Nuchal cord type B associated with an excessively long umbilical cord as a cause of stillbirth: A case report

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Summary

Nuchal cord (NC) is defined as the umbilical cord being wrapped 360 degrees around the fetal neck. It is one of the most common complications of the umbilical cord and any pregnancy might be complicated with a nuchal cord. If a nuchal cord occurs in a pregnant woman with decreased fetal movements, it should be considered to be at high risk, particularly for fetuses with multiple nuchal cords. We report a case in breech presentation with an excessively long umbilical cord (190 cm) which was complicated with five nuchal loops around the fetal neck and resulted in intrauterine death at the 37th week of pregnancy.

Key words: Nuchal cord; Cord accidents; Perinatal death.

Introduction

Of all fetal deaths 20-60% are attributed to fetal asphyxia. Although, the etiology of fetal asphyxia is not exactly understood [1], reduced placental circulation is thought to present in most cases. Umbilical cord complications constitute a rare and unexpected cause of fetal asphyxia [2]. Cord accidents compromise 5-18% of all fatal fetal asphyxia cases [1]. However, cord accidents are often not understood exactly by full pathologic examinations. It is well known that a decrease in the number of fetal movements in the latter part of pregnancy might be a sign of intrauterine asphyxia [2]. When evaluating decreased fetal movements during the latter part of the pregnancy, umbilical cord accidents including nuchal cord (NC) should be ruled out. In modern obstetric practice, cord accidents associated with fetal death are important since they are preventable. We present a case that resulted in intrauterine exitus at the 37th week of pregnancy although the patient had regular antenatal visits and there were no signs of fetal distress or abnormalities except decreased fetal movements for the last three days.

Case Report

A case of a 28-year-old women, gravida 2, parity 1, with an unremarkable medical history and regular antenatal visits is presented. TORCH antibodies, a 50-g glucose screening test and triple test were within normal limits. Ultrasonographic assessments of the fetus were in normal limits during the antenatal period and no evidence of oligohydramnios, growth restriction or placental abnormalities were detected. Fetal heart rate was in normal range at each visit. The presentation was observed as breech at the last antenatal visit. The patient was admitted to hospital for decreased fetal movements during the last three days at 37 weeks of gestation. Ultrasonographic assessment showed no fetal cardiac activity and intrauterine exitus was confirmed with Doppler evaluation. Misoprostole induction was performed and a 2,980 g male fetus with breech presentation was delivered by the vaginal route.

At the delivery, an excessively long umbilical cord with five tightly locked nuchal loops around the fetal neck was observed. After the delivery the umbilical cord was measured to be 190 cm in length. Pathological examination of the fetus and placenta could not reveal any abnormalities except an excessively long umbilical cord.

Discussion

It is not a recent idea that nuchal cord accidents may cause fetal distress and intrapartum complications. According to some authors, Hippocrates described in a book that names *"De Octimestri Partu"* the nuchal and chest coiling of the umbilical cord, and he speculated it as *"one of the dangers of the eighth month"*. Other scholars from the classics in medicine consider that the *"De Octimestri Partu"* was not from Hippocrates but by an unknown disciple [3]. In 1657 Harvey suggested that interruption of umbilical cord blood flow may be a cause of fetal death in fetuses with cord compression. In 1750, the British obstetrician William Smeille described a stillbirth fetus with four nuchal loops [10]. Today, it has been generally accepted that a decrease in the number of fetal movements and alterations in the fetal heart rate in the latter part of pregnancy might be a sign of intrauterine asphyxia [2]. It appears from the literature that cord accidents compromise 5-18% of all cases of fatal fetal asphyxia [1] and 10% of stillbirths are due to umbilical cord complications [2]. In Morrison's study of full-term asphyxiated infants, 48% had cord accidents [1]. More than 30,000 babies are stillborn in the United States every year. It is estimated that 4,000-8,000 genetically normal and non-malformed stillbirths are associated with umbilical cord accidents in the United States annually. Yet the cause of another 50-60% of the 30,000 stillborn babies are unknown [10]. Stillbirths with suspected umbilical cord accidents should be investigated thoroughly.

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The presence of umbilical cord encirclements is associated with length of the umbilical cord. Also, umbilical cord encirclements may cause fetal growth restriction. The severity of the restriction is positively related to the number of encirclements [4]. It is estimated that NC affects 23% to 33% of all pregnancies. Multiple nuchal cords are found in 2.5-8.3% of all pregnancies [5]. The incidence of nuchal cords with three loops was found to be 0.2 percent in a study [6]. Larson *et al.* found that nuchal cord entanglement increased significantly from 5.8% at 20 weeks to 29.0% at 42 weeks' gestation [7]. Generally, when there are two or more loops around the fetal neck, then the fetus is thought to be under risk of fetal asphyxia [1], however this is a controversial issue in perinatal medicine. Unfortunately, it is not well known which fetuses are affected poorly by nuchal cords.

The etiology and pathogenesis of NC are not understood exactly, but there are some known risk factors: length of the cord, hyperactivity of the fetus, male sexuality, monozygotic twins, prior history of cord accidents and posterior localization of the placenta. A nuchal cord can be classified into two types according to the pattern of looping; Type A, nuchal loop that encircles the fetal neck in an unlocked pattern. Type B, nuchal loop that encircles the neck in a locked pattern. Type A can undo itself, but type B cannot. In a prospective review of nuchal cords, the type B pattern occurred in one in 50 births. Cesarean section and stillbirth were more associated with type B [8].

Decreased fetal movements near the end of term need careful evaluation. Whenever ultrasonographic identification of a nuchal cord with other umbilical cord complications such as true knot, umbilical cord thrombosis, etc., are observed then the pregnancy should be accepted as a high risk for fetal compromise [9]. Previous reports have shown that an excessively long umbilical cord or nuchal cord was associated with fetal distress, growth restriction and stillbirth [2, 4, 8]. In our case, we could not find any pathologic signs except for an excessively long umbilical cord. The incidence of multiple umbilical cord abnormalities in the same fetus is not well known, but Collins reported two cases with multiple cord abnormalities in 5,000 births [9].

It is a catastrophy for families and obstetricians to lose a normal fetus at term. Also, the obstetrician may be accused of some medico-legal malpractice. If there are any clinical signs of umbilical cord complications, delivery should be considered after fetal lung maturity is reached. Otherwise, close observation of the fetus could be recommended with a biophysical propile and Doppler ultrasonography. If there are any signs of fetal distress the fetus should be delivered by cesarean section.

In our opinion, in order to reduce perinatal mortality and morbidity, ultrasonographic screening of the nuchal cord at the third trimester of pregnancy should be performed routinely especially in near-term fetuses with decreased movements. Fetuses with multiple umbilical cord abnormalities should be closely observed as high-risk pregnancies and during delivery close electronic fetal monitoring is necessary. If there are multiple umbilical cord abnormalities operative delivery may be unavoidable. If any signs of fetal distress are seen in a fetus with multiple umbilical cord abnormalities during labor, the fetus should be delivered by cesarean section as soon as possible to avoid inexcusable complications of a nuchal cord.

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