

Constriction of the Umbilical Cord by an Amniotic Band Leading to Fetal Demise

Patra Sharmishtha · Biswas Bidisha ·
Patra Rishavdeb

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About the Author



Dr Sharmishtha Patra completed her MBBS from Sawai Man Singh Medical College, Jaipur, 1999, and MS from Rabindranath Tagore Medical College, Udaipur, 2002, and MRCOG (London), 2008. She is a fellow of International College of Robotic Surgeons, 2014. Presently, she is a Consultant Obstetrician and Gynecologist at Apollo Gleneagles Hospital, Kolkata. She has been attached to Apollo Gleneagles Hospital, Kolkata since 2003. Her special areas of interest are high risk obstetrics, laparoscopy, and robotic surgery. She has been invited as a faculty in various local, state level, and national conferences. She has won various quiz competitions and awards for papers in the national conferences.

Introduction

Umbilical cord accidents (UCA) are responsible for sudden antenatal death syndrome (SADS). An UCA occurs when umbilical venous or arterial blood flow is compromised to a degree that leads to fetal injury or death. Cord prolapse, cord compression, cord entanglement, true knot formation, thrombosis, and rupture of cord blood vessels are some of the known cord-related causes of stillbirth. Twisting or

constriction of umbilical cord occurs less often than the above mentioned complications, and even rarer is umbilical cord constriction by amniotic band which occurs in one of 100,000–150,000 births [1].

Case Report

A 30-year-old primigravida was admitted at 26 weeks of gestation with loss of fetal movement for last 6 days. Patient had a history of primary subfertility. She was undergoing treatment and conceived following ovulation induction. This was her first pregnancy. She was under regular antenatal care. She was a known hypothyroid on thyroxine supplementation and was also a known epileptic on oral lamotrigine. Her first trimester combined test report showed very low risk for Trisomy 13, 18, and 21. Her anomaly scan at 20 weeks was normal.

At 26 weeks of pregnancy, patient presented with loss of fetal movements. Ultrasonography was done, which

Patra S., Consultant Gynecologist and Obstetrician ·
Biswas B., Registrar
Department of Gynecology and Obstetrics, Apollo Gleneagles
Hospital, 58, Canal Circular Road, Kolkata 700054, India

Patra S. (✉), Consultant Gynecologist and Obstetrician
BH-36, Sector-2, Salt Lake City, Kolkata 700091, India
e-mail: sharmishthapatra@yahoo.co.in

Patra R., Visiting Consultant Pediatric Surgeon
Department of Pediatric Surgery, Apollo Gleneagles Hospital,
58, Canal Circular Road, Kolkata 700054, India



Fig. 1 Amniotic band extending from fetal scalp to umbilical cord leading to constriction of the cord at multiple points

showed intrauterine fetal death. There were no antecedent incidents, warnings or complications. Termination was carried out with oral mifepristone 200 mg followed by vaginal misoprostol after 48 h. She expelled the fetus together with the placenta. It was a macerated male fetus weighing 500 g. On inspection, it was found that there was an amniotic band extending from fetal scalp to umbilical cord leading to constriction of the cord at multiple places (Fig. 1). There was no other gross anomaly in the fetus or placenta. Placenta did not show any signs of abruption; however, the umbilical cord was long. Postpartum period was uneventful, and she was discharged on 1st postpartum day.

The histopathological examination of placenta revealed evidence of chorionic villi sclerosis and intimal thickening. Few villi were avascular with hyalinized stroma.

Discussion

The umbilical cord serves as a critical lifeline to the developing fetus. The cord and its constituent tissues, an outer layer of amnion, porous Wharton's jelly, two arteries and one vein, are designed to provide and maintain the

blood flow to the developing fetus. The umbilical cord is vulnerable to a number of insults which may alter cord morphology, diminish cord blood flow, and ultimately compromise fetal nutrition.

Amniotic band syndrome is a congenital disorder caused by entrapment of fetal parts (usually a limb or digits) or umbilical cord in fibrous amniotic bands while in utero. There are several theories as to the cause of amniotic band syndrome. The most widely accepted theory is rupture of the amnion occurring early in gestation. The fibrous bands of amnion that occur from the amniotic rupture encircle the limbs, resulting in tourniquet-like defects and intrauterine amputations. If this band constricts the umbilical cord, then it can be life threatening for the fetus, which was seen in this case. The timing of the rupture is believed to occur between 28 days after conception and 18 weeks of gestation. However, late bands can occur and present at birth with multiple abnormalities of the limbs, even when an ultrasonography done at an earlier gestation was normal. Amniotic band syndrome is considered an accidental event and not genetic or hereditary, so the likelihood of it occurring in another pregnancy is remote. Possible causes of the postulated amniotic rupture are amniocentesis and fetal blood sampling. In this case, no such procedures were done. The cause of amnion tearing was unknown in this case as there were no antecedent events or procedures done. Amniotic band syndrome is often difficult to detect before birth as the individual strands are difficult to see on ultrasound. The bands are more often diagnosed by the effect that they have on the fetal anatomy. 3D ultrasound and MRI can be used for more detailed and accurate diagnosis of bands resulting damage to the fetus. Ultrasound identification of amniotic band syndrome affecting the umbilical cord may be an indication for foetoscopic surgical intervention. Unfortunately, in this case, the amniotic band could not be diagnosed during pregnancy. Only rare cases of strangulation of umbilical cord by amniotic band have been described in the literature [2], and in most of the cases, the outcome was intrauterine fetal death. Kanayama et al. [3] described the reversal of diastolic flow observed in a fetus with umbilical cord constriction due to amniotic bands. It is in cases like these that foetoscopic lysis of amniotic bands can be lifesaving [4].

Conclusion

Constriction of the umbilical cord by amniotic band is a very rare but a definite entity which obstetricians should keep in mind while evaluating the cause of sudden intrauterine fetal death. In future, we must try to develop better and sensitive imaging techniques and modalities to diagnose the amniotic band so that timely intervention like

foetoscopic excision can be carried out at specialized centers to salvage at risk pregnancies.

Conflict of interest Nil

Compliance with ethical requirements Parents of the case gave consent for publishing photograph, clinical history and management of the same and were assured that anonymity will be preserved.

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