9 at 1 and 5 minutes, respectively. The infant did not have any postnatal complications and was discharged from the hospital after 9 days and was alive and well at 10 months of age. Placental pathology confirmed the presence of vasa previa.

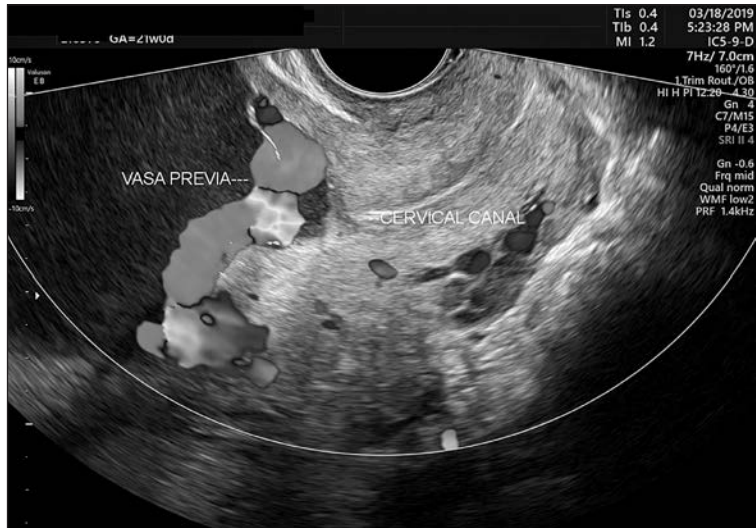
**Case 3**

This details the case of a 24-year-old woman (G2P0010) who underwent routine transabdominal/transvaginal ultrasound at 23 weeks of gestation; the exam disclosed the presence of vasa previa and a velamentous cord insertion (Figure 3). Ultrasound findings were confirmed at 24 and 30 weeks, at the time of the second confirmation, she was admitted to the hospital for observation and the administration of corticosteroids. At 32 weeks, the patient experienced regular uterine contractions, and a cesarean section was performed. A male infant weighing 1801 grams was delivered. The infant developed pneumonia and sepsis during his time in the NICU but was alive and well at 6 months of age. Placenta pathology confirmed the presence of vasa previa.

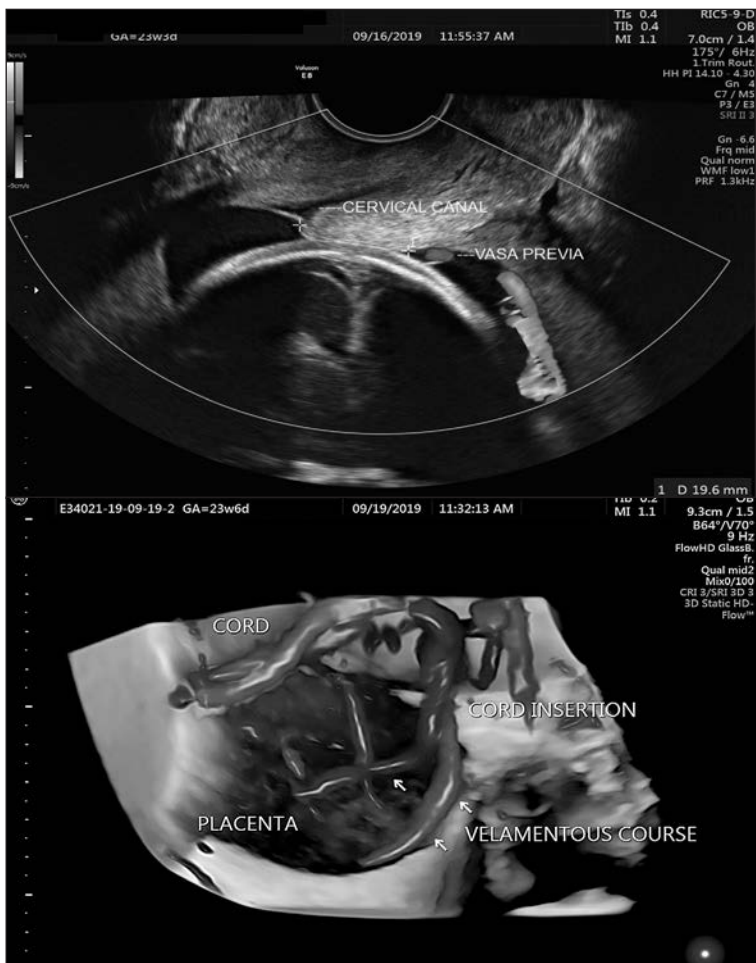
**Discussion**

The most common risk factors for vasa previa are velamentous cord insertion, succenturiate lobe, placenta previa, low-lying placenta, and multiple gestation. In a systematic review of 325 cases of vasa previa, 1 or more of these risk factors were present in 83% of the cases under study (2). Diagnosed prenatally, vasa previa has a 100% fetal survival rate; however, the perinatal mortality rate is approximately 56% if a diagnosis is not made antenatally (3). The American Institute of Ultrasound in Medicine and the American College of Obstetricians recommend that in all ultrasounds the placental cord insertion site be documented when technically possible (4). According to current guidelines, a transvaginal ultrasound with color Doppler is recommended for patients at risk for vasa previa (1).

Since an early and accurate diagnosis of vasa previa is the only way of avoiding the complications associated with this condition, increasing the diagnostic rate is of utmost importance. Ruiter et



**Figure 2.** Vasa previa overlying the internal cervical os



**Figure 3.** A color Doppler and a 3D rendering of velamentous insertion and vasa previa.

al. found that TVS with color Doppler was able to diagnose vasa previa with a sensitivity of 93% and a specificity of 99% (5). For this reason, it can be argued that institutions that already perform transvaginal ultrasound for cervical-length measurement should add color Doppler to the exam. Moreover, complementing routine TVS with color Doppler will add precision to the diagnosis of placental abnormalities, such as velamentous cord insertion and other conditions that are also risk factors for vasa previa, and will accomplish this without significantly increasing scan time or the need for personnel or equipment. Notwithstanding, we acknowledge that universal transvaginal ultrasound for cervical-length measurement is controversial.

A follow-up ultrasound every 4 weeks has been recommended, since the resolution of vasa previa by the third trimester has been observed in 14 to 39% of cases (6). If vasa previa persists, most authorities recommend the administration of antenatal corticosteroids at 28 to 32 weeks, hospitalization at 30 to 34 weeks, and elective cesarean section at 34 to 37 weeks of gestation (7). In our cases, all the patients were hospitalized for observation for from 28 to 32 weeks, were administered antenatal corticosteroids, and required cesarean sections at 30 to 34 weeks. Interestingly all our patients developed regular uterine contractions before 34 weeks while in the hospital, suggesting that elective early admission is beneficial.

In conclusion, fetal mortality due to vasa previa is highly preventable if the proper screening techniques, including the use of transvaginal ultrasound with color Doppler, are implemented during a woman's mid-pregnancy evaluation.

## Resumen

El diagnóstico prenatal de vasa previa es esencial para lograr un parto más seguro en todas las pacientes que sufren de esta condición. La ecografía transvaginal con Doppler a color realizada durante la ecografía de rutina en el segundo trimestre es una herramienta valiosa para lograr un diagnóstico oportuno y preciso de vasa previa.

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