

EXTREMELY LONG UMBILICAL CORD: A CASE STUDY ON ITS SIGNIFICANCE IN DIAGNOSIS AND PRENATAL CARE

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ABSTRACT

Access to the placenta is represented by the umbilical cord. Therefore, complications linked to the umbilical cord are directly conditioned to the nutritional part of the fetus. Problems relating to a long umbilical cord include risk of preterm labor, placental abruption, and vascular occlusion from thrombosis. Closer to delivery, it also predisposes to cord circulation in the cervical region, prolapse and true knot. Umbilical cord abnormalities can be detected by ultrasound, with important diagnostic and prognostic implications in terms of perinatal morbidity and mortality.

In this study we present the case report of a pregnant woman with previous ultrasound showing delayed intrauterine regrowth. At delivery, newborn with extremely long umbilical cord, six circular cords in the cervical region.

This abnormality in the umbilical cord can have numerous clinical repercussions for fetal well-being, showing the importance of knowing the anatomy and normal development of the umbilical cord for accurate prenatal diagnosis and evaluation.

KEYWORDS: LONG UMBILICAL CORD, ULTRASOUND, UMBILICAL CORD ABNORMALITIES

INTRODUCTION

Complications related to the umbilical cord are directly linked to the fetus's nutrition because the umbilical cord serves as the fetus's access channel to the placenta. These complications can also be associated with fetal malformations, chromosomal problems, and complications of the pregnancy itself. The length of the umbilical cord can be observed through ultrasound starting from the 7th week of gestation. Until the 30th week, its growth mirrors that of the fetus, but after that, it grows more rapidly, reaching a length of 30 to 70 centimeters. The umbilical cord contains two arteries and one vein, which can be identified via ultrasound starting from the 10th week, using a technique called color Doppler ultrasound.

The development of the umbilical cord is related to the formation of the fetus's anterior abdominal wall, and its growth is influenced by the fetus's movements and the amount of amniotic fluid present. Long umbilical cords may be associated with conditions such as maternal diabetes and Rh isoimmunization, increasing the risk of premature birth, placental abruption, and vascular obstruction due to thrombosis. Near the time of delivery, situations like nuchal cord can occur (when the cord completely encircles the fetus's neck, with an incidence of 25%), and in some cases, multiple wraps can occur, especially due to fetal movements.

Abnormalities in the umbilical cord can be identified

through ultrasound, which has significant implications for the diagnosis and prognosis regarding perinatal health, meaning the period surrounding childbirth. Therefore, it is essential to understand the normal anatomy and development of the umbilical cord to make an accurate diagnosis during prenatal care. The aim of this study is to describe a case of pregnancy in which a long umbilical cord is causing fetal growth restriction.

CASE REPORT

S.L.N.S.M, 22 years old, GIII, PI, CI, AI. The LMP on 03/05/21, EDD on 12/10/21, maternal weight gain of 15 kg, using 25 mcg/day of levothyroxine. In the 1st trimester, experienced bleeding and placental detachment, prescribed progesterone 200 mg until 12 weeks with remission. In the 2nd trimester, without complications, normal serologies. Starting from November 3rd, ultrasound diagnosed Intrauterine Growth Restriction (IUGR), fetus weighing 2025g with no apparent causes and normal blood flow, placenta at maturity grade II. On November 16th, weight was 2,166g, and on November 23rd, weight was 2,434g, showing a slight increase compared to the previous weight. (see Figure 1).

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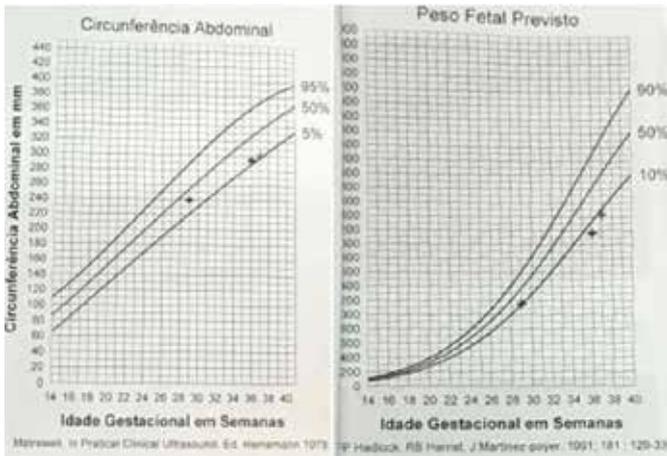


Figure 1: Image with the evolution curve of fetal biometric data.

Complementary exams carried out

Obstetric ultrasound (23/11/21) revealed a fetus in a longitudinal position, breech presentation. Fetal heart rate 131 bpm. Fetal weight 2,434 grams, fetal height 47.3cm. Posterior topical insertion placenta. Thickness 39mm, heterogeneous texture and grade II maturity, with two arteries and a normally inserted vein. Normal amniotic fluid, amniotic fluid 14cm. Topical, single pregnancy, 37 weeks and 4 days. Weight below the 10th percentile. Maternal-fetal Doppler within normal limits. (figure 2)



Figure 2: Images from the ultrasound performed on 11/23/2021.

Cesarean section was performed 11/28, breech presentation, female fetus, alive and with thick meconium amniotic fluid, APGAR 8/9, six cervical circulars of the umbilical cord measuring 155cm (figure 3), extraction of normal placenta weighing 635g, fetus measuring 45cm, weight 2,380g.



Figure 3. Image of long umbilical cord: measuring 155cm.

DISCUSSION

Access to the placenta is represented by the umbilical cord. Therefore, complications linked to the umbilical cord are directly dependent on the nutritional part of the fetus. Cord abnormalities may be associated with fetal malformations, chromosomal aberrations and complications related to pregnancy itself¹⁻⁵.

In embryogenesis, the umbilical cord presents its development related to the formation of the anterior abdominal wall. As the amnion expands, the embryo is covered with amniotic epithelium. From this connection, it develops blood vessels and fuses with the omphalomesenteric duct between 7-8 weeks of menstrual delay, giving rise to the umbilical cord. The blood vessels of the allantois give rise to the vessels of the umbilical cord; thus, the umbilical arteries are in continuity with the iliac arteries inside the pelvis^{1,2,5,6}.

The umbilical cord is first seen between 7-8 weeks of missed menstruation. At this gestational age, the length of the umbilical cord is approximately equal to the crown-rump length. It continues to be the same length as the fetus throughout pregnancy until the 30th week, after this age, the cord represents faster growth. Its diameter is normally less than 2cm. As the umbilical cord grows, it develops up to 40 coils, which are due to helical muscle layers within the umbilical arteries. This winding helps the cord resist compression from blood vessels. Its development in length and spiraling is related to fetal movement and the amount of amniotic fluid, through the tension force applied to this cord. However, there must be an adequate amount of fluid and

fetal activity to provide normal length and expiration⁵⁻⁷.

Since the growth of the cord is related to fetal movement and the amount of amniotic fluid. Fetuses with movement restrictions due to anomalies of the central nervous system or skeletal dysplasias and oligoamnios, or fetuses that present an embryonic defect, causing defects in the limbs and body wall, causing a short, smaller than average umbilical cord. These conditions are related to prematurity, growth restriction and fetal distress, Down syndrome¹⁻³.

Long cords are associated with maternal diabetes mellitus, Rh isoimmunization, hydrops, diffuse hematoma, and the correlation with increased fetal movements and long cord is unclear. In addition, problems related to long cords include risk of premature labor, placental abruption and vascular occlusion due to thrombosis. Habek et al report an umbilical cord measuring 190cm and six cervical circular cords⁷. Closer to birth, it also predisposes to cervical circular cord, prolapse and true knot. The circular cord is a loop of cord, completely surrounding the neck with an incidence of 25%, increased risk of fetal death when there is more than one circular, especially in relation to movements^{1,4,5}.

The umbilical cord contains two arteries and one vein. The umbilical vein carries oxygenated blood from the placenta to the fetus, where it comes into contact with the left portal vein of the liver. The umbilical arteries are continuous with the internal iliac arteries, and carry deoxygenated blood from the fetus to the placenta. The umbilical arteries are confirmed by ultrasound, visualizing two vessels lateral to the fetal bladder. These vessels in the cord are surrounded by Wharton's jelly, a gelatinous connective tissue that protects the umbilical vessels against compression. The vascular abnormalities found are the most common single umbilical artery; and the presence of more than one umbilical vein and more than two umbilical arteries are rare abnormalities^{6,7}.

The cord can have different implantation locations in the placental disc, in the central portion of the placenta, in the eccentric insertion, in the marginal insertion and in the velamentous insertion. The first two do not show any difference in pregnancy. However, veiled insertion can cause problems during pregnancy, such as growth restriction, prematurity, fetal hemorrhages, fetal death, among others^{3,4,6}.

The ultrasound identifies the umbilical cord from the 8th week onwards, and as the pregnancy progresses its changes become more apparent, in which length, thickness, number of vessels, place of implantation in the placenta and the presence of cysts and neoplasms can be assessed^{2,3}.

The normal length varies between 30-70cm, in long cords > 70cm, true, circular knots are investigated in the cord in any part of the body, being more frequent in the cervical region. When its thickness is greater than 2cm, maternal pathologies are investigated, gestational diabetes, alloimmunization, among others.

When the umbilical cord is short, there is a loss of the coin stacking signal, formed by the agglomeration of the normal umbilical cord^{3,7}.

Given the abnormalities that arise from the umbilical

cord, and the numerous clinical repercussions that can have on fetal well-being, the importance of knowing the anatomy and normal development of the umbilical cord for accurate diagnosis and prenatal evaluation is demonstrated³.

CONCLUSION

The present case is a case of an extremely long umbilical cord, with six circular cords, which resulted in intrauterine growth restriction and low birth weight.

The need for early diagnosis and the importance of knowing the anatomy and normal development of the umbilical cord for more accurate diagnosis and prenatal evaluation are evident. This diagnostic integration promotes more detailed and therefore safer prenatal care for the maternal-fetal binomial, and for the clinician to develop an appropriate therapeutic strategy.

In view of umbilical cord anomalies and the clinical repercussions that can compromise fetal well-being, the importance of knowing the anatomy and normal development of the umbilical cord for accurate diagnosis and prenatal evaluation and appropriate therapy is demonstrated.

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