BCW MFM Guideline:

ABNORMAL PLACENTAL CORD INSERTION IN SINGLETON PREGNANCIES

Definition:

Marginal: No consistent definition in the literature. Either < 3 cm from placental edge or < 2 cm from placental edge. Historically, BCWH has used < 2 cm from placental edge.

Velamentous: Umbilical vessels insert and run within the amniotic membranes, unprotected by Wharton’s jelly, before entering the placenta.

Incidence:

Marginal: Singleton 6.3%; Multiples 11%

Velamentous: Singleton 1.5%; Multiples 6%

Risk Factors:

AMA, Nulliparous, ART, Smoking, Multiples, Female fetus, 1st/2nd T APH, maternal asthma, maternal pre-existing hypertension, maternal pre-existing diabetes, maternal BMI ≥ 35.0, placenta previa.

Pathophysiology:

Anomalous placenta/ cord/ membrane development may be due to a common underlying mechanism given associations with similar adverse outcomes. Trophotropism theory is that over time, the placenta expands into the more richly vascularized areas and shrinks from the less perfused areas.

Possible mechanisms for adverse perinatal/maternal outcomes are:

1) Impaired maternofetal exchange due to decreased placental surface.
2) Unprotected vessels undergo more compression/trauma.
3) Umbilical compression leads to decreased fetal cardiac output and also increases pulmonary neonatal complications.
4) Abnormal anchoring is believed to lead to delayed placental detachment increasing postpartum hemorrhage risk.

Diagnosis

Hasegawa et al 2005 demonstrated the ability to identify the placental cord insertion on prenatal ultrasound in 97.7% of cases at the time of the detailed anatomy scan (18-22 wks). Velamentous cord insertion had a sensitivity of 62.5%, specificity of 100%, positive predictive value 100% and negative predictive value of 99.6%. Marginal cord insertion had a sensitivity of 72%, specificity of 99.9%, positive predictive value of 89% and negative predictive value of 99.7%.
Liu et al 2002 suggested a 360 degree view of the placental cord insertion (PCI) to identify a marginal insertion. The cord vessels were identified entering placental parenchyma and not just lying adjacent to the placenta to avoid confusion with a free loop of cord. The cord was then followed back into the amniotic cavity to avoid confusion with chorionic plate vessels. Color and power Doppler sonography were used freely as adjuncts to gray scale. Maternal position was varied as required. If the PCI was not located readily, the entire placental surface was scanned to locate it. All low-lying, bipartite or succinturiate lobed placentas were scanned with color and power Doppler (transabdominal or transvaginal as indicated) to rule out a vasa previa.

Hasegawa et al in 2009 suggested for a velamentous cord insertion, the umbilical vessels are demonstrated to approach the placental parenchyma edge marginally and parallel to the uterine wall. They further observed the PCI was immobile even as the uterus is “shaken” with the vessels diverging as they traverse the membrane. They further suggested that when it is difficult to image the PCI site, one should have a higher index of suspicion for an abnormal PCI. They also promote the use of color/power Doppler as well as a transvaginal scan to rule out vasa previa when the PCI is on the lower edge of the placenta, especially in those with risk factors for vasa previa.

Padula et al in 2016 found that PCI visualization was most successful prior to 23 weeks gestation and decreased in success with advancing gestational age and posterior placenta location.

Outcomes:

Marginal:

| Outcome                              | OR   | | Outcome                              | OR   |
|--------------------------------------|------| |--------------------------------------|------|
| PPROM                                | 1.1  | Oligohydramnios                  | 1.2  |
| Fetal anomalies                      | 1.1  | PROM                              | 1.2  |
| PPH                                  | 1.1  | Preterm birth                     | 1.5  |
| Manual removal of placenta           | 1.1  | Pre-eclampsia                     | 1.5  |
| NICU admission                       | 1.3  | Abruption                         | 1.5  |
| Small for gestational age            | 1.2  |                                  |      |

Not statistically significant – polyhydramnios, complicated variable decelerations, assisted vaginal delivery, emergency csection, postpartum D&C, perinatal mortality, low apgar.

Velamentous:

| Outcome                              | OR   | | Outcome                              | OR   |
|--------------------------------------|------| |--------------------------------------|------|
| PPROM                                | 2.4  | PROM                              | 1.5  |
| PTB                                  | 1.95 | Pre-eclampsia                     | 1.5  |
| Abruption                            | 2.0  | Polyhydramnios                    | 1.6  |
| Fetal anomalies                      | 1.6  | Complicated variable decels       | 2.6  |
| Assisted vaginal delivery            | 2.6  | PPH                               | 1.6-2.0 |
| Manual removal placenta              | 5.1  | Postpartum D&C                    | 3.2  |
| NICU admission                       | 1.8  | Perinatal mortality               | 2.15 |
| Low apgars (< 7 at 5 min)            | 1.96 | Small for gestational age         | 1.9  |

Not statistically significant – emergency csection

Author: LDahlgren; approved at BCW MFM Combo meeting December 2017
**Management:**

**Marginal:**

No clear evidence to support a change in pregnancy management given low risk of complications.

Consider a follow-up ultrasound at 30-32 weeks gestation if the cord insertion is \( \leq 5 \text{ mm} \) from the placental edge as Hasegawa et al in 2005 demonstrated that 6.3% of those were found to be velamentous at delivery.

**Velamentous:**

Transvaginal ultrasound to rule out vasa previa if placental cord insertion is located at lower edge of placenta.

Ultrasound for fetal growth at 30-32 weeks. If suspected IUGR, fetal surveillance as per IUGR protocol.

Continuous electronic fetal monitoring during labour.

Cautious cord traction during the 3\(^{rd}\) stage of labour due to increased chance of manual removal of the placenta (OR 5.1).
References


VELAMENTOUS CORD INSERTION

Placental cord insertion on low edge of placenta

EV scan to rule out vasa previa

If vasa previa identified, refer to OB/MFM and manage accordingly

Placental cord insertion on upper edge of placenta

No vasa previa

Growth at 30-32 weeks gestation

AC < 10th centile at 30-32 weeks GA

Fetal surveillance and delivery as per IUGR protocol
Continuous EFM in labour
Caution with cord traction during 3rd stage labour

AC >= 10th centile at 30-32 weeks GA

Routine prenatal care and delivery
Continuous EFM in labour
Caution with cord traction during 3rd stage of labour
MARGINAL PLACENTAL CORD INSERTION

Placental CI 6-19 mm from edge

- Reassure patient.
- No further management.
- Document on chart for 3rd stage purposes.

Placental CI 0-5 mm from edge

- Ultrasound at 30-32 weeks to reassess placental cord insertion.

30-32 week scan still demonstrates marginal cord insertion.

30-32 week scan now demonstrates velamentous cord insertion

REFER TO VELAMENTOUS PROTOCOL

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