

A case of a new-born with a four loops nuchal cord rescued from severe neonatal asphyxia: Have we learn anything new?

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Abstract

The presence of nuchal cord is frequent during delivery and does not usually cause adverse foetal or neonatal outcomes even in case of multiple loops. We report a case of a 30 year-old G3P2 with past history of nuchal cord in her previous pregnancies, one resulting into neonatal death and a previous caesarean section. She delivered through elective caesarean section of a female child with four loops nuchal cord and severe neonatal asphyxia who was rescued in the neonatal intensive care unit. We review the recommendations about the management of multiple loops nuchal cord and highlight the lesson learned.

Introduction

Nuchal cord is an abnormality of umbilical cord characterized by the entanglement of the cord around the neck or when the umbilical cord is wrapped around the neck 360 degrees [1, 2, 3]. The incidence of nuchal cord varies in the literature from 5 to more than 35% and many authors reports increasing rate with the advancing gestational age from 20 weeks [1, 3, 4]. Prior to delivery, obstetricians can assess presence of nuchal cords clinically by a test that involves transabdominal manual compression of the fetal neck. If compression of fetal neck elicits fetal heart rate decelerations (FHR), the test is considered positive. The diagnosis of nuchal cord can be done during the antenatal period using the ultrasound which can describe the number of loops, the tightness and the part of foetal body entangled; Ultrasonography with Doppler imaging is considered the gold standard for the diagnosis [5] but the presence of nuchal cord does not usually change the neonatal outcome in the majority of cases [3, 5, 6, 7]. Nuchal cord can lead to compression which can obstruct the blood flow in the umbilical vein but the infant artery may continue to pump blood outside the foetus; this can result to hypovolemia, acidosis and anaemia [2]. Despite all these potential adverse foetal outcomes, there is a lot of controversies on the management of the nuchal cord during pregnancy with few authors advocating for systematic sonographic screening during the third trimester [1, 8] while the vast majority only recommend more cautious foetal heart monitoring during labour [7, 9, 10]. The incidence of nuchal

cord with multiple loops is reported to vary from 1.99 % [4] to 5.8% [9, 10] and the occurrence of adverse outcomes is higher compared to single loop but vaginal delivery is not contra-indicated [10]. We report a case of early neonatal birth asphyxia after a caesarean section due to a nuchal cord with four loops which warranted a neonatal resuscitation. Recommendations on the management are revisited.

Case presentation

A 30-year-old G3P3002 delivered a female baby with four loops nuchal cord entanglement through caesarean section (CS) on August 25, 2022. She had a past history of stillbirth during the first delivery 7 years ago due to a tight nuchal cord. Her second child was born through caesarean section indicated for non-reassuring foetal heart rate 5 years ago and a loose nuchal cord was also discovered during the CS. The index pregnancy was followed at a district hospital (first level referral) till the 36th week of pregnancy when she was referred to us for further management. During the antenatal period, she received all the routine drugs supplementation according to National recommendation: Iron and Folic acid, Monthly dose of intermittent malaria treatment using Sulfadoxine Pyrimethamine; Antitetanic toxoid was also taken accordingly. Following laboratory investigations were done with no abnormal findings reported:

- Blood group and Rhesus: O rhesus positive.
- Haemoglobin electrophoresis: AA.
- Toxoplasmosis serology: IgG positive at 66 IU/ml and IgM:

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negative.

- Rubella serology: IgG positive at 66 IU/ml and IgM: negative.
- Veneral Disease Research Laboratory (VDRL) and Treponema Pallidum Haemagglutinin Assay (TPHA): negative,
- Blood sugar level was 72 milligrams per liter at 12 weeks.

Three obstetrical ultrasounds were done at 11, 24 and 32 weeks respectively with no abnormal findings reported and in particular no nuchal cord described. The obstetrical assessment at 36 weeks included a physical examination with Leopold maneuver revealing a cephalic presentation with the head not engaged and a normal foetal heart tone (FHR) varying between 132 and 146 beats per minute (bpm), the estimation of foetal weight was difficult because of the high body mass index (BMI = 32 before pregnancy) at 2700 g ± 275 g using the Johnson formula. The digital vaginal examination found a normal inlet with an obstetrical conjugate estimated at 11.3 centimeters and non-prominent ischial spines.

After counselling, a shared decision of trial of vaginal delivery (TOLAC) was taken, provided there is spontaneous onset of labour before 41 completed weeks of pregnancy. On the follow-up visit at 40 weeks and 4 days, there was no uterine contractions and the patient reported reduced foetal movements. An ultrasound done to assess the foetal wellbeing found a normal foetal heart rate of 142 bpm, sufficient amniotic fluid quantity and a cord around the neck.

- A decision was taken for a planned CS the next day.
- A preoperative workup including full blood count and coagulation profile tests were all normal.
- A lower uterine segment caesarean section was performed and a live female baby in cephalic presentation was delivered with a nuchal cord with 4 loops around the neck, Apgar score of 3/10, bluish color and asphyxiated (see figures 1 and 2).



Figure 1: Tight nuchal cord with 4 loops: Asphyxiated neonate.



Figure 2: Cord untwisted: Long cord, 81cm.

Resuscitation was done, obtaining a 5-minute Apgar score of 5/10. The new-born baby was admitted in the neonatal intensive care unit but recovered very fast within 24 hours. The full blood count and blood ionogramme done were normal. The umbilical cord was centrally inserted on the placenta and measured 81 cm.

The mother had an uneventful postoperative evolution and was discharged from the hospital at day 4 post caesarean section.

Discussion

Nuchal cord is a frequent situation in pregnancy but the multiple loops variety is relatively rare, with reported incidence of 1.99 to 5.8% [4, 10]. Risk factors of nuchal cord described in the literature include Primiparity, male sex of the foetus, post term pregnancy (> 42 weeks), and umbilical cord length > 70 cm [1, 8, 11, 12]. Likewise, our patient had a prolonged pregnancy, although not up to 42 weeks, the umbilical cord measured 81cm but on the contrary, she was a multiparous and had a female baby. Our patient also had past history of nuchal cord in all her 2 two previous pregnancies but this has not been described before as a risk factor.

The patient complained of reduced foetal movement and a cord entanglement was seen at ultrasound done that same day but the number of loops were not described. This is consistent with what is described in the literature concerning the diagnosis of nuchal cord; in fact, the diagnosis of nuchal cord can be done during the antenatal period using the ultrasound which can describe the number of loops, the tightness and the part of foetal body entangled; Ultrasonography with Doppler imaging is considered the gold standard for the diagnosis [5,

13]. The majority of cases of nuchal cord is discovered during the delivery of the foetal head and many authors report no significant difference in the neonatal outcomes in case of single loop [1, 6, 8].

Vaginal delivery is possible without increased rate of adverse foetal and neonatal outcomes even in case of multiple loops. Wang et al. reported a case of nuchal cord with 8 loops managed by vaginal delivery with just some transient adverse neonatal complications like low Apgar at 1 and 5 minutes, admission in neonatal intensive care unit (NICU) [9]. In our case, we performed a caesarean section for a different reason (previous scar and poor obstetrical history) and the finding of an asphyxiated baby was unforeseen. Like in this case, similar adverse neonatal outcomes have been reported when the nuchal cord has multiple loops and more so if the entanglement is tight [3, 6, 8, and 9]. We attribute the favorable evolution of the child condition to the presence of skilled paediatrician and a good neonatal intensive care with oxygen therapy facilities.

Conclusion

This case illustrates a rare occurrence of severe neonatal asphyxia due to four loops nuchal cord. The neonate was rescued because of the presence of a paediatrician and an intensive care unit with resuscitation facilities.

Lessons learned: Past history of nuchal cord can be considered a risk factor of the condition and Cases of multiple loops nuchal cord diagnosed antenatally should only be managed in hospitals with facilities with good NICU.

Authors' contributions: RT managed the case, drafted and wrote the report. IBE, YO, MN and TNN review the paper and contributed in literature review. All the authors approved the final version.

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References

1. Fouelifack FY, Dahda LCM, Fouedjio JH, Fouelifa LD, Mbu RE. Facteurs associés aux circulaires du cordon: étude cas-témoin dans trois hôpitaux de Yaoundé. *Pan Afr Med. J* 2020; 35(23).
2. Peesay M. Nuchal cord and its implications. *Matern Health Neonatol Perinatol*. 2017 Dec 6;3(1):28.
3. Nuchal chord: Causes, complications, and management. Available from: <https://www.medicalnewstoday.com/articles/319762>.
4. Ngowa JK, Kasia JM, Nsangou I, Zedjom C, Domkan I, Morfaw F, et al. Nuchal Cord and Perinatal Outcome at the Yaounde General Hospital, Cameroon. *Clin Mother Child Health*. 2011; 8(1).
5. Ranzini AC, Walters CA, Vintzileos AM. Ultrasound diagnosis of nuchal cord: the gray-scale divot sign. *Obstet Gynecol*. 1999; 93(5 Pt 2): 854.
6. Narang Y, Vaid NB, Jain S, Suneja A, Guleria K, Faridi MMA, et al. Is nuchal cord justified as a cause of obstetrician anxiety? *Arch Gynecol Obstet*. 2014; 289(4): 795-801.
7. Sherer DM, Sokolovski M, Dalloul M, Khoury-Collado F, Abulafia O. Is fetal cerebral vascular resistance affected by the presence of nuchal cord(s) in the third trimester of pregnancy? *Ultrasound Obstet Gynecol Off J Int Soc Ultrasound Obstet Gynecol*. 2005; 25(5): 454-8.
8. Foumane P, Nkomom G, Mboudou ET, Sama JD, Nguetack S, Moifo B. Risk factors of clinical birth asphyxia and subsequent newborn death following nuchal cord in a low-resource setting. *Open J Obstet Gynecol* [Internet]. 2013 Nov 4 [cited 2022 Aug 31]. 2013. Available from: <http://www.scirp.org/journal/PaperInformation.aspx?PaperID=39147>.
9. Wang Y, Le Ray C, Audibert F, Wagner MS. Management of Nuchal Cord With Multiple Loops. *Obstet Gynecol*. 2008; 112(2 Part 2): 460-1.
10. Larson JD, Rayburn WF, Crosby S, Thurnau GR. Multiple nuchal cord entanglements and intrapartum complications. *Am J Obstet Gynecol*. 1995; 173(4): 1228-31.
11. Nkwabong E, Ndoumbe Mballo J, Dohbit JS. Risk factors for nuchal cord entanglement at delivery. *Int J Gynecol Obstet*. 2018; 141(1): 108-12.
12. Rhoades DA, Latza U, Mueller BA. Risk factors and outcomes associated with nuchal cord. A population-based study. *J Reprod Med*. 1999; 44(1): 39-45.
13. Krzyżanowski A, Kwiatek M, Gęca T, Stupak A, Kwaśniewska A. Modern Ultrasonography of the Umbilical Cord: Prenatal Diagnosis of Umbilical Cord Abnormalities and Assessment of Fetal Wellbeing. *Med Sci Monit Int Med J Exp Clin Res*. 2019; 25: 3170-80.