Velamentous Insertion of Umbilical Cord: A Case Report and Review of the Literature

Aysel UYSAL DERBENT[1], Neval ÇAYÖNÜ[1], Mustafa SAKALLI[2], Mehmet KARACA[1], Selahattin KUMRU[1]

Antalya, Turkey

Velamentous cord insertion (VCI) is an abnormal cord insertion in which the umbilical vessels coursing through the fetal membranes before inserting into the placental disk. VCI is associated with fetal growth restriction, preterm labor, abnormal intrapartum fetal heart rate (FHR) pattern, abruption of the placenta, and neonatal death. Prenatal detection of umbilical cord abnormalities may reduce perinatal morbidity and mortality. In this study, we reviewed the literature over a case with VCI.

Key Words: Velamentous cord insertion, Umbilical cord, Ultrasound

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Introduction

The umbilical cord normally inserts in to the central area of the placenta. In cases complicated with VCI, membranous vessels originating from a cord with velamentous insertion radiate toward the placental disk and not protected by Wharton's jelly. The VCI is estimated nearly 1% of singleton pregnancies and 10 fold higher in multiple pregnancies than in singleton pregnancies.[1]

VCI is associated with variable decelerations, non-reassuring fetal status, and emergency cesarean section. As visualization of the placental cord insertion site becomes more difficult with advancing gestation, the placental cord insertion site should be evaluated in the mid trimester.[2,3] This case report is about intrauterine diagnosis and management of a pregnancy complicated with VCI.

Case Report

A 27 years old primigravida was referred to our clinic from a primary health center to undergo target ultrasound. The pregnancy started as a twin pregnancy, but one of the gestational sacs was vanishing at the 8th weeks of pregnancy. Combined test was normal. At the 18 gestational weeks, ultrasonography showed that a normal (central) cord insertion was not present and umbilical vessels diverge as they transverse the membranes (Figure 1). Abnormal cord insertion located in the middle uterine segment, 7 cm far away from the internal cervical ostium. Color Dopler sonography was also showed diverge of umbilical vessels under amniotic membrane before arrived the placental margin. In ultrasonographic examinations fetal growth curve was retarded after 29 weeks of gestation. Doppler studies showed abnormality of umbilical artery resistance after 31 weeks of gestation. Oligohydramnios was detected at the 36 week of gestation and she was hospitalized. Cesarean section was performed at the 37th week because of abnormal biophysical profile and unfavorable cervix. A 2200 gram, male fetus was delivered. Figure 2 showed insertion of the umbilical cord far away placental disk and diverge of umbilical vessels under amniotic membrane.

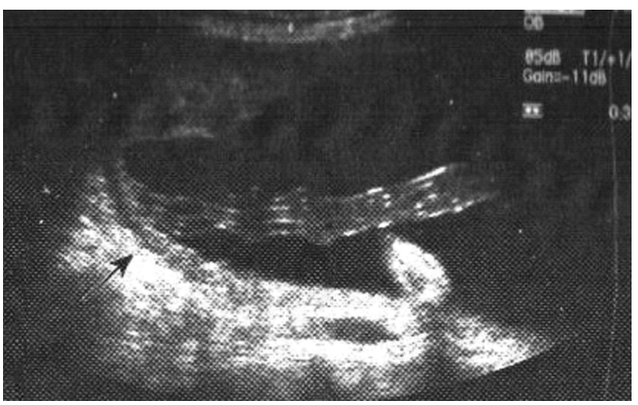

Figure1: Ultrasound image of velamentous cord insertion

[1]*Department of Obstetrics and Gynecology, Antalya Training and Research Hospital, Antalya*

[2]*Division of Obstetrics and Gynecology, Dr Burhan Nalbantoğlu State Hospital, Lefkoşa*

Address of Correspondence: *Aysel Uysal Derbent*
Antalya Training and Research Hospital
Department of Obstetrics and
Gynecology, Antalya
ayseluysal@hotmail.com

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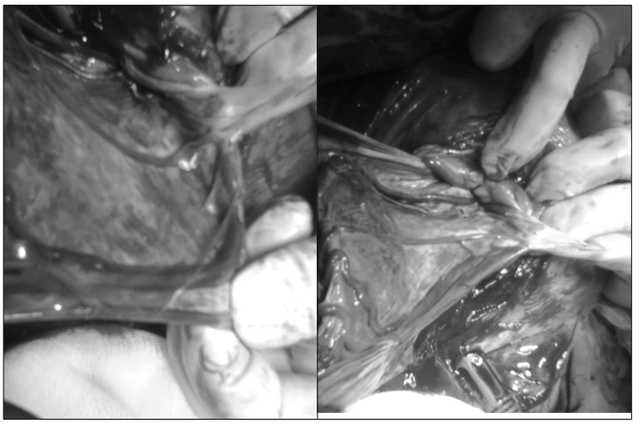

Figure 2: Placental pictures from cesarean section

Discussion

The umbilical cord normally inserts in to the central portion of the placenta. VCI is characterized by diverge of umbilical vessels as they transverse between the amnion and chorion before reaching the placenta. VCI is seen with a rate of 0.5-1.65% in singleton pregnancies, and 10 fold higher in multiple pregnancies than in singleton pregnancies.[1] VCI may be associated with fetal growth restriction, preterm labor, abnormal fetal heart rate pattern during labor, neonatal death and abruption of the placenta.[2] Our case was also started as a twin pregnancy, but later one of the sac was disappeared, and growth of the fetus was restricted after 29th weeks.

The umbilical cord contains two arteries and one vein, which is surrounded by mucoid connective tissue and this, is called the Wharton's jelly. In cases with VCI, it is thought that lack of Wharton's jelly results in the compression of vessels, and that blood flow in the arteries and vein would be obstructed at the same time by the uterine contraction. Consequently, a specific fetal cardiac heart rate pattern which is called VDNA (variable deceleration without barroreceptor – mediated acceleration) frequently occurs in VCI cases (Figure 3). Analysis of VDNA occurrence in the second stage of labor shows that rate of VDNA is about three times higher in VCI cases than in controls.[4] In this case we couldn't see this pattern during the pregnancy as we told before our patient didn't experience labor.

VCI can be located at different sites of the uterine segments. The relationship between occurrence of VDNA and length of aberrant vessels in VCI cases was also investigated. [5] When VCI located in upper segment length of aberrant vessels are changed between 3.9±3.3 cm, in middle segment 4.7±4.6cm, and in lower segment 10.6±6.8 cm. At the lower segment VCI, aberrant vessels are elongated as gestation g. It appears that the lower and longer aberrant vessels of VCI are readily compressed by the fetus, which result in an abnormal fetal heart rate pattern and intrapartum complications during labor. In addition lower VCI may be associated with extension of the lower uterine segment and atrophy of the chorion villosum that covers the lower segment of the uterus, resulting in abruptio placenta, placenta accreta, accessory placenta or placental infarction.[5]

In conclusion, antenatal diagnosis of a VCI in early gestation improves obstetric management. Especially in twin pregnancies but also in singletons cord insertion site must be identified during second trimester.

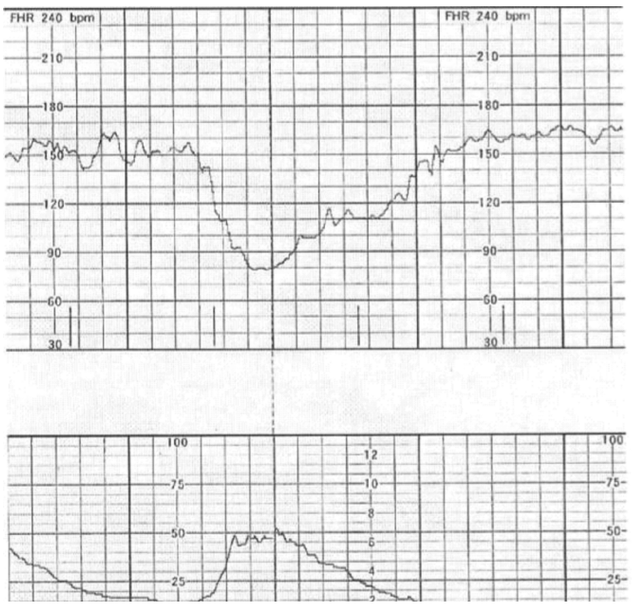

Figure 3: Characteristic fetal heart rate pattern in cases of velamentous cord insertion. Variable decelerations that were not accompanied with accelerations (<15 bpm) prior to or following deceleration.

Göbek Kordonunun Valementöz Girişi: Bir Vaka Sunumu ve Literatürün Özetlenmesi

Velamentöz kordon insersiyonu (VCI) anormal bir kordon girişi olup damarlar plasental diske ulaşmadan önce fetal membranlar arasında ilerlemektedir. VCI fetal gelişme kısıtlılığı, preterm doğum, anormal intrapartum fetal kalp atımı paterni, ablasyo plasenta ve neonatal ölümle birlikte olabilmektedir. Umblikal kordon anormalliklerinin prenatal tespiti perinatal morbidite ve mortaliteyi azaltabilir. Biz bu çalışmada VCI'lu bir olgu üzerinden literatürü tartıştık.

Anahtar Kelimeler: Velamentöz kordon insersiyon, Umblikal kordon, Ultrason

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