Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/20104
DOI URL: http://dx.doi.org/10.21474/IJAR01/20104

RESEARCH ARTICLE

ACUTE POST HEMORRHAGIC ANEMIA AND SHOCK IN NEONATE DUE TO RUPTURE UMBILICAL CORD DURING DELIVERY

Hala A.M Osman[1], Fadwa S.E Abdul Rhim[2], Eyas Mukhtar[3], Rikaz Bizzari[4] and Jinan Kalifa[5]

1. Department of Neonatology and Pediatric, Hatta Hospital, Dubai Health, UAE.
2. Department of Obstetrics and Gynecology, Hatta Hospital, Dubai Health, UAE.
3. Department of Neonatology and Pediatric, Hatta Hospital, Dubai Health, UAE.
4. Department of Neonatology and Pediatric, Hatta Hospital, Dubai Health, UAE.
5. Department of Obstetrics and Gynecology, Hatta Hospital, Dubai Health, UAE.

Manuscript Info

Manuscript History
Received: 20 October 2024
Final Accepted: 23 November 2024
Published: December 2024

Key words:-
Neonatal Haemorrhage, Nuchal Cord, Ruptured Umbilical Cord, Placental Succenturiate

Abstract

Umbilical cord rupture in utero is a very rare and critical emergency that can cause fetal death within minutes. Umbilical cords rupture can be associated with normal or adverse perinatal outcomes leading to stillbirth, asphyxia, fetal distress, and neurologic damage. When rupture does occur in utero signs of fetal distress appear and fetal mortality rate is approximately 50%.
We present the rare case of severe anaemia and shock immediately after delivery related to severe neonatal blood loss due to intrapartum umbilical cord rupture where there was a tight nuchal cord and the placenta was bilobed with a Succenturiate lobe. The umbilical cord ruptures close to the baby's side near the abdominal wall.This is an unusual site, as most cases tend to rupture from the weakest site at the insertion of the cord to the abnormal placenta.Following stabilization and resuscitation, the baby survived and recovered well.

Introduction:-

Post hemorrhage anemia in neonate due to acute fetal blood loss during labour and delivery is a rare but important cause of anemia in neonates and second only to hemolytic anemia of newborn.(1)The newborn has a limited capacity to tolerate acute hemorrhage, so prompt diagnosis and therapy essential for survival.Blood supply transported by umbilical cord provides oxygen to developing fetus, acting as a substitute for lung function until the baby breatheindependently.

The brain is extremely sensitive to a lack of oxygen, that can result in varying degrees of brain damage (hypoxic – ischemic encephalopathy) or even death When acute massive blood loss has occurred, the infant is extremely pale and requires immediate transfusions or volume expanders. Although the hemoglobin may be normal initially, it falls within six to eight hours after birthA full or partial break in umbilical cord also known as an ruptured umbilical cord – is rare but severe complication of childbirthThe umbilical cord generally cushionedand surrounded bythick sheath, and within the sheath is a protective substance called Wharton's jelly that reduces the risk of an umbilical cord rupture.Ruptured of umbilical cord is caused by weakening of umbilical cord due to infections, trauma, abnormal cord insertion, short cord or because of too much pressure on the cord. (2). Placenta succenturiata: refers to placenta with an additional /accessory lobe or lobes of placental tissue located a few

Corresponding Author:- Hala A.M Osman
Address:- Department of Neonatology and Pediatric, Hatta Hospital, Dubai Health, UAE.

centimeters away.its incidence is around 2-8% of placentas.Velamentousmembranous vessels occurs in approximately 1% in singleton gestations, and can occur between lobes of bilobed placenta and between main placenta and accessary lobes. Because Wharton's jelly does not surround and thereby protect the vessels, they are prone to rupture especially when they are located in membranes covering the cervical os (i.e., vasa Previa). (3)Nuchal cord is a loop of umbilical cord around the fetal neck and is a common finding at delivery reported incidence 19-24 %. It is not associated with significant increase in the rate of any clinically important adverse fetal / neonatal events.In case reports, tight nuchal cords have been associated with adverse outcomes, including fetal asphyxia, demise and long term neurodevelopmental consequences.Loose nuchal cord usually can be slipped over the head to free the fetus during delivery. but if too tight it is important to avoid avulsing or tearing of the cord while attempting to deliver the baby. This can be done either by somersault maneuver if not successful,the cord may be clamped and cut. (4)

Case report:

A 30-year-old gravida 2 para 1 had one other healthy sibling. The mother became pregnant naturally, NIPT low-risk male ,OGTT result was normal, the blood ferritin level was low, and she received a fernject injection. seen at the emergency department (ED) at 28 weeks gestation with palpitations and tachycardia, which a cardiologist identified as sinus tachycardia. In addition, she tested negative for GBS, had a history of imminent preterm labour, an ESBL E. Coli UTI, and a normal anomaly and growth scan. At 38 weeks gestation, she was taken to the hospital for rehydration due to epigastric pain and vomiting. Later, she experienced labour pain, but her CTG was normal, there was no foetal distress till birth, and there was no vaginal bleeding.During birth,while trying to free a particularly tight loop of cord around the baby's neck , the cord avulsed from the umbilicus side and began to bleed. The umbilical stump was not identified, therefore the cord clamped down on the thin portion of the umbilical to stop the bleeding right away. The infant shifted to the warmer and cried after the initial steps of resuscitation , but its tone was poor and its color was exceedingly pale. At one and five minutes, the Apgar score was 5, 7. And cord blood gas PH 7.129 PCO2 65 HCO3 21 Base -7.7, tachycardia HR200/m and respiratory distress emerged; desaturation SPO2 83-92% was treated with 2-liter oxygen per minute via nasal cannula in order to maintain 100% spo2. A neonatologist started resuscitation right away, inserting an urgent UVC at level 6 cm . As other teams brought the blood bag, the infant's skin began to turn pink after receiving a bolus of normal saline (10 ml/kg), and then the baby received a negative blood transfusion (20 ml/kg) within 4 hours . After that, His color turned pink, his BP returned to normal, and his health improved.First venous blood gas PH 7.311 PCO2 38.3 HCO3 24.4 Base1.8Brainand abdominal U/S were normal Chest and abdominal x ray: unremarkable studyExamination of the placenta revealed Bilobed Placenta and Succenturiate lobe (**Figure 1)**and normal cord insertion with 2 arteries and single vein Single vein supply the Succenturiate lobe from main placenta (**Figure 2)** The length of umbilical cord 50 cm was normal as well the amount of Wharton gelatin. No infection was detected. Neonate made a full recovery from the accident and was discharged from the hospital at fifth day of life.

Histopathological report of the cord and placenta

Gross description:

The placenta covered by membrane with eccentrically attached segment of umbilical cord, totally weight 558 grams, the placental disc measures 17x15x3 cm, the umbilical cord measures 50cm in length and 1.4x1.2 cm in diameter (slightly coiled), slicing of which shows three blood vessels.Another separate lobe of placenta (sucenturatelobe) cover by membrane is seen measuring 12x10x1.5 cm (Figure 1-2).

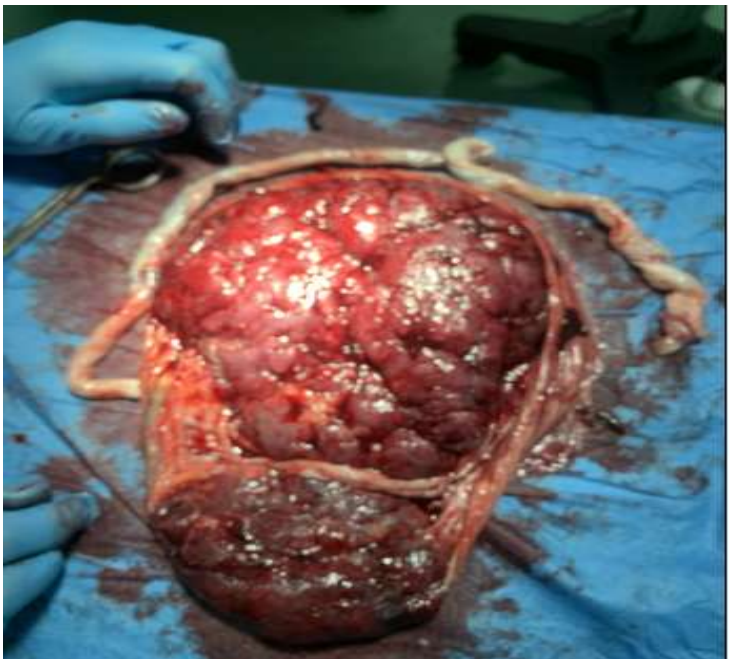

Figure 1:- Bilobed Placenta and Succenturiate lobe.

Figure 2:- Single vein is within membrane and extend from Main placenta to the accessary lobe.

Conclusion:-

Placenta disc: focal nonspecific intervillous fibrin depositions, foci of intervillous hemorrhage and features of patchy chorangiosis, no evidence of infarction or villitis.Membranes: no evidence of chorioamnionitis.Umbilical cord: normal with three vessels.no evidence funisitis.Separate Placental (accessory) lobe: -Placental tissue: focal nonspecific intervillous fibrin depositions, foci of intervillous hemorrhage and features of chorangiosis). Membrane: No evidence of chorioamnionitis.The histomorphology features are in keeping with the clinical diagnosis of Placenta with Succenturiate (accessory) lobe (Succenturiate Lobed Placenta).

Discussion:-

Rupture of umbilical vessel is estimated to occur about 1:6.000 deliveries and when rupture does occur in utero, the fetal mortality rate of approximately 50 %.There is 50%- 75% mortality in cases where umbilical cord blood vessels rupture due to vasa Previa(5). A review of the literature reveals that most often ruptures occur at the placental side, where the cord tends to be the weakest, and that cord rupture is often associated with other abnormalities such as hematoma, underwater births, short cord, ascending cord inflammation prior to the time of delivery, and velamentous cord insertions (6, 7).Zink and Reinhardt (1969) and Crichton (1973) claim that the placental implantation of the umbilical cord is weak (8). In 1995, Sporrerhypothesised that the rupture during childbirth might occur while standing or after suddenly getting up from a squatting position (9).The importance of the histological investigation of the placenta and umbilical cord is highlighted by the correlation between uterine abnormalities or inflammations, the nuchal cord, and the rupture of the umbilical cord (8).No matter how many predisposing conditions are present, the tension or traction force—which has to do with its dynamic or static nature—is a necessary component to break the umbilical cord (8).In a developing country, umbilical cord haemorrhage was reported to happen in approximately 9% of home deliveries, according to another study [9]. Massive blood loss in neonates has serious effects. When the total volume is reduced by 10%–15%, the newborn develops abnormalities in both the peripheral and central circulatory responses [10].The higher tensile strength when dynamic force is applied might be explained by a shorter time-length exposure (9).In this regard, Zink and Reinhardst (1969) add that the likelihood of a rupture is greater when the force acts suddenly (such as in a fall) than when it acts gradually. Pfannkuch (1875) stated that the foetal insertion is a weak area. (8) .These data from the literature suggest that one explanation for our case is a tight nuchal cord, and traction during the removal of the cord causes an avulsion from the foetal location.

The placenta was abnormally succenturiata, and there was only one vein connecting the accessary lobe to the main placenta; this vein did not rupture as depicted in the picture, and there was no hematoma in it. Examining the cord under a microscope and on a gross scale did not show any inflammation or deformity that would have encouraged the rupture during delivery.

Perhaps because it happened during the expulsion phase, the infant's enormous acute haemorrhage at birth was not lethal.

Another factor is that the baby's excellent neurological outcome following delivery was largely due to the integrated teamwork of resuscitation and stabilisation.The neonatologists faced a challenging and drawn-out procedure due to the absence of a prenatal diagnosis of the disease.In these situations, it is best to replenish volume right away with blood since it improves oxygen delivery to tissues more quickly. Recognising that maternal vaginal bleeding may indicate the need for a transfusion is a crucial indicator that should be anticipated, as is the necessity for resuscitation.

Consent:
In this instance, the parents of the child gave permission for the case to be published.

Conflict of interests:
The writer has disclosed no financial information or has any conflicts of interest to report.

Abbreviations:
NIPT: Noninvasive prenatal test.
OGTT: oral glucose tolerance tests
ED: Emergency department
ESBL : extended-spectrum beta -lactamase
UTI : urinary tract infection
CTG: cardiotocography
GBS : group B streptococcus
UVC : umbilical veins catheter

Reference:-

1-Singh. N, Suresh. G , Severe Hemorrhage from the Umbilical Cord at Birth:

A Preventable Cause of Neonatal Shock Case Reports in Pediatrics Volume 2013, Article ID 317627, 2 pageshttp://dx.doi.org/10.1155/2013/317627

2-Lubin, B. (1978, February). Neonatal Anaemia Secondary to Blood Loss.ClinicsinHaematology7(1), 19–34. https://doi.org/10.1016/s0308-2261(21)00568-3

3- Lockwood.C. J, Stieglitz,Velamentous umbilical cord insertion and vas previa inBarss. V.A (DE), UpToDate

4- Schaffer. L, Zimmerman. R, Nuchal cord, inChakrabarti, A (DE), UpToDate

5 -De Petris, L., Rita Sabatini, M., &Ruffini, E. (2018). Rupture of umbilical cord at birth: anunusual case of acute neonatal haemorrhage. Clinical Case Reports and Reviews, 4(8). https://doi.org/10.15761/ccrr.1000433

6 -Collins JH, Collins CL, Collins CC (2010) Umbilical cord accidents. ThePregnancy Institute.

7 -Sviggum HP, Gill LA, Traynor KD (2016) Velamentous Umbilical Cord Insertionand Ruptured Fetal Vessel: A Cause of Fetal-Maternal Hemorrhage: A Case Report. J ReprodMed 61: 598- 600. [Crossref]

8- Beliș V. Tratat de MedicinăLegală. II. EdituraMedicală, București, 1995

9- Kellet RJ. Infanticide and child destruction – the historical, legal and pathological aspects. Forensic Sci Int. 1992;53:1-28.

10-Harms DL, Giordano J. Ethical issues in high-risk infant care. Issues ComprPediatrNurs. 1990;13:1-14.10-

11-P. Garner, D. Lai, M. Baea, K. Edwards, and P. Heywood, "Avoidingneonatal death: an interventionstudy of umbilical cord care," Journal of Tropical Pediatrics, vol.40, no. 1, pp. 24–28, 1994.