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fetologue

FGi RESEARCH INSTITUTE
FETAL AND GYNAE IMAGING

From The Editor's Desk

We are delighted to present this edition of the fetologue on the third trimester ultrasound, a scan done for a wide range of indications between 28 weeks to term. Our attempt here is to standardize the performance of this almost universally done scan to optimize outcomes and care of the fetus. We present an easy to follow, step-wise approach for your reference with the best-available evidence to back it up. We are all together in our commitment to the fetus!

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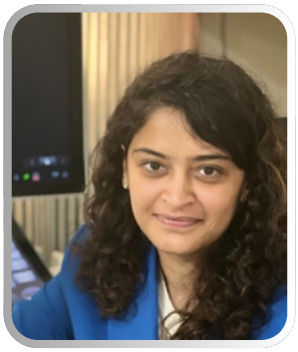

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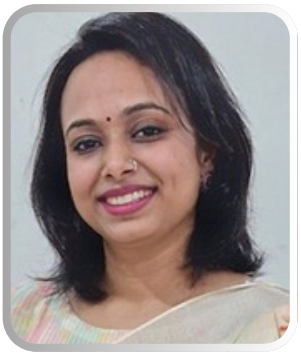

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THE THIRD TRIMESTER ULTRASOUND

The following fetologue provides an outline for a standardized practice with steps to optimize each scan performed in the third trimester. It is presented in two parts.

Part A lays out the assessment of growth and wellbeing while part B provides an approach to the evaluation of fetal anatomy in the 3rd trimester.

A 3T US must be offered in all high-risk pregnancies

1. Pre-pregnancy conditions: Hypertension, Diabetes, Renal disease
2. Prior scans with abnormal findings
3. Preeclampsia
4. Multiple pregnancy
5. H/o bleeding PV, decreased fetal movements
6. Suboptimal maternal weight gain
7. Clinically suspected small fetus

As per International guidelines, all high-risk pregnancies should be offered serial ultrasound assessments of fetal growth and well-being starting from 26–28 weeks' gestation and repeated every 2 - 4 weeks (depending on the indication).

Should a 3T US be offered to all

Universal third trimester scanning is not currently recommended in most guidelines due to insufficient evidence of overall benefit. Routine third trimester scans for all pregnancies may not be cost-effective in low-risk populations, especially in resource-limited settings. Large trials (e.g. the RADIUS and GRIT trials) did not show a significant reduction in perinatal mortality with routine third trimester ultrasound.

When to perform a routine 3T US, if requested

When performed as part of routine care for a low-risk pregnancy, two ultrasound examinations in the third trimester are ideal.

- ✓ Around 32 weeks – Fetal anatomy may be optimally studied due to the presence of sufficient liquor.
- ✓ Around 36 weeks – To screen for fetal growth disorders specifically fetal growth restriction (FGR).

Triad of 3T US

1. Fetal growth & well-being – Biometry, Amniotic fluid, Doppler & biophysical profile
2. Fetal anatomy
3. Fetal environment – Placenta & cervix

Fetal Growth & Well-being

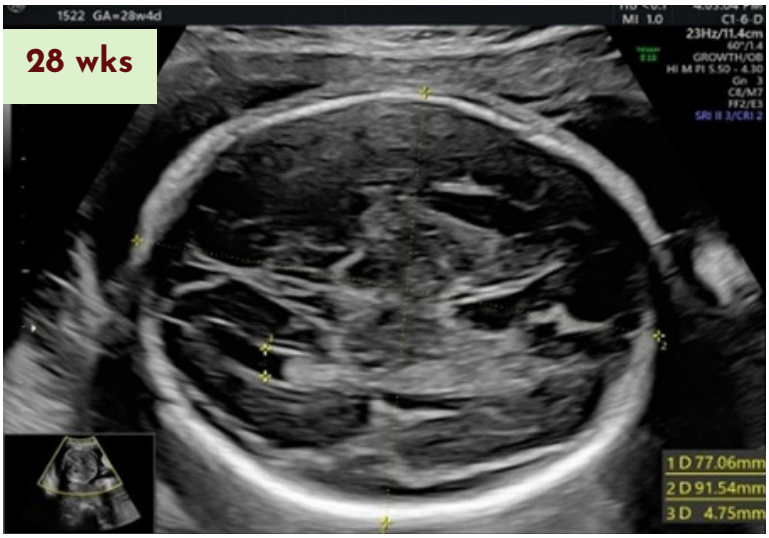
A. Fetal presentation & viability

Note which part of the fetus lies in the lower pole of the uterus. In the third trimester, the normal fetal heart rate (FHR) typically ranges between 110 to 160 beats per minute (bpm).

B. Fetal growth - Perform routine fetal biometry

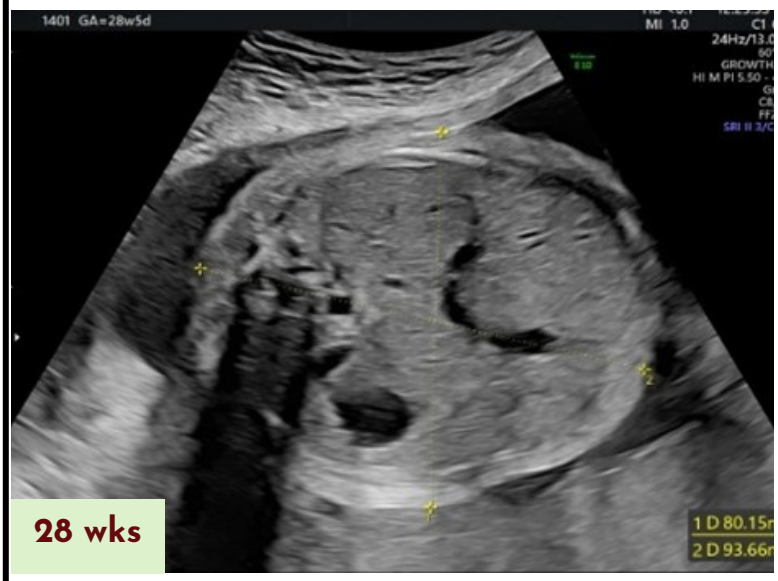
1. Biparietal Diameter (BPD)
2. Head Circumference (HC)
3. Abdominal Circumference (AC)
4. Femur Length (FL)

Technique



Biparietal Diameter (BPD) and Head Circumference (HC)

- Axial plane: Transthalamic/ Transventricular
- Midline falx horizontal, symmetric hemispheres
- Cavum Septi Pellucid (CSP) seen in anterior 1/3rd
- No posterior fossa structures seen
- Callipers: outer to outer/inner, of the cranial bones excluding the scalp

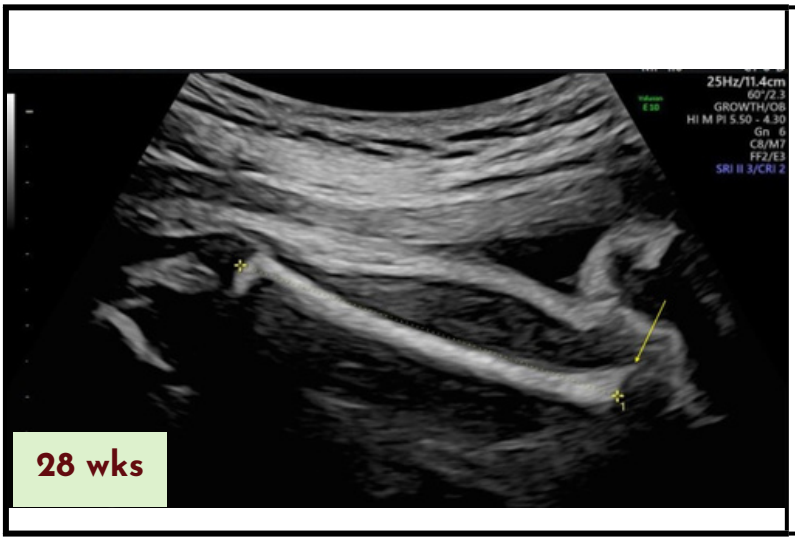


Abdominal Circumference (AC)

- Transverse plane
- Spine at 3 o'clock or 9 o'clock position
- Only midportion of umbilical vein seen
- Stomach bubble seen
- Kidneys not seen
- Measurement includes skin

✅ Round fetal abdomen - elliptical measurement

✅ Oval fetal abdomen - Anteroposterior Abdominal Diameter (APAD) and Transverse Abdominal Diameter (TAD)

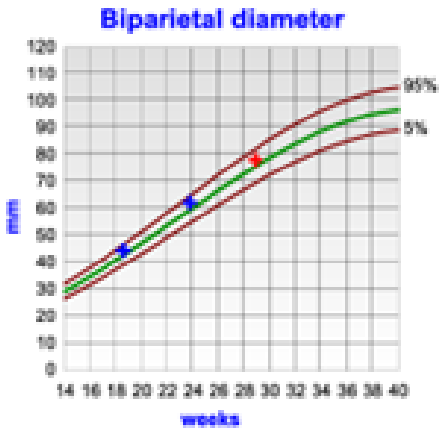


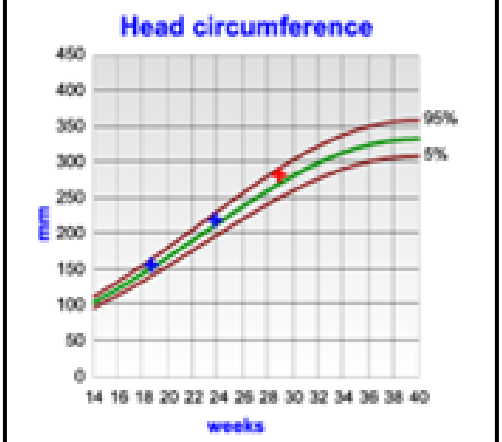
Femur Length (FL)

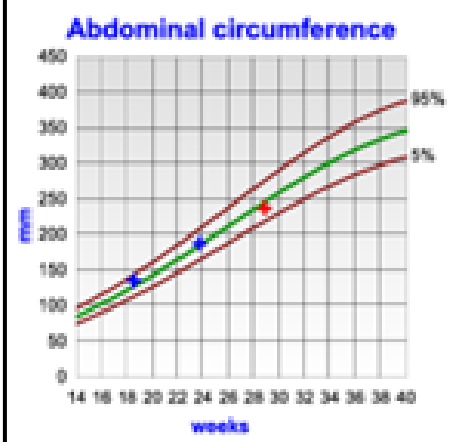
- Femur Length to be measured at approximately 45 degrees to the probe
- Only the ossified diaphysis is measured (exclude epiphyses if seen)
- Exclude triangular spur artefacts (as shown by the arrow)

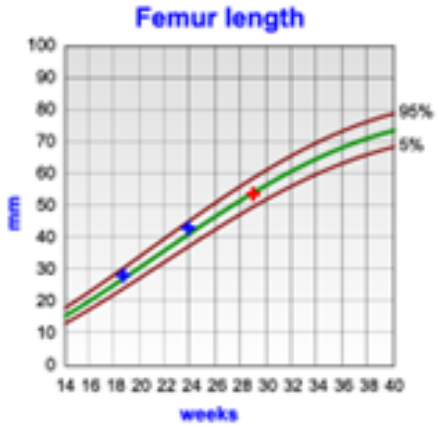
The biometry parameters are plotted against standardized growth charts (e.g. Hadlock, WHO, Intergrowth 21) to **Estimated Fetal Weight (EFW)** and assess growth trends.

The 3T biometry must be compared to the 2T biometry measured during the Anomaly scan to assess the growth trend.









Growth Patterns – Prior to assessment of growth pattern, it's vital to confirm a reliable EDD based on the mother's LMP or early dating scan, whichever has been confirmed. A previously confirmed EDD MUST NOT be reassigned as per the current 3T biometry as this will over or underestimate the fetal growth velocity.

Small for Gestational Age (SGA)	Appropriate for Gestational Age (AGA)	Large for Gestational Age (LGA)
• EFW < 10th percentile • May be constitutionally small or pathologically growth restricted.	EFW between 10th and 90th percentile.	AC/EFW > 90th percentile.

Fetal Growth Restriction (FGR)	Macrosomia
• Pathologic failure to reach growth potential. **Diagnosed when** • AC or EFW < 3rd centile • AC or EFW < 10th percentile or AC/EFW crossing > 2 quartiles (>50% drop between two consecutive measurements)+ signs of placental insufficiency noted on Doppler studies.	Estimated weight > 4,000–4,500 gms regardless of percentile.

Other interpretation of fetal biometry

Parameters	Interpretation
HC and BPD < 5th centile	Constitutional smallness or Microcephaly
HC < 3rd centile or HC < 3 standard deviation from mean	Diagnostic of Microcephaly
BPD < 5th centile, HC normal	Dolicocephaly (often associated with 'non-cephalic' presentation/ oligohydramnios)
HC > 98th centile or HC > 2 standard deviation	Macrocephaly
BPD > 95thcentile, HC normal	Brachycephaly (normal variant / marker for Trisomy 21)

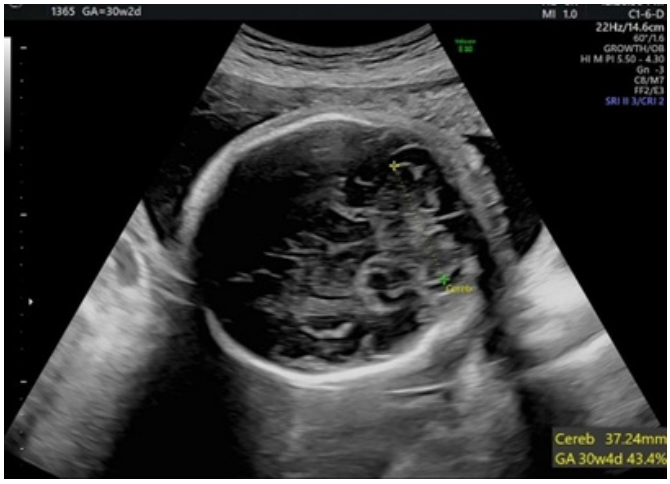
Parameters	Interpretation
FL < 5th percentile	Constitutional smallness/Skeletal Dysplasia/FGR
FL < 3rd percentile plus other features (e.g bowed long bones, polyhydramnios)	Strongly suggests Skeletal Dysplasia

When there is no prior reliable dating

The later in pregnancy, the less accurate the dating.

- First trimester: ±5 – 7 days accuracy (most reliable)
- Second trimester: ±10 – 14 days
- Third trimester: ±21 days

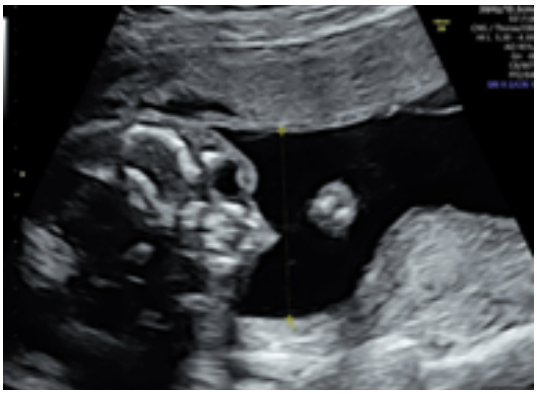
1. Use HC and FL (Hadlock) provided both these measurements fall within the normal centiles
2. Use Transcerebellar Diameter (TCD) in mm: GA in weeks computed by machine software.



TCD is usually the last to be affected in growth disorders. It does not vary with changes in skull shape. TCD shows a linear correlation with gestational age, particularly between 24 to 34 weeks

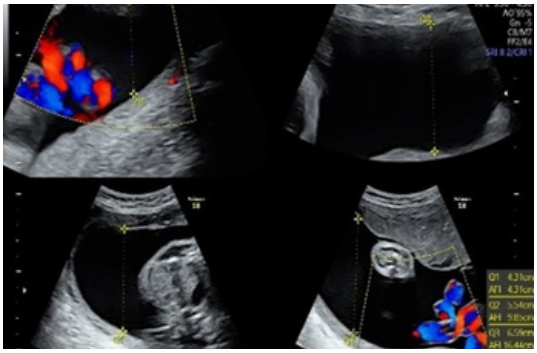
Amniotic Fluid assessment

The amount of amniotic fluid is regulated through a dynamic balance of fetal urine production and swallowing, as well as fluid exchange across the amniotic membranes and fetal respiratory tract.



Deepest Vertical Pocket (DVP)
Single Vertical Pocket (SVP)/
Single Deepest Pocket (SDP)/
Maximum Vertical Pocket (MVP)

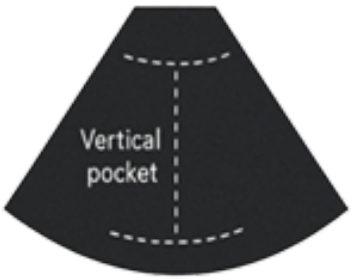
- Measure the largest vertical amniotic fluid pocket that is at least 1 cm wide and is free of fetal parts and umbilical cord
- Preferred for assessing oligohydramnios



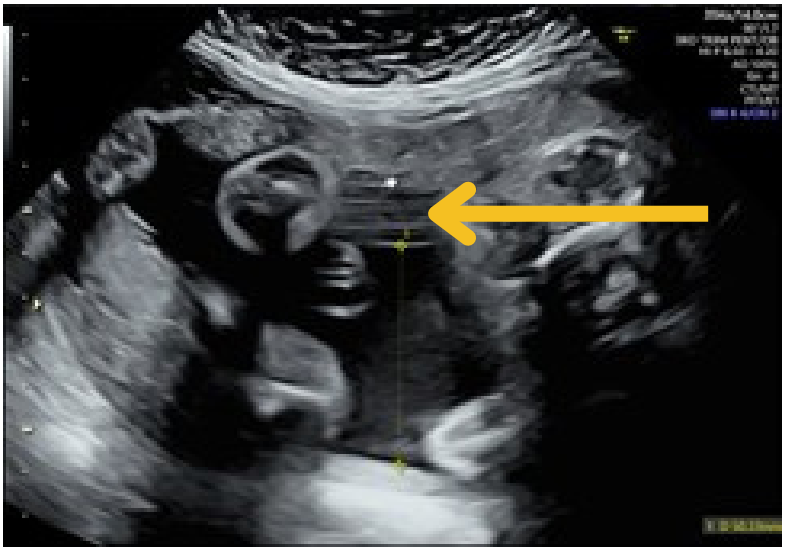
Amniotic Fluid Index (AFI)

For AFI, measure DVP in the 4 quadrants of the uterus that is at least 1 cm wide and is free of fetal parts and umbilical cord, and add the measurements

How to measure

Hold the ultrasound transducer perpendicular to the floor while scanning in the sagittal plane. (parallel to the long axis of the patient's body)	
Identify clear boundaries of the upper and lower edges of the amniotic fluid pocket.	

Note: Minimal transducer pressure on maternal abdomen

	**Reverberation artifact** • Do not mistake it as the border of the liquor pocket. • Reduce gain, to eliminate the same.

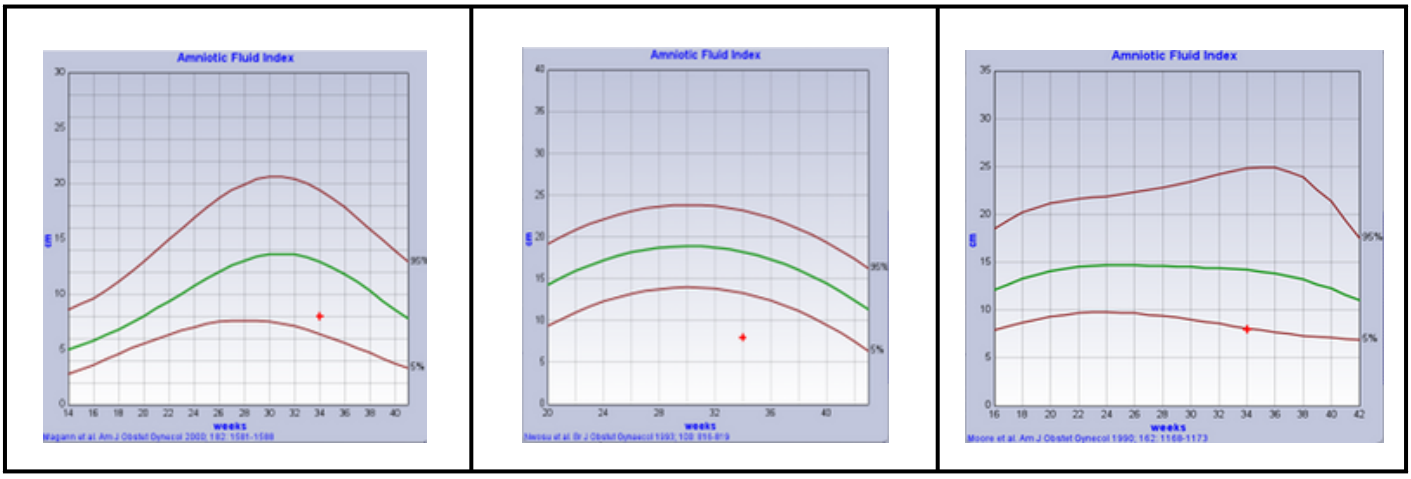
Criteria	Amniotic Fluid Index (AFI)	DVP / SVP
Normal	5- 25 cm	2.0 - 8.0 cm
Oligohydramnios	< 5 cm	< 2 cm
Polyhydramnios	≥ 25 cm	≥ 8 cm

Interpretation of AFI - AF volume depends on the GA of the fetus. In addition, the interpretation may differ based on the chart being used. As an example, AFI of 8 as plotted in chart developed based on the values by Magann et, Nwosu et al and Moore and Cayle is shown below.

The chart developed by Moore and Cayle is the most popular.

AFI at 34 wks	Magann	Nwosu	Moore and Cayle
95th centile	19.0	23..0	25.0
50th centile	13.0	18.0	14.0
5th centile	6.5	13.0	8.0

AFI = 8cm at 34 weeks | Magann et al – normal | Nwosu et al– oligohydramnios | M&C – borderline (5th centile)



Oligohydramnios: Evaluation and Causes

Maternal History:

- Leaking per vaginum
- Chronic Hypertension / Preeclampsia
- Vascular disease
- Thrombophilia
- Intake of drugs:
- NSAIDs
- ACE inhibitors

Fetal urinary system abnormalities:

- Bilateral renal agenesis
- Multicystic or polycystic kidneys
- Lower Urinary Tract Obstruction(LUTO)

Uteroplacental insufficiency:

- Fetal Growth Restriction (FGR) with abnormal Doppler
- Twin-to-Twin Transfusion Syndrome (TTTS)

Idiopathic

- Accounts for approximately 50% of cases in the 3rd trimester

The presence of abnormal umbilical artery Doppler findings in pregnancies complicated by oligohydramnios may indicate a higher risk for adverse perinatal outcomes. However large-scale studies are needed to validate this.

There is insufficient data to recommend therapeutic amnioinfusion.

Polyhydramnios: Evaluation and Causes

Maternal :	Fetal and Placental :	Idiopathic :
• Diabetes	• Large for gestational age (LGA) • Fetal anomalies especially that of the face, neck, kidneys, GI tract, spine, heart and hydrops from any cause • Lack of fetal movements and abnormal positioning of the limbs suggestive of arthrogryposis or neuromuscular genetic condition • Placenta - tumours especially Chorioangioma	• 50-60%

Severity	MVP	Amniotic Fluid Index (AFI)	Incidence
Mild	8-11 cm	25-29.9 cm	70%
Moderate	12-15 cm	30-34.9 cm	20%
Severe	>/= 16 cm	>/= 35 cm	10%

Fetal growth restriction associated with polyhydramnios presents a high risk for an underlying fetal abnormality, including Trisomy 13 or 18.

The underlying risk that a structural or genetic abnormality will be discovered postnatally in a pregnancy associated with apparently idiopathic polyhydramnios ranges from 9% in the neonatal period to as high as 28% when infants were followed up to 1 year of age.

The residual risk that an abnormality would be detected in the immediate neonatal period ranged from 1% with mild polyhydramnios to >10% with severe polyhydramnios.

Management of polyhydramnios

- Mild idiopathic polyhydramnios – Expectant management, with monitoring of cervical length.
- Amnioreduction in select symptomatic or severe cases.
- No evidence-based recommendation for usage of indomethacin for the reduction of amniotic fluid.

Adverse Outcomes due to Oligohydramnios

- Umbilical cord compression
- Meconium aspiration syndrome
- Increased operative deliveries
- Low Apgar score / NICU admission
- Pulmonary hypoplasia

Adverse Outcomes due to Polyhydramnios

- Malpresentation (e.g., breech, transverse lie)
- Preterm labor
- Umbilical cord prolapse
- Uterine atony
- Postpartum hemorrhage

Doppler Monitoring in 3T

Recommendations from professional bodies (ISUOG, ACOG, NICE) on the use of Doppler in 3T US is as follows:

✅ Not recommended for routine use in low-risk pregnancies
- No significant reduction in perinatal mortality
- Potential for unnecessary interventions: False positives can lead to increased anxiety, additional testing, and interventions without clear benefits.

Abnormal Doppler findings in AGA fetus

- Low CPR or abnormal umbilical artery Doppler can identify functional placental insufficiency even in AGA fetuses.
- Current trials and cohort studies suggest an increased risk of adverse outcomes, particularly intrapartum fetal distress and NICU admission, in these cases.
- However, predictive accuracy remains modest, limiting its use as a stand-alone screening tool in the absence of other clinical risk factors.
- Closer surveillance is recommended in AGA fetues with incidental abnormal Doppler findings

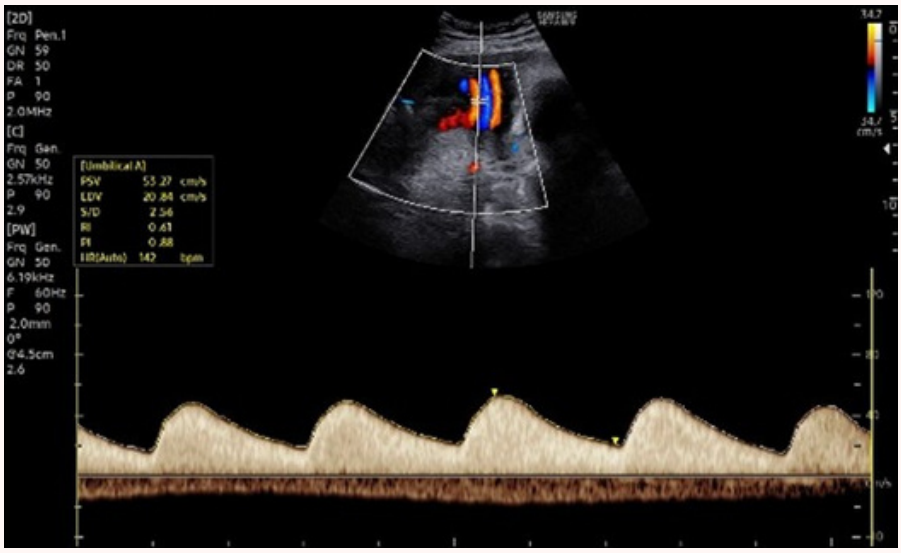
Doppler studies are indicated when risk factors are present.

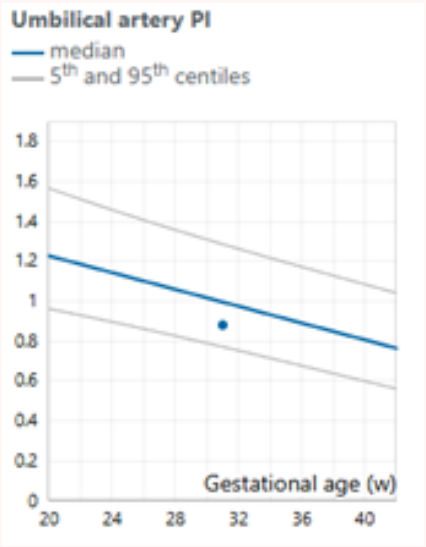
- Fetal Growth Restriction
- Hypertensive disorders
- Diabetes with complications
- Previous history of FGR or stillbirth
- Multiple pregnancy with discordant growth
- Autoimmune or thrombophilia disorders

General principles

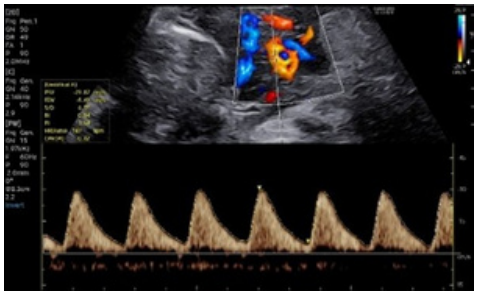
- Avoid during maternal/fetal movements
- Avoid using excessive probe pressure
- Sample angle should be <30° to the direction of blood flow
- Evaluate 3–5 cardiac cycles for each Doppler waveform
- Always interpret in the clinical context
- Serial Doppler studies are more meaningful than single measurement.
- When a measurement is abnormal, ideally it is better to repeat in the next 12– 24 hours
- Ideally, Doppler studies should be reported as Pulsatality Index (PI), absent or reversed flow.
- Abnormal Doppler often precedes changes in biophysical profile or CTG
- Prioritize umbilical artery Doppler for placental resistance
- Use MCA and CPR to detect brain-sparing and fetal adaptation
- Ductus venosus Doppler is used in advanced surveillance (e.g., preterm FGR)

Umbilical Artery (UA) Doppler

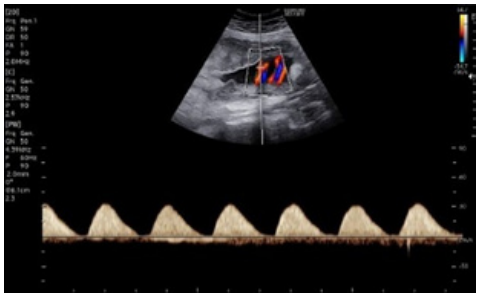




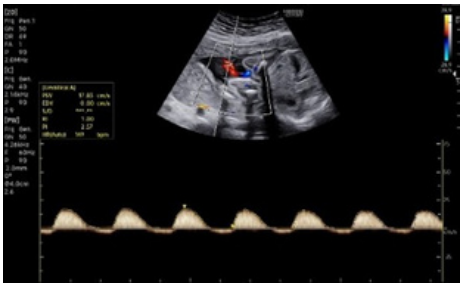
Normal



Increased UA PI> 95th centile

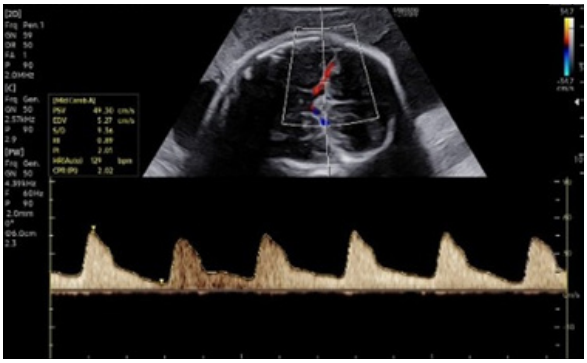


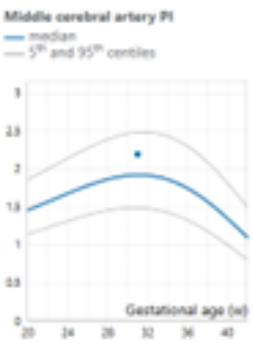
Abnormal: Absent End Diastolic Flow (AEDF)



Abnormal: Reversed End Diastolic Flow (REDF)

Middle Cerebral Artery (MCA) Doppler





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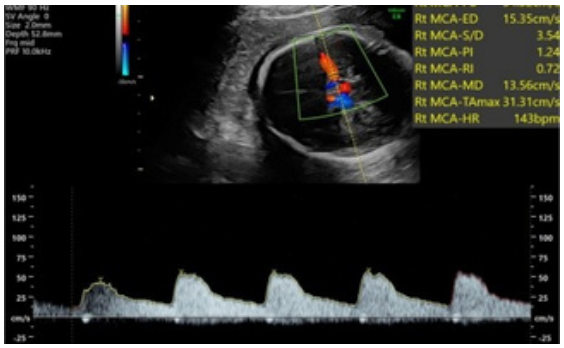
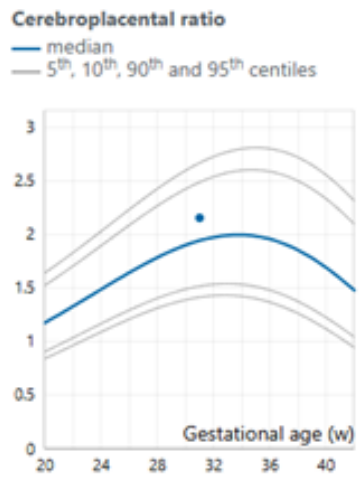


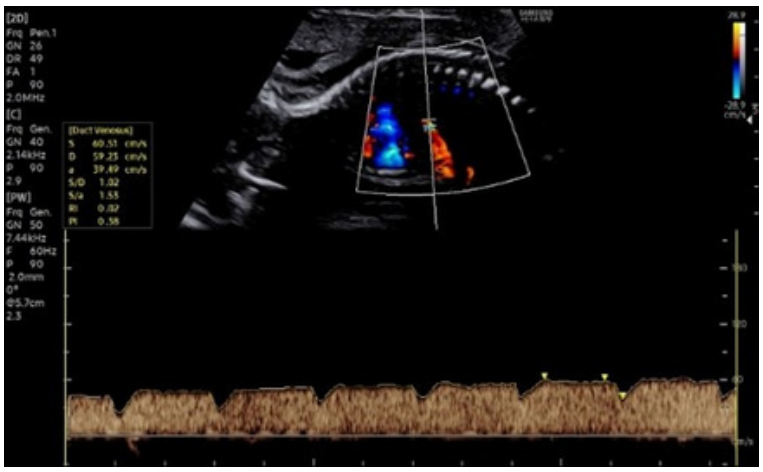
Abnormal: MCA PI < 5th centile

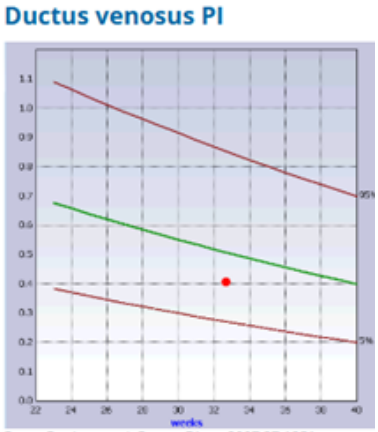
Cerebroplacental Ratio(CPR) CPR = MCA PI / UA PI



- Normal CPR > 1.08
- More sensitive to hypoxia than either index alone.
- Even when MCA and UA PIs are within normal limits CPR may be reduced, indicating early compromise

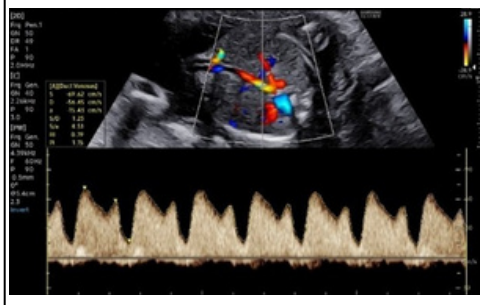
Ductus Venosus (DV) Doppler



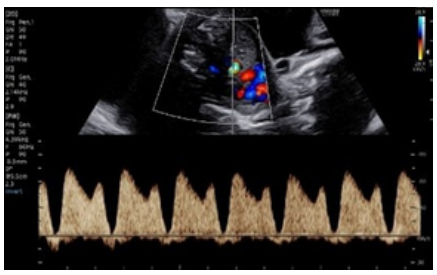


Parra-Cordero et al. Prenat Diagn 2007;27:1251

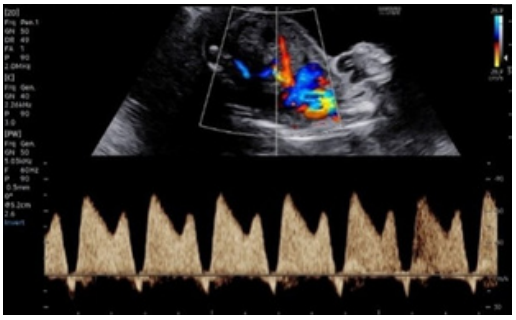
Normal



Abnormal : DV PI > 95th centile

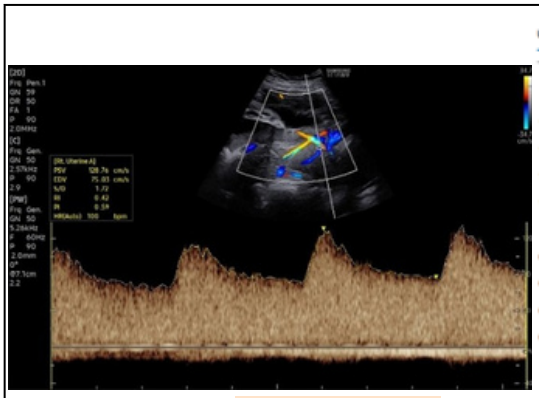


Abnormal: Absent a-wave

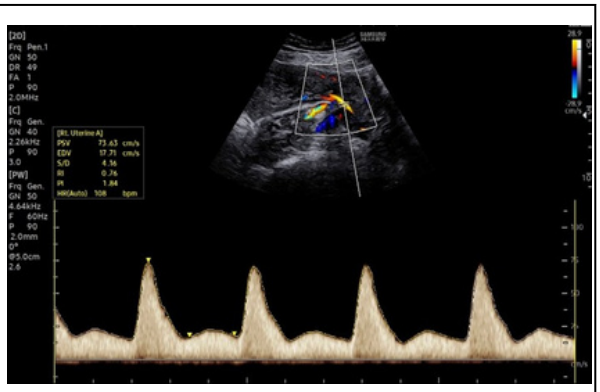


Abnormal: Reversed a-wave

Uterine Artery (Ut A) Doppler



Normal



Abnormal = Ut A PI > 95th centile

Biophysical profile

Components	Normal (2 Points Each)
Fetal Heart Rate	>/= 2 accelerations over 20 minutes (<32 weeks - 10bpm lasting for 10s; >32 weeks - 15bpm lasting for 15 seconds)
Fetal Breathing	At least 30 seconds of sustained breathing movements (including hiccups)
Body movement	Three discrete body or limb movements in 30 minutes
Fetal tone	One or more episodes of active extensions with return to flexion in 30 minutes
Amniotic fluid volume	Single deepest pocket >2 cm

Interpretation of BPP and associated management

BPP
- Normal
- Equivocal
- Abnormal
- Very Abnormal

Score	Perinatal Mortality <1 week without intervention	Management
10/10 (All Parameters - Normal) 8/10 with amniotic fluid MVP>2cm	1/1000	Continue expectant management
8/10 (MVP <2 cm) 6/10 (MVP >2cm)	89/1000 Variable	Repeat BPP within 24 hr
6/10 (MVP <2cm) 4/10	89/1000 91/1000	Evaluate for delivery if persistent
</=2/10	125/1000 600/1000	Deliver

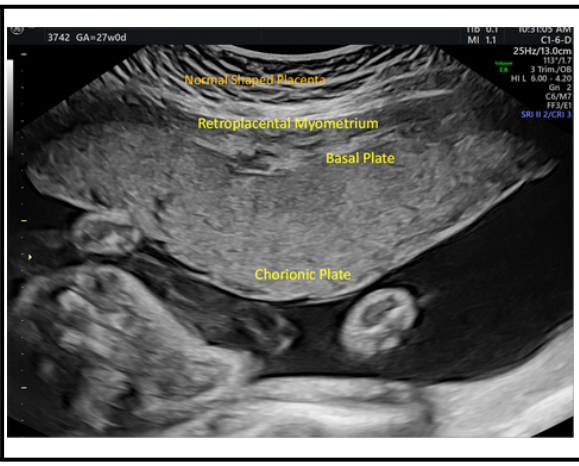
The modified BPP (mBPP) is comprised of fetal heart activity using NST and amniotic fluid index (AFI) or single deepest pocket (SDP). The modified BPP is normal when the NST and amniotic fluid are normal. A nonreactive NST or an abnormal AFI or MVP require further evaluation, typically by a full BPP.

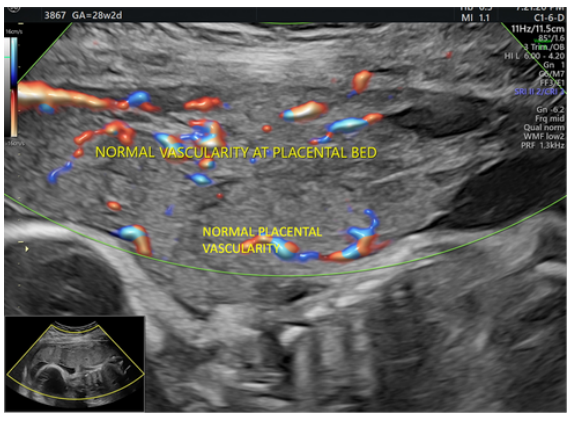
Components	Normal	Abnormal	Follow-up if abnormal
Fetal heart rate testing	Two or more fetal heart rate accelerations during 20 minutes of observation Magnitude of acceleration <32 weeks ; 10 beats/min lasting for 10 seconds >/=32 weeks ; 15 beats/min lasting for 15 seconds	One or no acceleration is noted after 40 minutes of observation	Full 5-component BPP
Amniotic	SDP >2cm/ AFI >8cm before 37 weeks or 5cm thereafter (>37 weeks) or if AFI is within the gestational age cut off	Amniotic fluid does not meet the criteria	Full 5-component BPP

Biophysical profile testing is used mostly in the USA and Canada where it was first developed.

Placenta

Note the following:
- Location
- Shape
- Thickness
- Grade
- Echogenicity

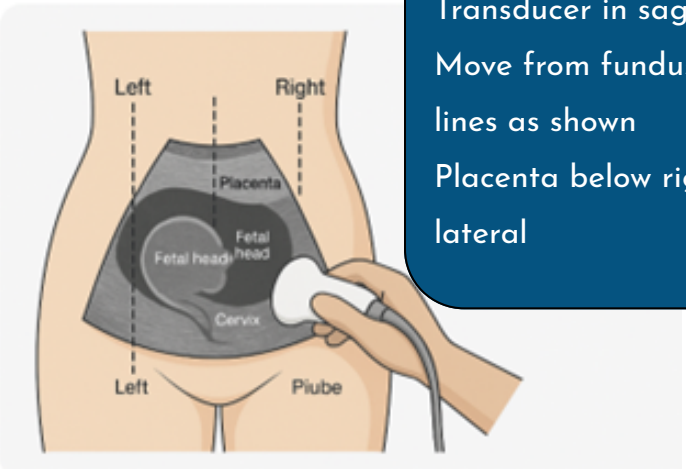




Location

A. Wall of the uterus: Anterior/posterior/lateral (right/left)

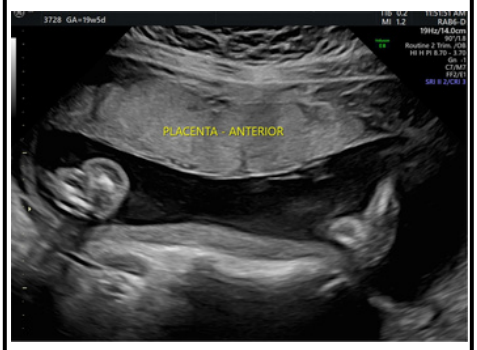
B. Distance of lower edge of the placenta from the internal os



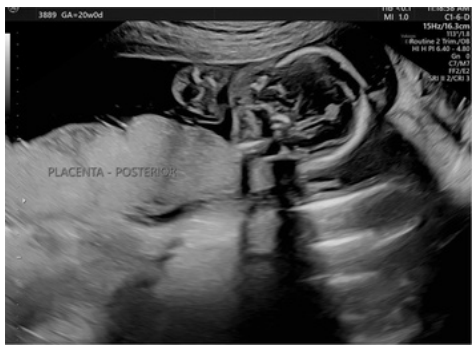
Transducer in sagittal plane
Move from fundus to cervix along three lines as shown
Placenta below right/left line – right /left lateral

On a transverse view of the uterus if > 75% of the placenta (subjective assessment) is on either the right or left side of the uterus, it is termed a lateral placenta.

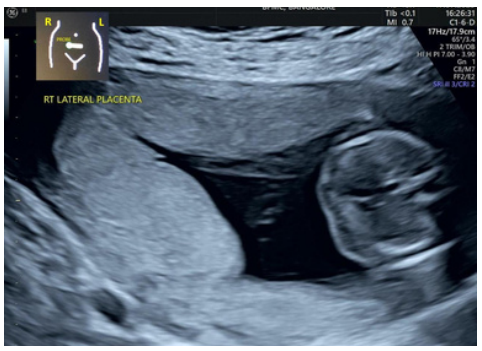
Normal location



Anterior placenta, upper segment



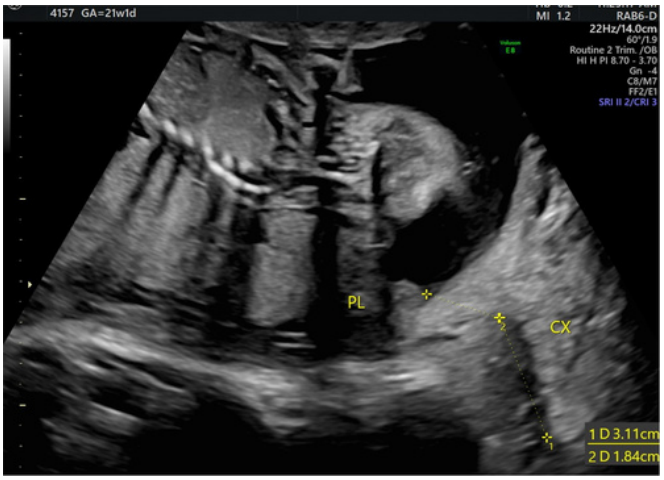
Posterior placenta, upper segment



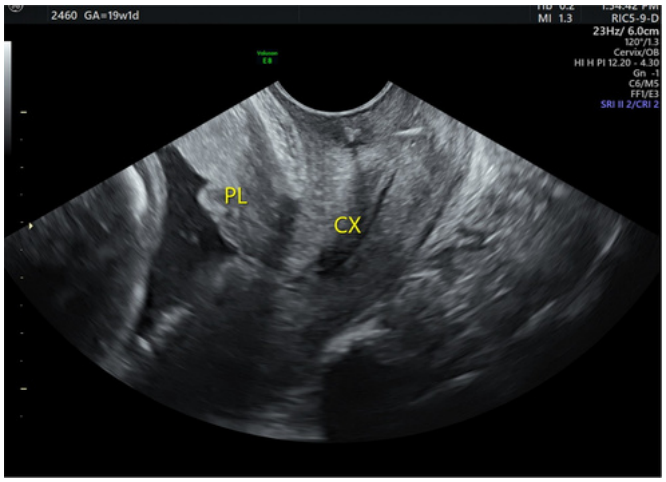
Right lateral placenta

Abnormal location

1. Low lying placenta



Transabdominal



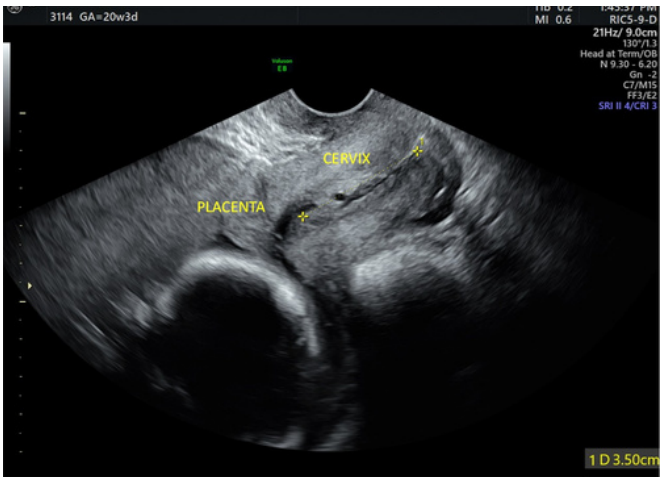
Transvaginal

Low lying placenta:

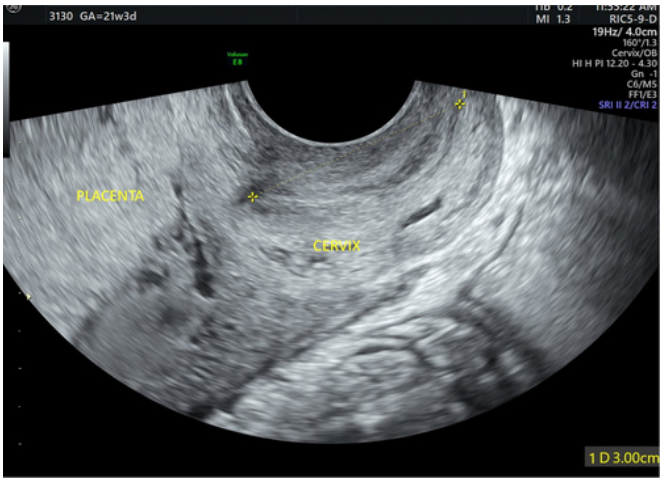
- Distance from the lower edge of the placenta to internal os is < 2 cms

Placenta previa

Placental edge is covering the internal os either partially (placenta covering a closed internal os, but not completely covering a dilated os) or completely (placenta straddling over the internal os)



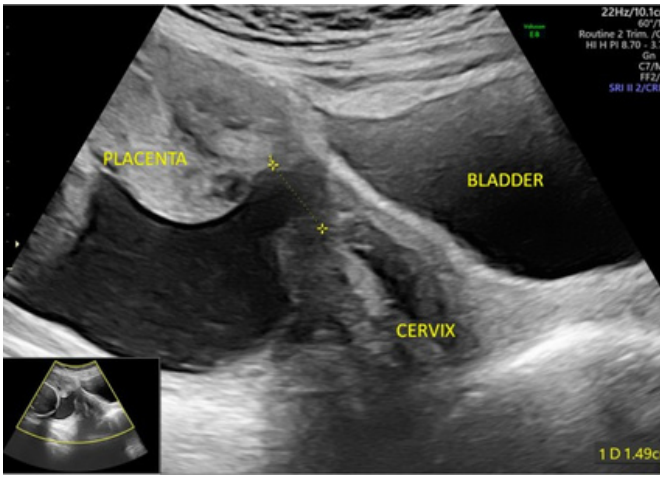
Partial Placenta previa

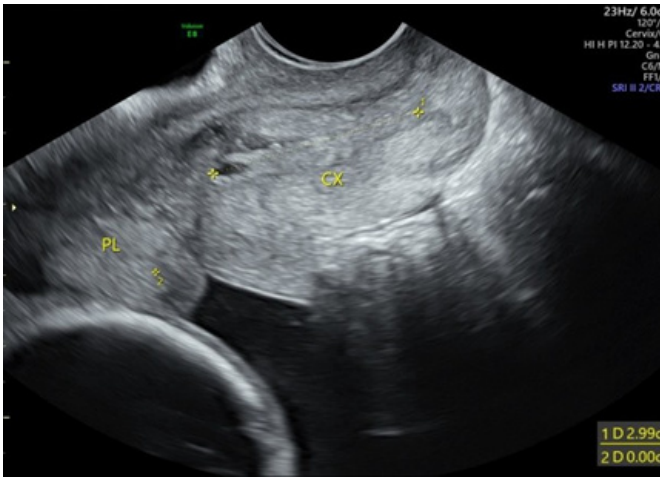


Complete Placenta previa

All low-lying placentas or placenta previa, detected on Transabdominal Sonography (TAS) should be confirmed with Transvaginal Sonography (TVS)

Pitfalls with TAS - Uterine contractions or filled bladder may hinder the localisation of the placenta.





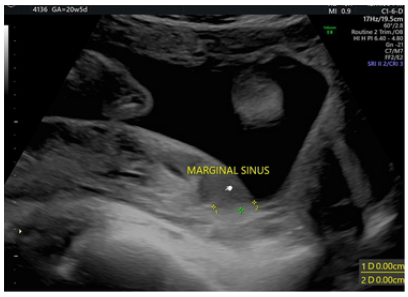
TAS – Placenta 1.5cm away from internal os

TVS – After bladder emptying, placenta covering the internal os

Low lying placenta/placenta previa – What next?

- Look for features of Placenta Accreta Spectrum (PAS)
- Look for vasa previa
- Rescan at 32 weeks – if persistently low lying – reassess at 36 weeks to plan mode of delivery
- Assess invasion of placenta if low lying (rate of invasion is more in anterior than posterior placenta)

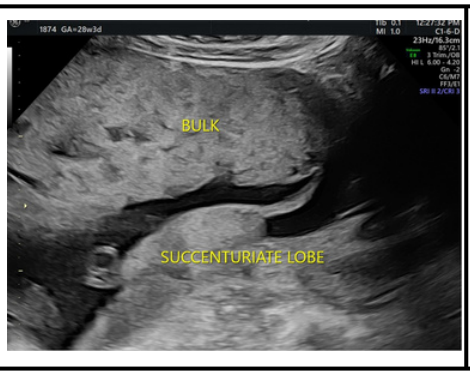
Marginal sinus – Echo-free region with slow blood flow located at the lower margin of the placenta. However, the lower edge of placenta should be measured from the parenchyma (point in figure) to label it as low lying.

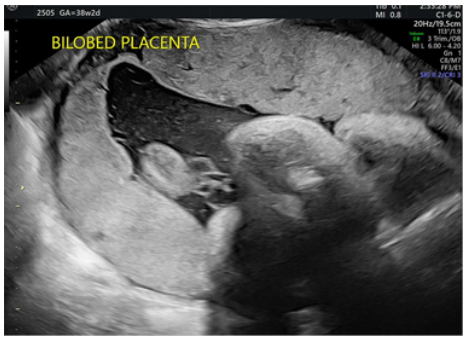


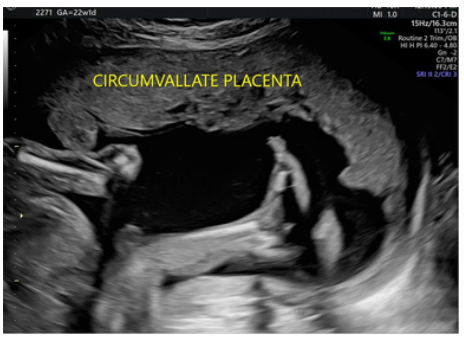
Normal: Single mass showing disk like appearance

Shape of the Placenta

Shape of Placenta	Feature	Significance
Succenturiate/accessory lobe	An additional lobe of placenta, separate from the main bulk	Rupture of connecting vessel Retention of Succenturiate Lobe
Bilobed Placenta	2 similar sized lobes connected by thin bridge of placenta	No known risk
Circumvallate Placenta	Chorionic plate smaller than basal plate with rolled out edges	Placental abruption and hemorrhage



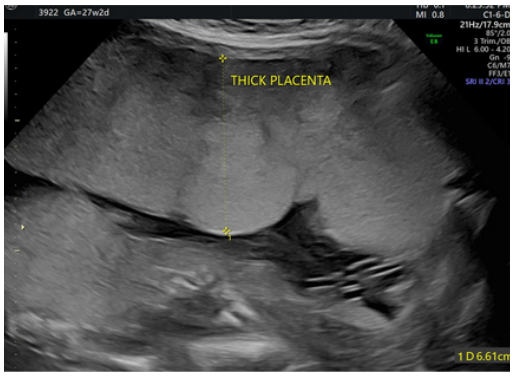




Thickness

This is usually a subjective assessment.

Objective: Normal –< 4cms in the 2nd trimester; > 6 cms in the 3rd trimester

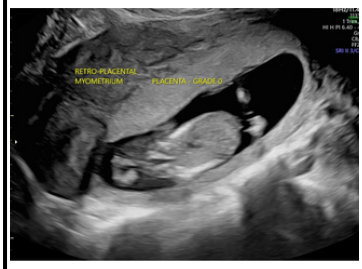


Cause :

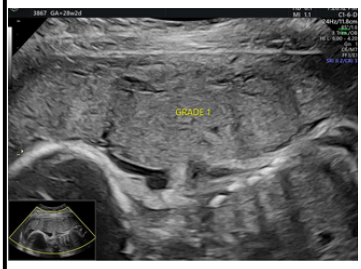
- Maternal Anaemia, Diabetes, Rh Isoimmunization
- Fetal hydrops/ fetal malformations/ aneuploidies
- Placental chorioangioma/ Placental Mesenchymal dysplasia/ Molar pregnancy

Grade

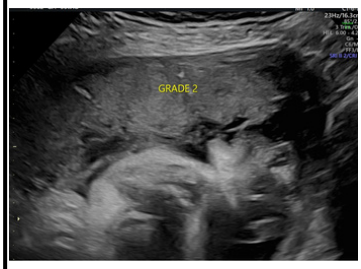
Grade of Placenta	USG Appearance	Gestational Age
Grade 0	Homogenous	First trimester to early second trimester
Grade 1	Mildly echogenic	Mid trimester to early third trimester
Grade 2	Marked indentation, creating comma like densities	Late 3rd trimester
Grade 3	Complete indentation, creating cotyledons	39 weeks till post-term



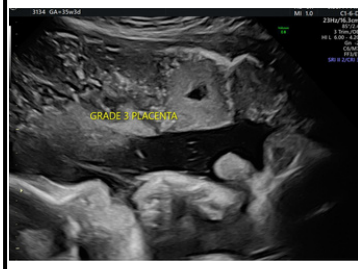
Grade 0



Grade 1



Grade 2

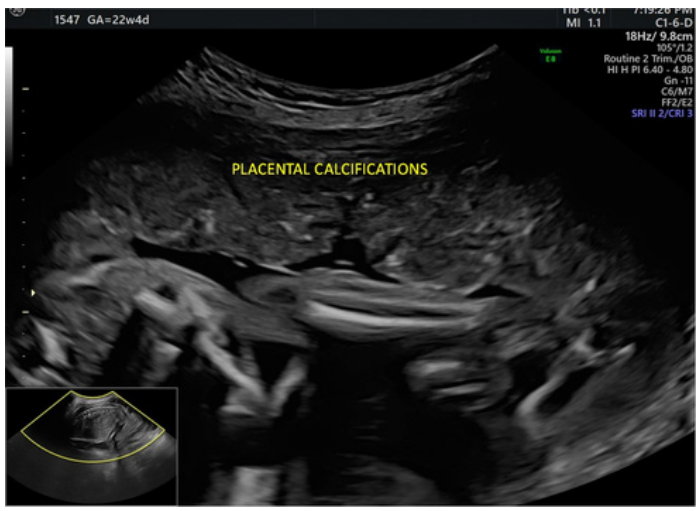


Grade 3

Placental Grading did not show direct association with fetal pulmonary maturity. However, 'mature' appearance of the placenta in early gestation has been postulated to be associated with placental dysfunction.

Echogenicity

May appear homogenous or heterogenous in the third trimester

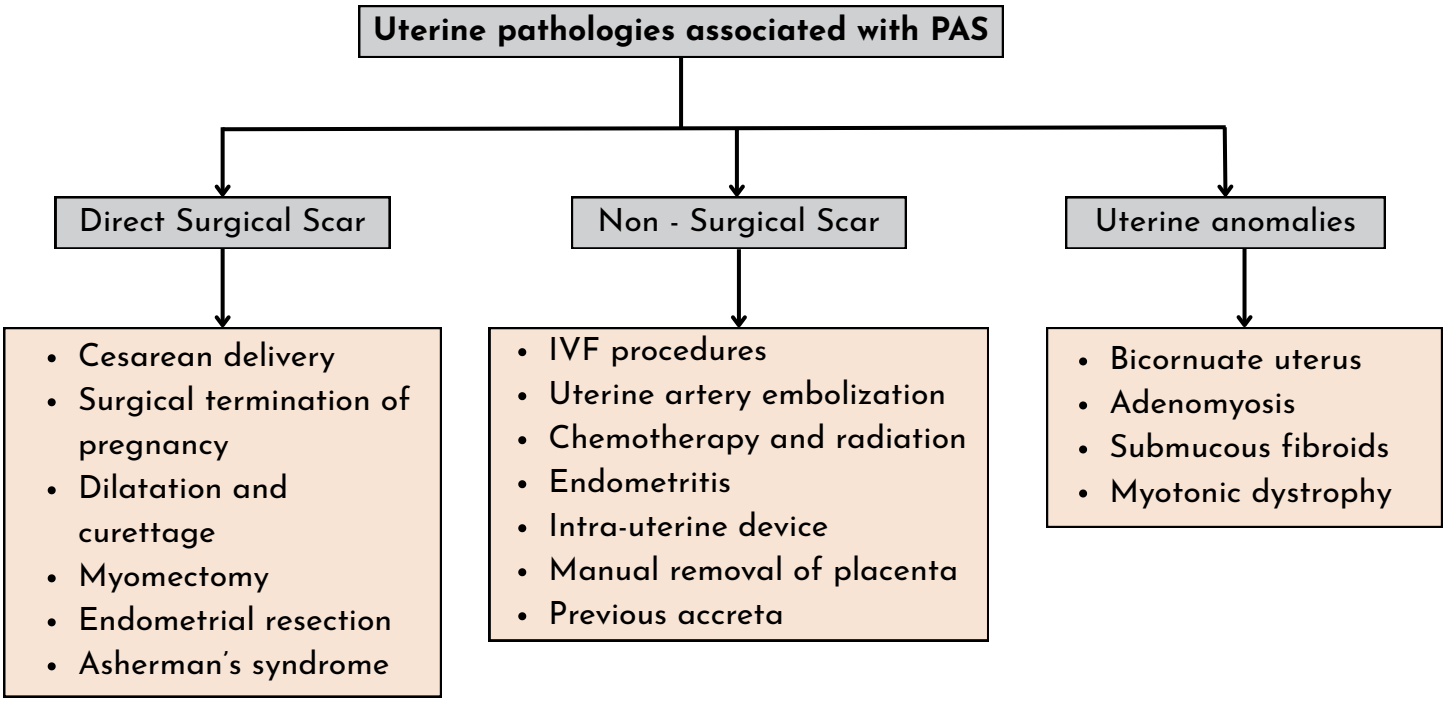


Placental Calcifications

- Advanced gestational age
- Utero-placental insufficiency
- Fetal Infections

Placenta Accreta Spectrum (PAS)

PAS is defined as abnormal adhesion or invasion of trophoblastic tissue into the myometrium. It includes placenta accreta, placenta increta, and placenta percreta.



US requisites for diagnosis of PAS

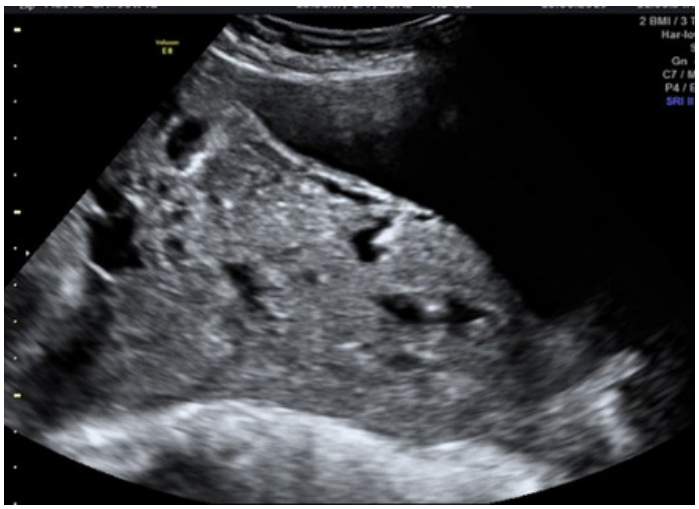
- Bladder should be filled to the extent that the entire lower uterine segment and the uterovesical interface can be well visualized
- Ideal time to assess is after 28 weeks, to reduce the false positive diagnosis

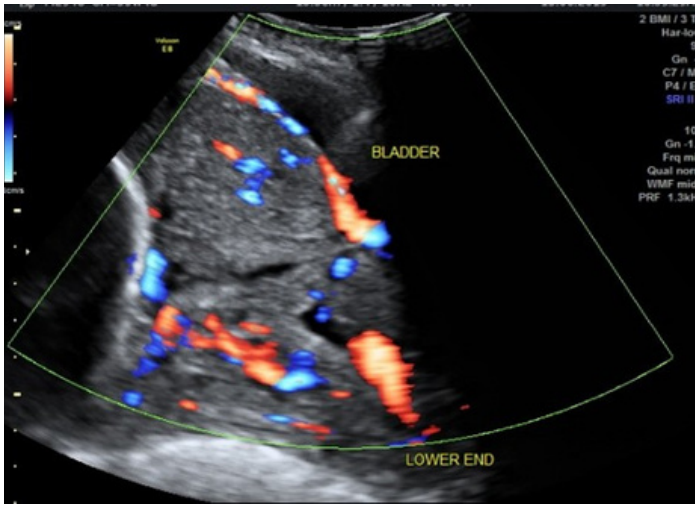
The European Working group on Abnormally Invasive Placenta has proposed a proforma to report an abnormally invasive placenta, which has been accepted by ISUOG and is available at https://www.isuog.org/static/uploaded/47f06637-da3c-4908-bc35378e5f42880b.pdf

Feature	0	1	2
Placental location	Normal	Low-lying (≤ 2 cm)	Previa
Placental thickness	≤ 35 mm	35 ~ 40 mm	≥ 40 mm
Retroplacental space	Present	Absence	'not applicable'
Thickness of the retroplacental myometrium	> 1 mm	≤ 1 mm	Absence
Placental lacunae	None	Present	Numerous and confluent
Retroplacental myometrial blood flow	Normal	Hypervascularity	Numerous and confluent
History of cesarean section	0	1	≥ 2

- No PAS – Score of </=5 (Sensitivity of 69%, Specificity of 92%)
- Placenta Accreta/increta – Score of 5 - 10 (Sensitivity of 58%, Specificity of 91%)
- Placenta Percreta – Score of >/=10 (Sensitivity of 74%, Specificity of 83%)

(Ref: Zhang J, Li H, Feng D, Wu J, Wang Z, Feng F. Ultrasound scoring system for prenatal diagnosis of placenta accreta spectrum. BMC Pregnancy Childbirth. 2023)





Placental lakes vs placental lacunae

Feature	Placental Lake	Placental Lacunae
Gestational Age	Can be visualized at any gestational age.	Typically increase progressively after the second trimester.
Influence of External Factors	Size, number, and shape can vary depending on maternal position, uterine contractions, placental location, and direct ultrasound probe pressure.	Shape and size remain unaffected by maternal position, uterine contractions, placental location, or ultrasound probe pressure.
Perinatal Outcome	Usually no significant effect unless the lakes are large — large placental lakes may warrant closer monitoring.	Strongly associated with Placenta Accreta Spectrum (PAS) and adverse perinatal outcomes.
Ultrasound Appearance	• Regular anechoic spaces > 2 cm. • Located centrally, near the chorionic plate, or at the placental edge. • Low-velocity blood flow (spiral artery origin) • Typically not visualized on color Doppler.	• Large, irregular spaces creating a moth-eaten placental appearance. • Commonly located adjacent to the basal plate or diffusely throughout the placenta. • Frequently seen in cases of PAS. • High-velocity blood flow (>10 cm/s) with identifiable feeder vessels (radial or arcuate artery) on Doppler.

The false positive rate for US diagnosis of PAS is around 60% by sonologist at referring centre to 15.9% by experts at tertiary care centre, while the false negative rate is 2%.

MRI may be of value in posterior placenta and suspected placenta percreta to assess the depth of invasion.

Placental Abruption

Premature separation of a previously reported normally implanted placenta

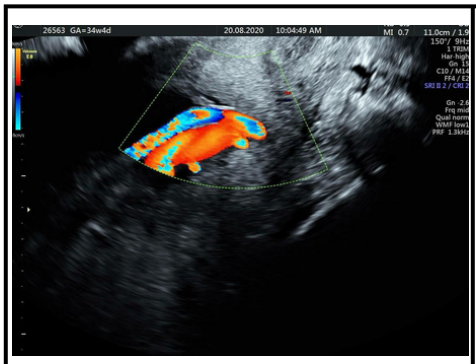
Ultrasound Features

Retroplacental hematomas

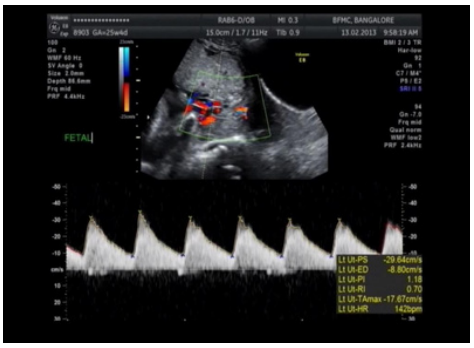
- Hypoechoic/anechoic well circumscribed masses
- Absence of flow on colour Doppler

Vasa previa

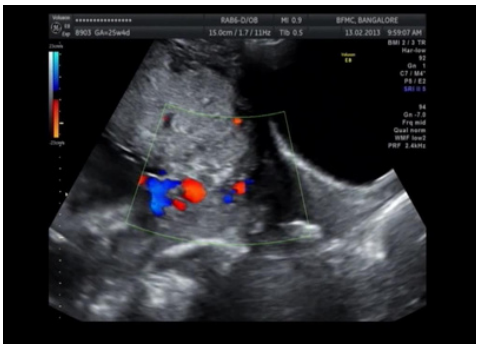
This is a condition where unprotected fetal vessels run through the amniotic membrane in the region of the internal os.



Vasa previa(TVS)



Vasa previa (Doppler)



Vasa previa(TAS)

Risk factors:

- Velamentous cord insertion (75%)
- Succenturiate or bilobed placenta (25%)
- At MTAS: Low lying placenta/placenta previa – 60% have vasa previa
- Multiple pregnancy
- IVF conceptions (1 in 260)

Majority of the cases with vasa previa do not have risk factors.

US diagnosis of Vasa previa:

- Sweep across the lower segment on 2D and Doppler
- On 2D: Circular structures (bubbles) or linear structures (lines) across or in proximity (usually less than 2 cm) to the internal os.
- Doppler confirms the above finding, as fetal vessels

Vasa Previa vs Cord presentation

- Presence of Wharton's jelly surrounding the cord vessels
- Change in maternal position – cord moves away from the cervical os

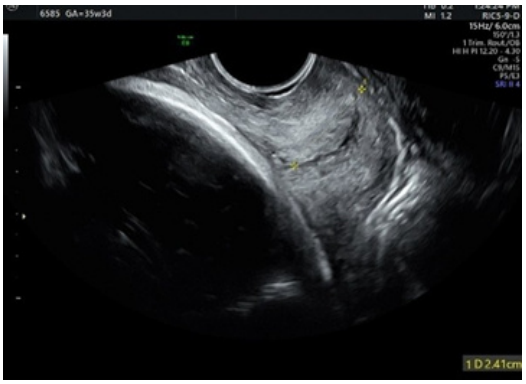
Cervical length

There is a potential role of cervical length (CL) assessment in predicting spontaneous late preterm birth (PTB), particularly between 34 and 36 weeks of gestation.

A prospective study involving over 1,000 women demonstrated that a short CL (<22 mm) measured between 31–34 weeks was significantly associated with late PTB. Using a cutoff of 22 mm, the test could predict 17% of late PTB cases with a false-positive rate of 10%. However, the predictive value remains lower than that of second-trimester screening, and standardized protocols regarding timing and frequency of assessment are still lacking.

Longitudinal studies have also revealed dynamic changes in CL between trimesters. According to Hong et al. (2024), approximately 13% of women with a normal second-trimester CL developed a short cervix (<25 mm) in the third trimester, placing them at significantly increased risk of PTB compared to those with consistently normal lengths. This finding supports the value of serial assessments in select populations.

The method of measurement also plays a crucial role. Tsakiridis et al. reported that transabdominal and transvaginal CL measurements showed strong correlation in the third trimester. However, the feasibility of transabdominal assessment was limited, particularly in cephalic presentations, where the cervix could be visualized in only about 51% of cases with an empty bladder.Despite these limitations, transabdominal screening may still offer clinical value. A study by Korniluk et al. (2022) demonstrated that if the transabdominal CL is greater than 30.5 mm, it can reliably predict a transvaginal CL of >25 mm with 100% sensitivity.

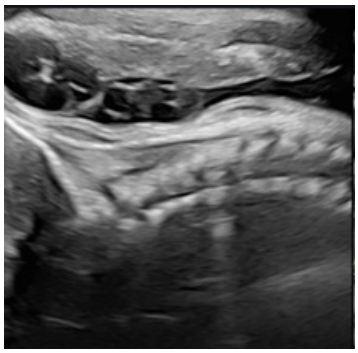


Nuchal Cord

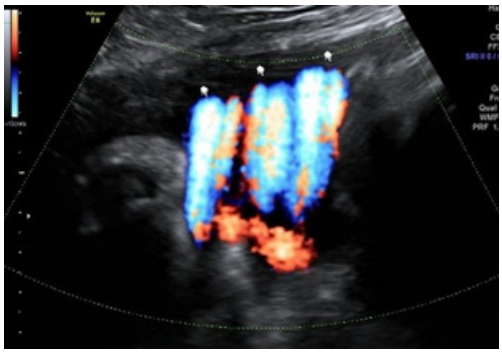
Nuchal cord is seen in 22% of pregnancies, with multiple loops present in approximately 4% of cases. Routine identification and reporting may lead to parental anxiety and an increased rate of obstetric interventions, without clear evidence of improved outcomes.

There are no prospective studies or randomized controlled trials evaluating the clinical implications of nuchal cord. A cord loop may resolve spontaneously, particularly when detected remote from term, contributing to a relatively high false-positive rate.

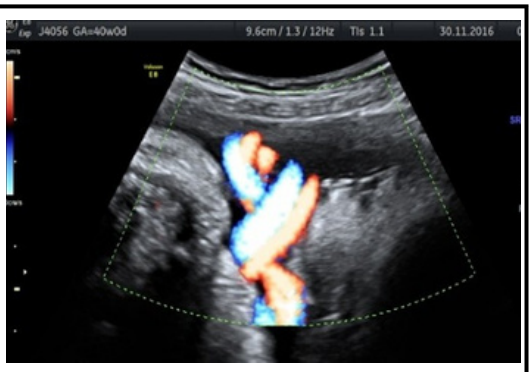
Assessment for nuchal cord should include both longitudinal and transverse views of the fetal neck.



Divot sign- Impression of cord



3 loops of cord on the neck



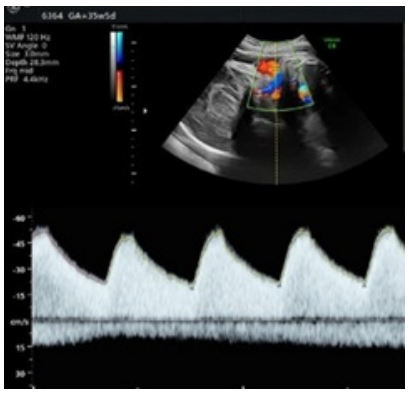
Nuchal cord knot

Adverse Perinatal Outcomes in the Presence of Nuchal Cord

- Multiple loops (≥3).
- Compounding factors:
    - Fetal Growth Restriction (FGR)
    - True knot of the umbilical cord
    - Single umbilical artery
    - Thin cord (due to decreased Wharton's jelly)
    - Oligohydramnios

Clinical Implication:

Lehtonen et al. (Finland) – In a national review of stillbirth causes, severe constricting loops or knots were identified in 16 out of 98 cases (16.3%), highlighting their potential contribution to stillbirth.



Normal waveform – No cord constriction

In case of cord constriction, the umbilical vein will show a pulsatile waveform

Compromise of the umbilical cord typically manifests as fetal heart rate abnormalities. Hence when a nuchal cord is suspected or confirmed, continuous electronic Fetal heart rate monitoring via CTG is recommended when in labour.

Key Points

1. Third trimester ultrasound may be done for a variety of indications between 28 weeks to 40 weeks of gestation.
2. Presently there is insufficient evidence to determine whether routine ultrasound scan done in the third trimester in a low risk pregnancy impacts perinatal outcomes.
3. There is no consensus on the period of gestation at which a routine third trimester ultrasound in a low risk pregnancy should be performed.
4. A scan at 36 weeks better identifies pregnancy at risk for growth related poor perinatal outcomes. A scan done between 30-34 weeks of gestation performs better in the assessment of fetal anatomy.
5. Growth should be reported as appropriate for gestational age(AGA), small for gestational age(SGA) or large for gestational age(LGA)
6. Doppler should be used to assess a small baby to rule out FGR.
7. Growth percentiles should be reported on appropriate charts.
8. Once fixed, preferably in the first half of the Pregnancy, the EDD should not be reassigned in every scan.
9. A standard step-wise approach should be followed in each third trimester scan as described.

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