Vasa previa is a rare but serious medical condition characterized by a velamentous insertion of fetal blood vessels onto the placenta, which places those vessels at high risk of rupturing with rupturing of the membranes. Often vasa previa goes undetected until fetal compromise ensues following rupture of membranes.

Keywords: Succenturiate placental lobe, vasa previa, velamentous insertion.

Vasa previa is a rare condition characterized by an abnormal insertion of blood vessels onto the placenta during pregnancy. Vasa previa occurs approximately once in every 2,500 births, and has an almost 95% fetal mortality rate if the condition is not identified prenatally. Without imaging studies to identify abnormalities in fetal blood vessels, it is a condition often times associated with fetal demise during the labor process due to exsanguination of the fetus. This is a case study that depicts the anesthetic management and outcome of a patient with unknown vasa previa at the time of delivery.

Case Report

A 25-year-old female, G2P2001, ASA class 2, presented to the obstetrics unit at 39 weeks and 2 days gestation for evaluation of pregnancy. Prior to arrival at the hospital, she had an office visit in which her blood pressure was 126/90 and she had plus 2 proteinuria. On arrival to the hospital, she weighed 52.2 kg and was 157.5 cm tall. Her allergies identified as penicillin and cifenline, a class I antiarrhythmic agent also known as cibenzoline. Her past medical history included Factor 5 Leiden, hyperlipidemia, migraines, history of post-partum hemorrhage, and mild pre-eclampsia intrapartum for her most recent pregnancy. Her past surgical history was significant for cervical carcinoma in situ requiring cervical cone removal with LOOP electrode.

Maternal Fetal Medicine had been following the patient during this pregnancy due to her identified pre-eclampsia as well as a known placental abnormality. Transabdominal ultrasound imaging two months prior showed an anterior placental lake measuring 2.3cm × 1.8cm × 2.6cm. Although it was noted that the placental lake was slightly different than the typical presentation, the physician interpreting the study postulated that this lake could have been due to placental trauma from a recent motor vehicle accident the patient was involved in.

On the morning of her delivery, she received Cervidil for induction and had assisted rupture of membranes (AROM) at 0844. Upon AROM, it was noted by the midwife that there was a return of bloody fluid with clots. At 0850, the patient was experiencing steady vaginal bleeding. Fetal heart monitoring showed bradycardia with a fetal heart rate (FHR) in the 60s to 70s. The obstetrician arrived at the beside at this time. The patient was moved onto her right side, then her left side, and finally with knees to chest without improvement. Arrangements were made for an emergent cesarean section.

At 0858, the patient arrived in the operating room. Fetal heart rate (FHR) at that time was 110. The patient was on her hands and knees. The mother was placed on the operating room table and 100mg 2% Lidocaine, 200 mg Propofol, and 120mg succinylcholine, were given for induction of anesthesia. Intubation occurred at 0907 and delivery occurred at 0908. Maternal blood loss was 1000 mL. Two bags of 30mg of Pitocin in 500 cc of saline were given as well as 0.2mg of methergine. The patient’s blood pressure was 135/90 the day before delivery. Intraoperatively, her highest blood pressure reached was 150/70 and occurred just prior to incision. Throughout the procedure, the patient was maintained on Sevoflurane and nitrous and titrated for hemodynamic stability. The patient’s systolic blood pressure was maintained between 97 and 134, and her diastolic pressure was maintained between 66 and 98.

Upon delivery, the baby was given to the pediatrics staff, which included 2 pediatricians, an anesthesiologist, CRNA, and 2 obstetrical nurses, who immediately initiated cardiopulmonary resuscitation. The baby was white in color and motionless. The baby was intubated without difficulty and breaths and compressions were given according to neonatal resuscitation guidelines. Apgar scores were zero at one minute, five minutes, ten minutes, fifteen minutes, and twenty minutes. Intravenous access was obtained via the umbilical vein, but no blood return was noted. After 90 minutes, the resuscitation attempt was terminated.

Resuscitation effectiveness and potential causes of the baby’s condition were reviewed frequently throughout
the resuscitation attempt. It was only after careful examination of the placenta and careful review of the entire case that a diagnosis of vasa previa was determined.

**Discussion**

Normal physiology of fetal blood flow is through the umbilical cord towards the placenta via two coiled arteries. On the surface of the placenta, these coiled arteries split into chorionic arteries which eventually subdivide into terminal arterioles. These arterioles, in turn, form up to four capillary loops which allow for the ideal exchange of maternal and fetal blood. The venous ends of these capillary loops form larger veins which travel towards the attachment location of the umbilical cord. These veins then empty into a single umbilical vein, which is responsible for transporting blood to the fetus.\(^3\) (Figure)

Vasa previa occurs when the fetal blood vessels are found outside of the umbilical cord or placenta. The blood vessels lack necessary protection as they pass through the amniotic membranes and cross the cervical opening.\(^4\) Type I vasa previa is characterized by the presence of a velamentous cord insertion. In this instance, the insertion lies in between the umbilical cord and the placenta. Fetal vessels, without the protection of the umbilical cord and placenta, travel freely within the amniotic membranes and cross the cervical os, or run very close to the os.\(^4\) Type II vasa previa is associated with a succenturiate lobe or multilobed placenta. The fetal vessels that connect these lobes travel across or within close proximity of the cervix.\(^4\) In either type, the unprotected fetal vessels can be torn with rupture of membranes, leading to exsanguination of the baby.\(^3\)

Vasa previa can be asymptomatic but it can also present as sudden onset of abnormally heavy bleeding or small amounts of painless vaginal bleeding. This bleeding takes place in the second or third trimester.\(^3\) On rare occasion, practitioners can palpate pulsatile blood vessels in the membranes covering the opening of the cervix during a digital exam.\(^6\) Unfortunately, this condition is usually identified during labor, when fetal vessels have already ruptured.\(^2\)

There are several risk factors associated with the development of vasa previa. These include multiple gestations, velamentous cord insertion, low-lying placenta or placenta previa identified with ultrasound during the second trimester, bilobed placenta or succenturiate placental lobe, and the use of *in vitro* fertilization.\(^3\) Based upon a systematic review performed on these risk factors as predictors of vasa previa, 83 percent of cases saw mothers having at least one risk factor.\(^2\)

The utilization of ultrasonography can allow for the visualization of the velamentous insertion of blood vessels. Colored transvaginal Doppler imaging can be used to support in diagnostic confirmation. The diagnosis of vasa previa should be considered if bleeding accom-

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**REFERENCES**


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**Velamentous cord**

Figure. Velamentous Cord Insertion onto the Placenta

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DISCLOSURES

The authors have declared no financial relationship with any commercial entity to the context of this article. The authors did not discuss off-label use within the article.

ACKNOWLEDGMENTS

The authors would like to thank all those CRNAs who have encouraged them and inspired them along the way.