

## CASE REPORT

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# Vasa previa with velamentous cord insertion: a case report

## Vasa previa con inserción velamentosa de cordón: comunicación de un caso

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### ABSTRACT

Vasa previa is a rare and infrequent prenatal finding of hemorrhage in the second half of pregnancy, in which umbilical vessels devoid of Wharton's jelly interpose between the fetal presentation and the internal cervical os. When undetected and rupture of the vessels occurs, it is associated with a high perinatal mortality rate. Three types are described; the case presented is type 1 vasa previa secondary to velamentous insertion of the cord. It was diagnosed prenatally by transvaginal ultrasound associated with color Doppler. A cesarean section was performed with favorable maternal and perinatal evolution.

**Key words:** Vasa previa, Umbilical cord, Prenatal diagnosis, Ultrasonography, prenatal, Doppler

### RESUMEN

La afeción vasa previa es un hallazgo prenatal raro y poco frecuente de hemorragia en la segunda mitad del embarazo, en la que los vasos umbilicales desprovistos de la gelatina de Wharton se interponen entre la presentación fetal y el orificio cervical interno. Cuando no se la detecta y se produce la rotura de los vasos, se asocia a una alta tasa de mortalidad perinatal. Se describen 3 tipos; el caso presentado se trata de vasa previa de tipo 1 secundaria a inserción velamentosa de cordón. Fue diagnosticada prenatalmente mediante ecografía por vía transvaginal asociada a Doppler color. Se practicó una cesárea con evolución materno perinatal favorable.

**Palabras clave:** Vasa previa, Cordón umbilical, Diagnóstico prenatal, Ultrasonografía prenatal, Doppler

### INTRODUCTION

Vasa previa (VP) represents a rare entity of hemorrhage in the second half of pregnancy in which unprotected fetal vessels of Wharton's jelly or placental tissue flow across the amniotic membrane through the internal cervical os and ahead of the fetal presentation<sup>(1)</sup>. The estimated incidence is 0.46-0.6 in 1,000 pregnancies<sup>(2,3)</sup>.

Three variants of vasa previa have been identified: type 1, secondary to a velamentous insertion of the cord; type 2, associated with bilobed or succenturiata placenta; and type 3, where there are one or more boomerang-shaped vessels crossing the membranes along the placental margin<sup>(4)</sup>.

The risk factors associated with the entity are: placenta previa (OR: 19; 95% CI: 6.1-58), velamentous insertion (OR: 672; 95% CI: 112-4,034), assisted reproductive techniques such as in vitro fertilization and intracytoplasmic sperm injection (OR: 19; 95% CI: 6.6-54), morphological abnormalities of the placenta such as bilobed placenta and succenturiata (OR: 71; 95% CI: 14-349) and multiple gestation (OR: 2.66; 95% CI: 0.80-8.8)<sup>(3)</sup>. It should be noted that between 6%-14.3% of cases are detected VP in the absence of risk factors<sup>(5)</sup>.

The clinical course can be complicated by rupture of the vessels causing fetal hemorrhage or extrinsic compression of the cord causing heart rate decelerations, asphyxia, and fetal death<sup>(6)</sup>. When VP is not detected prenatally, fetal mortality ranges from 22.5%-100%<sup>(7)</sup>, but if the diag-



nosis is made prenatally, the neonatal mortality rate is <1%; one third of patients will require an unscheduled delivery<sup>(8)</sup>.

Most international guidelines performing routine prenatal ultrasound recommend an ultrasound evaluation of the umbilical vessels and cord insertion<sup>(9)</sup>. However, universal ultrasound screening for VP is not recommended unless prenatal risk factors are present<sup>(10)</sup>.

We present a case of prenatal diagnosis of vasa previa secondary to velamentous insertion.

### CASE REPORT

A 38-year-old female patient, G3P1011, 29 weeks 4 days by first trimester ultrasound, with previous vaginal delivery and medical abortion, without pathological or surgical history of interest and who had 5 prenatal controls in a health center, presented with emergency uterine contractions and little bleeding from the vaginal canal. On physical examination she was hemodynamically stable, with a soft, depressible abdomen occupied by a pregnant uterus of normal tone. The vaginal canal showed scanty dark red bleeding. Fetal monitoring was performed and showed two rhythmic uterine contractions in 10 minutes.

Obstetric ultrasound showed a single fetus in breech presentation without morphological alterations, with a heart rate of 142 beats per minute, fetal weight estimated at 1,494 g at the 62nd percentile for gestational age, normal amniotic fluid volume, low insertion posterior body placenta and, in front of the fetal presentation, vessels passing over the cervix were observed (Figure 1). Transvaginal ultrasound revealed cervical length of 35 mm, and color Doppler showed vessels devoid of umbilical cord running longitudinally above the internal cervical os (Figure 2). Pulsed Doppler exhibited an arterial vessel and another fetal venous vessel (Figure 3), which led to the diagnosis of vasa previa with velamentous insertion. She was hospitalized for tocolysis and pulmonary maturation. Five days later she was discharged without uterine contractions or intercurrents. Weekly outpatient follow-up was indicated. The patient attended only two check-ups.

FIGURE 1. ABDOMINAL ULTRASOUND: VESSELS (¶) FROM THE PLACENTA (‡) PASSING OVER THE CERVIX (\*) ARE SEEN IN FRONT OF THE FETAL PRESENTATION (†). THE MATERNAL BLADDER IS VISUALIZED (S).

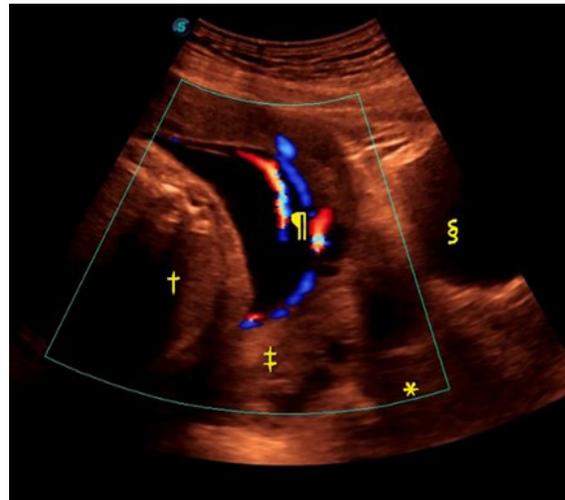


FIGURE 2. TRANSVAGINAL ULTRASOUND: IN FRONT OF THE FETAL PRESENTATION (†), COLOR DOPPLER SHOWS FETAL VESSELS (¶) RUNNING LONGITUDINALLY ABOVE THE INTERNAL CERVICAL OS (\*). PLACENTA (‡).

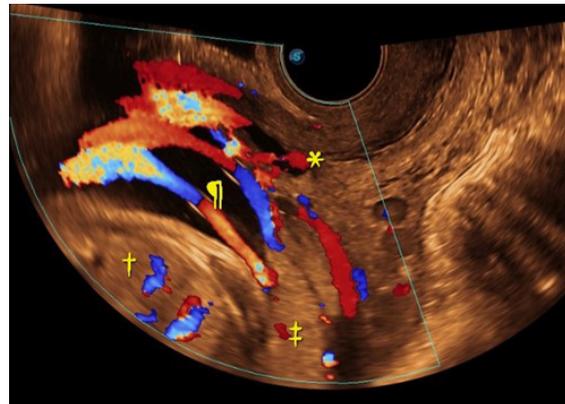
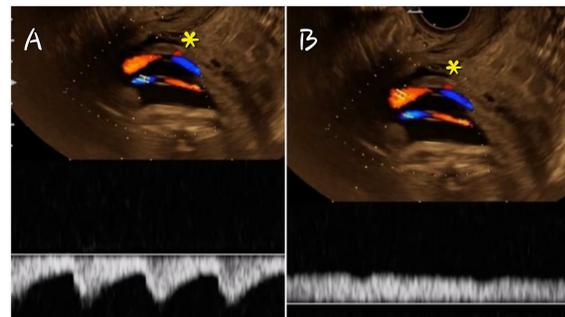


FIGURE 3. PULSED DOPPLER. A. FETAL ARTERIAL VESSEL. B. FETAL VENOUS VESSEL.



At 35 weeks and 5 days of gestation, the patient presented in emergency for regular uterine contractions and scant vaginal bleeding. A cesarean section was performed without complications, in which a live male newborn was obtained,



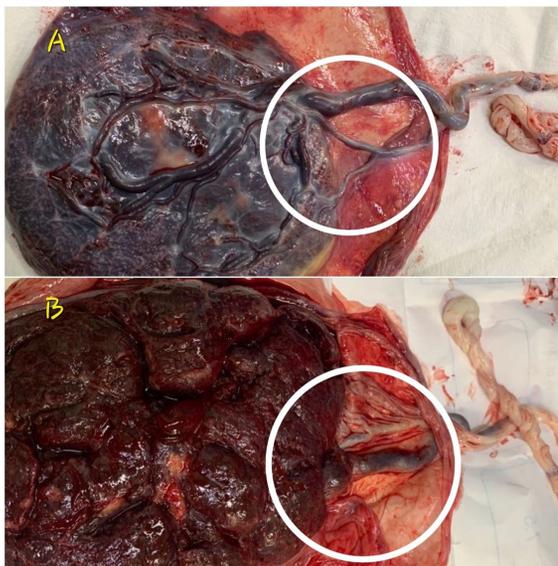
2,512 grams, 37 weeks by Capurro, adequate for gestational age and Apgar 7 at 1 minute and 9 at 5 minutes. Macroscopic examination of the placenta (Figure 4) confirmed the ultrasound findings of vasa previa secondary to velamentous insertion. In-hospital maternal and neonatal evolution was favorable, and the mother and newborn were discharged after 48 hours.

## DISCUSSION

The umbilical cord normally inserts into the center of the placenta. However, two main types of abnormal insertion have been identified, both of which have clinical significance during labor<sup>(11)</sup>. One is marginal insertion when the cord inserts at the periphery of the placental mass, which is supported by very little placental tissue; and the second is velamentous insertion (VI), when the cord attaches only to the amniotic membranes rather than to the placental mass, leaving the umbilical vessels unprotected by Wharton's jelly<sup>(12)</sup>. These vessels are prone to compression and rupture, especially in labor. In the VI, when the vessels pass through the internal cervical os and in front of the fetal presentation or are within 2 cm of the internal cervical os they constitute the type 1 variant of vasa previa (VP1)<sup>(5,13)</sup>.

The VP1 entity represents a rare entity, estimating that 1-50 cases of VI is complicated with VP and is associated with high perinatal mortality

**FIGURE 4. MACROSCOPIC EXAMINATION OF THE PLACENTA; IN THE CIRCLE, FETAL VESSELS UNPROTECTED FROM WHARTON'S JELLY ARE SEEN RUNNING THROUGH THE AMNIOTIC MEMBRANE. A. FETAL PLACENTAL SIDE. B. MATERNAL PLACENTAL SIDE.**



rates, particularly when it is not suspected during the prenatal stage<sup>(1,11)</sup>. VI has an incidence of 0.4-11% in singleton pregnancies and increases in twin pregnancies (1.6-40%). In addition, it has adverse pregnancy outcomes, such as small-for-gestational-age newborns, preterm delivery, perinatal death, intrauterine fetal death, and intrapartum complications, including emergency cesarean delivery<sup>(12,14)</sup>.

Most routine prenatal ultrasound protocols include an ultrasound evaluation of the umbilical vessels and cord insertion into the fetal abdomen<sup>(15)</sup>. However, routine ultrasound often fails to detect VI and universal ultrasound screening is not recommended but may be performed in cases where prenatal risk factors are present<sup>(5)</sup>. Prenatal VI identification is a desirable clinical goal, as these pregnancies have an increased risk of adverse perinatal outcomes and, despite the obvious importance of prenatal VI detection in obstetric practice, only a few studies have focused on the systematic identification of the site of placental cord insertion during prenatal ultrasonography<sup>(16)</sup>.

Prenatal diagnosis of VP is most often made by ultrasound between 18-26 weeks of gestation. On the gray scale, parallel or circular echogenic lines are observed near the internal cervical os; and if associated with color Doppler, pulsed Doppler fetal vessels show an arterial or venous waveform. The accuracy of ultrasound when performed transvaginally combined with color Doppler is 93%, with specificity between 99%-100%<sup>(1,17)</sup>. Prenatal diagnosis is associated with 97%-99% perinatal survival, while the absence of diagnosis increases the risk of hypoxic morbidity 50-fold and the risk of perinatal death 25-fold<sup>(18)</sup>.

Because the vessels are attached to the chorion, rupture of the membranes may result in rupture of the vessels with fetal hemorrhage. Or extrinsic compression of the cord may occur leading to fetal heart rate decelerations which, if prolonged, may lead to fetal asphyxia and subsequent death<sup>(10)</sup>.

For this reason, the goal of management will be to prolong pregnancy in a safe manner, avoiding possible complications related to rupture of membranes or delivery, as well as minimizing the impact of prematurity<sup>(19)</sup>. Although it is diffi-



cult to establish the optimal gestational age for delivery, in cases of uncomplicated VP, elective cesarean section is recommended at around 36 weeks gestation, when a low rate of perinatal mortality and morbidity is observed<sup>(20)</sup>.

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