

NORTHWEST PERINATAL
CENTER

PERINATAL PROGRESS

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OLIGOHYDRAMNIOS: MEASUREMENT & MANAGEMENT

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Amniotic fluid volume assessment has been an important clinical tool in identifying pregnancies at increased risk for perinatal morbidity and stillbirth. The prevailing paradigm has been that amniotic fluid volume reflects placental function and that decreasing or low amniotic fluid volumes (in the absence of fetal genitourinary anomalies) indicate placental insufficiency. Low amniotic fluid volume or oligohydramnios has been associated with fetal growth restriction, non-reassuring fetal heart tracings, meconium staining, cesarean delivery, low 5-minute Apgar scores and perinatal mortality. Oligohydramnios is defined as the single deepest pocket (SDP) $< 2 \text{ cm}^1$ or an amniotic fluid index (AFI) $< 5 \text{ cm}^2$. Debate continues over the optimal method for the evaluation of amniotic fluid volume.

The AFI provides a “global” assessment of amniotic fluid volume by dividing the uterine compartment into four quadrants. It identifies more at-risk pregnancies with low fluid (higher sensitivity), but has a lower specificity than SDP for predicting perinatal morbidity. In the last decade, several prospective randomized controlled trials have compared the performance of AFI to SDP for predicting poor perinatal outcomes in a variety of clinical scenarios.

In 2003, Morris et al evaluated the ability of these two methods in predicting adverse outcomes in 1,584 uncomplicated postterm pregnancies at 40 weeks or more gestational age.³ Oligohydramnios with an AFI $< 5 \text{ cm}$ was identified in 7.9% of subjects compared with only 1.4% of subjects with an SDP $< 2 \text{ cm}$. Cesarean delivery for fetal distress was more common in the AFI $< 5 \text{ cm}$ group (26%) vs. the SDP $< 2 \text{ cm}$ group (16%), as was a cord pH less than 7.0 (5.1% vs. 1.3%). Although the AFI has improved sensitivity compared to SDP for identifying perinatal complications, overall AFI $< 5 \text{ cm}$ had poor sensitivity for predicting major adverse outcome (28.6%), fetal distress in labor (12%) and admission to intensive care nursery (11.5%).

Similarly, in 2004, Magann and colleagues found that the criterion of AFI of 5 cm or less identified twice as many patients with oligohydramnios than using SDP $< 2 \text{ cm}$ (38% vs. 17%).⁴ In their prospective randomized study comparing the use of AFI or SDP criteria for antepartum biophysical profile assessments of high risk pregnancies, using the AFI $< 5 \text{ cm}$ criterion

resulted in twice as many labor inductions (30% vs. 15%) and cesarean deliveries for fetal distress (13% vs. 7%). Although this study of 537 patients was not adequately powered to compare infrequent adverse outcomes, such as perinatal death, the increased interventions in the AFI group did not result in improved perinatal outcome measures, namely meconium, cord pH less than 7.1, 5-minute Apgar scores less than 7 or admission to intensive care nursery.

In a meta-analysis comparing the two methods (AFI and SDP), there was not a superior method in preventing poor outcomes (ICN admission, 5-minute Apgar score < 7 , meconium staining, umbilical artery pH < 7.1). When AFI was used, more cases of oligohydramnios were diagnosed (RR 2.39) and more women had induction of labor (RR 1.92) and cesarean delivery for fetal distress (RR 1.46). In summary, the use of AFI identifies twice as many cases of oligohydramnios compared to SDP and has been shown to lead to increased obstetric interventions (which have not improved perinatal outcomes) and increased rates for cesarean delivery.

NWP continues to approach the evaluation of amniotic fluid volume after 24 weeks' gestation with AFI measurement to maintain an increased sensitivity, but also takes into account SDP for determining the need for intervention and surveillance.

Due to the concern for increased obstetric intervention without significant difference in perinatal outcomes, in the most recent consensus statement on fetal imaging both SMFM and ACOG have suggested screening with SDP as the preferred mode of evaluating amniotic fluid volume.⁵ NWP continues to approach the evaluation of amniotic fluid volume after 24 weeks' gestation with AFI measurement to maintain an increased sensitivity, but also takes into account SDP for determining the need for intervention and surveillance.

Regardless of the method of amniotic fluid volume assessment, decreased amniotic fluid volume warrants further assessment. Excluding rupture of membranes and fetal urinary tract abnormalities are important initial steps to be performed while assessing placental function. Placental function is commonly affected by maternal comorbidities, such as hypertension, dia

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betes, renal disease, rheumatologic disorders and chronic placental abruption.

GENERAL APPROACH TO OLIGOHYDRAMNIOS OR BORDERLINE AMNIOTIC FLUID VOLUME

We recommend a fetal growth assessment if it has not been performed in the three weeks prior to a diagnosis of oligohydramnios or borderline fluid volume (AFI 5 to 8 cm) as a screen for long-term placental function. Antenatal testing (either biophysical profile and/or non-stress test) should also be performed with oligohydramnios or borderline low fluid volume and repeat assessments of amniotic fluid volume with antenatal testing weekly should be conducted until there has been normalization of amniotic fluid on two consecutive assessments. If fetal growth restriction (estimated fetal weight < 10th percentile) is present, twice weekly antenatal testing and weekly umbilical cord artery Dopplers should be performed and MFM consultation considered to develop a long-term plan for surveillance and delivery timing. Maternal oral hydration has also been shown to improve or correct low amniotic fluid volumes and should be considered during an initial evaluation.

Isolated oligohydramnios (AFI <5.0 cm)

In the absence of other pregnancy complications, such as hypertension, diabetes, congenital anomalies, fetal growth restriction or preterm premature rupture of membranes, uncertainty remains regarding the optimal timing of delivery for isolated oligohydramnios. A few studies have attempted to address the risk of expectant management and delivery timing in preterm isolated oligohydramnios, which occurs in 0.5% to 0.8% of pregnancies.

In 2011, Melamed and colleagues compared outcomes for women with isolated oligohydramnios prior to 37 weeks that were actively managed (delivery) vs. expectantly managed (close surveillance with antenatal testing), and also compared outcomes of both study groups to matched controls with normal amniotic fluid.⁶ They confirmed that isolated oligohydramnios led to more interventions with a higher induction rate (50% vs. 9.6% in normal controls), higher cesarean delivery rate (47% vs. 17%) and higher rates of failed induction and non-reassuring intrapartum fetal status. In the expectantly managed cases of isolated oligohydramnios, nearly 10% of subjects had normalization of amniotic fluid. Additionally, there was a much lower cesarean delivery rate (16.7% vs. 59% in actively managed group) and advanced gestational age (38.9 weeks vs. 36.7 weeks) with no differences in neonatal outcomes.

Given the increased rate of cesarean delivery without improvement in neonatal outcomes associated with immediate delivery in the late preterm or early term setting, consideration should be given to expectant management.

Oligohydramnios less than 36 weeks' gestation

For pregnancies affected by oligohydramnios *with an SDP < 2.0 cm*, MFM consultation should be considered to develop an individualized care plan. In pregnancies affected by oligohydramnios *with an SDP > 2.0 cm*, weekly BPP (or NST/AFI) until normalization of AFI is appropriate.

Oligohydramnios after 36 weeks' gestation

Pregnancies complicated by oligohydramnios at 36 weeks' gestation or beyond with a favorable cervix, prior deliveries or obstetric indications for cesarean may not benefit from expectant management, but still may pursue expectant management with reassuring antenatal testing to avoid potential complications of early term birth.

In cases of persistent oligohydramnios with SDP < 2.0 cm, we recommend proceeding with delivery. Again, maternal oral hydration may improve or correct oligohydramnios and repeat amniotic fluid assessment 4-6 hours after maternal hydration should be considered prior to delivery.

In cases of persistent oligohydramnios with SDP > 2.0 cm, twice weekly BPP (or NST/AFI) and delivery at 38 weeks' gestation is recommended. Patients pursuing expectant management beyond 38 weeks' gestation (due to declined delivery recommendation or additional risk factors for cesarean delivery, such as an unfavorable cervix or nulliparity) should undergo twice weekly BPP (or NST/AFI) and delivery at 39 weeks' gestation or sooner if SDP becomes < 2.0 cm.

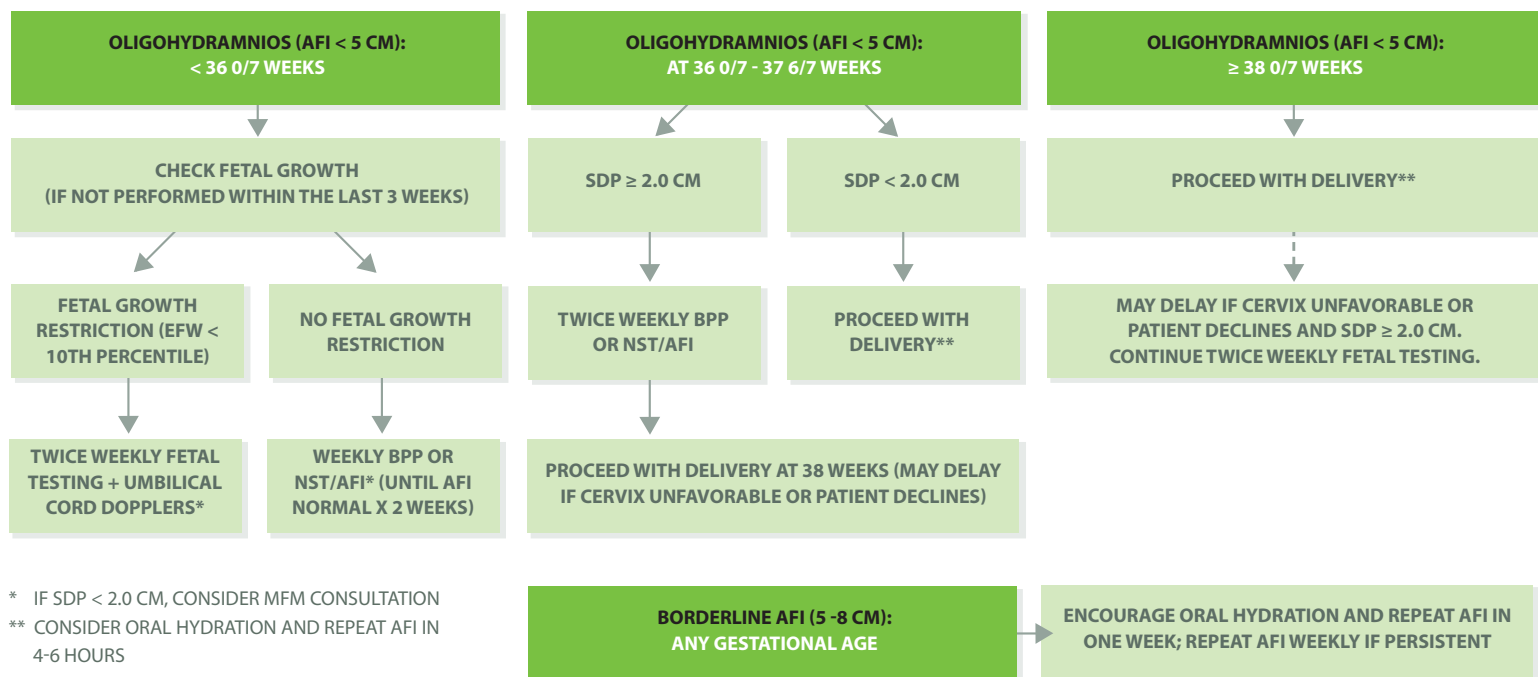
Borderline AFI (5-8 cm)

In pregnancies noted to have a borderline AFI, but not yet meeting criteria for oligohydramnios, a repeat AFI in one week is suggested. If persistent borderline AFI is noted, weekly AFIs should be considered until normalization of AFI or delivery.

In cases of late preterm or early term oligohydramnios with adequate fluid (SDP > 2.0 cm), obstetric intervention has led to increased rates of cesarean delivery without an improvement in neonatal outcomes. Consideration should be given to continued surveillance if fetal testing remains reassuring.

Oligohydramnios, continued...

PROTOCOL FOR MANAGING OLIGOHYDRAMNIOS AND BORDERLINE AFI



* IF SDP < 2.0 CM, CONSIDER MFM CONSULTATION

** CONSIDER ORAL HYDRATION AND REPEAT AFI IN 4-6 HOURS

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OUR AUTHOR...

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Dr. Smrtka was raised in Detroit, Michigan and attended Fordham University in New York City for his undergraduate studies. He completed medical school, residency in Obstetrics and Gynecology, and fellowship in Maternal-Fetal Medicine at Duke University in Durham, North Carolina. While there, he served as Administrative Chief Resident and conducted research in bleeding and clotting disorders in pregnancy and obesity in pregnancy. Dr. Smrtka is a member of the Society for Maternal-Fetal Medicine and the American Congress of Obstetricians and Gynecologists. He is board-certified in Obstetrics and Gynecology and board-eligible in Maternal-Fetal Medicine.



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IN THIS ISSUE:

OLIGOHYDRAMNIOS: MEASUREMENT & MANAGEMENT

Amniotic fluid volume assessment can help to identify pregnancies at increased risk for perinatal morbidity and stillbirth due to placental insufficiency. A new finding of oligohydramnios (amniotic fluid index < 5 cm) warrants further investigation and fetal testing to determine the safety of continuing a pregnancy. Factors affecting delivery timing for isolated oligohydramnios are gestational age, adequacy of fluid volume, likelihood of successful induction, and importantly, reassurance from other fetal testing.



COMING SOON: 'NWP EAST'

We are excited to announce that construction has begun on a second location of Northwest Perinatal Center in 'The Plaza' medical office building adjacent to Providence Portland Medical Center. This will be a full-service high-risk obstetrics and genetics practice staffed by our team of maternal-fetal medicine specialists, genetic counselors and sonographers.

Our target opening is this August, shortly before the Level 2 NICU opens at the medical center. We hope NWP East provides you and your patients with added convenience. Look for additional information in the coming months.

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