Volume 13 Issue 10
Originally issued as E2



Global Journal of Medical research
Gynecology and Obstetrics
Volume 13 Issue 2 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN : 0975-5888

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By Natasha Gupta Md, Mina Tirabassi Rdms, Jeff B Chapa Md, Ori Kushnir Md & Josef Blankstein Md

Mount Sinai Hospital, United States

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GJMR-E Classification : NLMC Code: WQ 210, WQ 212



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Early Suspicion of Vasa Previa with Velamentous Umbilical Cord Insertion and Low Laying Placenta and its Management

Natasha Gupta Md [α], Mina Tirabassi Rdms [σ], Jeff B Chapa Md [ρ], Ori Kushnir Md [ω] & Josef Blankstein Md [¥]

Abstract- We present a case of a 34 years old female who was suspected to have vasa previa due to sonographic evidence of low lying placenta and velamentous cord insertion, early in the pregnancy. Vasa previa can lead to significant perinatal morbidity by causing fetal exsanguination, if diagnosis is delayed. This case demonstrates the need for early suspicion of vasa previa in presence of persistent high risk features on repeated ultrasounds, importance of patient preparation with antenatal steroids as well as comprehensive education of patient regarding the warning signs and symptoms.

I. Case Presentation

A 34-years old female, gravida 2, para 1, presented at 32.5 weeks gestation with complaints of contractions every 2 minutes. She denied any vaginal bleeding or leakage of fluid. She was being closely followed for low lying placenta and velamentous insertion of umbilical cord, with serial ultrasounds. Her sonogram at 20.2 weeks showed an anterior, low lying placenta. A follow up ultrasound at 24.2 weeks noted anterior, marginal placenta. A transvaginal sonogram at 29.5 weeks revealed anterior marginal placenta with suspicion for funic presentation (FIGURE A). Color flow mapping was suggestive of velamentous cord insertion with suspicion for vasa previa (FIGURE B).

Patient was administered a course of steroids in preparation for preterm delivery for suspected vasa previa. She also received instructions to return to hospital in case of leakage of fluid or vaginal bleeding. An ultrasound at 31.2 weeks again noted velamentous cord insertion, with vessels seen coursing the membranes in close proximity of internal cervical os, thus providing strong suspicion for previa. Patient returned to labor and delivery with frequent contractions and was delivered with Cesarean section to prevent fetal head compression of vessels or their rupture from uterine contractions. Placental inspection confirmed the diagnosis of velamentous insertion and vasa previa. Infant with APGAR scores of 7 and 7 at 1 and 5 minutes respectively was born. Baby was admitted to neonatal intensive care unit (NICU) for further care, did not require transfusion and was discharged after 15 days stay in NICU. Mother and baby continued to do well on their follow up.

II. Discussion

Vasa Previa is an uncommon obstetric complication where fetal blood vessels travel the membranes covering the internal cervical os, in front of the fetal presenting part [1]. Type 1 vasa previa is associated with velamentous umbilical cord insertion, where cord is inserted marginally into the placenta and lacks the protective covering of Wharton's jelly around it, such that umbilical vessels are covered only by the membranes [1]. These vessels are prone to rupture and compression with onset of labor and with rupture of membranes. Type 2 vasa previa is seen in association with bilobed placenta or placenta with a succenturiate lobe, where fetal vessels travel the membranes connecting 2 lobes of placenta or those connecting placenta with its accessory or succenturiate lobe. The incidence of vasa previa is 1 in 2500 in United States.

Risk factors for vasa previa include placental and cord abnormalities like velamentous insertion of umbilical cord [2], bilobed placenta, placenta with succenturiate or accessory lobe, low-lying placenta or placenta previa as well as multifetal pregnancies and pregnancies following in vitro fertilization[3]. It is essential to identify vasa previa in a timely manner since onset of labor or premature rupture of membranes results in rapid fetal exsanguination causing feta anemia, hypotension and demise within

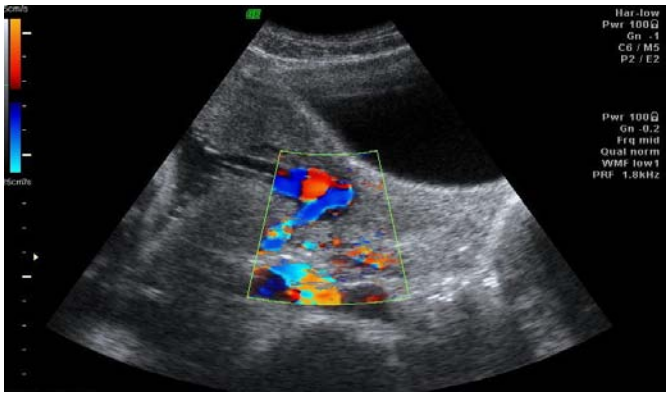


Figure A : Transvaginal Scan showing anterior marginal placenta with funic presentation.

Authors α ¥: Department of Obstetrics and Gynecology, Mount Sinai Hospital,1500 S California Ave, Chicago, IL, 60608. e-mail: docnatasha3@gmail.com
Authors σ ρ ω : Department of Obstetrics and Gynecology, Cleveland Clinic Children's Hospital, Cleveland, Ohio, 44195.

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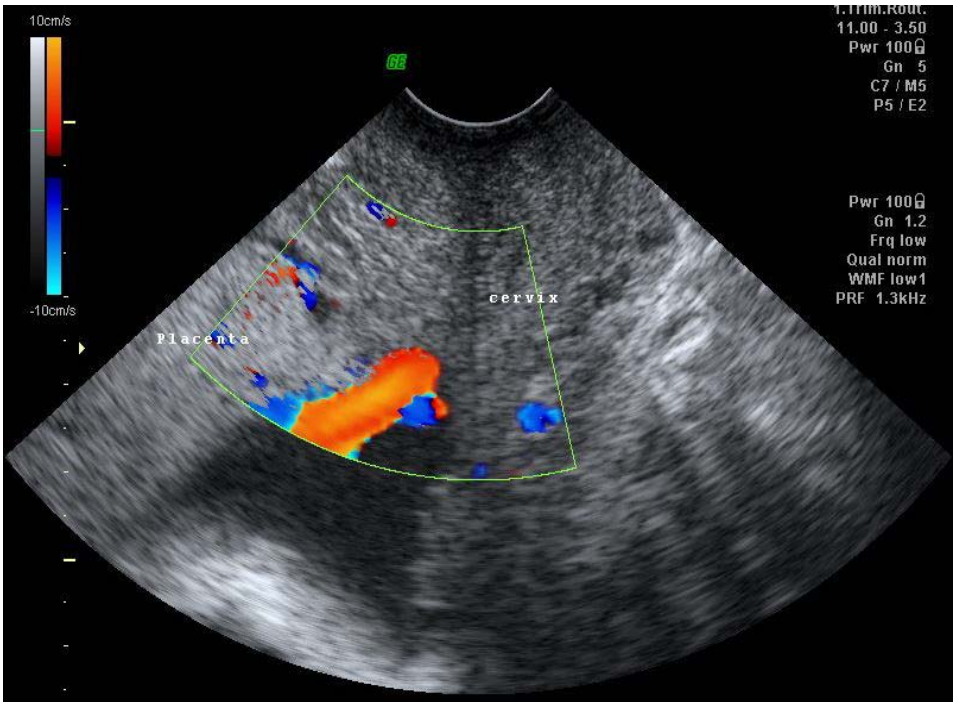


Figure B : Color flow mapping depicting velamentous cord insertion with suspicion for vasa previa

minutes[3]. Due to lethal nature of this rare condition, several authors recommend early prenatal diagnosis of vasa previa by using color flow mapping in second trimester, especially in patients with risk factors[4]. Color flow imaging is popularly employed for the purpose of identifying umbilical cord and placental pathologies as compared to Gray scale imaging alone. Nomiyama et al reported 100% sensitivity of color Doppler imaging in identifying velamentous cord insertion, when performed routinely between 18-20 weeks gestation[5]. They proceeded to identify vasa previa in the patients that were noted to have velamentous cord insertion on color doppler imaging and they concluded that color doppler had 100% sensitivity, 99.8% specificity, 83% positive predictive value and 100% negative predictive value in identification of velamentous cord insertion. We applied same investigational technique in our patient when we noted a low lying placenta on a second trimester scan, following which careful attention was paid to placental insertion site of umbilical cord using color doppler. This revealed velamentous insertion and a close follow up with serial scans suggested vasa previa. Cipriano et al studied the cost effectiveness of a screening ultrasound for vasa previa in all twin gestations and in-vitro fertilization pregnancies and concluded that these screening ultrasounds are cost effective[6]. Catanzarite et al followed 11 cases of vasa previa diagnosed by color doppler sonography, of which 10 were confirmed to have vasa previa upon delivery by the delivering physician, thus noting a 91% specificity of the sonographic diagnosis of vasa previa[1]. Thus, color doppler can be reliably used for umbilical cord and placental pathologies and has a very low false positive rate. Also, transvaginal approach is considered superior to the transabdominal approach, which may not be practical in obese patients, those with abdominal scars or difficult fetal presentations [3]. Rarely, transvaginal ultrasound may pose challenges in diagnosis due to motion artifacts or when a funic presentation is misinterpreted as vasa previa[3]. Second trimester is considered the best time for antenatal screening for vasa previa[7].

Several studies have compared the neonatal outcomes in vasa previa recognized prenatally with those recognized intrapartum and they described significantly better survival rates, improved APGAR scores, shorter NICU stay and lower transfusion rates in those diagnosed prenatally. Perinatal mortality up to 56% is noted if vasa previa remains undiagnosed prenatally, compared to 3% in those diagnosed prenatally. Similarly, neonatal blood transfusion rates of 58. 5 % is reported in those that remain undiagnosed prenatally versus 3.4% in those diagnosed prenatally [8-10].

Optimal management of vasa previa consists of patient education regarding signs of labor, early administration of a course of steroids, hospitalization at 31-32 weeks for fetal monitoring and cesarean delivery at 34 weeks or before, if labor ensues or if fetal wellbeing is compromised by membrane rupture or cord compression. Robinson et al reported that verification of fetal lung maturity through amniocentesis, prior to delivery of patients with vasa previa does not improve

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outcomes [11]. Thus, most authors recommend a scheduled delivery at 34 or 35 weeks in the patients that do not go into labor or rupture spontaneously [11]. Chmait et al described a patient with type 2 vasa previa that they treated with fetoscopic laser ablation, who delivered at 33.3 weeks with a good perinatal outcome [12, 13].

Our patient was administered a course of steroids in anticipation of preterm delivery due to suspected vasa previa. She was also educated about this condition and about warning signs and symptoms suggestive of onset of labor. She underwent an uncomplicated cesarean section which confirmed our diagnosis of vasa previa and there were no neonatal squeal due to vasa previa or preterm delivery.

III. Conclusion

- Vasa Previa is a condition where fetal vessels travel unprotected in front of the cervical os and are at risk of rupture with the rupture of membranes or at risk of compression from the fetal head when the labor ensues.
- It is commonly associated with velamentous insertion of umbilical cord or low lying placenta and other placental abnormalities.
- A screening ultrasound in second trimester can detect these risk factors. Patients noted to have these risk factors on ultrasound should be followed with color doppler sonography to diagnose vasa previa.
- If vasa previa is suspected, patient should be educated about this condition and counseled to return to hospital in case of rupture of membranes or onset of labor.
- Patients with suspected vasa previa should be administered antepartum steroids in preparation for preterm delivery. Cesarean Section is the mode of delivery when patient presents in labor or with ruptured membranes. A scheduled delivery by cesarean should be performed at 34-35 weeks.
- Vasa previa can be a very fatal condition if not diagnosed antenatally, leading to rapid fetal exsanguination and requiring neonatal transfusion. Neonatal survival rates are significantly improved if vasa previa is diagnosed antenatally.

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