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Incidence of Nuchal Cord in Late Trimester Pregnancy Sonography

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Abstract: ***It is a prospective study conducted in 360 pregnant patients to identify the presence of nuchal cord during the third trimester of pregnancy sonography. Initially with gray scale ultrasound the dorsum of the fetal neck was identified and tried to look for the presence of umbilical cord around the neck. The findings were confirmed using color doppler sonography. Among 360 cases in 90 cases presented with complete cord around the neck both in gray scale and color doppler. 10 cases had incomplete loop and were excluded from the study. Among ninety cases of nuchal cord 56 had single loop nuchal cored and 34 had multiple nuchal cords. Post natally presence of the nuchal cord were confirmed. Identification of the presence of nuchal cord in late trimester sonography is very important to plan the method of delivery and to predict the possible complications. Also it is of great importance for the obstetricians in the management of the multiple gestations and in non vertex presentations like breech and shoulder presentations.***

Keywords: Nuchal Chord, Sonography, Color Doppler

1. Introduction

Presence of an umbilical cord looped around the neck of the fetus is a common finding at the birth of the baby. Umbilical cord looping may occur around the neck, shoulder or body. Incidence of cord looping is about one-third of all deliveries. Looping around the neck of fetus is the most common type and in most of the cases it does not causes severe problem. However nuchal cords have been the cause for intrapartum complications like delayed labour, fetal heart rate decelerations and academia of the new born.

Ultrasonography is a necessary investigations done during pregnancy at various months for various indications. Identification of nuchal cord is one of the indications in third trimester sonography. Advancement in ultrasound technology resulted in accurate identification of nuchal cord and again it can be confirmed with more confidence with color doppler sonography. Color doppler is significant help in differentiating the single and multiple nuchal cord loops. Most previously reported studies are case reports , or short series , which describe nuchal cord sonographic appearance at the end of the third trimester of pregnancy. So, gray scale ultrasound coupled with color doppler can now be potentially used to cord position in third trimester gestation.

Aim of this study was to assess the incidence of single and multiple nuchal cords during third trimester pregnancy.

2. Patients and Methods

360 singleton pregnancies with no complications between 34 to 40 weeks of gestation were investigated prospectively by ultrasound and color doppler for the presence of nuchal cord. Study was conducted for the period of six months from 1/06/16 to 31/12/16. In every case, using curvilinear probe initially fetal positions was identified and a search was made for the presence of the umbilical cord at the dorsum of the fetal neck using real-time gray-scale imaging and color imaging (Accuson NX3). Sagittal and axial sections were obtained and the searched for the presence of single or multiple nuchal cords**.** Later the cords were traced to confirm the presence of complete loops. Cases with incomplete loops were excluded from the study. Multiple gestations and pregnancies with other complications were excluded from the study. Post delivery Clinical findings data were obtained from obstetric notes.

After obtaining the data of the cases with nuchal cords, cases were further classified into a. No nuchal cord b. Single loop nuchal cord c. Two loop nuchal cord d. Three loop nuchal cord e. Four loops nuchal cord.

3. Results

Table 1: Mean age of the study population:

Total	Mean Age	Standard Deviation
360	28.33 years	2.46 years

The mean age of the population was found to be 28.33 years and the standard deviation was found to be 2.46 years.

Table 2: Frequency of nuchal cord

Total	Nuchal cord Present	Nuchal cord Not Found
360	90	270

Out of 360 thrid trimester ultrasound scans, 90 patients had nuchal cord.

Table 3: Frequency of multiple nuchal cord

No. of loops	Frequency
Single loop	65
Two loops	19
Three loops	5
Four loops	1

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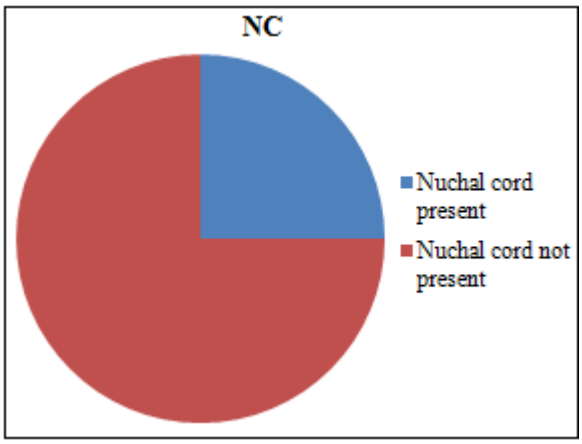


Image 1: Frequency of Nuchal cord Positivity:

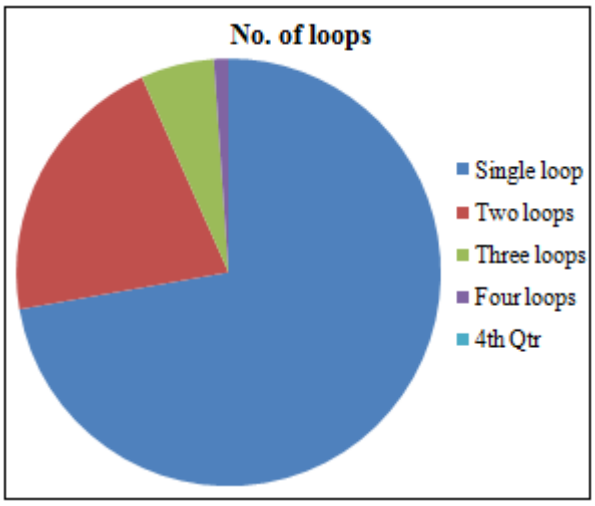


Image 2: Frequency of multiple nuchal cord

Table 4: Table of Association

Type	P Value	Significance (<0.05)
Single loop	0.034	Significant

Table 1 shows the number of pregnant women included in the study and the age range.

Table 2 shows the results of nuchal cord positivity. 90 (25%) cases examined using gray scale and color imaging demonstrated the presence of nuchal cord.

Table 3 shows the results of multiple nuchal cord. 65 cases had singe loop nuchal cord, 19 cases had two loops nuchal cord, 5 cases had three loops nuchal cord, 1case had four loops nuchal cord.

4. Discussion

Nuchal cord is where the umbilical cord will be wrapped around the fetal neck completely about 360 degrees. The prevalence rate of nuchal cords is 7% to 38%. Sonography diagnosis of a cord around the neck was first described in 1982. Loop around the neck occur in about 25% of cases and ordinarily do no harm, but rarely they may be tight causing compression of the umbilical cord vessels and consequent hypoxia.

Our study has demonstrated that gray scale and color imaging improves the prenatal detection of nuchal cord during the third trimester of pregnancy. Our study results showed that nuchal cord incidence is about 25% and most common type is single loop and four loop nuchal cord is very rare. Ultrasound features of cord around the neck have been reported around term by several authors using gray-scale imaging. Although our study included cases with gestational ages ranging from 35 weeks until term, nuchal cords can be diagnosed earlier in the second trimester using color imaging.

No study proved that by ultrasound it is possible to distinguish between a loose or a tight cord. Peregrine concludes that ultrasound diagnosis of nuchal cords will only be useful if doctors are able to do so reliably and predict which of those fetuses are likely to have a problem., However, the perinatologists routinely look for umbilical cord issues in twins. Studies have shown an improvement in outcomes where cord entanglement was prenatally identified in these cases. Ultrasound measurement of the velocity of flow in the cord may be useful in the management of twins and chronically growth-retarded fetuses.

The rate of true-positive cases detected using color imaging, and its sensitivity, increased significantly during the last month of gestation. These differences can be explained by the improvement of sonographic visualization of the umbilical cord anatomy *in utero* with advancing gestational age, but also because of shorter delays between ultrasound diagnosis and birth. Indeed, a nuchal cord is more likely to be found at delivery when sonographic examination has been performed a few days before. This is because subsequently fetal movements are unlikely to modify the cord position. Furthermore, we found a better ultrasound-clinical correlation for multiple coils than for a single nuchal cord. The former has probably fewer chances to disappear between the time of ultrasound examination and delivery than the latter. These findings also suggest that the sensitivity , and positive and negative predictive values of color imaging in detecting nuchal cord could be close to 100% if the investigation was performed within 48 hrs of delivery.

Management of fetuses with antepartum diagnosis of a nuchal cord must be carried individually. Potential fetal short-term complications of nuchal cord include variable fetal heart rate decelerations during the first and second stages of labor and lower mean umbilical artery and venous pH at birth. Newborn infants from pregnancies uncomplicated before labor rarely have metabolic umbilical cord academia, and in almost all cases the acute fetal distress is corrected rapidly by adequate neonatal care.

Management of a presenting nuchal cord should be tailored to prevent cord compression whenever possible. Techniques to preserve an intact nuchal cord depend on how tightly the cord is wrapped around the infant's neck. If the cord is loose, it can easily be slipped over the infant's head. If the cord is too tight to go over the infant's head, the provider may be able to slip it over the infant's shoulders and deliver the body through the cord. The cord can then be unwrapped from around the baby after birth. Finally, if the cord is too

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tight to slip back over the shoulders, one may use the somersault maneuver to allow the body to be delivered.

Birnholz et al. in their study has suggested a nuchal compression stress test for chronically compromised pregnancies presenting with a nuchal cord. Therefore we believe that the clinical usefulness of routine identification *in utero* of nuchal cord in pregnancies presenting with a normal fetus in the vertex position is limited. However, a tight cord around the fetal neck may have serious implications for external cephalic version, or for the vaginal delivery of breech and twin pregnancies. Given the large number of fetuses who present with nuchal cord at delivery, a randomized. Double-blind clinical trial is required to estimate the role ultrasound may have in the management of this condition.

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