29 EKİM

CUMHURİYET BAYRAMIMIZ KUTLU OLSUN

"Ne Mutlu Türküm Diyene"

Maternal - Fetal Tıp ve Perinatoloji Derneği Türkiye 23-06-1998

TÜRKİYE MATERNAL-FETAL TIP ve PERİNATOLOJİ DERNEĞİ

ULTRASONOGRAFİ KURSU

29 -31 EKİM 2015 • HARBİYE ASKERİ MÜZE - İSTANBUL

ISUOG KILAVUZLARI

Doç. Dr. Esra Esim Büyükbayrak

Marmara Üniversitesi Pendik Eğitim ve Araştırma Hastanesi,

Kadın Hastalıkları ve Doğum Kliniği,

Perinatoloji Ünitesi.

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I-ISUOG İle İlgili Genel Bilgiler

II-Fetal Santral Sinir Sistemi Ultrasonu: 'Temel Muayene' ve 'Nörosonogram' Kılavuzu (Ocak 2007)

III-Rutin İkinci Üçay Fetal Ultrason Taraması Kılavuzu (Ocak 2011)

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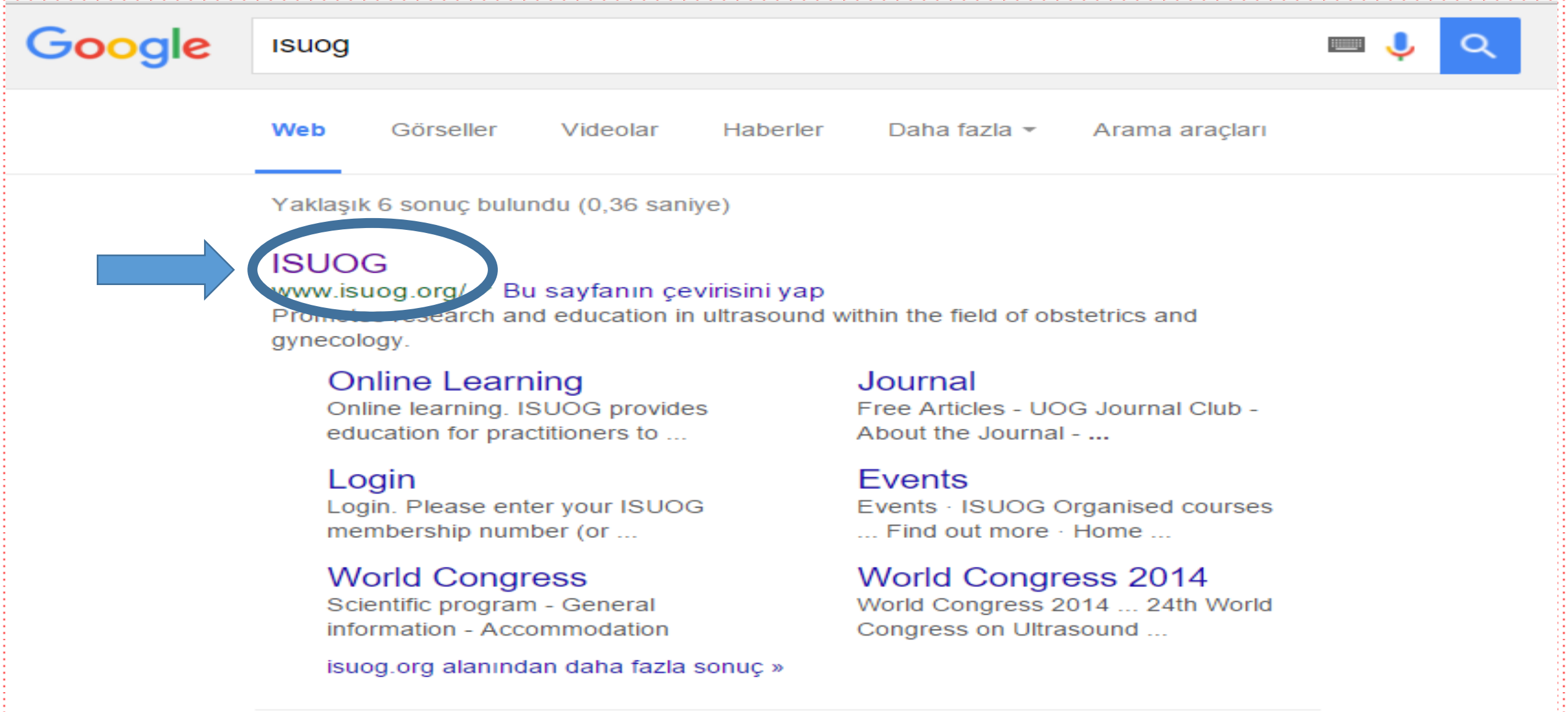
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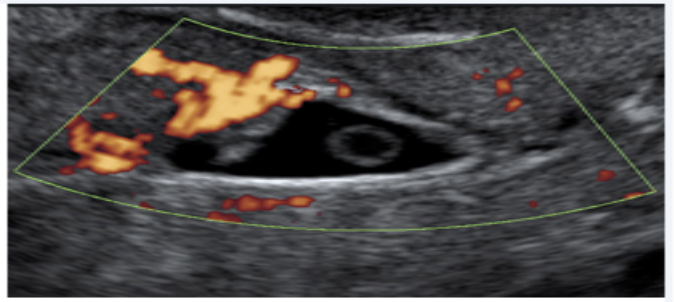

ISUOG is a professional membership association and charity that aims to improve women's healthcare services through the provision and broad dissemination of the highest quality education and research information around ultrasound in obstetrics and gynecology. With 13,300 members in 128 countries, we are the leading society in this niche medical speciality. Member benefits include our Journal, Ultrasound in Obstetrics and Gynecology, reduced fees to our Courses and Congress, and online educational material (400+ Web Lectures and Congress presentations on ISUOG On Demand). ISUOG is committed to extending education to under-resourced regions through its Outreach Program. Find out more about our latest endeavours on our news pages.

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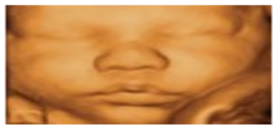
Thank you to delegates and faculty for their support of our recent Congress in Montreal. It's not too late to tweet or share your experiences @ISUOG using #loveultrasound and #ISUOG2015. Watch this space for our OnDemand lectures from the Congress, coming soon for 2016 members...



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Practice Guidelines provide systematically developed recommendations for the use of diagnostic imaging in obstetrics and gynecology. Their primary aim is to assist health care professionals in maintaining the highest possible clinical practice standards for our speciality.

Current ISUOG Guidelines include:

Practice Guidelines (updated): sonographic screening examination of the fetal heart
(UOG Volume 41, Issue 3,Date: March 2013, Pages: 348–359)

Practice Guidelines: use of Doppler ultrasonography in obstetrics
(UOG Volume 41, Issue 2, Date: February 2013, Pages: 233-239)
Supporting presentation (PPT, 2.5MB)

Practice Guidelines: performance of first-trimester fetal ultrasound scan
(UOG Volume 41, Issue 1, Date: January 2013, Pages: 102-113)

Practice Guidelines for performance of the routine mid-trimester fetal ultrasound scan
(UOG Volume 37, Issue 1, Date: January 2011, Pages: 116 - 126)
Supporting presentation (PPT, 2MB)

Sonographic examination of the fetal central nervous system: guidelines for performing the 'basic examination' and the 'fetal neurosonogram'
(UOG Volume 29, Issue 1, Date: January 2007, Pages: 109-116)

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Ultrasound Obstet Gynecol 2007; 29: 109–116
Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/uog.3909

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GUIDELINES

Sonographic examination of the fetal central nervous system: guidelines for performing the 'basic examination' and the 'fetal neurosonogram'

1-Genel Bilgiler

2-Temel Muayene

A- Fetal Beyin

*Transventriküler Kesit

*Transserebellar Kesit

*Translamik Kesit

B- Vertebral Kesit

3- Fetal Nörosonogram

A- Fetal Beyin

*Koronal Kesitler

*Sagital Kesitler

B- Fetal Vertebra

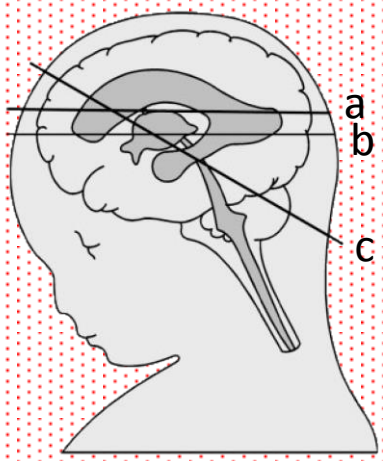
1- Genel Bilgiler

- Gebelik Haftası; Bazı SSS anomalileri erken gebelik haftalarında da tanınabilmekle beraber tatmin edici değerlendirme 2. trimesterde yapılabilir.
- Teknik Faktörler; 3–5-MHz transabdominal veya 5-10 MHz transvaginal prob yeterlidir. (3-4 boyutlu USG muayeneyi kolaylaştırabilir ancak şart değildir.)

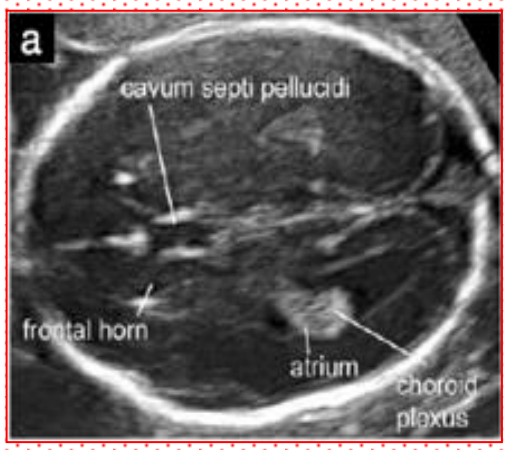
2- Temel Muayene

Fetal SSS Temel Muayenesinde Bakılması Gereken Yapılar;

- Kafa Şekli
- Lateral ventriküller
- Cavum septi pellucidi
- Talamus
- Serebellum
- Cisterna magna
- Vertebra



Transventriküler



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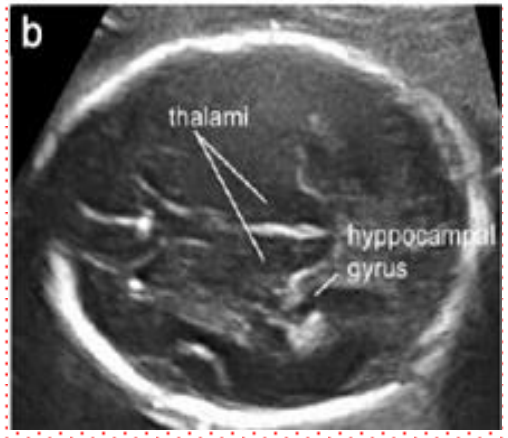
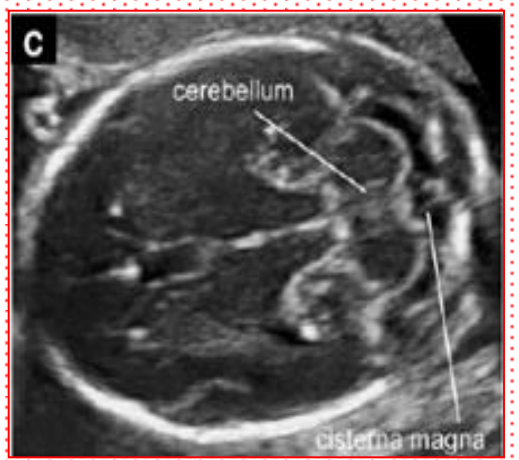


Transserebellar



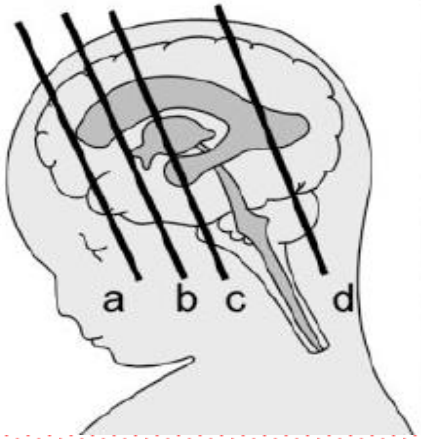
3- Fetal Nörosonogram

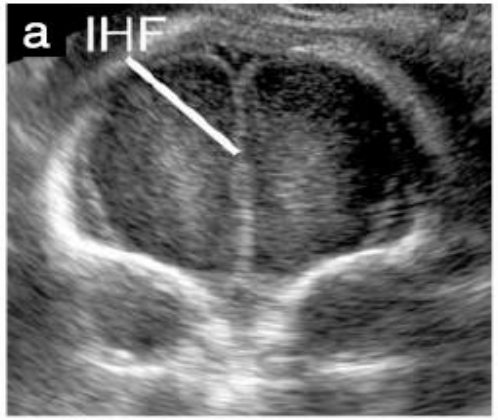
- SSS anomalisi için artmış riski olanlar veya temel SSS muayenesinde anomali şüphesi olan hastalara önerilir.
- Vertex prezentasyonlu fetüslerde transabdominal ve/veya transvaginal prob kullanılabilir.
- Fetal beyin; koronal ve sagital kesitlerle daha ayrıntılı değerlendirilir.
- Vertebra, transverse, sagital ve koronal kesitlerle daha ayrıntılı değerlendirilir.

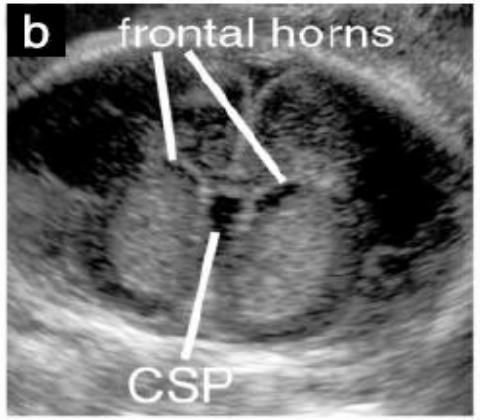
3- Fetal Nörosonogram

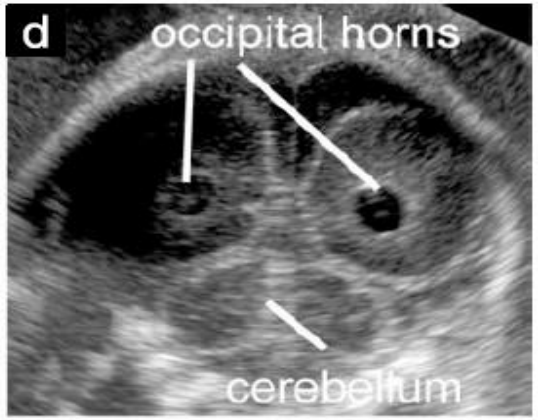
Kraniyal Koronal Kesitler

- Transfrontal plan; Anterior fontanel üzerinden görüntülenir. Ortahat interhemisferik fissure(IHF) kesintisiz. Ayrıca sphenoidal kemik ve orbitalar izlenir.
- Transkaudat plan: Kaudat nükleus seviyesindedir. İHF korpus kallosumun ön kısmıyla kesintiye uğramıştır. cavum septi pellucidi anekoik üçgen yapı şeklinde izlenir.
- Transtalamik plan: Heriki talamik çekirdek ve bazen 3. ventrikül izlenir.
- Transserebellar plan: Posterior fontanel üzerinden görüntülenir. lateral ventriküllerin arka boynuzu izlenir. Serebellar hemisferler ve vermis izlenir.





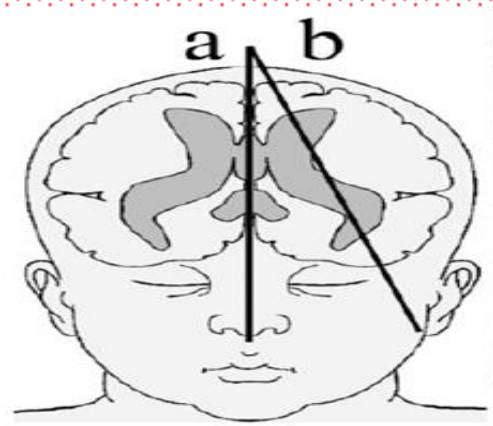


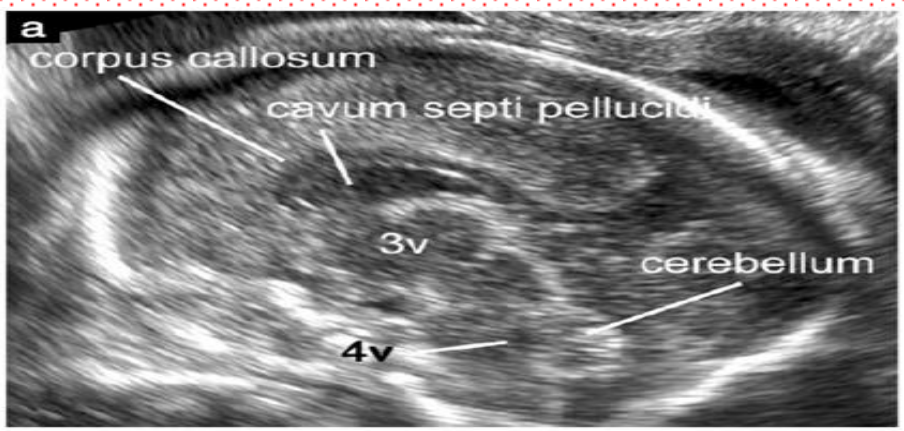


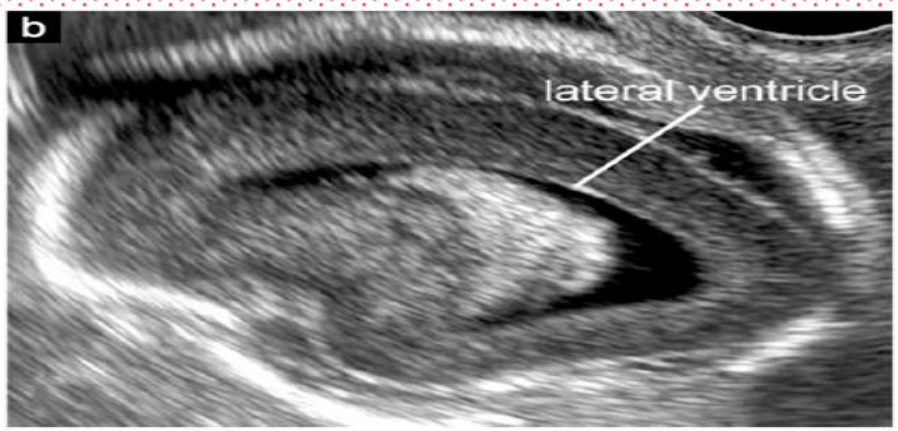
3- Fetal Nörosonogram

Kraniyal Sagital Kesitler

- Midsagittal plan: corpus callosum tüm elemanlarıyla izlenir, cavum septi pellucidi, bazen cavum vergae ve cavum veli interpositi görülür. Beyin sapı, vermis ve posterior fossa izlenir. Renkli Doppler ile anterior serebral arter, pericallosal arter ve Galen veni görülebilir.
- Parasagital plan: Tüm lateral ventrikül, koroid plexus, periventriküler doku izlenir.



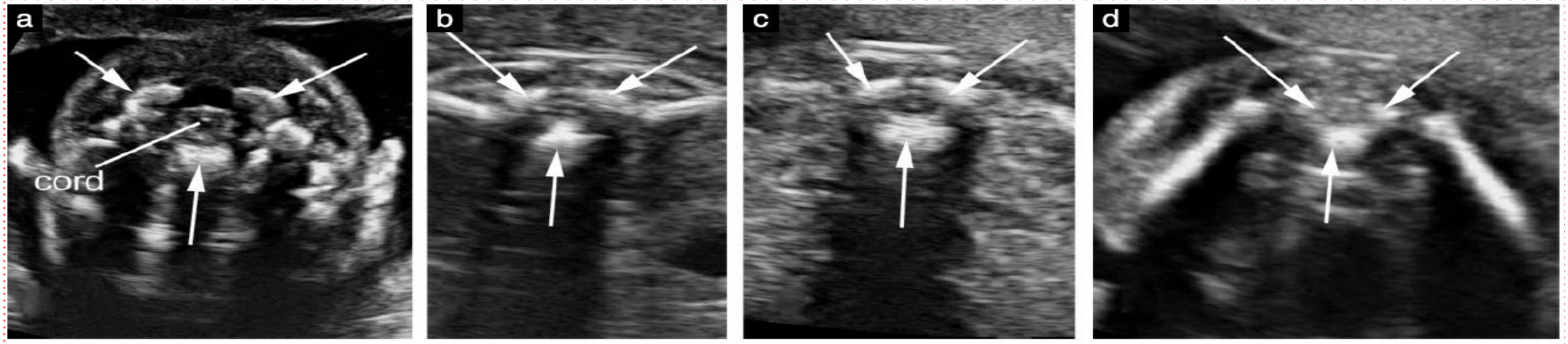




3- Fetal Nörosonogram

Vertebra

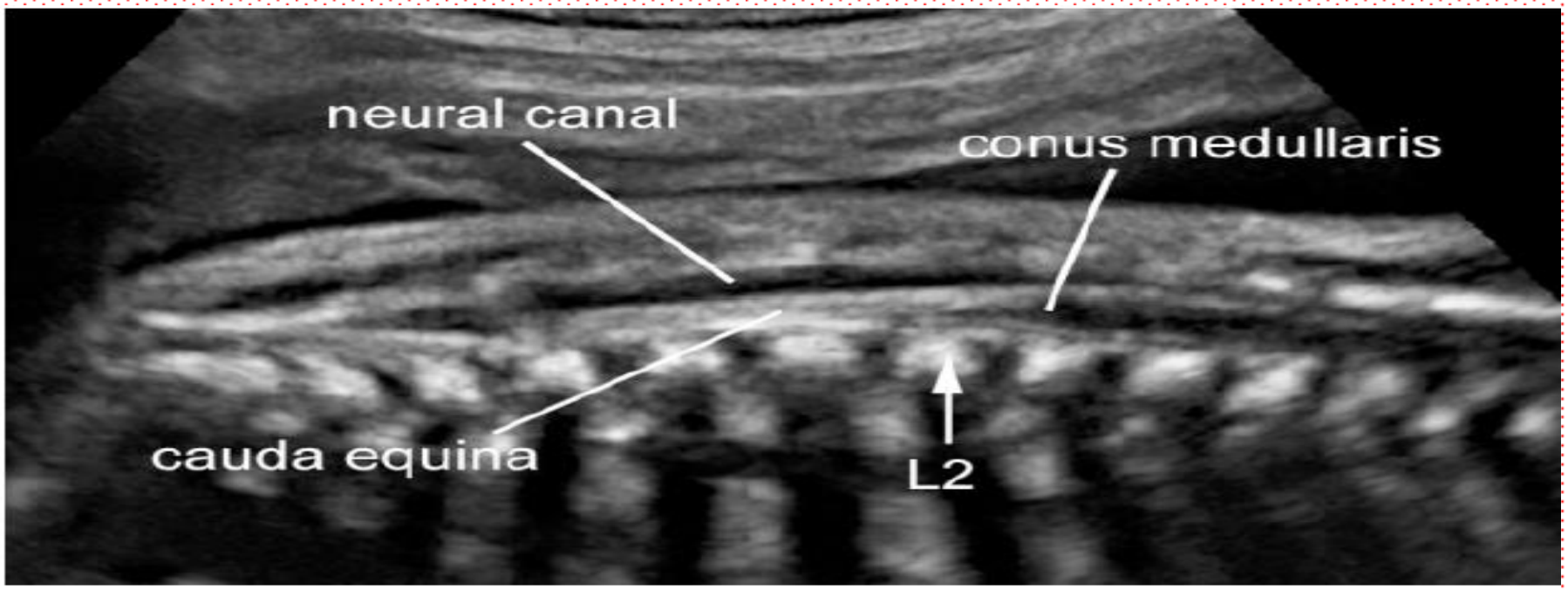
- Transverse plan:Dinamik olarak prob süpürme hareketiyle tüm vertebra taranır. Fetal ilk servikal vertebra dörtgen şekillidir, torasik ve lumbar vertebralar üçgen şekillidir, sakral vertebralar düzdür.



3- Fetal Nörosonogram

Vertebra

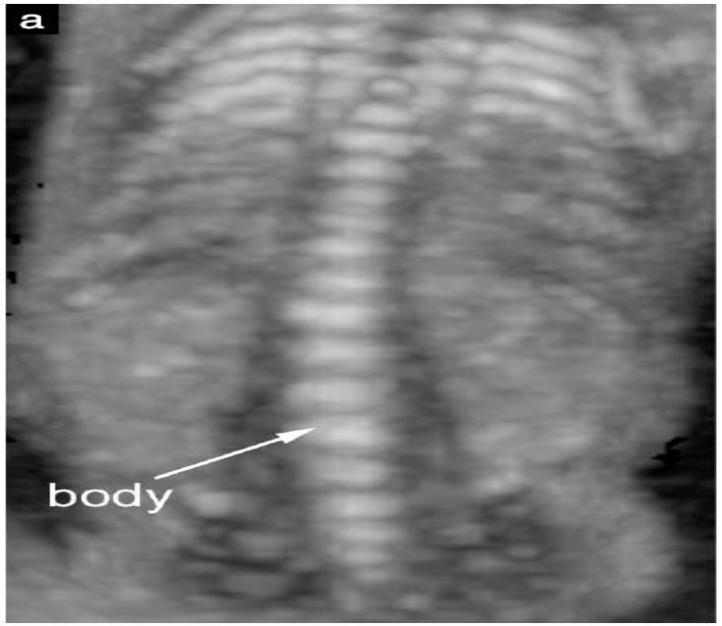
- Sagital plan: Spinal kanal ve kord izlenebilir. 2.-3. trimesterlerde konus medullaris L2-L3 seviyesinde izlenir.

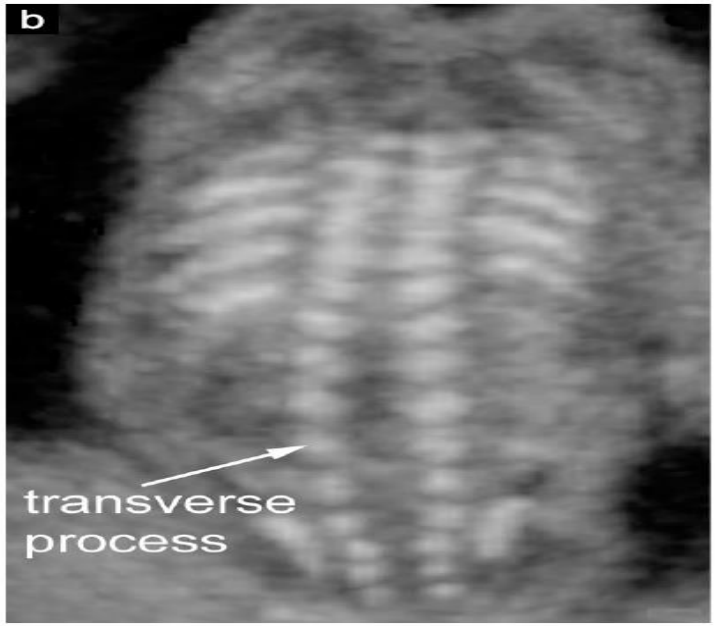


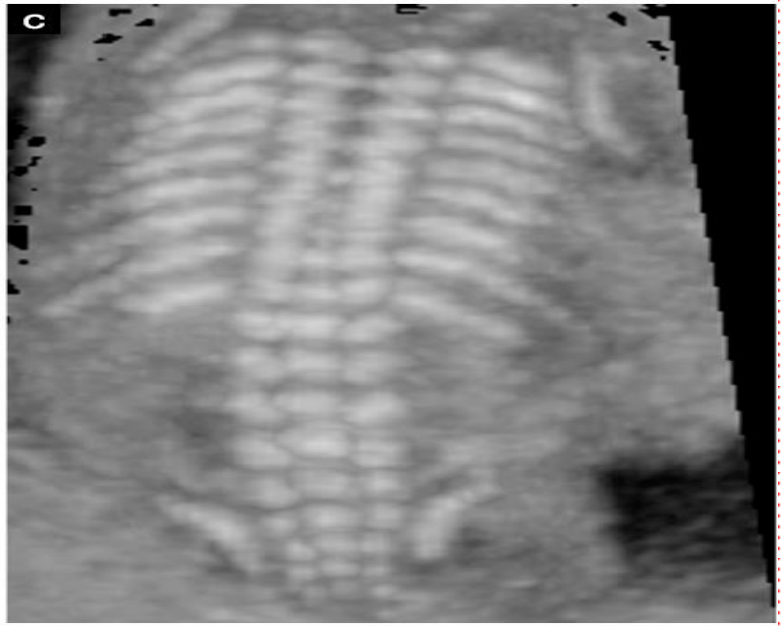
3- Fetal Nörosonogram

Vertebra

- Koronal plan: Vertebral gövde, transverse prosesler 1,2 ya da 3 çizgi şeklinde izlenir.







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GUIDELINES

Practice guidelines for performance of the routine mid-trimester fetal ultrasound scan

L. J. SALOMON, Z. ALFIREVIC, V. BERGHELLA, C. BILARDO, E. HERNANDEZ-ANDRADE, S. L. JOHNSEN, K. KALACHE, K.-Y. LEUNG, G. MALINGER, H. MUNOZ, F. PREFUMO, A. TOI and W. LEE on behalf of the ISUOG Clinical Standards Committee

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1-Genel Bilgiler

2-Muayene Rehberi

I- Genel Bilgiler

Rutin İkinci Üçay Fetal Ultrason Taraması;

- **Amacı nedir?**
- **Kime yapılmalıdır?**
- **Ne zaman yapılmalıdır?**
- **Kim tarafından yapılmalıdır?**
- **Ekipman nasıl olmalıdır?**
- **Dokümentasyon nasıl olmalıdır?**
- **Güvenli midir?**
- **Kılavuza uygun tarama yapılamazsa ne olur?**

II- Muayene Rehberi

A- Fetal İyilik Hali Değerlendirmesi

B- Fetal Biyometrik Ölçümler

C- Fetal Anatomik Değerlendirme

Mid-Trimester Fetal Ultrasound Scan Report Form

Patient: **ID number:**

Date of birth (DD/MM/YYYY):
Referring physician:

Date of exam (DD/MM/YYYY):
Sonographer / Supervisor:

Indication for scan and relevant clinical information:

Gestational age (W + D):
Based on: *LMP / Previous US / Other* :

Technical conditions: *Good / Limited by:*
Singleton / Multiple (use 1 sheet/fetus)
=> Chorionicity:

PLACENTA: Position:
Relation to cervical os: ☐ clear ☐ covering ____ mm from os
Appearance ☐ Normal ☐ Abnormal*

AMNIOTIC FLUID: ☐ Normal ☐ Abnormal*
FETAL MOVEMENT: ☐ Normal ☐ Abnormal*

MEASUREMENTS	mm	Percentile (References)
Biparietal diameter		
Head circumference		
Abdominal circumference		
Femur diaphysis length		
Other:		
Other:		
Other:		

***Abnormal findings (please detail):**

CONCLUSION:
☐ Normal and complete examination.
☐ Normal but incomplete examination.
☐ Abnormal examination*
☐ Plans: ☐ No further ultrasound scans required.
☐ Follow up planned in ….. weeks.
☐ Referred to ……
☐ Other:

SONOGRAPHIC APPEARANCE OF FETAL ANATOMY: (N=Normal; Ab=Abnormal*; NV=Not visualized) Gray=optional	N	Ab*	NV
Head			
Shape			
Cavum septi pellucidi			
Midline falx			
Thalami			
Lateral ventricle			
Cerebellum			
Cisterna magna			
Face			
Upper lip			
Median profile			
Orbits			
Nose			
Nostrils			
Neck			
Thorax			
Shape			
No masses			
Heart			
Heart activity			
Size			
Cardiac axis			
Four-chamber view			
Left ventricular outflow			
Right ventricular outflow			
Abdomen			
Stomach			
Bowel			
Kidneys			
Urinary bladder			
Abdominal cord insertion			
Cord vessels (optional)			
Spine			
Limbs			
Right arm (incl. hand)			
Right leg (incl. foot)			
Left arm (incl. hand)			
Left leg (incl. foot)			
Gender (optional): ☐ M ☐ F			
Other :			

	Produced	Printed	Stored
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C- Fetal Anatomik Değerlendirme

Table 1 Recommended minimum requirements for basic mid-trimester fetal anatomical survey

Head	Intact cranium
	Cavum septi pellucidi
	Midline falx
	Thalami
	Cerebral ventricles
	Cerebellum
	Cisterna magna
Face	Both orbits present
	Median facial profile*
	Mouth present
	Upper lip intact
Neck	Absence of masses (e.g. cystic hygroma)
Chest/Heart	Normal appearing shape/size of chest and lungs
	Heart activity present
	Four-chamber view of heart in normal position
	Aortic and pulmonary outflow tracts*
	No evidence of diaphragmatic hernia
Abdomen	Stomach in normal position
	Bowel not dilated
	Both kidneys present
	Cord insertion site
Skeletal	No spinal defects or masses (transverse and sagittal views)
	Arms and hands present, normal relationships
	Legs and feet present, normal relationships
Placenta	Position
	No masses present
	Accessory lobe
Umbilical cord	Three-vessel cord*
Genitalia	Male or female*

*Optional component of checklist: can be evaluated if technically feasible.

SONOGRAPHIC APPEARANCE OF FETAL ANATOMY: (N=Normal; Ab=Abnormal**; NV=Not visualized) Gray=optional	N	Ab**	NV
Head			
Shape			
Cavum septi pellucidi			
Midline falx			
Thalami			
Lateral ventricle			
Cerebellum			
Cisterna magna			
Face			
Upper lip			
Median profile			
Orbits			
Nose			
Nostrils			
Neck			
Thorax			
Shape			
No masses			
Heart			
Heart activity			
Size			
Cardiac axis			
Four-chamber view			
Left ventricular outflow			
Right ventricular outflow			
Abdomen			
Stomach			
Bowel			
Kidneys			
Urinary bladder			
Abdominal cord insertion			
Cord vessels (optional)			
Spine			
Limbs			
Right arm (incl. hand)			
Right leg (incl. foot)			
Left arm (incl. hand)			
Left leg (incl. foot)			
Gender (optional): ☐ M ☐ F			
Other :			

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KAFA

YÜZ

KALP

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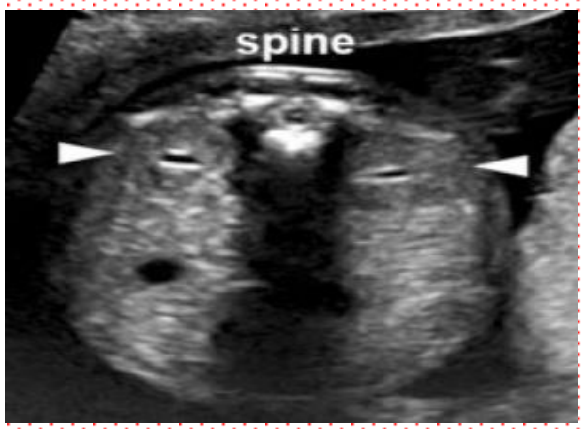
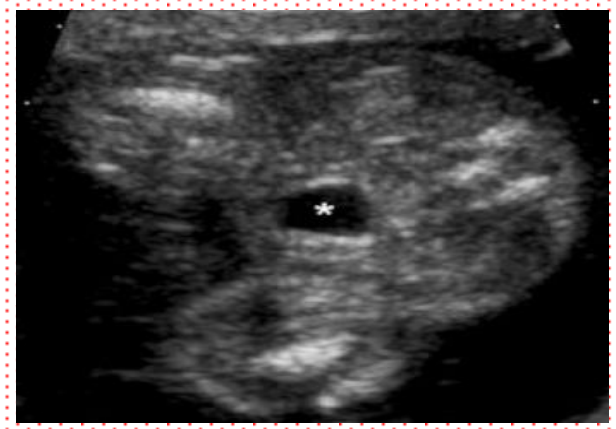
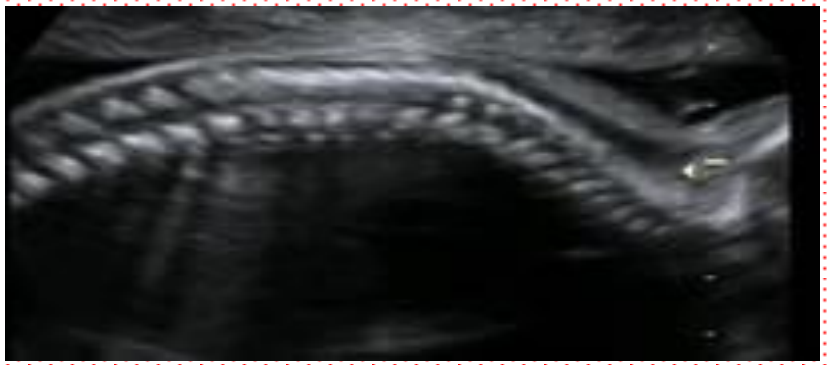
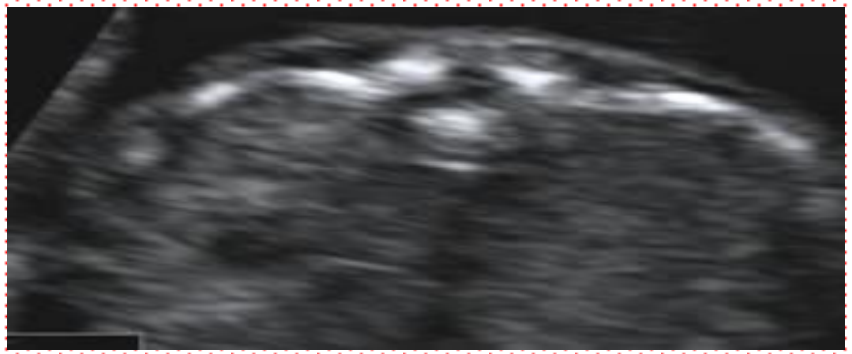
ABDOMEN



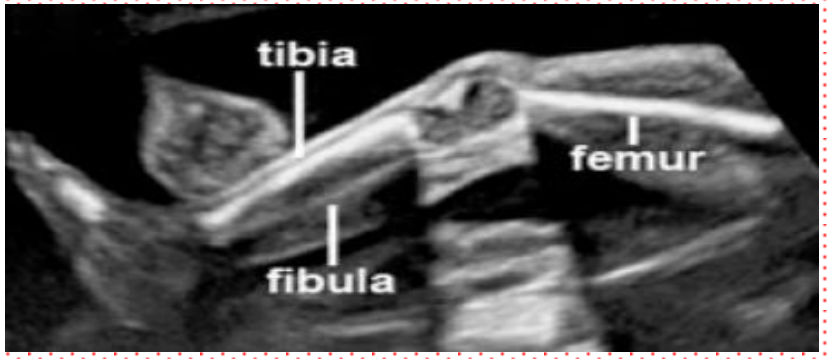


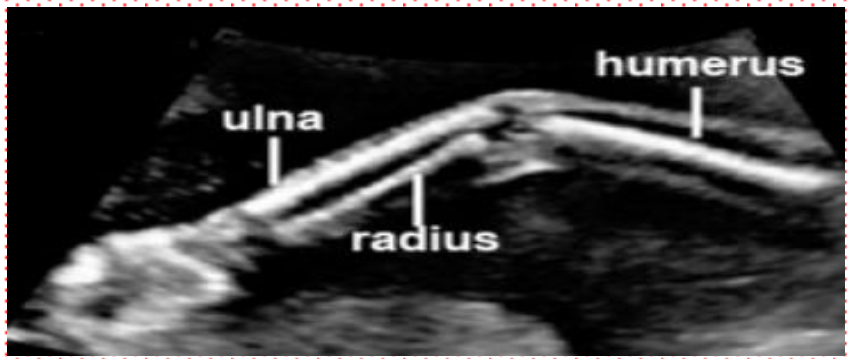
VERTEBRA





EKSTREMİTE





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Mid-Trimester Fetal Ultrasound Scan Report Form

Patient: **ID number:**

Date of birth (DD/MM/YYYY):
Referring physician:

Date of exam (DD/MM/YYYY):
Sonographer / Supervisor:

Indication for scan and relevant clinical information:

Gestational age (W + D):
Based on: *LMP / Previous US / Other* :

Technical conditions: *Good / Limited by:*
Singleton / Multiple (use 1 sheet/fetus)
=> Chorionicity:

PLACENTA: Position:
Relation to cervical os: ☐ clear ☐ covering _____ mm from os
Appearance ☐ Normal ☐ Abnormal*

AMNIOTIC FLUID: ☐ Normal ☐ Abnormal*
FETAL MOVEMENT: ☐ Normal ☐ Abnormal*

MEASUREMENTS	mm	Percentile (References)
Biparietal diameter		
Head circumference		
Abdominal circumference		
Femur diaphysis length		
Other:		
Other:		
Other:		

***Abnormal findings (please detail):**

CONCLUSION:

- ☐ Normal and complete examination.
- ☐ Normal but incomplete examination.
- ☐ Abnormal examination*
- ☐ Plans:
  - ☐ No further ultrasound scans required.
  - ☐ Follow up planned in ..... weeks.
  - ☐ Referred to .....
  - ☐ Other:

SONOGRAPHIC APPEARANCE OF FETAL ANATOMY: (N=Normal; Ab=Abnormal*; NV=Not visualized) Gray=optional	N	Ab*	NV
Head			
Shape			
Cavum septi pellucidi			
Midline falx			
Thalami			
Lateral ventricle			
Cerebellum			
Cisterna magna			
Face			
Upper lip			
Median profile			
Orbits			
Nose			
Nostrils			
Neck			
Thorax			
Shape			
No masses			
Heart			
Heart activity			
Size			
Cardiac axis			
Four-chamber view			
Left ventricular outflow			
Right ventricular outflow			
Abdomen			
Stomach			
Bowel			
Kidneys			
Urinary bladder			
Abdominal cord insertion			
Cord vessels (optional)			
Spine			
Limbs			
Right arm (incl. hand)			
Right leg (incl. foot)			
Left arm (incl. hand)			
Left leg (incl. foot)			
Gender (optional): ☐ M ☐ F			
Other :			

	Produced	Printed	Stored
No. of images			

SUNUM AKIŞI

I-ISUOG İle İlgili Genel Bilgiler

II-Fetal Santral Sinir Sistemi Ultrasonu: 'Temel Muayene' ve 'Nörosonogram' Kılavuzu (Ocak 2007)

III-Rutin İkinci Üçay Fetal Ultrason Taraması Kılavuzu (Ocak 2011)

IV- İlk Üçay Fetal Ultrason Taraması Kılavuzu (Ocak 2013)

V-Obstetrik Doppler Ultrason Kılavuzu (Şubat 2013)

VI-Fetal Kalp Taraması Kılavuzu (Mart 2013)

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Ultrasound Obstet Gynecol 2013; 41: 102–113
Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.12342

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GUIDELINES

ISUOG Practice Guidelines: performance of first-trimester fetal ultrasound scan

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1-Genel Bilgiler

2-Muayene Rehberi

1- Genel Bilgiler

İlk Üçay Ultrasonunun;

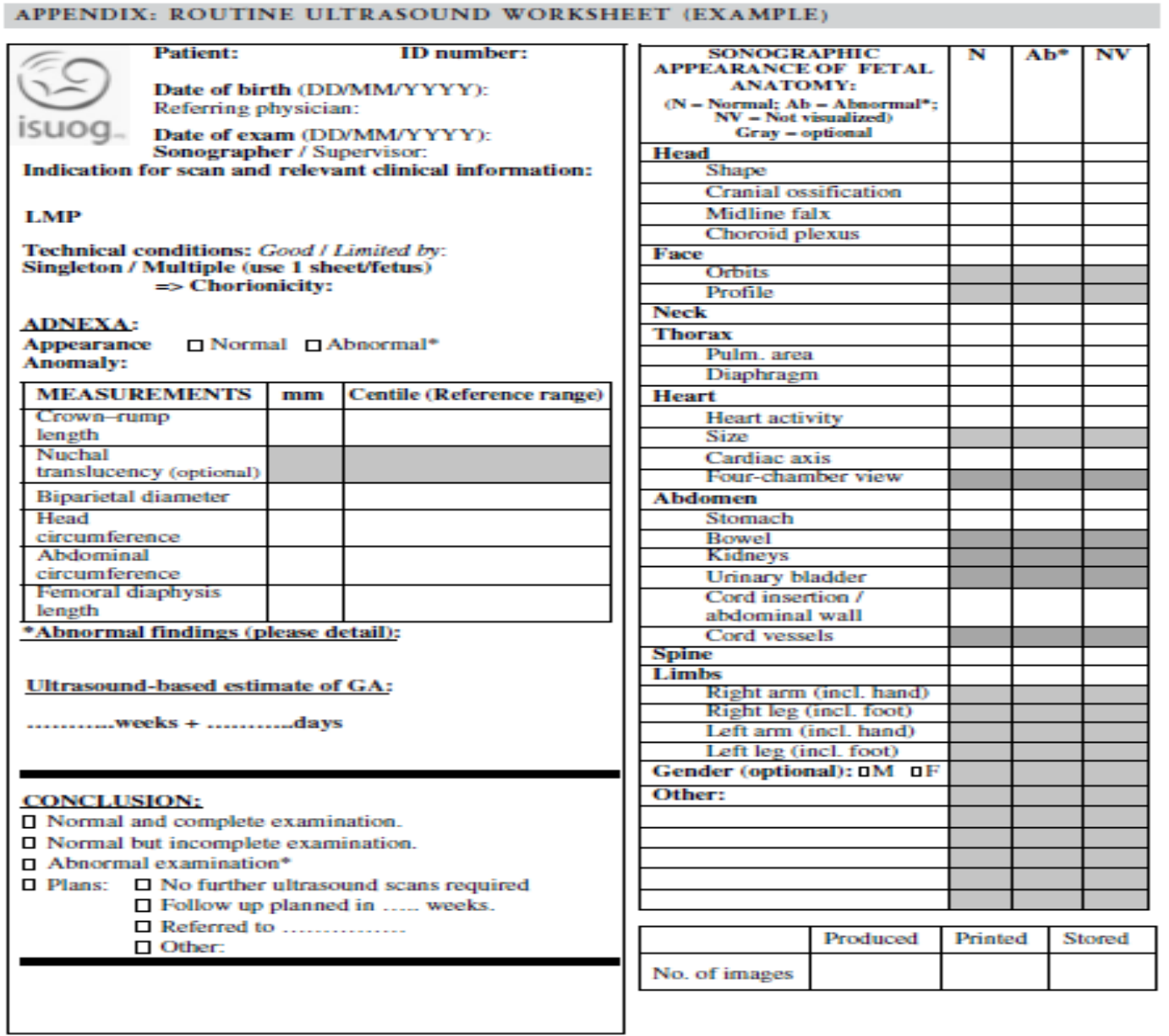
- Amacı nedir?
- Ne zaman yapılmalıdır?
- Kim tarafından yapılmalıdır?
- Ekipman nasıl olmalıdır?
- Dokümentasyon nasıl olmalıdır?
- Güvenli midir?
- Kılavuza uygun yapılamazsa ne olur?

2-Muayene Rehberi

A- İntrauterin Gebelik, Viabilite ve Gestasyonel Yaş Değerlendirmesi

B- Fetal Anatomik Değerlendirme

C- Fetal Kromozomal Değerlendirme



APPENDIX: ROUTINE ULTRASOUND WORKSHEET (EXAMPLE)

isuog

Patient: **ID number:**

Date of birth (DD/MM/YYYY):
Referring physician:

Date of exam (DD/MM/YYYY):
Sonographer / Supervisor:

Indication for scan and relevant clinical information:

LMP

Technical conditions: *Good / Limited by:*
Singleton / Multiple (use 1 sheet/fetus)
=> Chorionicity:

ADNEXA:
Appearance ☐ Normal ☐ Abnormal*
Anomaly:

MEASUREMENTS	mm	Centile (Reference range)
Crown–rump length		
Nuchal translucency (optional)		
Biparietal diameter		
Head circumference		
Abdominal circumference		
Femoral diaphysis length		

***Abnormal findings (please detail):**

Ultrasound-based estimate of GA:

.....**weeks +** .....**days**

CONCLUSION:
☐ Normal and complete examination.
☐ Normal but incomplete examination.
☐ Abnormal examination*
☐ Plans: ☐ No further ultrasound scans required
☐ Follow up planned in ..... weeks.
☐ Referred to .....
☐ Other:

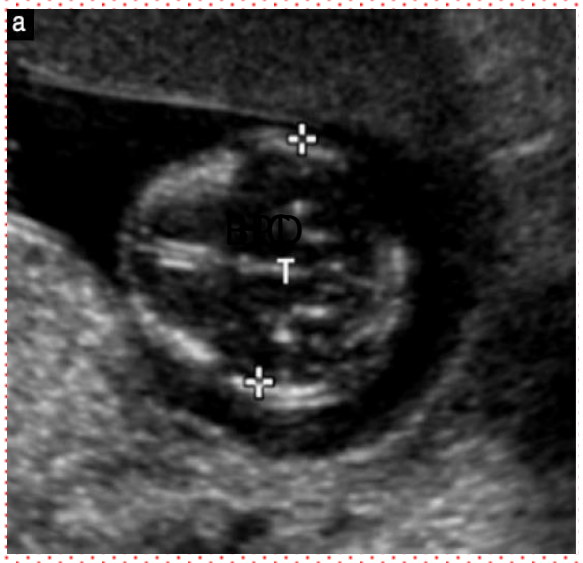
SONOGRAPHIC APPEARANCE OF FETAL ANATOMY: (N – Normal; Ab – Abnormal*; NV – Not visualized) Gray – optional	N	Ab*	NV
Head			
Shape			
Cranial ossification			
Midline falx			
Choroid plexus			
Face			
Orbits			
Profile			
Neck			
Thorax			
Pulm. area			
Diaphragm			
Heart			
Heart activity			
Size			
Cardiac axis			
Four-chamber view			
Abdomen			
Stomach			
Bowel			
Kidneys			
Urinary bladder			
Cord insertion / abdominal wall			
Cord vessels			
Spine			
Limbs			
Right arm (incl. hand)			
Right leg (incl. foot)			
Left arm (incl. hand)			
Left leg (incl. foot)			
Gender (optional): ☐M ☐F			
Other:			

	Produced	Printed	Stored
No. of images			

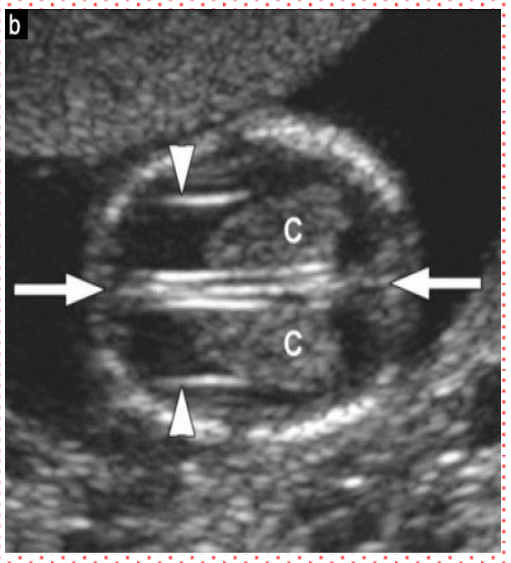
A- İntrauterin Gebelik, Viabilite ve Gestasyonel Yaş Değerlendirmesi

- İlk üçay fetus ölçümleri neler olmalı?

CRL



BPD



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B- Fetal Anatomik Değerlendirme

Table 2 Suggested anatomical assessment at time of 11 to 13 + 6-week scan

Organ/anatomical area	*Present and/or normal?*
Head	Present
	Cranial bones
	Midline falx
	Choroid-plexus-filled ventricles
Neck	Normal appearance
	Nuchal translucency thickness (if accepted after informed consent and trained/certified operator available)*
Face	Eyes with lens*
	Nasal bone*
	Normal profile/mandible*
	Intact lips*
Spine	Vertebrae (longitudinal and axial)*
	Intact overlying skin*
Chest	Symmetrical lung fields
	No effusions or masses
Heart	Cardiac regular activity
	Four symmetrical chambers*
Abdomen	Stomach present in left upper quadrant
	Bladder*
	Kidneys*
Abdominal wall	Normal cord insertion
	No umbilical defects
Extremities	Four limbs each with three segments
	Hands and feet with normal orientation*
Placenta	Size and texture
Cord	Three-vessel cord*

*Optional structures. Modified from Fong *et al.*[28], McAuliffe *et al.*[87], Taipale *et al.*[60] and von Kaisenberg *et al.*[88].

SONOGRAPHIC APPEARANCE OF FETAL ANATOMY: (N – Normal; Ab – Abnormal*; NV – Not visualized) Gray – optional	N	Ab*	NV
Head			
Shape			
Cranial ossification			
Midline falx			
Choroid plexus			
Face			
Orbits			
Profile			
Neck			
Thorax			
Pulm. area			
Diaphragm			
Heart			
Heart activity			
Size			
Cardiac axis			
Four-chamber view			
Abdomen			
Stomach			
Bowel			
Kidneys			
Urinary bladder			
Cord insertion / abdominal wall			
Cord vessels			
Spine			
Limbs			
Right arm (incl. hand)			
Right leg (incl. foot)			
Left arm (incl. hand)			
Left leg (incl. foot)			
Gender (optional): ☐M ☐F			
Other:			

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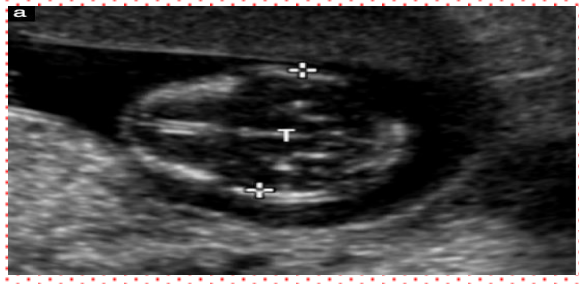
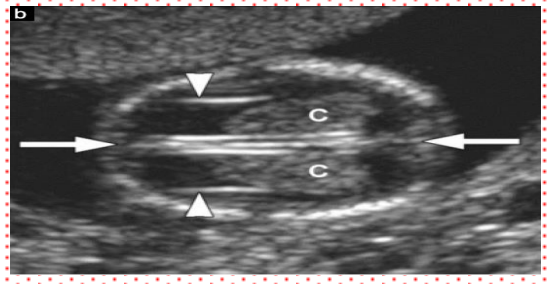
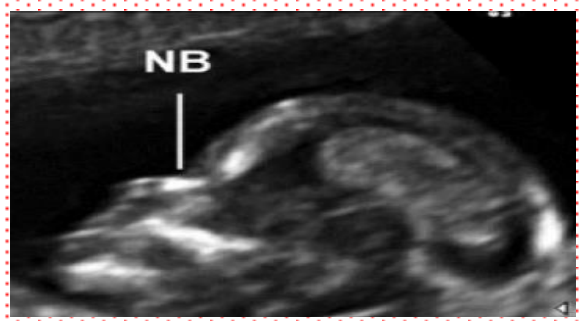
B- Fetal Anatomik Değerlendirme

KAFA

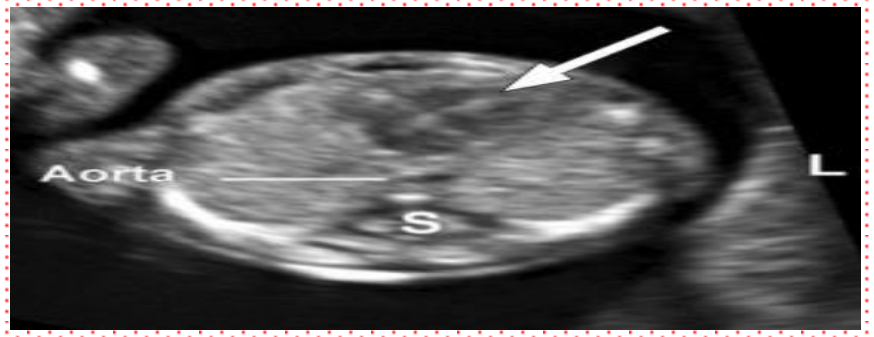




YÜZ



KALP



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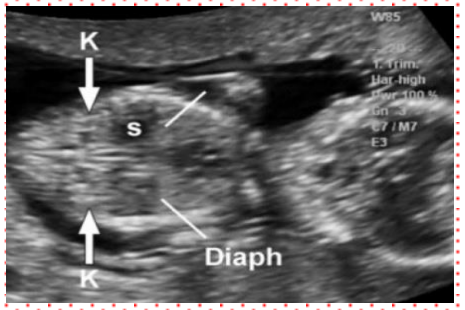
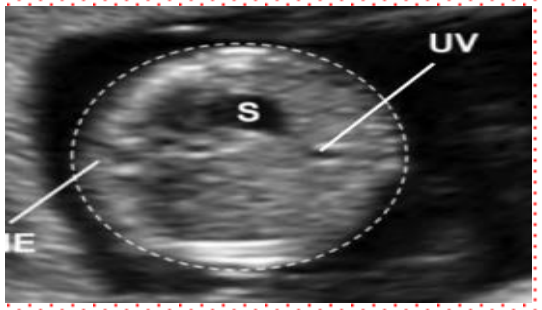
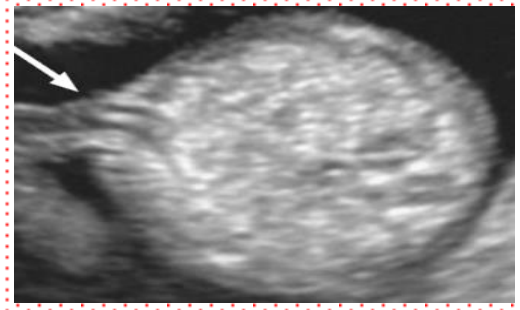
B- Fetal Anatomik Değerlendirme

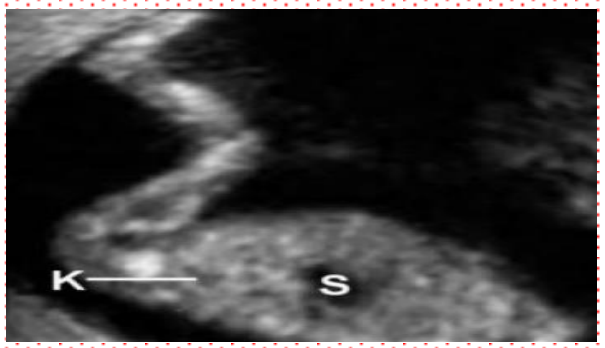
ABDOMEN







EKSTREMİTELER



C- Fetal Kromozomal Değerlendirme

- NT ölçümü
- NT ölçümü için uygun ekipman, eğitimli sertifikalı klinisyen ve sertifikasyonun devam ettirilmesi önerilir.
- NT taraması yapılmayacaksa da fetusun boynu kalitatif olarak değerlendirilmeli ve kalın olduğu düşünülürse tersiyer merkeze refere edilmesi önerilir.

APPENDIX: ROUTINE ULTRASOUND WORKSHEET (EXAMPLE)

Patient: **ID number:**

Date of birth (DD/MM/YYYY):
Referring physician:
Date of exam (DD/MM/YYYY):
Sonographer / Supervisor:

Indication for scan and relevant clinical information:

LMP

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=> Chorionicity:

ADNEXA:
Appearance ☐ Normal ☐ Abnormal*
Anomaly:

MEASUREMENTS	mm	Centile (Reference range)
Crown–rump length		
Nuchal translucency (optional)		
Biparietal diameter		
Head circumference		
Abdominal circumference		
Femoral diaphysis length		

***Abnormal findings (please detail):**

Ultrasound-based estimate of GA:

.....weeks + ...days

CONCLUSION:
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☐ Normal but incomplete examination.
☐ Abnormal examination*
☐ Plans: ☐ No further ultrasound scans required
☐ Follow up planned in ..... weeks.
☐ Referred to .....
☐ Other:

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Head			
Shape			
Cranial ossification			
Midline falx			
Choroid plexus			
Face			
Orbits			
Profile			
Neck			
Thorax			
Pulm. area			
Diaphragm			
Heart			
Heart activity			
Size			
Cardiac axis			
Four-chamber view			
Abdomen			
Stomach			
Bowel			
Kidneys			
Urinary bladder			
Cord insertion / abdominal wall			
Cord vessels			
Spine			
Limbs			
Right arm (incl. hand)			
Right leg (incl. foot)			
Left arm (incl. hand)			
Left leg (incl. foot)			
Gender (optional): ☐ M ☐ F			
Other:			

	Produced	Printed	Stored
No. of images			

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VI-Fetal Kalp Taraması Kılavuzu (Mart 2013)

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Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.12371

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GUIDELINES

ISUOG Practice Guidelines: use of Doppler ultrasonography in obstetrics

Bhide A, Acharya G, Bilardo CM, Brezinka C, Cafici D, Hernandez- Andrade E, Kalache K, Kingdom J, Kiserud T, Lee W, Lees C, Leung KY, Malinger G, Mari G, Prefumo F, Sepulveda W and Trudinger B. on behalf of the ISUOG Clinical Standards Committee

1- Amaç
2- Öneriler

- Ölçümlerin doğruluğu nasıl iyileştirilebilir?
  * Renkli (Colour) Doppler
  * Kesik Akım (Pulsed Wave) Doppler
  * Enerji (Power) Doppler
- Uygun teknik nedir?
  * Uterin Arter
  * Umblikal Arter
  * Orta Serebral Arter
  * Duktus Venosus
- Hangi İndeksleri Kullanalım?

1- Kılavuzun Amacı

- Fetoplasental dolaşımda Doppler ultrasonografinin nasıl yapılacağını (tekniği) özetleyen bir kılavuzdur.

- Bu kılavuz klinik endikasyonları belirlemeyi, uygulama zamanlamasını belirlemeyi ve bulguları yorumlamayı amaçlamaz.

2- Öneriler

Ölçümlerin doğruluğu nasıl iyileştirilebilir?

Renkli (Colour) Doppler:

- Renk penceresi küçültüldüğünde rezolusyon artar. Bu nedenle pencere sadece çalışılan bölgeyi içine almalı ve mümkün olduğunca küçük tutulmalıdır.
- Hız skalası (PRF) çalışılan damara göre ayarlanmalıdır.
- Artefaktları önlemek için Gain (kazanç) ayarı yapılmalıdır.
- İnsonasyon açısı ayarlanmalıdır.

2- Öneriler

Ölçümlerin doğruluğu nasıl iyileştirilebilir?

Kesik Akım (Pulsed wave) Doppler:

- Kayıtlar fetal hareket ve solunum yokken alınmalıdır.
- Renkli akım haritalaması şart değildir.
- İdeal insonation kan akımıyla tam hizalanmadır.
- Frekans etraftaki damarların gürültüsünü elemine etmek için mümkün olan en düşük değere (≤ 50–60 Hz) ayarlanmalıdır.
- Hız skalası/puls tekrarlama frekansı (PRF) dalga formları doppler ekranının %75'ini dolduracak şekilde ayarlanmalıdır.
- Kazanç (gain) dalgaformlarını net görecek şekilde ve etraftaki dokulardan artefakt gelmeyecek şekilde ayarlanmalıdır.

2- Öneriler

Ölçümlerin doğruluğu nasıl iyileştirilebilir?

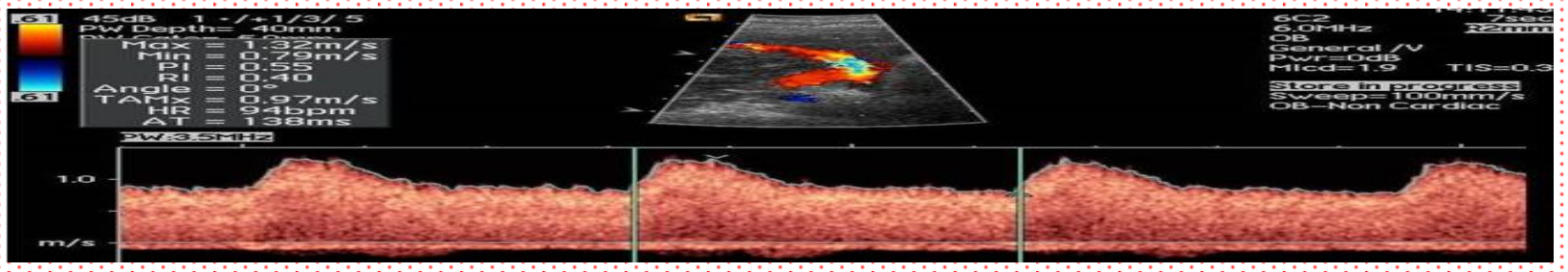
Enerji (Power) Doppler:

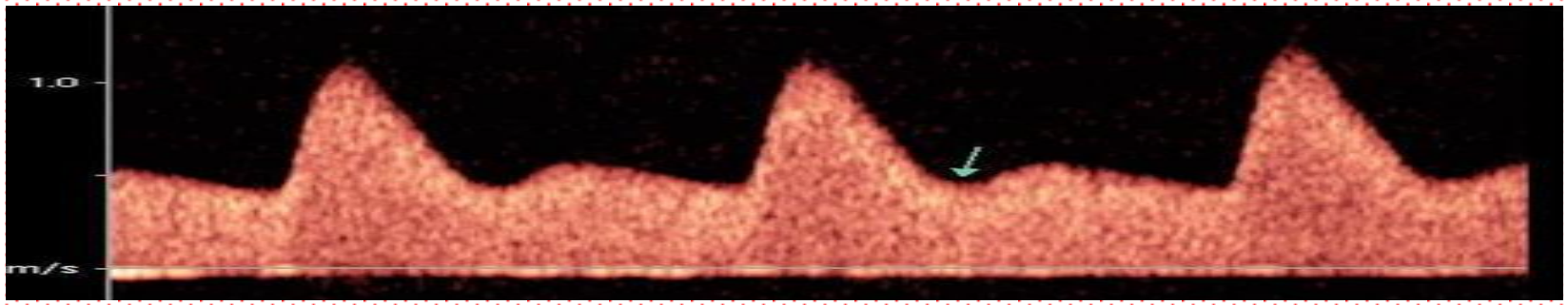
- Renkli doppler iyileştirme yöntemleri kullanılır ancak insonasyon açısı daha az etkiye sahiptir.
- Enerji (power) dopplerle ‘aliasing’ olmaz ancak düşük hız skalası (PRF) gürültü ve artefaktlara neden olabilir.
- Kazanç (Gain) gürültünün artışını önlemek için azaltılmalıdır.

2- Öneriler

Uterin Arter Doppleri için uygun teknik nedir?

- Transabdominal veya transvaginal probla eksternal iliak arteri çaprazladığı yer renkli akım haritalamayla tespit edilir.
- İnceleme alanı çaprazlama noktasından 1 cm. aşağıya konur.

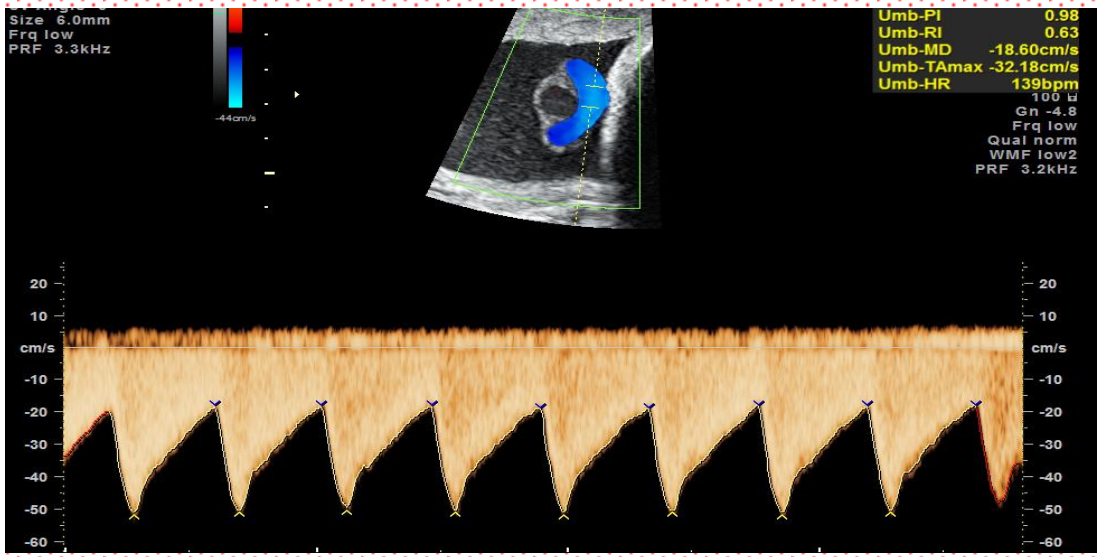




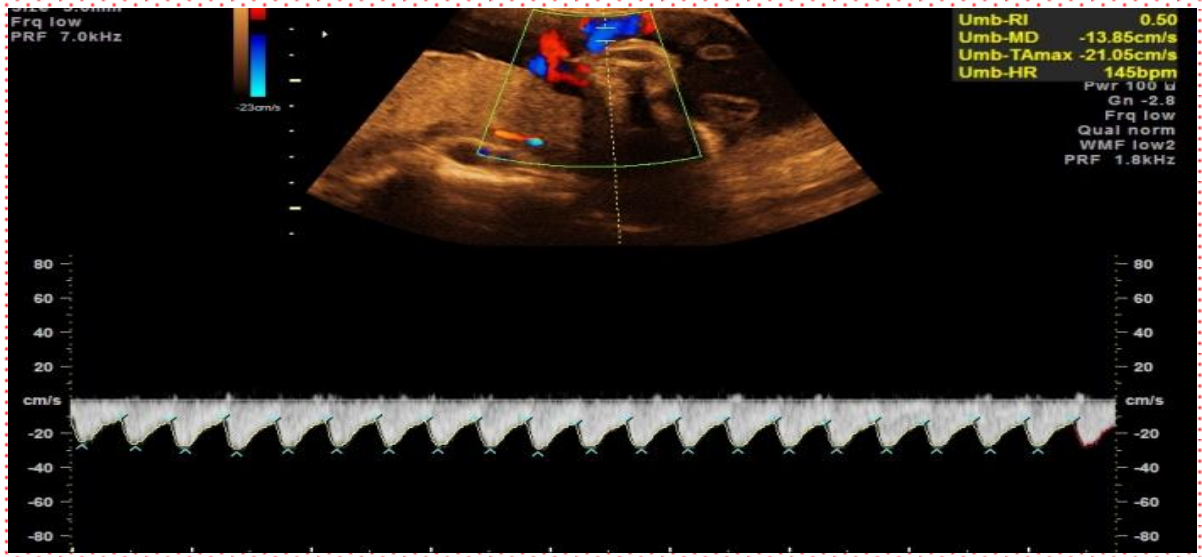
2- Öneriler

Umbilikal arter Doppleri için uygun teknik nedir?

- Fetal uç, plasental uç ve serbest kord ölçümleri arasında önemli farklar vardır.
- Ölçümler serbest kord bölümünden yapılmalıdır.



Uygun teknik

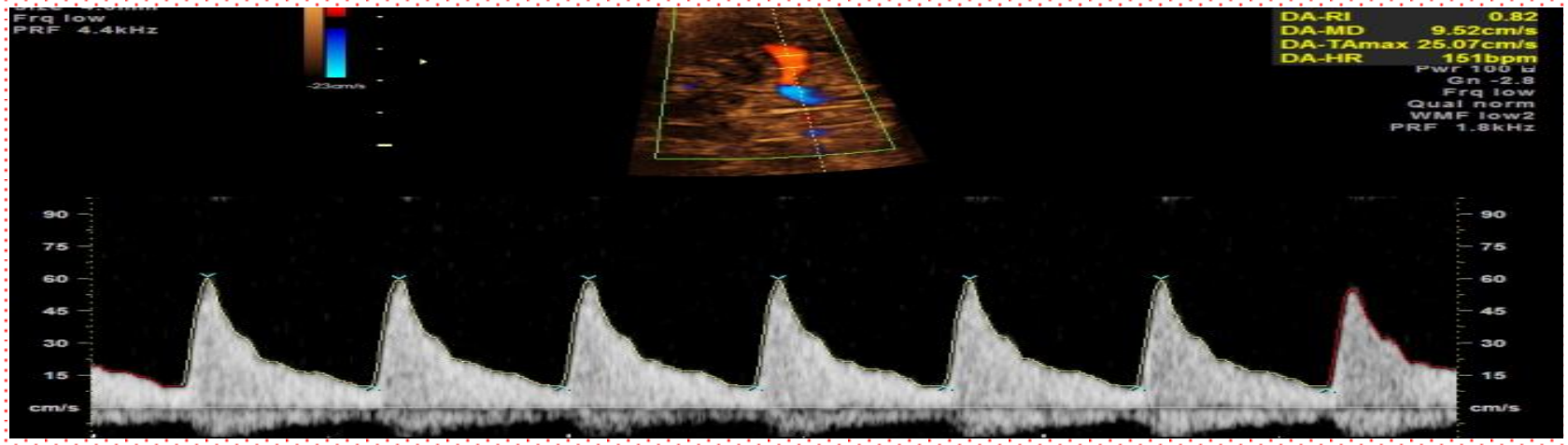


Uygun olmayan teknik

2- Öneriler

Fetal Orta Serebral Arter Doppleri İçin Uygun Teknik Nedir?

- Talamusun görüldüğü axiyal kesit alınıp büyütülmeli, renkli akım haritalamayla Willis halkası ve proximal orta serebral arter(MCA) görüntülenmeli.
- İnsonasyon açısı 20 ° nin altında ve mümkün olduğunca 0 ° yakın olmalıdır.
- En az üç peşpeşe dalgaformu kaydedilmelidir.

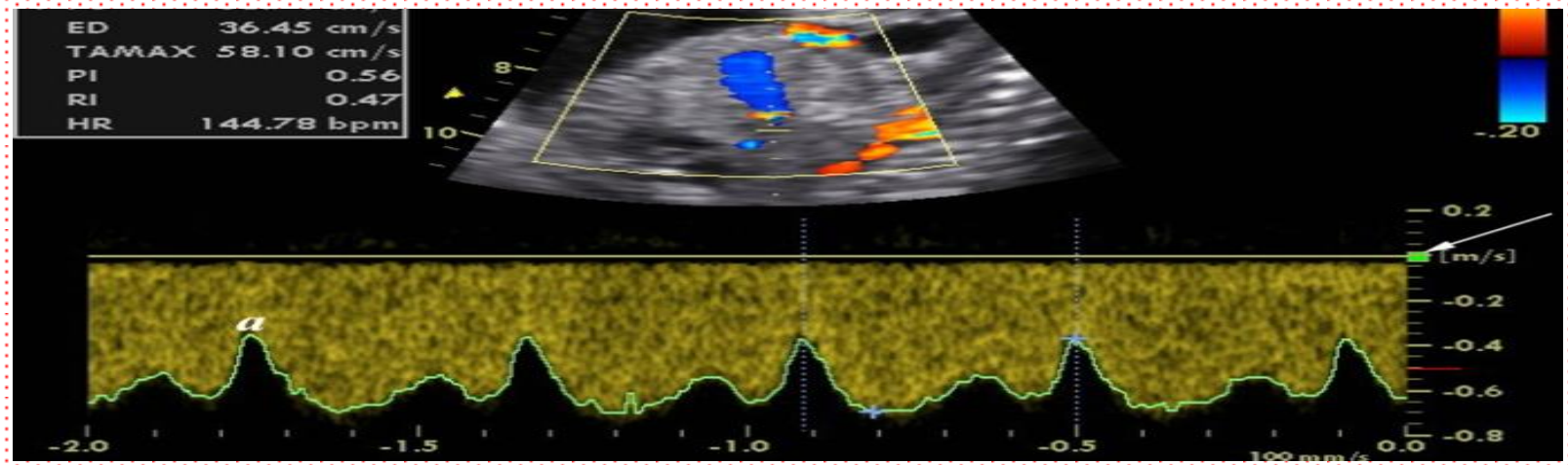


Uygun MCA Doppleri

2- Öneriler

Fetal Venöz Doppler İçin Uygun Teknik Nedir?

- Duktus venosus fetal gövdenin mid-sagittal longitudinal planında veya üst abdominal oblik transverse planda görüntülenir.
- Renkli akım haritalamayla yüksek hızlı türbülan akım (aliasing) görülür.
- Örneklem penceresi temiz kayıt alabilmek için daraltılır.



2- Öneriler

Hangi İndeksleri Kullanalım?

- S/D oranı, Rezistans indeksi (RI) ve Pulsatilite Indeksi (PI) arteriyal dalga formlarında en iyi bilinen ve en çok kullanılan indekslerdir.
- Üç indeks birbiriyle koreledir.
- Birbirlerine üstünlüklerini gösteren basılmış kanıt yoktur. Günlük pratikte PI en sık kullanılan indekstir.
- Venöz dalga formlarında venler için pulsatilite indeksi (PIV) en sık kullanılan indekstir.

SUNUM AKIŞI

I-ISUOG İle İlgili Genel Bilgiler

II-Fetal Santral Sinir Sistemi Ultrasonu: 'Temel Muayene' ve 'Nörosonogram' Kılavuzu (Ocak 2007)

III-Rutin İkinci Üçay Fetal Ultrason Taraması Kılavuzu (Ocak 2011)

IV- İlk Üçay Fetal Ultrason Taraması Kılavuzu (Ocak 2013)

V-Obstetrik Doppler Ultrason Kılavuzu (Şubat 2013)

VI-Fetal Kalp Taraması Kılavuzu (Mart 2013)

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GUIDELINES

ISUOG Practice Guidelines (updated): sonographic screening examination of the fetal heart

1-Giriş

2-Genel Değerlendirme

A- Gestasyonel yaş
B- Teknik Faktörler

3-Kardiak Değerlendirme

A- 4 odacık değerlendirmesi
B- Kardiak Çıkışyollarının değerlendirilmesi (Sağ-Sol)
C- Renkli Doppler
D- Fetal Echo

1- Giriş

- Konjenital Kalp Hastalıkları (KKH) insidansı 4-13/1000 canlı doğum
- Yapısal kalp anomalileri prenatal ultrasonda en sık atlanan anomalilerdir.
- Bu kılavuz düşük riskli fetüslerin rutin prenatal muayenesinde kullanılabilir.
- Şüphelenilen kalp anomalileri fetal ekokardiografi ile daha kapsamlı değerlendirme gerektirir.

2-Genel Değerlendirme

A- Gestasyonel yaş:

Kalp taraması için en uygun dönem 18.-22. gestasyonel haftalar arasıdır.

B- Teknik Faktörler:

*Ultrason Probu: Yüksek frekanslı problar ince defektleri tanıma ihtimalini arttırır.

*Görüntüleme parametreleri: Ayarlar yüksek frame hızı, yüksek kontrast, tek odak ve dar görüntü alanına ayarlanmalıdır.

*Zoom ve Cine loop: Görüntüler kalp ekranın en azından 1/3 – 1/2 sini doldurana kadar büyütülmelidir. Cine loop özelliği kullanılmalıdır.

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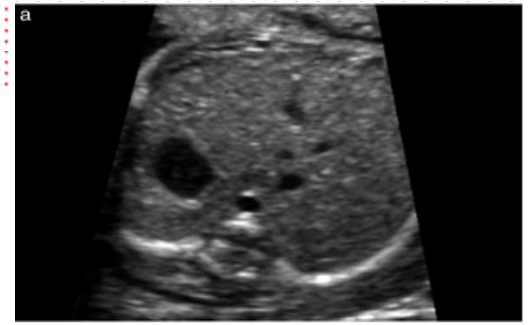
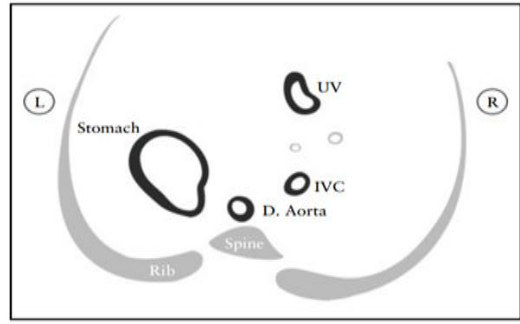
3-Kardiak Değerlendirme

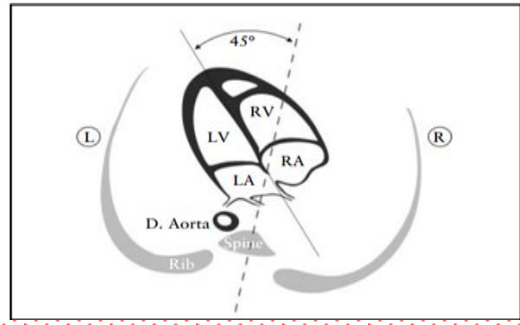
A- Dört odacık değerlendirmesi

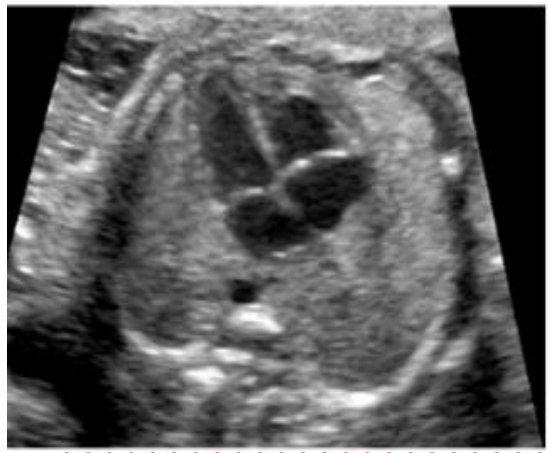
Table 1 Assessment of fetal situs/laterality and the four-chamber view

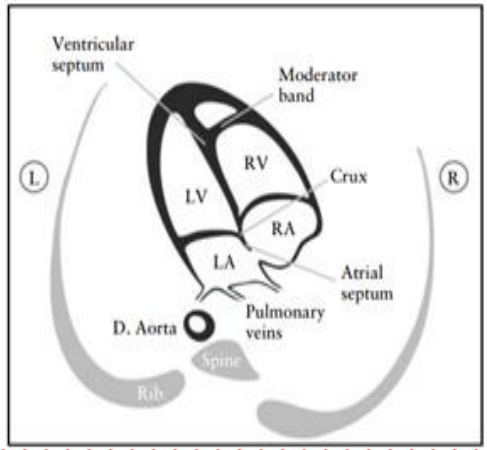
Situs and general aspects
Fetal laterality (identify right and left sides of fetus)
Stomach and heart on left
Heart occupies a third of thoracic area
Majority of heart in left chest
Cardiac axis (apex) points to left by 45° ± 20°
Four chambers present
Regular cardiac rhythm
No pericardial effusion
Atrial chambers
Two atria, approximately equal in size
Foramen ovale flap in left atrium
Atrial septum primum present (near to crux)
Pulmonary veins entering left atrium
Ventricular chambers
Two ventricles, approximately equal in size
No ventricular wall hypertrophy
Moderator band at right ventricular apex
Ventricular septum intact (apex to crux)
Atrioventricular junction and valves
Intact cardiac crux
Two atrioventricular valves open and move freely
Differential offsetting: tricuspid valve leaflet inserts on ventricular septum closer to cardiac apex than does mitral valve



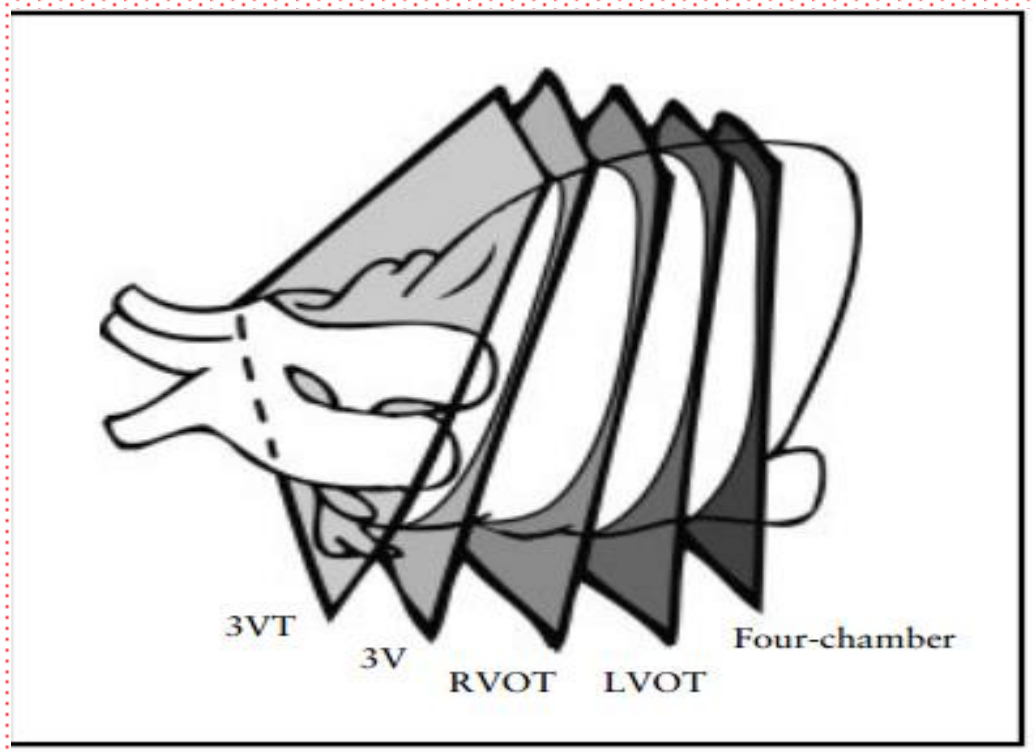


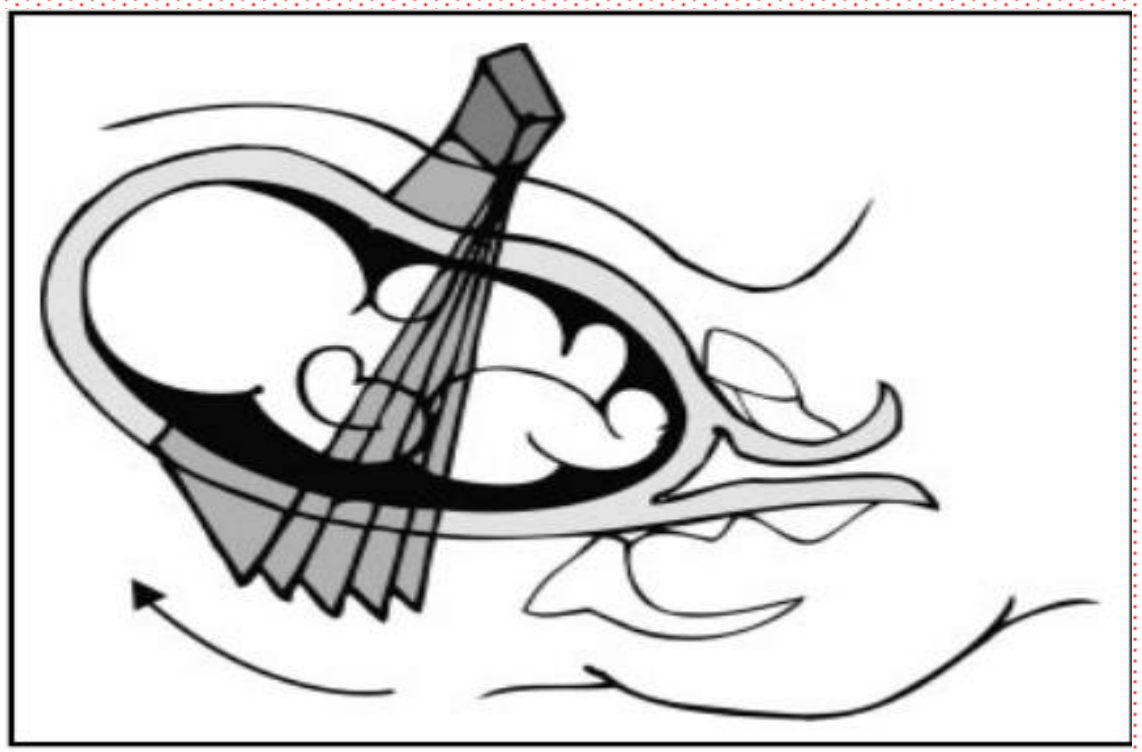






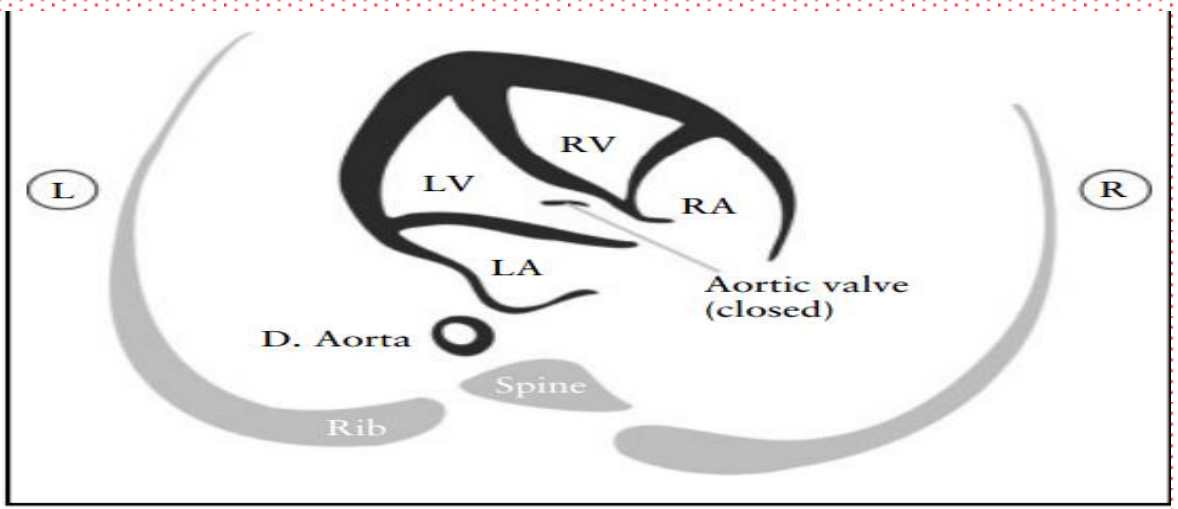
Teknik

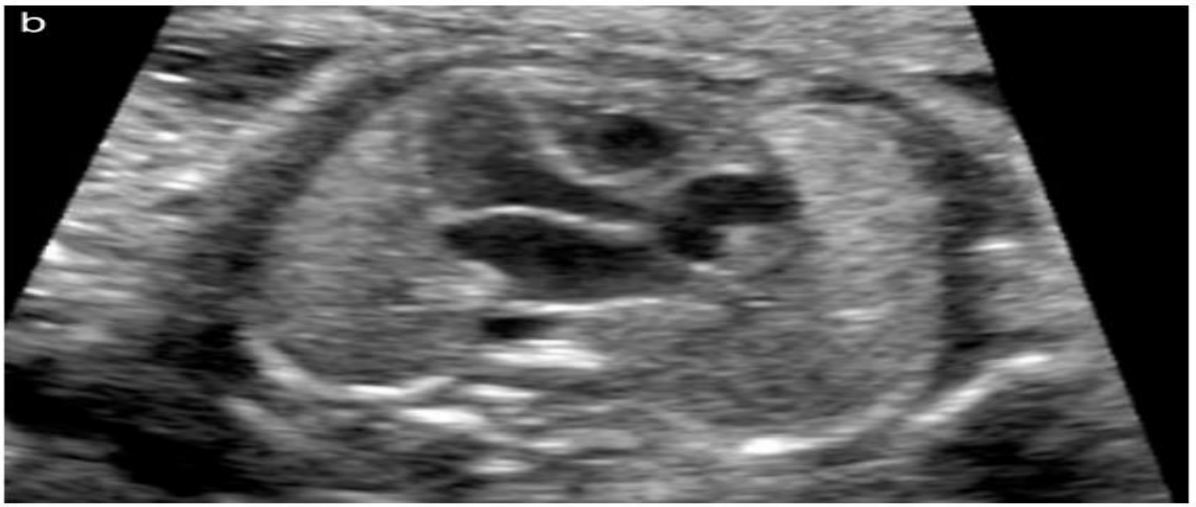


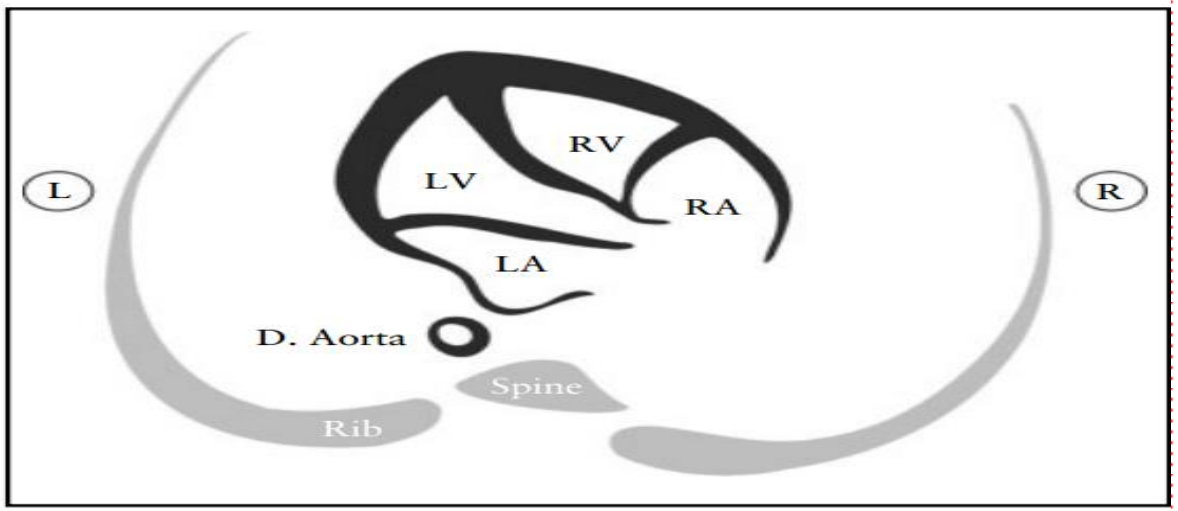


Sol Çıkış

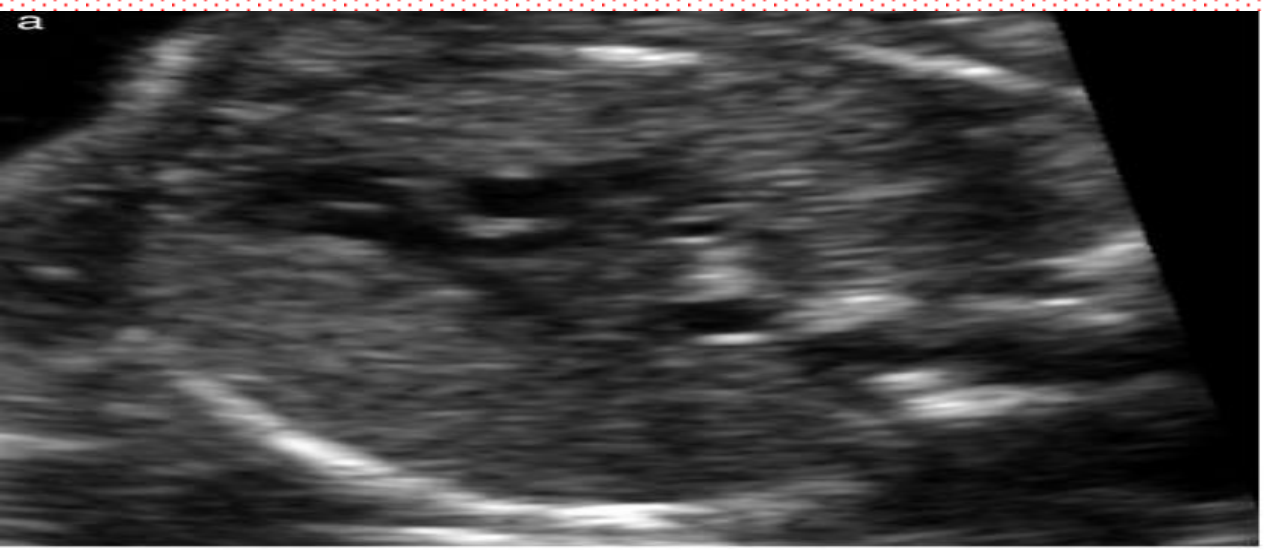
a


L
R
RV
LV
RA
LA
Aortic valve
(closed)
D. Aorta
Spine
Rib


b


L
R
RV
LV
RA
LA
D. Aorta
Spine
Rib

Sağ Çıkış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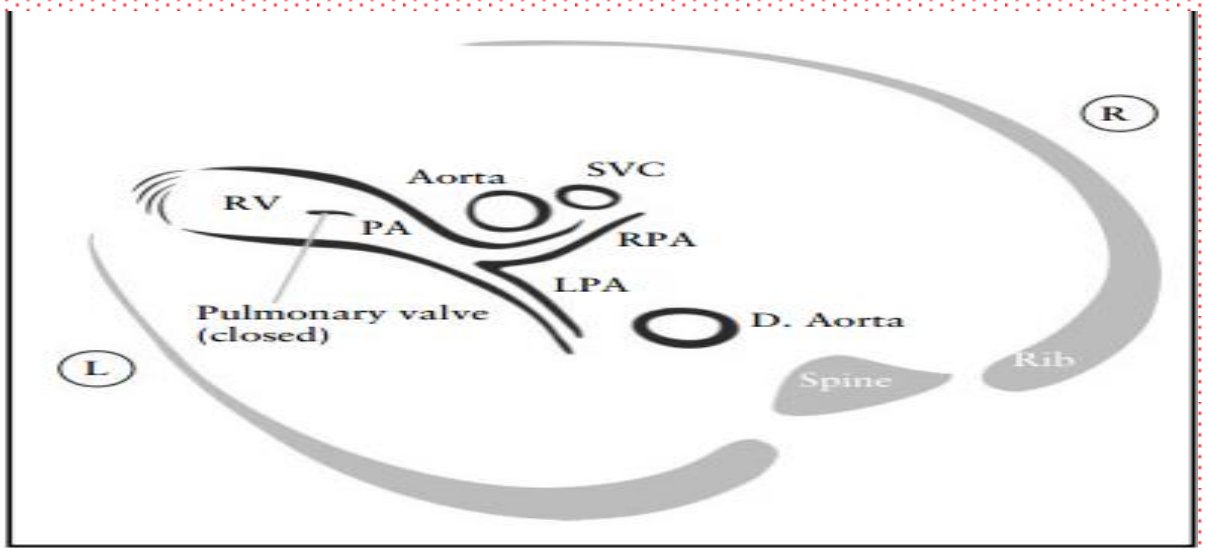
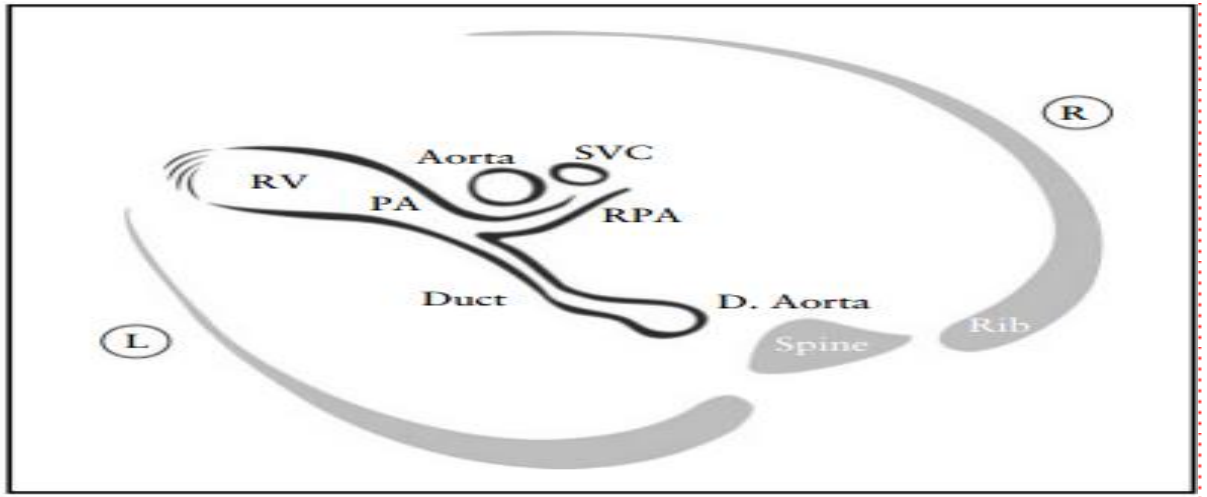

R
Aorta
SVC
RV
PA
RPA
LPA
Pulmonary valve
(closed)
D. Aorta
L
Spine
Rib

b


R
Aorta
SVC
RV
PA
RPA
Duct
D. Aorta
L
Spine
Rib

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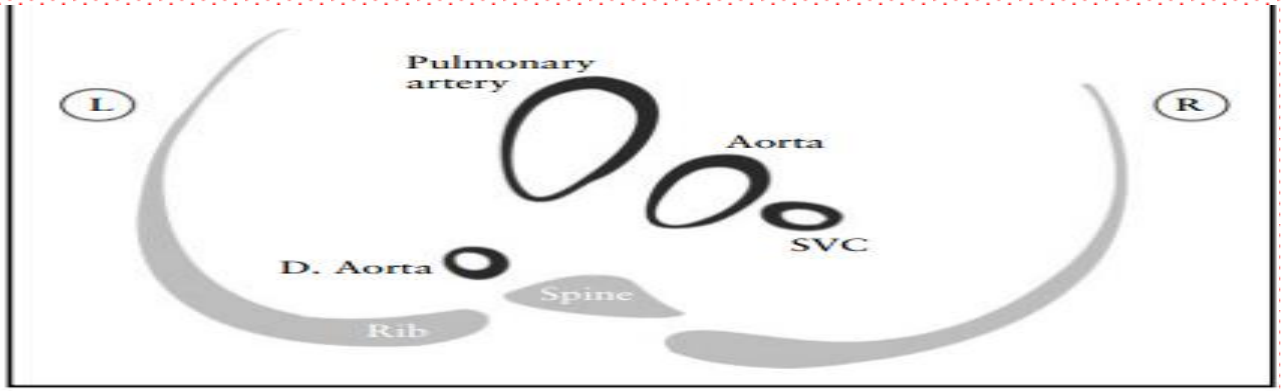

Figure 7 Three-vessel (3V) view. This view best demonstrates the relationship between the pulmonary artery, aorta and superior vena cava (SVC) in the upper mediastinum. It is important to note the correct position and alignment of the three vessels as well as their relative size. The pulmonary artery, to the left, is the largest of the three and the most anterior, whereas the SVC is the smallest and most posterior. D. Aorta, descending aorta.

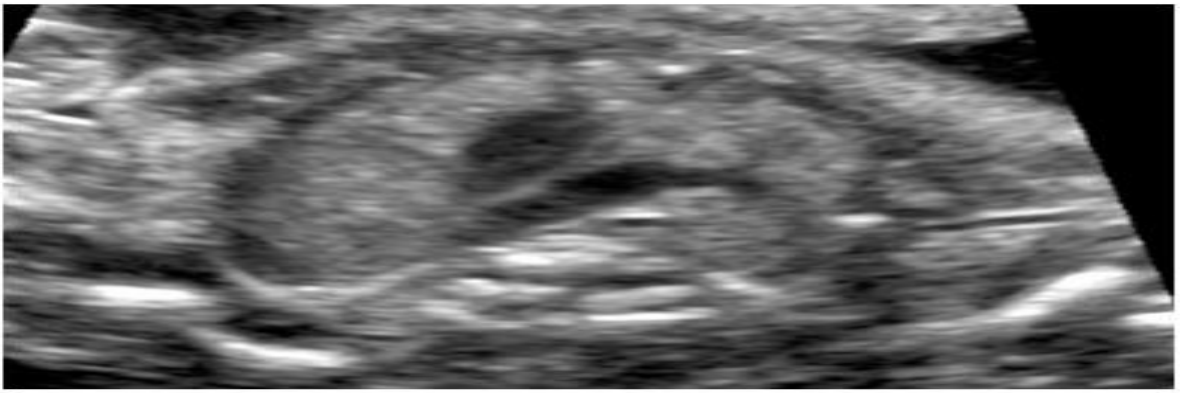

Figure 8 Three vessels and trachea (3VT) view. This view best demonstrates the transverse aortic arch and its relationship with the trachea. In the normal heart, both the aortic arch and the ductal arch are located to the left of the trachea, in a 'V'-shaped configuration. L, left; R, right; SVC, superior vena cava.

C- Renkli Akım Doppler

Renkli doppler kullanımı zorunlu olmamasına rağmen kullanımına alışmak ve rutin taramaya eklenmesi teşvik edilmelidir.

D- Fetal Ekokardiografi

- Yüksek riskli hastalarda, Kardiak değerlendirmede anomali saptanan hastalarda önerilir.
- M-Mod, Doppler, 3D/4D/spatiotemporal image correlation (STIC) gibi ek teknikler kullanılabilir.

DİNLEDİĞİNİZ İÇİN TEŞEKKÜRLER….