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Silent Strangulation: A Case Report of the Unseen Threat of Nuchal Cord Discovered During Caesarean Section.

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ABSTRACT

Background: Nuchal cord, one or more loops of umbilical cord around the foetal neck, is common, with global incidence ranging from 3% to 38%. Although usually benigh, tight multiple loops can lead to significant perinatal issues.

Case presentation: We report a rare case of a 36-year-old primiparous woman induced at 41 weeks for postdatism and reduced foetal movements. Despite normal antenatal findings, persistent variable decelerations during labour prompted emergency caesarean section. Intraoperatively, three tight nuchal cord loops were discovered. The male neonate was delivered with moderate asphyxia (1 minute Apgar score was 5), which was initially concerning. However, he responded remarkably well to our resuscitation efforts, attaining 5-minute and 10-minute Apgar scores of 8 and 10, respectively. The neonate was subsequently observed in Neonatal Intensive Care Unit by the neonatologist for 10 hours.

Discussion/conclusion: The diagnostic limitations of routine antenatal ultrasound in detecting tight nuchal cords, particularly in resource-constrained areas like Nigeria, are highlighted by our index case. This reinforces the importance of individualized clinical assessment, watchful monitoring during labour and maintaining a high index of suspicion when foetal distress persists despite conservative interventions

Keywords: Unremarkable antenatal care, three tight loop of cords, nuchal cords, silent strangulation, caesarean section.

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INTRODUCTION

Nuchal cord, which refers to one or more loops of the umbilical cord wrapped 360° around the neck of the foetus, is a common observation during delivery.[1, 2] The umbilical cord acts as the essential connection between the developing foetus and the placenta, providing crucial nutritive, metabolic, and excretory functions from as early as the fifth week of pregnancy. In addition to its biological function, it represents the deep connection between mother and child.[1] However, issues associated with the cord, especially nuchal cord, where the umbilical cord wraps around the foetus's neck, can have a significant impact on perinatal outcomes. [3]

Nuchal cord is a relatively common obstetric finding, with reported prevalence ranging from approximately 3% to 38% at delivery.[4-7] The incidence of single, double, triple and quadruple loops of cord varies geographically; for example, a Nigerian study noted frequencies of 80.6%, 12.5%, 4.2% and 2.7% respectively.[7] Though often benign, the presence of the cord around the neck can result in intermittent compression during labour, especially as the foetus descends the birth canal.[1] This compression may impair umbilical venous flow, while arterial circulation continues, potentially causing foetal hypovolemia, acidosis, and anaemia, contributing to 5–18% of foetal asphyxia cases and approximately 10% of stillbirths.[8]

Advanced imaging, particularly ultrasonography with Doppler, is the gold standard for antenatal diagnosis. These modalities can assess the number of loops, degree of tightness, and the precise location of cord entanglement.[9] Clinically, the suspicion of a nuchal cord can be raised through transabdominal manual compression tests, in which foetal heart rate decelerations resulting from gentle neck pressure may suggest its existence.[10] Despite advancements in diagnosis, most nuchal cords do not lead to negative outcomes for newborns, and the routine screening during the third trimester is still a matter of debate.[11] The prevailing opinion now leans towards attentive monitoring during labor rather than taking preemptive measures. The occurrence of a tight triple nuchal cord is a rare phenomenon, especially in the literature from Nigeria, and it is linked to a greater risk of complications; however, it does not always require a caesarean section. Following informed written consent from Mrs. A. Z, we present a unique and instructive case of a woman who had induction of labour with persistent variable decelerations and was discovered, during caesarean section, to have tight three loops of nuchal cord, highlighting the unpredictable nature of this condition and the need for individualized and meticulous clinical judgment.

Case presentation

A 36-year-old G5P1+3 delivered a male neonate with three firmly attached loops of nuchal cord through caesarean section (CS) on the 12th February, 2025, at 41weeks gestational age. She had a spontaneous vaginal delivery 3 years ago and 3 premarital terminations of pregnancies with no complication.

The index pregnancy was booked in a private hospital in Benin City, Edo State, Nigeria, at gestational age of 11 weeks and 6 days. She had routine booking investigations done which were essentially normal: There was no abnormality reported in urinalysis; Blood group and Rhesus-B rhesus positive; Genotype-AA; Pack Cell Volume-34%; Retroviral Disease Screening-non-reactive; Hepatitis B and C-non- reactive; Veneral Disease Research Laboratory (VDRL)-non-reactive; fasting Blood sugar level was 80 mg/dl at the booking clinic. During the antenatal period, she received all the routine drugs supplementation: Iron and Folic acid; Monthly intermittent malaria prophylaxis using Sulfadoxine Pyrimethamine; Antitetanus toxoid was also taken according to protocol. Four obstetric ultrasound scans were done at booking, 22, 30 and 36 weeks of gestational age respectively with no abnormal findings reported. The antenatal period remained uneventful with normal maternal and foetal parameters. The assessment at the gestational age of 39 weeks 6 days included a physical examination with Leopold manoeuver revealing a cephalic presentation with the head not engaged and a normal foetal heart tone (FHR) varying between 136 and 142 beats per minute; the estimated foetal

weight was 3.2kg. After detailed discussion with the patient, we mutually agreed on labour induction should spontaneous labour onset fail to occur before the gestational age of 41 weeks and 3 days. On the follow up visit at 40 weeks and 6 days, there was no uterine contractions and the patient reported reduced foetal movements. An ultrasound assessment of biophysical profile showed normal foetal breathing movement, foetal movement, foetal tone and amniotic fluid volume. No cord around the neck was reported and there was normal foetal heart rate of 144 bpm. Following thorough counseling about our clinical findings, the patient and care team agreed on labour induction, with plans for continuous monitoring of both maternal and foetal parameters throughout the induction process. Pre-procedure workups were all normal. Six hours into induction of labour, labour pain had started, and variable deceleration was noted, which persisted despite foetal resuscitation by giving the parturient normal saline, intranasal oxygen and encouraging her to lie down on left lateral position. The parturient and her husband were informed of the findings and decision was reached for emergency caesarean section. A lower uterine segment caesarean section was performed and a live male neonate in cephalic presentation was delivered with 3 loops firm nuchal cord around the neck, Apgar score of 5 at 1 minute, acrocyanosis, and moderately asphyxiated.

Resuscitation was carried out by the neonatologist and anaesthetist, obtaining a 5-minute Apgar score of 8/10 and a 10-minute Apgar score of 10/10. The newborn was transferred to the Neonatal Intensive Care Unit for observation, achieving clinical stability within 10 hours. Investigations revealed no abnormalities. The umbilical cord was centrally inserted on the placenta and measured 76.5 cm. The mother had an uneventful postoperative recovery and she was discharged from the hospital on fifth post operative day and given 2 weeks postnatal clinic appointment.

Figure 1: three tight loops of nuchal cord discovered only at caesarean section

Discussion

The presence of a nuchal cord, defined as one or more loops of the umbilical cord encircling the foetal neck, remains a frequent yet unrecognized intrapartum complication with significant implications for foetal well-being.[12] This case of a 36-year-old primiparous woman delivering a neonate with three tight loops of nuchal cord discovered only at caesarean section emphasizes the complex and yet to be fully understood nature of this condition, particularly in low resource settings, where clinical and basic ultrasonographic assessments may appear deceptively normal, masking a potentially life-threatening condition.

The index patient's antenatal course was uncomplicated, with normal booking investigations, routine supplementation, and serial obstetric ultrasounds failing to detect any cord abnormalities. This agrees with existing literature indicating that antenatal sonographic identification of nuchal cord, while possible, is

not universally reliable, particularly in cases of multiple, tightly wound loops.[13] Despite advances such as Doppler ultrasound and techniques like the gray-scale divot sign[9], accurate diagnosis remains inconsistent and often limited by foetal position, cord thickness, and operator competence.

The decision for labour induction at 41 weeks was clinically justified given the absence of spontaneous onset and reduced foetal movements (a known marker of foetal distress). The persistent variable decelerations observed following induction, which did not resolve with standard foetal intrauterine resuscitative measures, were classical signs of cord compression, as reported in studies by Joshi et al.[8] and Awowole et al.,[7] These decelerations, particularly when unresponsive to conservative management, should prompt early consideration of cord-related pathology, especially in the setting of an otherwise reassuring antenatal profile.

Although existing research generally indicates that a single or even double nuchal cord is not significantly linked to adverse perinatal outcomes, more recent studies suggest that the presence of three or more loops may be associated with a heightened risk of stillbirth or neonatal compromise at birth.[13] In this instance, the intraoperative finding of three tight loops of nuchal cord, a rare phenomenon with a reported incidence of just 4.2% in Nigerian populations,[7] clearly explains the foetal distress encountered. The resultant moderate asphyxia, evidenced by a low initial Apgar score (5 in the 1st minute and acrocyanosis), required prompt neonatal resuscitation. The improvement in Apgar to 8 in the 5th minute and subsequent recovery within 10 hours reinforces the critical importance of timely surgical intervention in mitigating long-term morbidity.

This case also brings to light the limitations of antenatal screening protocols, particularly in low resource settings where reliance on basic ultrasonography may not suffice for detailed cord assessment. It emphasizes the need for individualized clinical judgment, particularly when abnormal intrapartum findings such as non-reassuring foetal heart patterns arise. While tight nuchal cords do not mandate caesarean delivery in all cases, the failure of foetal resuscitation and progressive decelerations in this scenario made surgical delivery the most appropriate course.

Nuchal cords are particularly problematic when they are tightly encircling the foetal neck, as the physiological effects in such cases are conceptually similar to strangulation.[12] Compression of the umbilical cord resulting from a tight nuchal loop can impede blood flow, especially within the thin-walled umbilical vein.

Moreover, the presence of a centrally inserted umbilical cord measuring 76.5 cm, a length well within normal limits, suggests that cord length alone does not necessarily predict adverse outcomes but rather the degree of entanglement and tightness, which can precipitate intermittent hypoxia and ischaemia.

Conclusion: This case adds to the growing body of evidence highlighting the "silent strangulation" caused by undetected nuchal cords. It reiterates the importance of careful intrapartum monitoring, a high index of suspicion for cord complications in the presence of variable decelerations, and prompt decision-making when there is of foetal compromise. As suggested by Mekala et al.[1], while most nuchal cords may be benign, their unpredictability necessitates heightened clinical awareness and preparedness to intervene quickly to ensure optimal neonatal outcomes.

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