

## **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, 1<sup>st</sup>/2<sup>nd</sup> 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 succinuriate 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:

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

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

Velamentous:

PPROM	OR 2.4	PROM	OR 1.5
PTB	OR 1.95	Pre-eclampsia	OR 1.5
Abruption	OR 2.0	Polyhydramnios	OR 1.6
Fetal anomalies	OR 1.6	Complicated variable decels	OR 2-6
Assisted vaginal delivery	OR 2-6	PPH	OR 1.6-2.0
Manual removal placenta	OR 5.1	Postpartum D&C	OR 3.2
NICU admission	OR 1.8	Perinatal mortality	OR 2.15
Low apgars (< 7 at 5 min)	OR 1.96	Small for gestational age	OR 1.9

Not statistically significant – emergency csection

**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  $\leq 5$  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<sup>rd</sup> stage of labour due to increased chance of manual removal of the placenta (OR 5.1).

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VELAMENTOUS CORD INSERTION

Placental cord insertion on low edge of placenta

Placental cord insertion on upper edge of placenta

EV scan to rule out vasa previa

Growth at 30-32 weeks gestation

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

No vasa previa

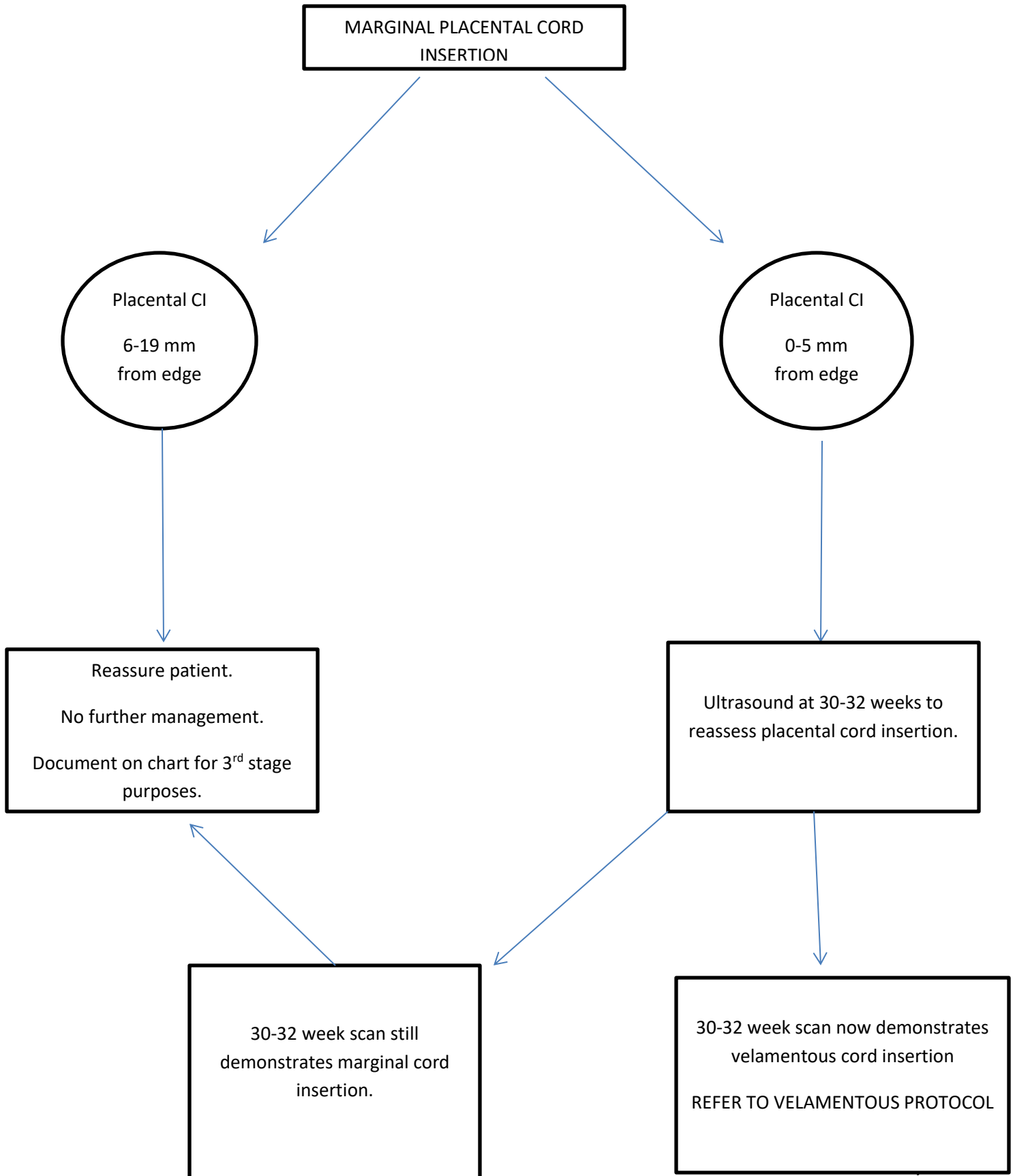
AC < 10<sup>th</sup> centile at 30-32 weeks GA

AC ≥ 10<sup>th</sup> centile at 30-32 weeks GA

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

Routine prenatal care and delivery  
Continuous EFM in labour  
Caution with cord traction during 3<sup>rd</sup> stage of labour

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