

Hydrops Fetalis

Hima Prabhakar

UMDNJ-Robert Wood Johnson (MSIV)

Gillian Lieberman, MD



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Gillian Lieberman, MD

Patient History

- 16 YO G1P0, 17 weeks gestation by LMP

by physician for abnormally low maternal •
Referred for full fetal ultrasound evaluation
AFP

18), and fetal demise.include incorrect

dates, Down syndrome • Some causes of low maternal serum AFP (trisomy 21), Edward's syndrome (trisomy



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17w Fetus Sagittal Body

Findings consistent with hydrops fetalis





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Hydrops fetalis

- First described in 1892
 - Latin for “edema of the fetus”
 - Incidence of 1/1500 to 1/4000 deliveries
- fluid collections in serous cavities•
Characterized by generalized edema
and

- Peripheral edema may be significant (anasarca)



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Diagnosis of Hydrops Fetalis

- Fluid accumulations must involve more than 1 site for the term “hydrops” to be used

diagnosis (isolated ascites) - can have a

better prognosis, and narrows
differential • If fluid collection in only one
cavity (i.e.



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Sonographic Findings

- Subcutaneous edema (thickness 5mm)
- Pleural Effusion
- Ascites
- Pericardial Effusion
- Polyhydramnios

- Placental Thickening (more than 6 cm)

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17 week fetus. All
abnormal images
are from our
patient's
17 week fetus. from a

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All comparisons are



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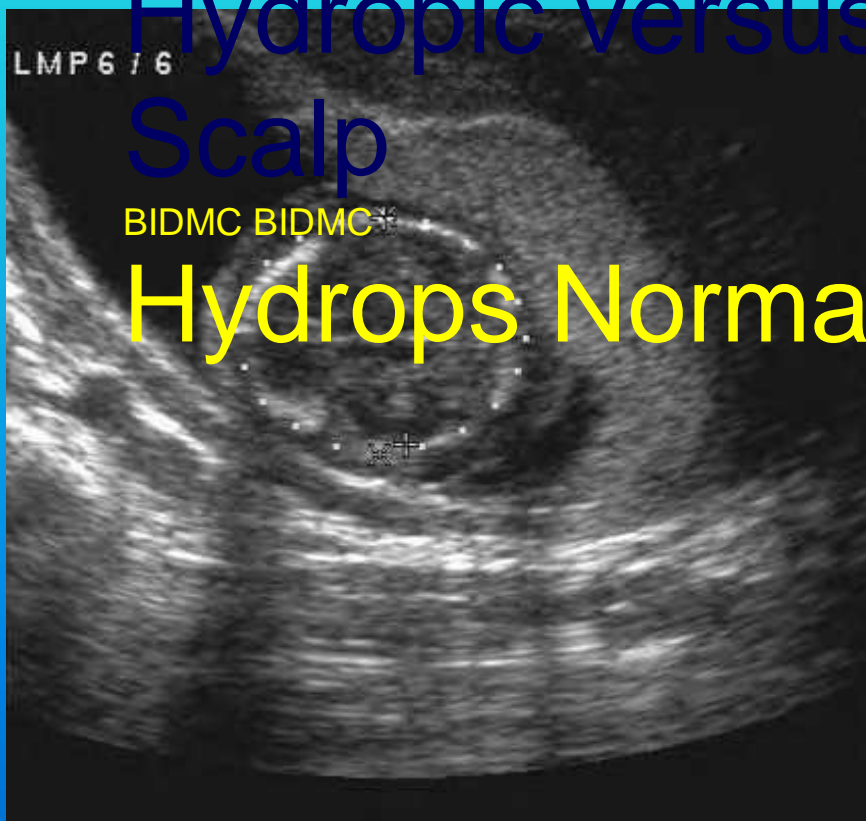
- Placental Thickening (more than 6 cm)

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Hydropic versus Normal Fetal Scalp

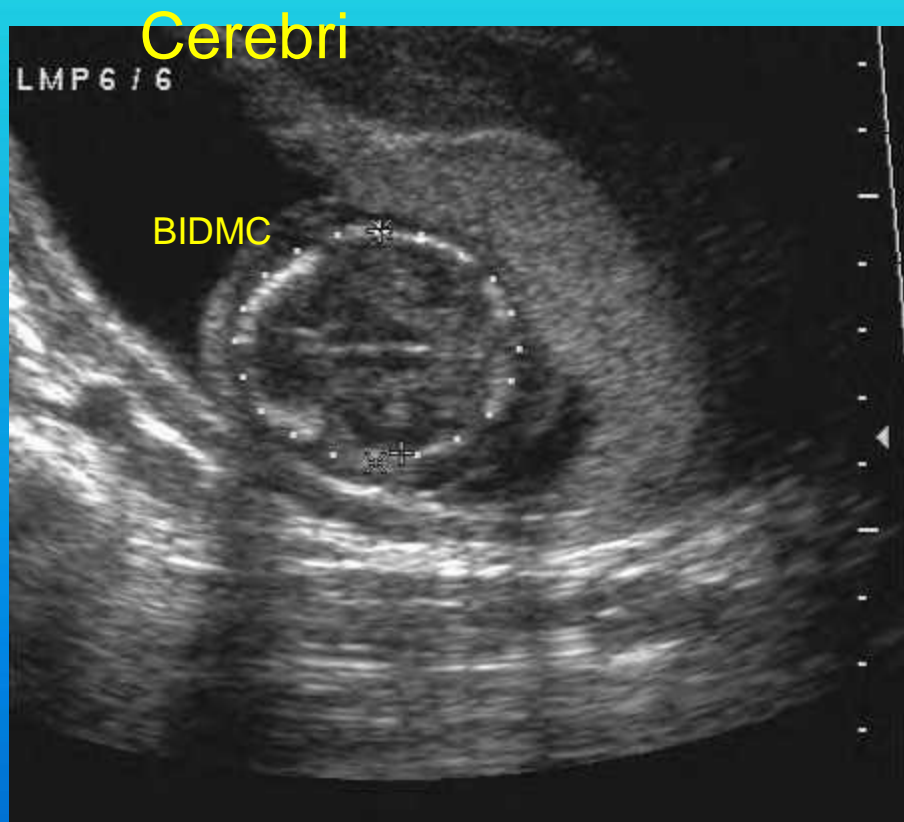


Hydrops Normal



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Hydrops, Scalp Edema



Falx

Placenta

Cranium

Skin

10



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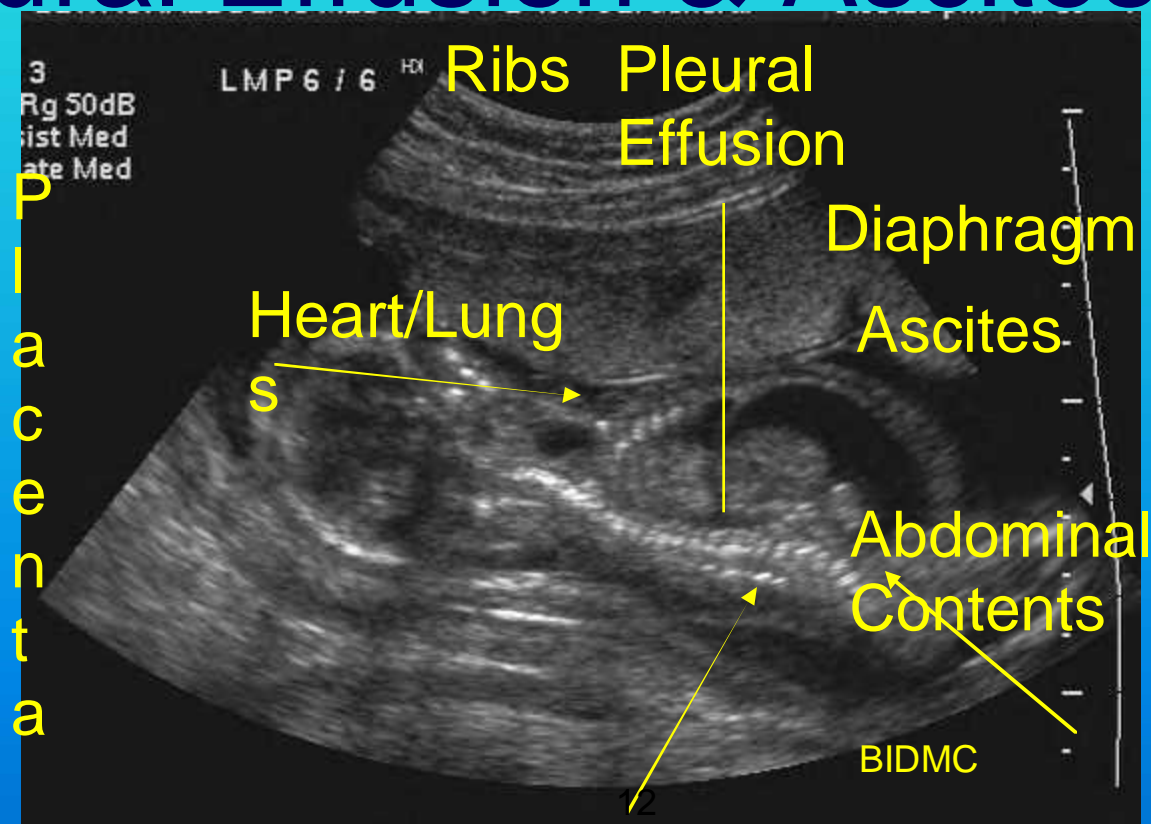
- Placental Thickening (more than 6 cm)

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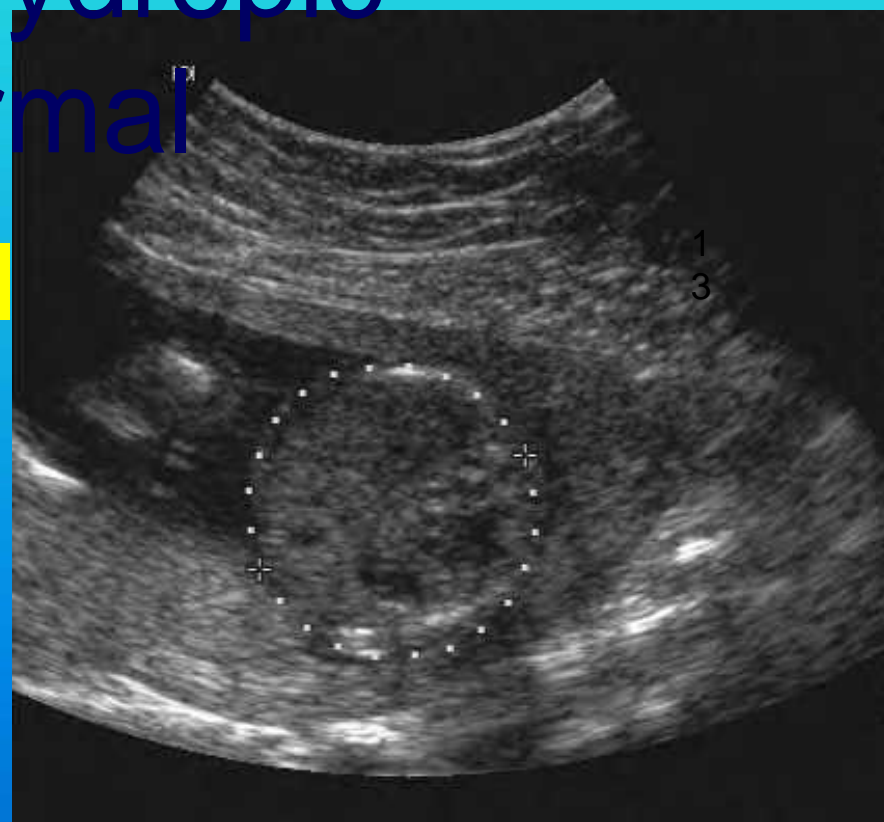
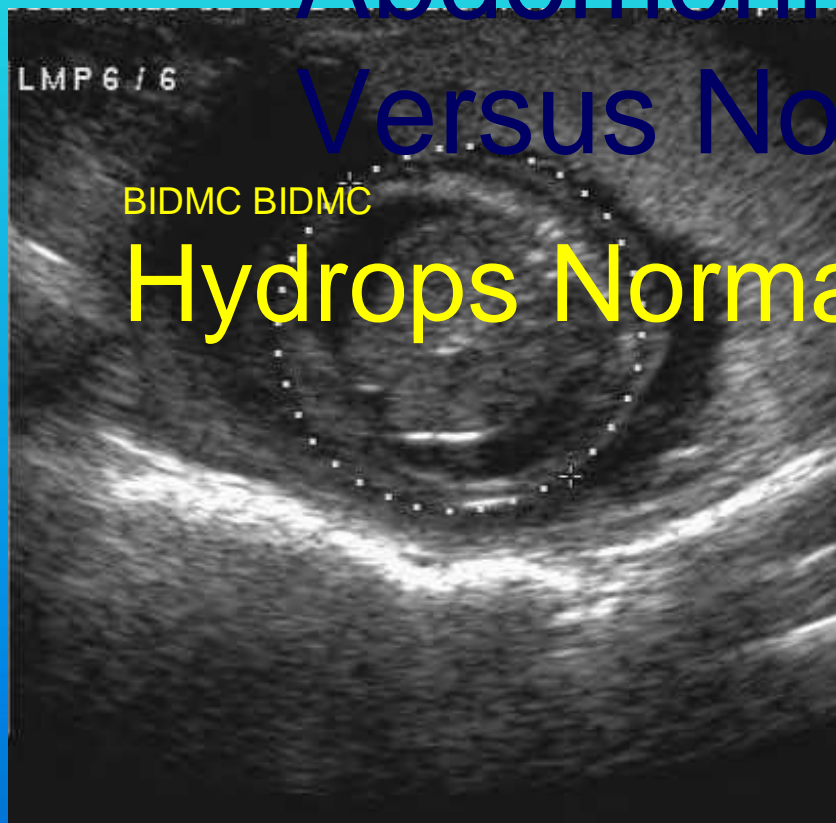
Pleural Effusion & Ascites





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AbdomenHydropic Versus Normal



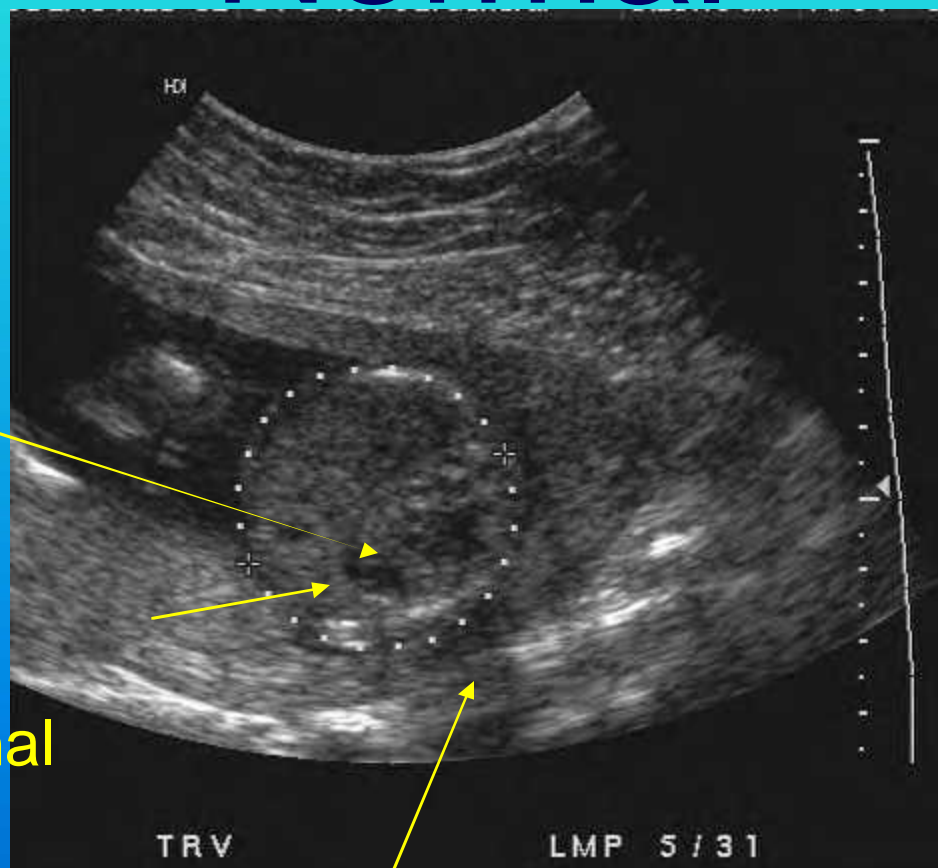


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Normal

Liver

Abdominal
Wall



Placenta^C

Spine

14

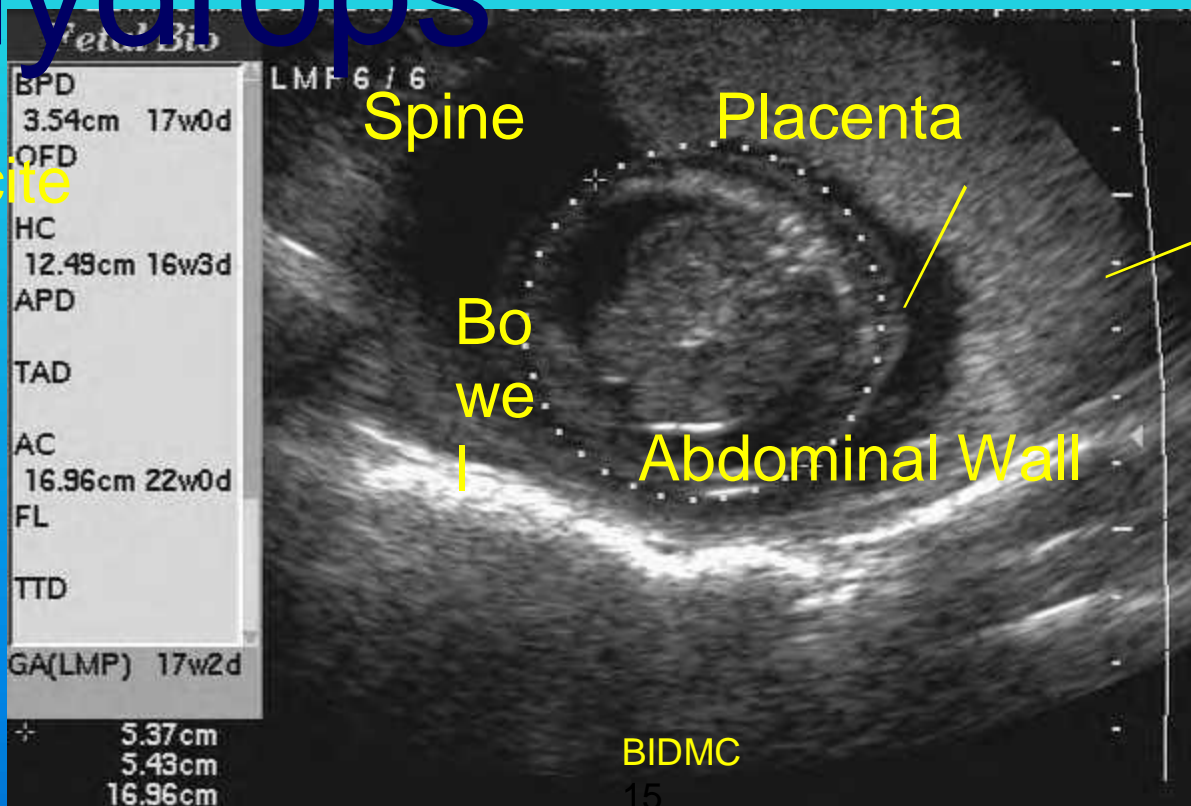
Stomach



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Hydrops

Ascites
S





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- Ascites
- **Pericardial Effusion**
- Polyhydramnios

- Placental Thickening (more than 6 cm)

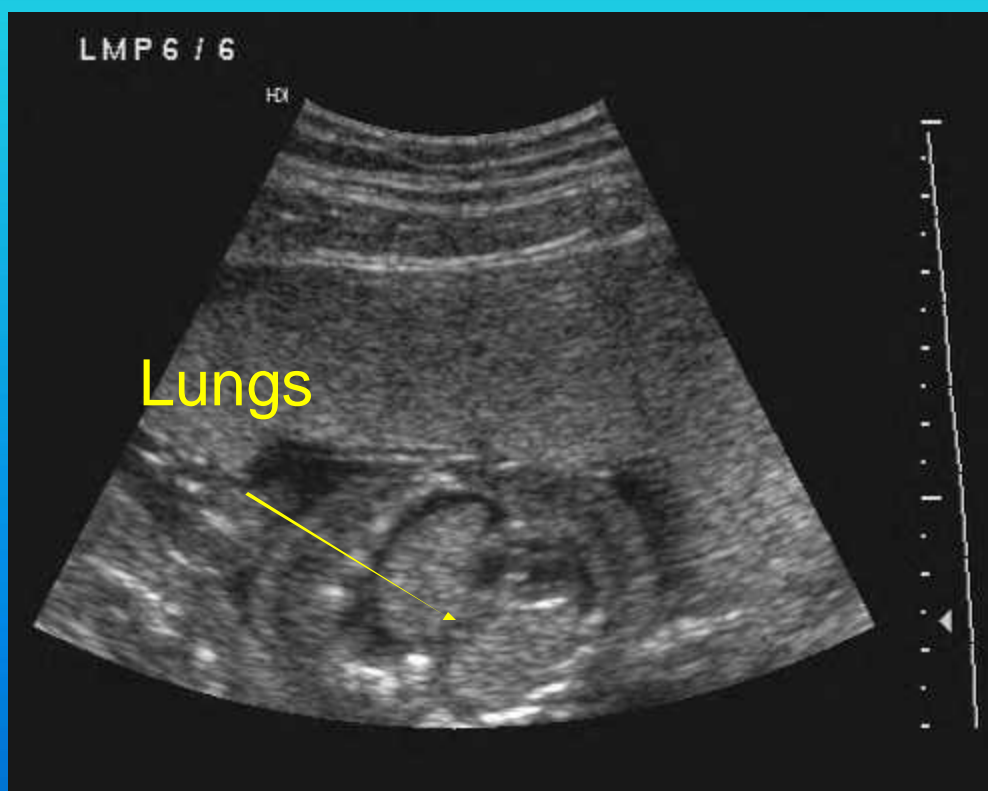
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Pericardial Effusion

Ribs



Heart

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BIDMC



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Sonographic Findings

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Gross Placental Pathology

Hydropic Placenta



Normal Placenta

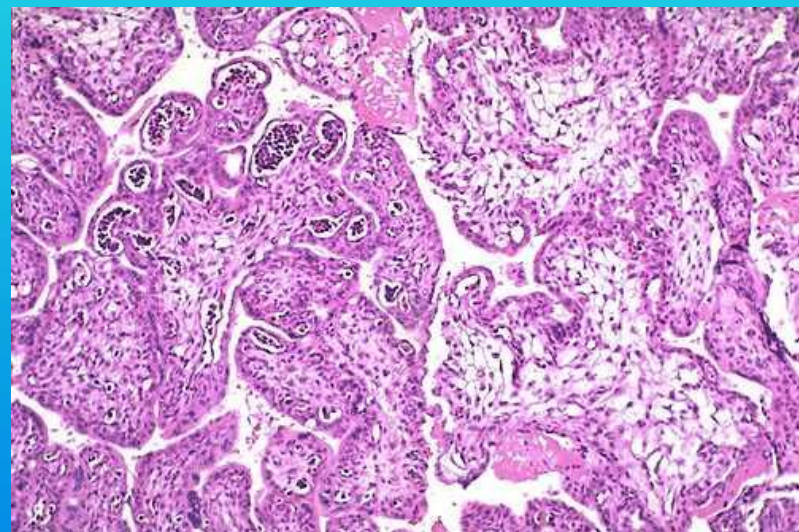
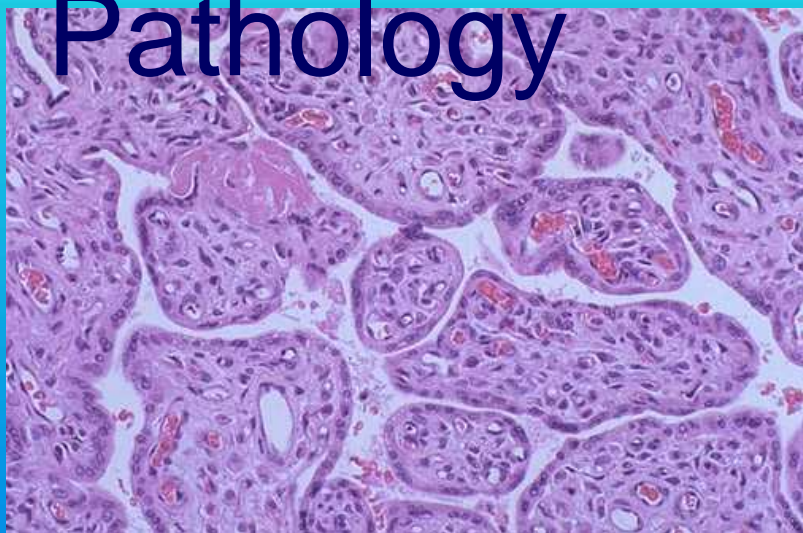
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http://www.echt.chm.msu.edu/courseware/blockII/Pathology/Gest_14.html



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Microscopic Placental Pathology



Normal Placenta Hydropic Placenta

<http://www-medlib.med.utah.edu/WebPath/PLACHTML/PLAC076.html>

<http://www-medlib.med.utah.edu/WebPath/PLACHTML/PLAC097.html>



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abnormalities:of the fetus
revealed further Careful
sonographic analysis

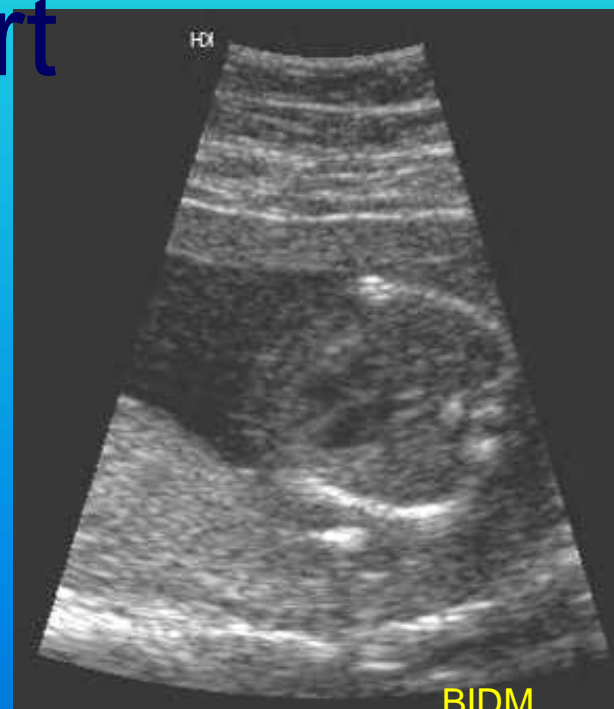
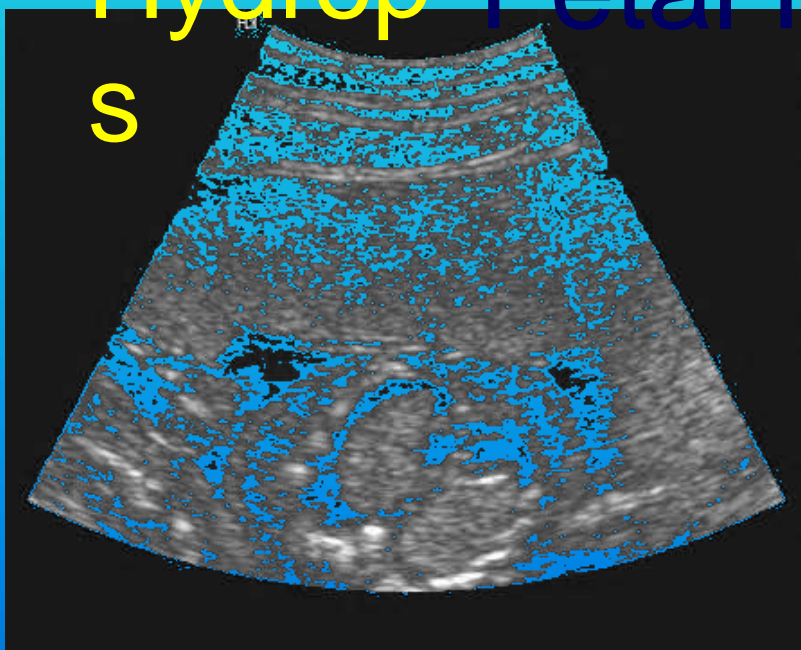
1. Congenital Heart Defect

2. Cystic Hygroma



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Normal versus Abnormal Hydrop Fetal Heart



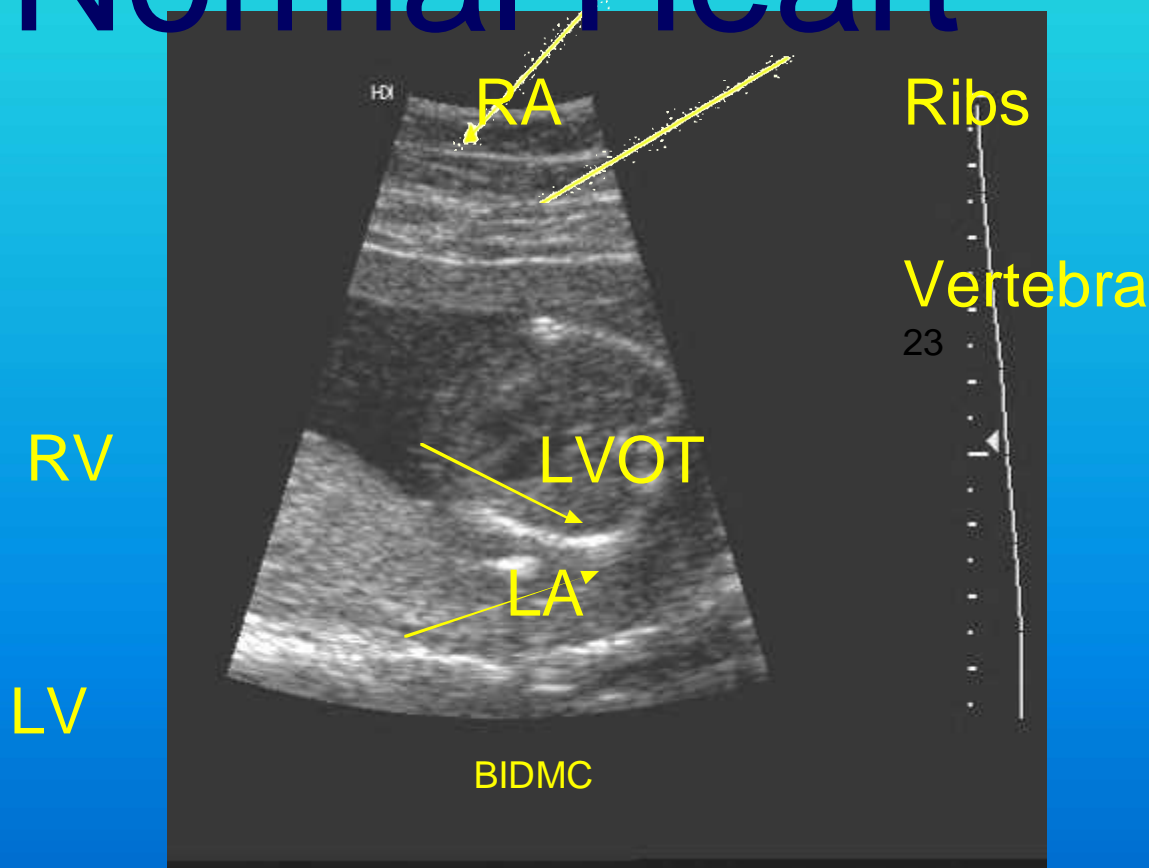
Normal

BIDMC
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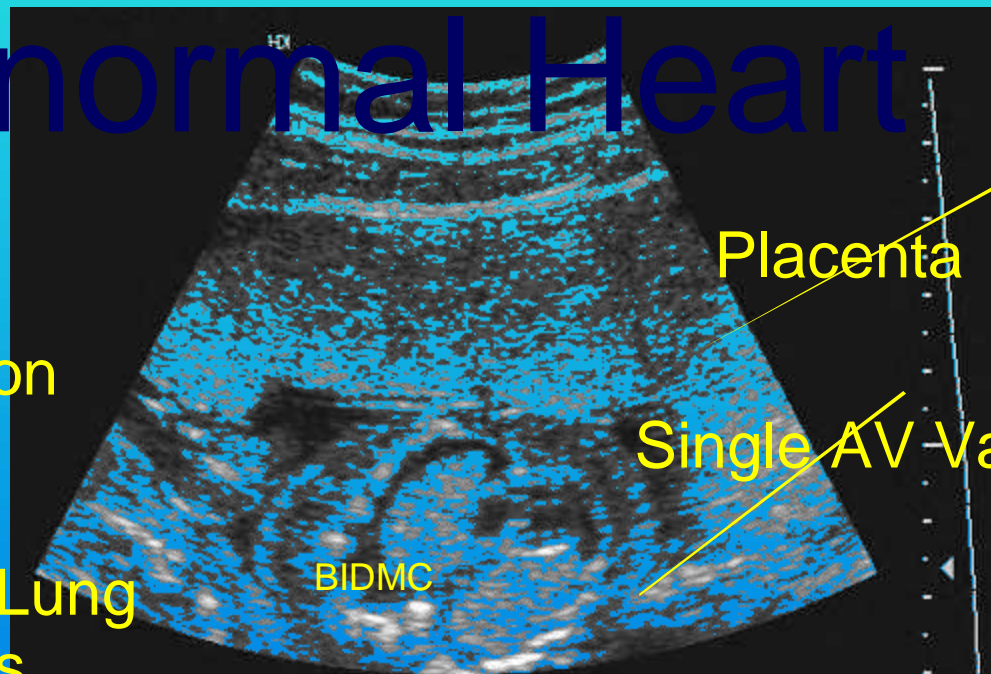
Normal Heart





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Abnormal Heart



Pleural Effusion

Placenta

Single AV Valve

BIDMC

Lung
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Ribs
Skin
n

complex congenital heart disease. There is a single AV valve. Other views (not included) showed a s i

single ventricular outflow tract, consistent with

2
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2
5

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on this sagittal fetal
ultrasound? Can you diagnose
the abnormality

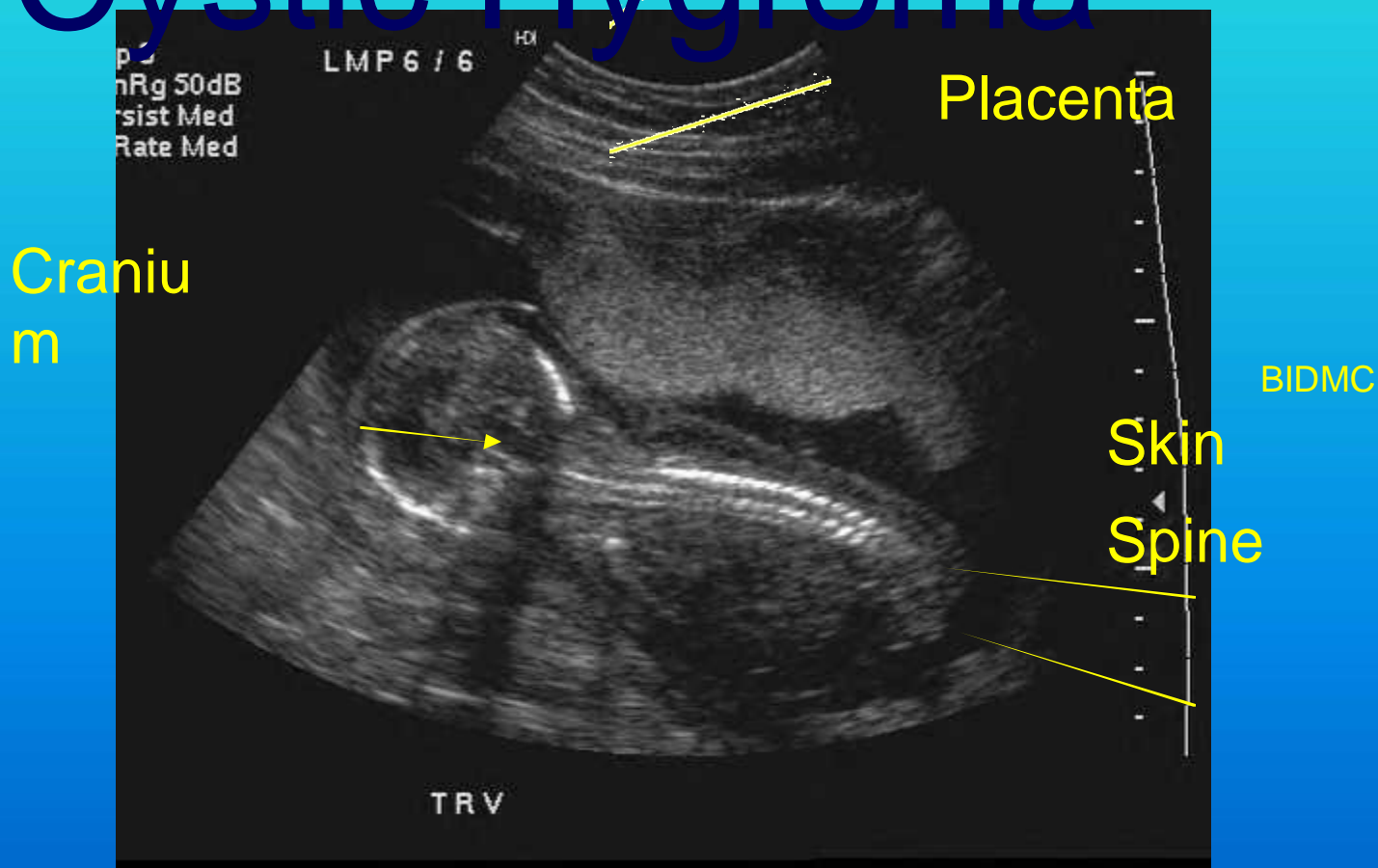
BIDMC





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Cystic Hygroma



Cystic Hygrom

a

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Cystic Hygroma

- Incidence 1/12,000 births
- Dilates embryonic venous system, causing dilation of embryonic lymphatics to connect with the venous system
- Develops around 40d gestation
- failure of regression
- 50% are chromosomally normal
- 50% are aneuploid) have trisomy 18, 21, 13 (total

60-75% • Half have Turner's syndrome (XO), 10-15%

• Usually associated with elevated AFP



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Differential Diagnosis

the majority of cases prior to
1960s) disease/Rh isoimmunization
(etiology for • Immune Hydrops -
alloimmune hemolytic

number of

- Nonimmune Hydrops - LARGE causes!
Currently comprises approximately
75% of cases



Some Causes of

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Non-Immune

- **Hematologic** - homozygous α -thalassemia
- **Congenital Infections** - Syphilis,

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parvovirus, CMV, HSV type I

tachyarrhythmias, bradyarrhythmias•

Cardiovascular - Structural
anomalies,

• **Lymphatic Abnormalities**

sequestration, CCAM• **Pulmonary**

Malformations - Pulmonary



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Some Causes of Non-Immune Hydrops (cont.)

- (13, 21, 18), triploidy • **Chromosomal Abnormalities** - Trisomies
- **Neoplasms** - Sacrococcygeal teratoma
- **Placental Abnormalities** - Chorioangioma disease, mucopolysaccharidosis •

Metabolic/Storage Disorders - Gaucher's

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Prenatal Evaluation of Hydrops

echo• Complete ultrasound evaluation
+/- fetal

incompatibility• Exclusion of
isoimmunization - Rh

- Amniotic fluid analysis with cultures/PCR
- Chromosomal evaluation
- Maternal serology



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Hydrops Fetalis Prognosis of Non-Immune

fetal death. • 50% of all cases diagnosed in utero result in

immune hydrops die. • 50% of all live born infants with non-

condition - some fetal infections (i.e. parvovirus B19) can have remission of •

Exact prognosis depends on the
underlying
hydrops.

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Poor Prognostic Indicators

- Identification prior to 24w gestation
- Structural Malformations, esp. Cardiac
- Chromosomal Disorder
- Pleural Effusions/Pulmonary Hypoplasia
- Severe Hydrops

- Prematurity

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References

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- Jaffe, Richard. Manual of Obstetric & Gynecologic Ultrasound. New York:Lippincott-Raven, 1997.
- Palmer, P. Manual of Diagnostic Ultrasound. Geneva, Switzerland: WHO, 1995.
- Romero, R. Prenatal Diagnosis of Congenital Anomalies. New York: Appleton & Lange, 1988.

Articles:

- Jauniaux, E. "Diagnosis and Management of Early Non-Immune Hydrops Fetalis." Prenatal Diagnosis. 17: 1261-68, 1997.

Web Sites:

Merck Manual Online - Chapters 18 & 19

www.merck.com/pubs/mmanual

University of Minnesota - Neonatology Department Teaching Files

www.peds.umn.edu/divisions/neonatology/tfiles/hydrops.html

Brigham & Women's Radiology cases (BrighamRad)

<http://brighamrad.harvard.edu/cases/bwh/hcache/36.full.html>

Pathology Web Sites:

http://www.echt.chm.msu.edu/courseware/blockII/Pathology/Gest_14.html

<http://www-medlib.med.utah.edu/WebPath/PLACHTML/PLAC076.html>



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