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ULTRASOUND DIAGNOSIS AND MANAGEMENT IN VASA PREVIA

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When dealing with low inserted placentas, the succenturiate placenta and velamentous insertion of the cord, the fetal vessels can establish themselves at the internal cervical os. This anomaly is known as vasa previa. The aim of our study was to identify cases with vasa previa through ultrasound exams and correct management of this pathology. Vasa previa will be diagnosed before birth, using abdominal, transvaginal and color Doppler ultrasound to increase the newborn survival rate, using qualified personnel and specific resources. Discovering a low lying placenta when performing 2nd trimester fetal morphology must lead to close monitoring of the umbilical cord insertion, the internal cervical os and the blood vessels in the area. Color Doppler endovaginal ultrasound is mandatory. We had examined pregnant pacients in "Panait Sirbu" Hospital and we came across 9 pregnancies complicated by vasa previa. ResuThe patients with this condition can undergo elective C-section before the term, to avoid going into labor. The patient receives corticosteroids therapy at 28-32 weeks of gestation to help fetal lungs in reaching maturity. She is admitted into a high grade Using ultrasound and color Doppler exams in high risk vasa previa pregnancies helps identify and describe the pathology, leading to improved survival rates for the newborn.

Keywords: Vasa Previa, ultrasound diagnosis, velamentous insertion, C-section, survival rate.

INTRODUCTION

Vasa previa is a rarely reported condition in which exposed fetal vessels cross the entrance to the birth canal beneath the fetus, between the presenting parts and the internal cervical os.
The incidence of vasa previa has been estimated at 1 at 2500 births, although has been reported to vary between 1:513 and 1:6000 in naturally conceived pregnancies, and as high as 1:293 in IVF assisted pregnancies. (International Vasa Previa Foundation)[1].
The condition has a fetal mortality rate of 50-95% - extremely high – when undiagnosed prenatally[2].
This is attributed to fetal exsanguination resulting from the vessels tearing when the cervix dilates, membranes rupture or they are compressed between the fetus and the walls of the birth canal.
The aberrant vessels result from bi-lobed placenta and velamentous insertion of the cord[3].
The most widely recognized theory is called trophotropism. According to Dr. Harris Finberg, trophotropism in placental tissue can be compared to the tendency of a plant to lean towards the sun to get the light it needs to survive. Since the lower segment of the uterus is not as nourishing as the upper segment, the placenta will remodel itself upwards to reach more nourishing tissue[4].
As the placenta remodels, new growth may occur away from the location where the cord inserts into the placental resulting in velamentous cord insertion. Or the remodeling may leave the placenta in lobes connected by unprotected blood vessels running through the membranes between the lobes (bi-lobed, succenturiate lobed placenta)[7].

MATERIAL AND METHODS

During our ultrasound examination in "Panait Sirbu" Hospital we came across 9 pregnancies complicated by vasa previa.
We have performed obstetrical ultrasounds with color Doppler in order to identify the risk of every patient concerning low lying placenta or placenta previa, succenturiate placenta, velamentous insertion of the cord, IVF pregnancies, multiple gestations, history of uterine surgery.

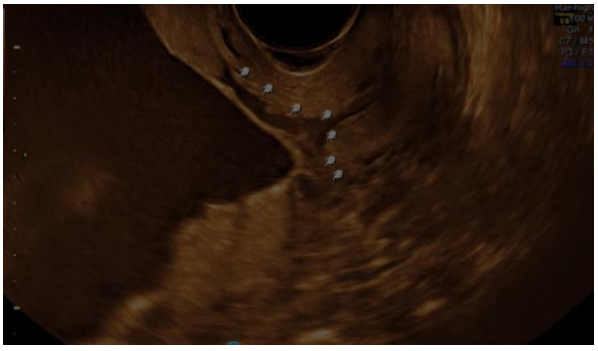

Figure 1. Vessels overlying the internal cervical os (own repository).

The diagnosis was often made with transabdominal Doppler sonography demonstrating flow within vessels which are seen overlying the internal cervical os

(Figure 1,2). Occasionally a transvaginal scan was required to aid a better visualization of aberrant vessels. Non Doppler images may have suggested the diagnosis when there were echogenic parallel or circular lines within the placenta near cervix.
During our attempts in establishing a diagnosis we encountered a series of challenges: maternal obesity, anterior abdominal wall scarring, fetal position, vessels that course over the cervix in a transverse rather than antero-posterior direction may have been missed by transabdominal colour Doppler ultrasound.

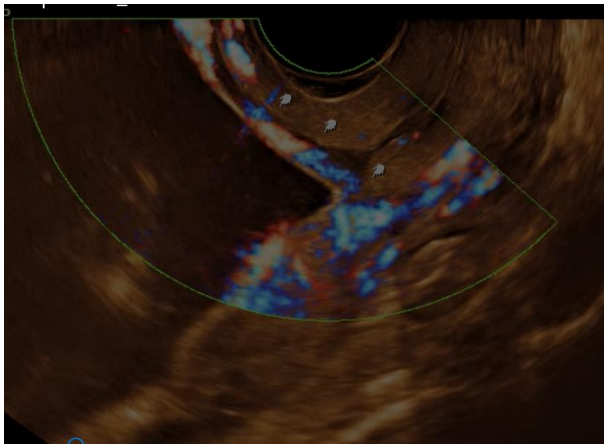

Figure 2. Vessels overlying the internal cervical os in Colour Doppler (own repository).

While 2D sonography with power or color Doppler is frequently adequate in making the diagnosis of vasa previa, 3D ultrasound allows precise depiction of complex spatial relationships, and helps confirm the initial suspicion of vasa previa. This is of great importance since it allows the surgeons, preoperatively, to map out the fetal vessels and determine the ideal incision into the uterus in order to avoid transecting the aberrant vessels[5].

RESULTS AND DISCUSSIONS

Our patients were diagnosed by ultrasound examination, 6 of them having vasa previa type I (abnormal fetal vessels connect a velamentous cord insertion with the main body of the placenta) and 3 of them having vasa previa type II (abnormal vessels connect portions of a bilobated placenta), excluding another 3 cases with variant placental morphology, pathology explained in[6].
We had 4 cases of IVF pregnancies, 3 of them multiple (1 triple and 2 double) and 2 patients with placenta previa (1 placenta accrete).
We considered as differential diagnosis on antenatal ultrasound the marginal sinus previa (maternal vessels at the edge of the placenta) and cord presentation (umbilical cord points towards the internal cervical os) significant after 32 weeks of gestation.

As a management we have used tocolytes (hexoprenaline, ritodrine, calcium channel blockers), antispastic drugs and we have recommended total pelvic rest, with no sexual intercourse or vaginal exams other than transvaginal ultrasound (which we consider to be totally safe).
We have hospitalized all patients in the 3rd trimester from about 30 weeks of gestation and we have performed monitoring of the progression of vasa previa. All patients had steroid treatment to develop fetal lung maturity (Dexamethasone 4x6 mg/12h or Betamethasone 2.5 mg, imx2/24 h), as mentioned in[7].
We have programmed C sections at 35 weeks of gestation for 5 of our cases, with good results.
Three of our cases were performed emergency C section at 31 and 33 weeks of gestation for vaginal bleeding with one fetal death (31 weeks fetus). One of our patients has refused the C section at 35 weeks and reconsidered it at 36.5 weeks, with a new born of 2650 g, female, Apgar Scored[9].
We performed quantitative fetal fibronectin measurement at 3 of our patients and the value was over 50 ng/ml. The fNF test was useful for both patients with twins as well as cervical cerclage pregnancies. The main benefit of fNF was in predicting the occurrence of birth within 10 days. We used this test despite the recommendations of American College of Obstetrics and Gynecology who considered fNF usage and vaginal bacteria testing not predictable[8].
Very rarely (and fortuitously), vasa previa may be diagnosed during a digital cervical examination when the examiner's fingers palpate fetal vessels running through the membranes[9]. Use of an amnioscope in this situation may allow direct visualization of the vessels.
When bleeding occurs in pregnancy or during labor, a test to determine the presence of fetal blood cells in the vaginal blood, such as Kleihauer-Bettke test (blood test used to measure the amount of fetal hemoglobin transferred to mother's bloodstream), may aid in the diagnosis of vasa previa[10]. However, when acute bleeding occurs from a ruptured vasa previa, emergent delivery is frequently indicated, and there may be no time to test for fetal blood cells. Whenever bleeding accompanies rupture of the membranes in labor, especially if there are associated fetal heart rate decelerations, fetal bradycardia, or a sinusoidal fetal heart rate pattern, the obstetrician should have a high index of suspicion for a ruptured vasa previa. In these situations, most frequently, immediate delivery by cesarean is indicated. Even when the neonate has lost considerable blood, immediate transfusion may be lifesaving[10].
Good outcomes with vasa previa depend on prenatal diagnosis and delivery by cesarean before rupture of the membranes[11]. In the absence of prenatal diagnosis, the perinatal mortality was 56%, whereas 97% of fetuses survived when the diagnosis was made prenatally (retrospective study in 155 patients[14])
Among survivors, when the diagnosis was not made

prenatally, the median 1- and 5-minute Apgar scores were only 1 and 4, respectively, compared with 8 and 9, respectively, when the condition was diagnosed prenatally[10]. Approximately 10% of women will rupture their membranes before the onset of labor, so this risk is significant[10,11].

Delivery should occur at an institution where there are adequate facilities for neonatal resuscitation that might include emergent blood transfusions. It is preferable that, before surgery, the surgeon is aware of the position of the fetal vessels and plans the incision to avoid lacerating these vessels[12,13].

CONCLUSIONS

Vasa previa with an antepartum or intrapartum hemorrhage should be delivered by a category 1 emergency caesarean section, after confirming fetal wellbeing. Where vasa previa is suspected the diagnosis should be confirmed with transvaginal color Doppler US, provided there is no fetal compromise.

If vasa previa is confirmed at term, an elective caesarean at 35 weeks should be performed prior to labor, balancing the risk of neonatal lung injury and fetal hemorrhage Outpatient management may be possible if there is no evidence of cervical shortening on TVUS, bleeding or preterm uterine activity. We should consider antenatal corticosteroids for fetal lung maturity due to the high risk of preterm labor[14,15].

A gestational age of between 35 and 36 weeks is the optimal age for cesarean delivery in women with vasa previa. In case of membranes rupture, the risks of fetal death or adverse outcome are so severe that we feel it is justifiable to deliver these women by 36 weeks without amniocentesis documentation of lung maturity.

We can think of no other condition in which prenatal diagnosis and appropriate perinatal management makes such a dramatic impact on the difference between survival and death for an otherwise healthy infant. Thus, especially because it adds little in terms of time to the routine obstetric sonogram, it is our opinion that screening for vasa previa should be routine.

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