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Case Report

Velamentous cord insertion with low-lying placenta and fetal growth restriction in a singleton pregnancy: a case report

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ABSTRACT

Velamentous insertion is where the umbilical cord does not insert into the placenta- but rather into the membranes, where the umbilical arteries and vein traverse the membranes along the uterine wall unprotected by Wharton jelly before entering the placental margin which in turn causes various complications. This renders vessels vulnerable to compression and rupture leading to adverse outcomes such as Fetal Growth Restriction, preterm delivery, abnormal fetal heart rate patterns and perinatal morbidity. A 29-year-old primi, 38 weeks 1 day, GDM on OHA, with low lying Placenta with Velamentous cord insertion complicated with FGR with normal Doppler was taken up for Elective Caesarean section and a baby of 1.8 kg was delivered. Gross examination showed a cord away from placenta running through the membranes. There is a correlation between cord insertion and higher incidence of FGR and cesarean deliveries. Velamentous insertion of cord is taken as a high -risk pregnancy and enhanced care should be provided. Systematic evaluation of placental cord insertion during routine scans is vital for early recognition and improved perinatal prognosis and to prevent complications like FGR, IUFD, massive hemorrhage.

Keywords: Velamentous cord insertion, Fetal growth restriction, Low lying placenta

INTRODUCTION

The cord normally inserts centrally into the placental disc, but eccentric, marginal, or velamentous insertions are variants. Of these, eccentric insertions in general pose, no identifiable fetal risk. Marginal insertion is a common variant - sometimes referred to as a battledore placenta, in which the cord anchors at the placental margin. With velamentous insertion, the umbilical vessels characteristically travel within the membranes before reaching the placental margin. The incidence of velamentous insertion approximates 1 percent but is 6 percent with twins. It is more commonly seen with placenta previa.

Antenatal diagnosis is possible sonographically, and cord vessels are seen traveling along the uterine wall before

entering the placental disc. Clinically, vessels are vulnerable to compression and trauma which may lead to fetal hypoperfusion and acidemia. Higher associated rates of low Apgar scores, stillbirth, preterm delivery, FGR, small for gestational age and abnormal heart rate patterns have been noted.¹

Higher rate of perinatal mortality is noted and there is a rise in incidence of pre-eclampsia, placenta previa and abruption. Accordingly, monitoring of fetal growth is reasonable either clinically or sonographically as a method of improving perinatal care.² Last, with the rare furcate insertion, umbilical vessels branch and separate and lose their protective Wharton jelly shortly before they insert. As a result, they are covered only by an amnion sheath and prone to compression, twisting, and thrombosis.

CASE REPORT

A 29-year-old primi, booked and immunized, was diagnosed to have low lying placenta in NT scan and was followed up and even in Anomaly scan the placenta was found to be low lying reaching up to the internal os. At routine OGTT she was diagnosed as GDM and subsequently started on OHA. At 31 weeks she was diagnosed to have dynamic cervix with velamentous insertion of cord for which she was admitted and managed conservatively. Serial scans were done for growth monitoring and was found to have FGR and was kept in close monitoring. At 37 weeks she was admitted with stage 1 FGR and oligohydramnios. MRI was done to confirm the findings of velamentous insertion and rule out placenta accreta spectrum.

She was taken up for Elective LSCS in view of Placenta Previa with Velamentous insertion of cord with FGR. An elective LSCS was done at 38 weeks and 3 days. She delivered an alive female baby of weight 1.88 kg with APGAR of 8/10, 9/10. Placenta was anterior, low lying up to the internal os and placental bed had minimal bleeding and hemostasis was achieved. There was no PPH and blood loss was approximately around 500 ml. Placenta was examined and was found to have Velamentous insertion of cord as shown in the figure below. Patient was treated postoperatively with antibiotics and analgesics. Baby was given to mother in the immediate postpartum period. On POD 1 catheter was removed. Post op Hb was 10 g / dl. On POD 3 dressing was removed and she was discharged on POD 5.

DISCUSSION

A Velamentous insertion of cord is a variant which has a considerable clinical importance. In velamentous insertion, the umbilical vessels characteristically travel within the membranes before reaching the placental margin.³ The cord vessels are vulnerable to compression which leads to fetal hypoperfusion and fetal acidemia and which in turn leads to growth restriction and increased fetal morbidity. There is an increased incidence of SGA, FGR, Doppler abnormalities, and even IUFD. The incidence of velamentous insertion approximates 1 percent.

The mechanism of abnormal cord insertion and placental migration remains unclear. One of the theories is trophotropism. The concept of “trophotropism” has been introduced to explain the preferential development of the placental tissue at sites for optimal uterine perfusion, and more or less distant from the original implantation site.⁴ Abnormal cord insertion was associated with an increased risk of other placental conditions such as placental abruption, placenta previa, pre-eclampsia and intrauterine growth restriction. It suggests shared genetic and environmental mechanisms associated with altered implantation, migration, invasion and transformation of the spiral arterioles and the natural tendency of placenta to migrate towards area of uterus with better blood supply.

There is ultimate need for the diagnosis of placental position and the cord insertion into placenta to reduce the complications arising due to that.⁵ Case studies resulted in the findings that early diagnosis of velamentous cord insertion in the prenatal period, especially in the second trimester of pregnancy, can significantly reduce labor complications of VCI placental pathology.^{6,7} The present case illustrates the association of VCI with FGR and poor neonatal outcome, consistent with findings from large cohort studies such as Matsuzaki S et al who reported increased risks of low birth weight, emergency cesarean section, and perinatal mortality in affected pregnancies.⁸

The risk of pre-eclampsia, preterm birth and delivery by emergency caesarean was doubled, as was the risk of low Apgar score, NICU admissions, low birthweight and malformations. For velamentous insertion the risk of perinatal death at term was tripled. The present population-based study found prevalence rates of 1.5% for velamentous cord insertions, respectively, in singleton pregnancies, and higher rates in multiple pregnancies.

Pregnant women with VCI face increased risks of preterm delivery, low birth weight, and small-for-gestational age compared to those with normal cord insertion, based on a 10-year observational study involving 501 cases of VCI and 59,976 normal cord insertions. The findings indicate a moderate risk of preterm birth, fetal growth retardation, and perinatal mortality associated with VCI.⁹ Abnormal insertion of the cord triples the risk of perinatal death at term, which may justify an increased focus during pregnancy to identify this condition in order to provide better antenatal care for the care provided at term.



Figure 1: Figure showing low lying placenta with velamentous insertion.



Figure 2: Velamentous insertion clinical picture.



Figure 3: Figure showing MRI of the velamentous insertion.



Figure 4: Figure showing low lying placenta.

CONCLUSION

Velamentous cord insertion is an important placental abnormality associated with adverse perinatal outcomes, including fetal growth restriction and low birth weight.

This case highlights its coexistence with a low-lying placenta and fetal growth restriction in a singleton pregnancy, emphasizing the importance of systematic assessment of placental cord insertion during antenatal ultrasonography. Early recognition, serial fetal growth assessment, appropriate fetal surveillance, and individualized timing and mode of delivery are essential to optimize maternal and neonatal outcomes. A high index of suspicion and a multidisciplinary approach can facilitate timely intervention and help minimize potential complications associated with this condition.

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