

PRENATAL DIAGNOSIS OF VASA PREVIA BY ROUTINE TRANSVAGINAL COLOR DOPPLER

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Introduction

Vasa previa is a potentially catastrophic condition that occurs when fetal blood vessels that are unprotected by the placenta or umbilical cord run through the amniotic membranes and transverse the cervix or lie within 2 cm. Its prevalence is reported at 2.95 per 1000 pregnancies (1). It results in a high perinatal mortality rate due to fetal exsanguination if not diagnosed before rupture of membranes and labor. We report three cases of vasa previa that were prenatally diagnosed in the second trimester during routine transabdominal/transvaginal ultrasound confirmed with color Doppler. All three cases were diagnosed within a 6-month period in a practice that performs an average of 300 routine mid trimester ultrasounds, for an incidence of 1:500. All cases were managed successfully with antepartum hospitalization and cesarean section before rupture of membranes.

Case 1

Case of a 28-year-old woman G6P4131 who underwent a routine transabdominal/transvaginal ultrasound at 20 weeks of gestation. TVS with color Doppler revealed 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 administration of corticosteroids. At 30 5/7 weeks she developed regular uterine contractions. Cesarean section was performed, and a female infant was delivered with a birth weight of 1500 grams and Apgar scores of 5/8 at 1 and 5 minutes. The infant remained in the hospital 3 weeks but did not develop major complications, and is alive and well at 9 months of age. Placental examination confirmed velamentous insertion of the umbilical cord and the presence of vasa previa.

Case 2

Case of a 27-year-old woman primigravida who had a routine transabdominal/transvaginal ultrasound with color Doppler performed at 21 weeks of gestation that revealed a posterior marginal placenta previa with velamentous insertion of the umbilical cord and vasa previa. (figure 2). Findings were confirmed at 25 and 32 weeks. The patient was admitted to the hospital at 32 weeks for observation and 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 Apgar scores of 8/9 at 1 and 5 minutes. The infant did not have any complications and was discharged after 9 days and is alive and well at 10 months of age. Placental pathology confirmed the presence of vasa previa.

Case 3

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

Figures

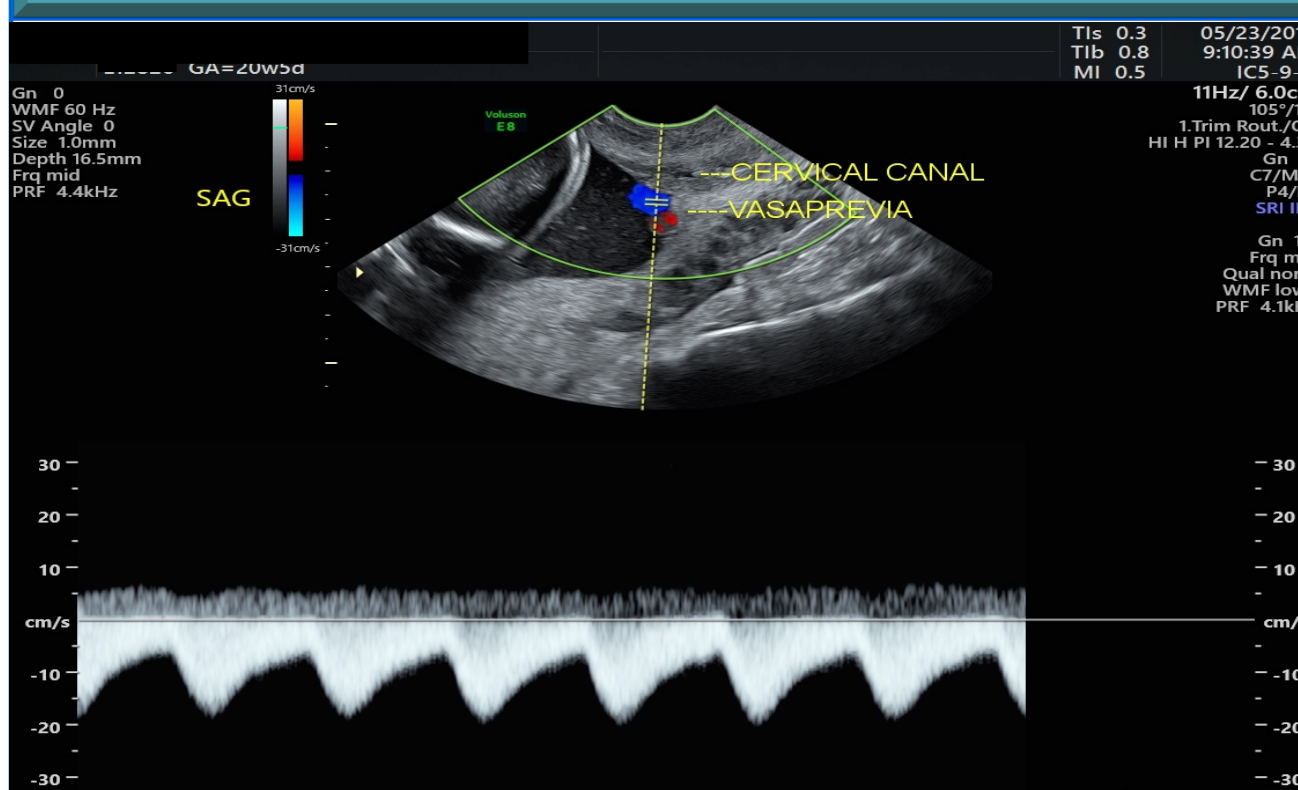


Figure 1: Vasa previa arterial waveform

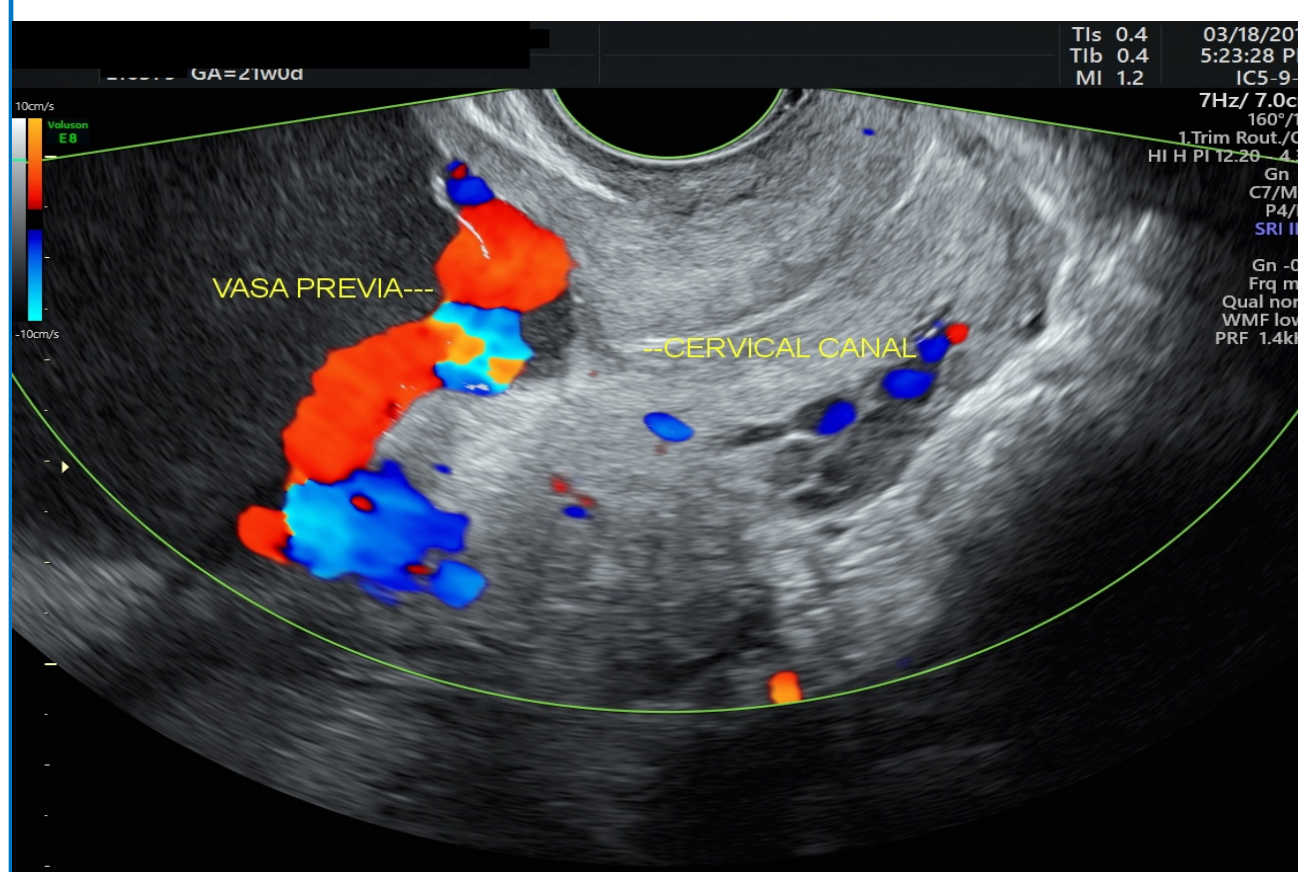


Figure 2: Vasa previa overlying the internal cervical os

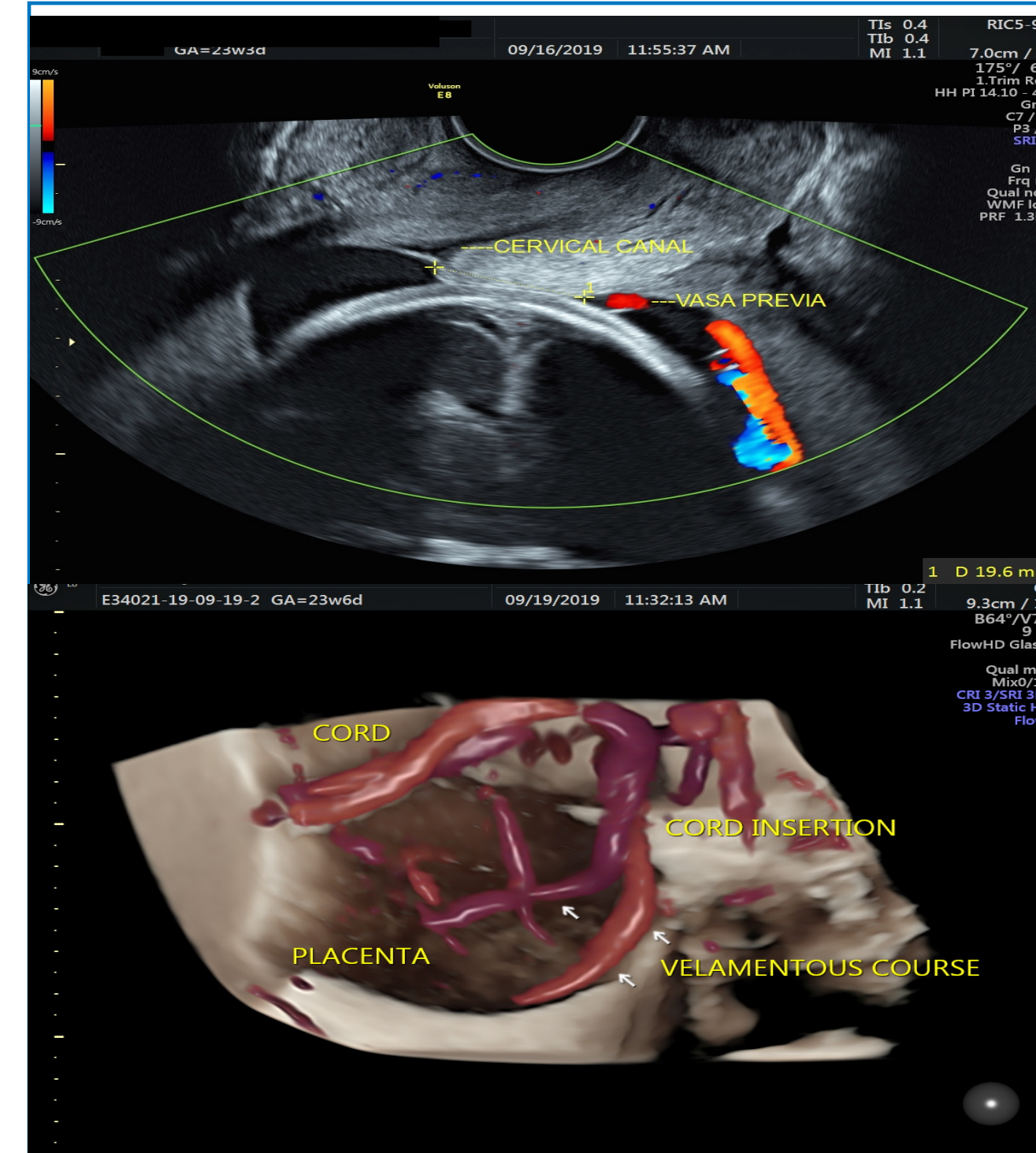


Figure 3: Color Doppler's and 3D rendering of velamentous insertion and vasa previa

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, one or more of these risk factors were present in 83% of cases (2). When the condition is not diagnosed antenatally, the perinatal mortality rate is reported to be approximately 56%, whereas 100% of fetuses survive when the condition is diagnosed prenatally (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, transvaginal ultrasound with color Doppler is recommended in patients at risk for vasa previa (1).

Since an early and accurate diagnosis of vasa previa is the only way of avoiding complications associated with this condition, increasing the diagnostic rate is of utmost importance. Ruiter et al found that the use of TVS with color Doppler was able to diagnose vasa previa with a sensitivity of 93% and a specificity of 99% (5).

For these reasons, it can be argued that institutions that already perform transvaginal ultrasound for cervical length measurement should add color Doppler to their exam. Moreover, complementing routine TVS with color Doppler will add precision to the diagnosis of placental abnormalities such as velamentous cord insertion and other risk factors for vasa previa and without significantly increasing scan time, personnel or equipment. Notwithstanding, we acknowledge that universal transvaginal ultrasound for cervical length measurement is controversial.

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

Conclusions

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 mid pregnancy evaluation.

References

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