

UMBILICAL CORD TORSION WITH INTRAUTERINE FETAL DEATH IN A MULTIPARA WITH TWO PREVIOUS CAESAREAN SECTIONS: A CASE REPORT

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ABSTRACT

Background:

Umbilical cord torsion and other cord accidents are causes of perinatal morbidity and mortality. Umbilical cord torsion accounts for a 4-fold increase in perinatal death.

Aim: *The aim of this paper is to present a rare clinical entity and create awareness on its management modalities.*

Case Report

Mrs. P.O. a 39 year old G4 para 2+1 (2 alive) with two previous caesarean sections presented at the antenatal clinic at 36 weeks gestation with a 2-day history of absence of fetal movement. Intrauterine fetal demise was confirmed via a sonogram. The antenatal period was before now uneventful. She was diagnosed with an unexplained intrauterine fetal death; and subsequently had an elective repeat caesarean section. At surgery, the fetal death was strongly suspected to have resulted from torsion of the umbilical cord. Her post-operative period was uneventful. She was discharged on the 7th post-operative day.

Conclusion

Due to the emotional pain expressed by parturients with antenatal fetal death, mostly in those in whom the cause of death is uncertain and unexpected, we recommend that more steps be employed in antepartum fetal surveillance, including the use of Doppler, which may pick up some vascular disorders that may increase the predictability of intrauterine fetal death. However, in resource poor countries the acquisition of these tools may still seem far-fetched.

KEYWORDS: *Umbilical cord torsion, intrauterine fetal death, caesarean section*

INTRODUCTION

Normally the umbilical cord has many twists and turns; the normal average is 0.2 twists per centimeter (cm) of the cord.¹ Umbilical cord torsion, also referred to as hypercoiling of the umbilical cord, is defined as a condition where there is excessive coiling of the umbilical cord.¹ Approximately 10% of pregnancies can have hypercoiling of the umbilical cord.² and the condition affects pregnant women of all ages.³ There is no racial, ethnic or geographical predilection.³ Umbilical cord torsion and other cord accidents are causes of perinatal morbidity and mortality.⁴⁻⁷

CASE REPORT

Mrs P.O. a 39-year old booked G4Para2⁺¹ with two previous caesarean sections presented at the antenatal clinic at 36 weeks gestation with a 2-day history of absence of fetal movement. There was no history of abdominal pain, trauma to the abdomen, abdominal massage, drainage of liquor, fever, urinary symptoms or bleeding per vaginam. The indications for her operative deliveries were malpresentations and the 2 children are alive.

She registered for antenatal care at 16 weeks gestation and the antenatal period had been essentially uneventful. The index pregnancy was

desired and she has been supported by her husband. At booking her weight and height were 78kg and 1.6m respectively; blood pressure was $110/70$ mmHg and packed cell volume was 33%. Her haemoglobin genotype is AA and blood group is “B” rhesus D positive; Venereal Disease Research Laboratory test was non reactive; Human Immunodeficiency Viruses I and II tests were sero-negative and her fasting blood sugar was normal. She received 2 courses of intermittent preventive therapy for malaria with sulphadoxine-pyrimethamine at 20 and 24 weeks respectively. She had a dose of tetanus toxoid at 20 weeks gestation.

She had no medical co-morbidity like hypertension or diabetes mellitus and no family history of same. She is neither a smoker nor recreational drug user and did not take alcohol in the index pregnancy. She had been on supplementary haematinics.

On examination at presentation she was anicteric, afebrile, not pale and had no pedal oedema. Her respiratory rate was 18 cycles per minute and her chest was clear. Her pulse was 84 beats per minute, and the pulse was of good volume and was regular and the blood pressure was $120/80$ mmHg. Her abdomen was enlarged and she had a transverse suprapubic scar and there was no area of tenderness or palpable uterine contraction. The symphysio-fundal height was 33cm and the fetus was lying longitudinally, but presenting with the breech; the fetal heart sound was not heard with a hand-held Doppler device.

A diagnosis of unexplained intrauterine fetal death in a multipara with 2 previous caesarean sections was made. She was admitted into the ward. Her full blood count and differentials and clotting profile were within normal range, packed cell volume was 33%, and 2 units of whole blood were screened, grouped and cross matched; fasting blood sugar and other biochemical tests were normal; urinalysis was normal and urine culture yielded no growth and obstetric ultrasound scan confirmed intrauterine fetal death with Robert's and Spalding's signs noted.

She had an elective repeat caesarean section and significant findings at operation were a macerated male stillborn that weighed 2.3kg; a fundal placenta

with no obvious abnormality and weighing 0.4kg; there were no retro-placental blood clots; umbilical cord was 128cm long and had 36 twists with torsion of the cord at the fetal end and the cord had 3 vessels. The estimated blood loss was 600ml. Her post-operative period was uneventful and she was informed of the findings at surgery. She was counselled on family planning and discharged home on the 7th post-operative day in stable clinical state. She declined to a detailed post-mortem examination of the stillborn, placenta or umbilical cord.

DISCUSSION

Most of the information on the diagnosis of umbilical cord torsion and other cord anomalies prenatally from the literature were from the developed countries of the world. Herman et al. reported extremely large number of twists of the umbilical cord causing torsion of the umbilical cord in two cases of intrauterine fetal death and no additional pathology such as stricture or abnormalities of Wharton's jelly was observed, but for one baby having an abnormally long umbilical cord⁶. The two mothers complained of reduced fetal movement and both newborns were later found to be growth retarded. The average length of the umbilical cord is 55-70cm, with a diameter of 1-2cm and having about 11 helices/twists.⁴

Several factors may increase the incidence of umbilical cord torsion and other cord anomalies. These may arise from movements of the fetus in utero in early gestation and this is more likely to happen due to the relatively more amniotic fluid present and greater fetal movement^{3,4}. Advanced maternal age, multiparity, male fetus, and long umbilical cord are risk factors for torsion of the umbilical cord; these risks applied to the index case discussed. Other factors implicated as predisposing factors for umbilical cord torsion are maternal anaemia, prolonged gravidity, previous miscarriages, obesity, cocaine use, gestational diabetes and preeclampsia.^{4,9}

Figure 1 Showing torsion of the umbilical cord with focus at the baby's end.



Figure 2 showing the macerated male stillborn and torsion of the umbilical cord during extraction at caesarean section.



Prenatally it is difficult to diagnose umbilical cord torsion and other cord anomalies by ultrasonography because of the difficulties in visualizing the full length of the cord and such anomalies occurring in different trimesters and even intrapartum. Furthermore, in the third trimester, visualization of segments of the umbilical cord may be obscured by the fetus, thus the limitations may lead to possible misdiagnosis. However it is worth noting that prenatal diagnosis is possible in some cases. Even though ultrasonography was done for Mrs. P.O the diagnosis of cord torsion was missed; a 2-dimensional ultrasonography machine was used for the scanning.

Fetal demise from umbilical cord torsion results from compression of the umbilical cord blood vessels when the cord tightens. Wharton's jelly surrounding the umbilical cord protects the vessels from complete compression in case of tightening of the umbilical cord, but enough of the jelly may not be developed along all the segments of the cord leading to fetal demise if compression of the cord occurs.^{10,11} An autopsy of the fetus and histology of cross-sections of the umbilical cord and the placenta were not done in the index case because the patient declined consent.

Abdominal delivery may be considered if hypercoiling of the umbilical cord is suspected on prenatal ultrasonography after the gestational age for fetal viability has been met due to the inherent risk of extreme torsion and fetal demise. However some obstetricians have a contrary opinion as they may allow a short trial of vaginal delivery with continuous electronic fetal surveillance and a quick resort to caesarean section if the fetal heart rate tracing becomes non re-assuring.^{4,10,12-14} Our patient presented with intrauterine fetal demise and an elective repeat caesarean section was carried out because she already had 2 previous caesarean sections.

The prevention of stillbirths from torsion of the umbilical cord is a herculean task. Predisposing factors such as smoking, intake of alcohol and cocaine use during pregnancy should be avoided. Prenatal diagnosis of hypercoiling of the umbilical

cord should be the goal if perinatal deaths from umbilical cord torsion are to be drastically minimized. Advances in ultrasound technology with improvements in resolution and mapping out of pulse Doppler patterns of the umbilical vessels in suspected hypercoiled cords, especially when the vein-to-vein pitch is <2cm,¹⁵ and identification of peculiar findings in other cord abnormalities would help in achieving the set goal. Pregnant women with complaints of reduced fetal movement and having unexplained intrauterine growth restriction should have meticulous ultrasound visualization of as much as possible of the full length of the cord for detection of cord anomalies to ensure a more aggressive fetal monitoring and possible early intervention.

Post-mortem examinations of the umbilical cord may reveal inherent abnormalities with the cord and patients should be encouraged to consent to such examinations, most especially if they are relieved of the financial burden and such examinations do not go against their socio-cultural and religious inclinations. Such examinations may in future explain familial clustering observed with this condition.^{16,17}

CONCLUSION

Fetal demise causes anguish to the parturient and the care-giver because of failed expectations, most especially when it was unexplained and unexpected. The establishment of subspecialties like fetal medicine and feto-maternal medicine, and the provision of essential medical equipment like high resolution ultrasonography machines with Doppler, and manpower training, mostly in resource poor settings, would likely bring about more prenatal diagnoses. Likewise, improved neonatal care, especially of the preterm baby, have to be made because improved survival rates for these babies would have a ripple effect and result in early interventions on the part of the obstetricians.

REFERENCES

1. Strong TH, Jarles DL, Vega JS, Feldman DB. The Umbilical Coiling

- Index. *Am J Obstet Gynecol.* 1994, 170(1):29-32
2. Robinson JN, Abuhamad AZ. Abdominal wall and umbilical cord anomalies. *Obstet Gynecol Clin North Am* 2000. 27(4): 947-978.
 3. American Congress of Obstetricians and Gynecologists. [Http://www.acog.org](http://www.acog.org) (accessed 01/10/2016).
 4. Ikechebelu JI, Eleje GU, Ofoegbu CJ. True umbilical cord knot leading to fetal demise. *Ann Med Health Sci Resp* 2014; 4(8) :155-8.
 5. Kolingo EL, Allagoa DO. True umbilical cord knots, nuchal cord and cord round body with favourable obstetrics outcome in an unbooked elderly nullipara: A case report and literature review. [Http://www.researchgate.net/publication/...](http://www.researchgate.net/publication/...) (Accessed 01/10/2016).
 6. Herman A, Zabow P, Segal M, Ron-el R, Bukovsky Y, Caspi E. Extremely large number of twists of umbilical cord causing torsion and intrauterine fetal death. *Int J Gynecol Obstet.* 1991; 35(2): 165-7.
 7. Hadar A, Hallak M. Single umbilical artery and umbilical cord torsion leading to fetal death. A case report. *J Reprod Med.* 2003; 48(9): 739-40.
 8. Ezimokhai M, Rizk DE, Thomas L. Abnormal vascular coiling of the umbilical cord in gestational diabetes mellitus. *Arch Physiol Biochem* 2001 ;109(3):209-14
 9. Ezimokhai M, Rizk DE, Thomas L. Maternal risk factors for abnormal vascular coiling of the umbilical cord. *Am J Perinatol* 2000; 17(8):441-6
 10. Sherer DM, Dallou M, Zigalo A. Doppler and 3- dimensional sonographic diagnosis of multiple separate true knots of the umbilical cord. *J Ultrasound Med* 2005; 24(9): 1321-3.
 11. Dutman AC, Nikkels PG. Umbilical hypercoiling in 2nd- and 3rd- trimester intrauterine fetal death. *Pediatr Dev Pathol.* 2015;18(1): 10-6.
 12. Hasegawa J, Matsuoka R, Ichizuka K, Sekizawa A, Okai T. Ultrasound Diagnosis and Management of Umbilical Cord Abnormalities. *Taiwanese Journal of Obstetrics and Gynecology.* 2009; 48(1): 23-27.
 13. Hershkovitz R, Silberstein T, Sheiner E, Sholam-Vardi I, Holcberg G, Katz M, Mazor M. Risk factors associated with true knots of the umbilical cord. *Eur J Obstet Gynecol Reprod Biol* 2001; 98(1):36-9
 14. Ramon Y, Cajal CL, Martinez RO. Four dimensional ultrasonography of a true knot of the umbilical cord. *Am J Obstet Gynecol* 2006:195:896-8
 15. Collin JH. Prenatal observation of umbilical cord torsion with subsequent premature labor and delivery of a 31-week infant with mild nonimmune hydrops. *Am J Obstet Gynecol.* 1995; 172:1048-9
 16. Hallak M, Pryde PG, Qureshi F, Johnson MP, Jacques SM, Evans MI. Constriction of the umbilical cord leading to fetal death. A report of three cases. *J Reprod Med.* 1994;39:561 -5
 17. Bakovic BW, Boyd T, Poppiti R, Pflueger S. Recurrent umbilical cord torsion leading to fetal death in 3 subsequent pregnancies. A case report and review of the literature. *Arch Path Lab Med* 2000 Sept: 124(9)1352-5