FETAL CHEST

Contents:

Development
Sonographic Scanning
Lung mass lesion
;Congenital Cystic Adenomatoid Malformation., Laryngeal Atresia.
Lung Sequestration. Congenital diaphragmatic hernia
Pleural Effusions.
Cervicomediastinal and Axillary Cystic Hygroma.

Study goal:

To menorize check points in fetall chest scanning

Ⅰ.NORMAL DEVELOPMENT

;respiratory tract and the esophagus are derived from the primitive foregut

0 - 5wks ; embryo
primitive foregut? ? ? ? ? ? branching

5 - 17wks ; pseudoglandular period
main bronchi
appearance of the developing lung.

17 - 24wks ; canalicular period
primitive alveoli

24 - term ; during the terminal sac period
capillaries bulge into the sacs, begining the facilitation of gas exchange.
Type 1,2 pneumocyte

Three factors for lung development

-adequate thoracic space
-fetal breathing movement
-adequate amiotic fluid volume

Ⅱ SONOGRAPHIC SCANNING

: chest shape
chest size-C.C for 4 chamber level

chest symmetry
cardic size and morphology
pulmonary echo texture-increased as gestational age
Fetal Thoracic circumference Measurement Table<Chitkara U.Am j Obstet Gynecol 1987>

Chest shape;

Rib should gradually enlarge toward the abdomen in a bell shape.
Thanatophoric dwarf-narrow chest
O.I-multiple rib fracture
TC/AC=0.89+-0.06(S.D), constant from 16th week to 40th weeks<Chitkara,1987>

Clavicle;

Cleidocranial dysplasia
Holt-Oram syndrome
Goltz syndrome
Melnick-Needles syndrome

Ⅲ.LUNG MASS LESION

A.Congenital Cystic Adenomatoid Malformation.(CCAM)

Overgrowth of terminal bronchiloe
insult at pseudoglandular stage
unilateral 80-95%

the essential feature- usually involve one lobe or segment
excessive overgrowth of the bronchioles,
communicate with the normal trachiobronchial tree
polyhydramnios.(decreased swallowing,eosophagial compression,increased lung liquid production)

①Type I CCAM

*large size ;2-10cm cyst
50%
alveolus-like structures adjacent to or communicating with the larger cysts.
blood vessels- normal.
Favorable outcome

②Type II CCAM

*smaller cysts(> 1cm)-visible by sono

40%

associated other abnormalities

renal agenesis

TOF

Jejunal atresia

CDH

Hydrocephalus

Skeletal anormaly

③Type III CCAM

*solid echogenic mass

microcystic (2-5mm)

10%

poor outcome

④Treatment.

Sono F/U. (hydrops-poor prognosis,hydroamniosis-70%)

May regress

thoraco-amnotic catheter shunt.

in utero deconpression of cysts.

in utero sugical excision.-endoscopic ablation<Kings,U.K>

⑤Prognosis

;Poor prognositic factor-polyhydroamniosis

mediastinal shift

Stillbirth-25%

Preterm-50%

Later lobectomy-20

Spont. Regression-6

Summary of outcome of 132 cases of antenatally diagnosed CCAM

TOP(44) -	33%
Continuing pregnancy(88)-	67%
Intrauterine death(6)	-5%
Neonatal death(21)	-16%
15 after surgery	
6 before surgery	
Alive(61)	46%
45 after surgery	

16 before surgery

B.Laryngeal Atresia.

;three type of laryngeal atresia

Type I : supra- and infraglottic.

Type II : infraglottic.

Type III ; glottic.

- presence of a fluid - filled trachea.
- context of Fraser syndrome ; autosomal recessive disorder
  includes other anomalies- ears, nose, genitalia, skeleton, mentalretardation.

*Esophageal atresia - polyhydramnios (60-70%;after 24wks)
absent stomach bubble (50%)
defection rate(50%).

-mamagement - other severe anomalies:associate

C.Lung sequestration

;an area of the lung is nonfunctioning and receives its blood supply from the systemic circulation

-Caudally supranumerary lung bud growth

-Lack of communication with the normal bronchial tree.

-lower lung(85%)

①**Extralobar type**(25%)–after pleural development
left side(90%)
Between the lower lobe and diaphragm(m/c)
color doppler ;systemic circulation
its own pleura
fetal hydrops.-poor outcome
asso. Anormaly(59%):CDH,T-E fistula,CHD
sonographic findinfs:
well-circumscribe echogenic mass in the fetal thorax.
Pleural effusion(50%)
Mediastinal shift(50%)
fetal hydrops.
polyhydramnios

D.Dx; small vessel
- from CCAM
lobar emphysema
CDH
Management; Fetal karyotype
Fetal echocardiogram
Prognosis-if diagnosed prenatally-survival rate 36%
:rarely symptomatic in the neonatal period

②**Intralobar type**(75%)-before pleural development
Asso. Anormaly(10%)
Only one case reported.

D.Bronchogenic Cyst

;Resusults from abnormal development in the budding or branching of the Trcheobronchial tree.
Not associated with other congenital anomaly
Sonofindings;echogenic mass in the left upper lobe

E.Pleural Effusion.

Primary fetal hydrothorax
Chylothorax(m/c)
Thoracic duct atresia

Secondary fetal hydrothorax
Hydrops fetalis
Chest mass
Posterior urethral valves associated with urinary ascites
Cardic disease(5%)
intrauterine infection(Adeno V)
Chromosomal anomaly(Down-4.9%, Noonan, Turner syndrome)

Management:
;Prenatal karyotype and echocardiogram
1.Observation
2.Thoracentesis
3.Pleuroamniotic shunting after 2 thoracentesis

Prognosis
For thoracentesis,shunting-survival rate 56 to 90%

Primary chylous effusion(unass. with anormaly)-50%<Weber AM,1992>

Prognostic indicators

Characteristics		% Survival
Age at diagnosis	<33 wks	43
	>=33 wks	80
Age at delivery	<35 wks	30
	>=35 wks	79
Spont. Resolution	Yes	100
	No	52
Hydrops	Yes	52
	No	100
Bilteral	Yes	52
	No	100

F.Congenital Diaphragmatic Hernia(CDH)

①Prognotic factors

Phrenic nerve injury during repair

Location of liver

②Long term complication

Heating loss(60%) in CDH survivor

Athma,bronchitis,

reflux scoliosis-muscle pulling,infection

Poor tolerance to effort

G.Cervicomediastinal and Axillary Cystic Hygroma

*Hydrops fetalis- jugular lymphatic obstructive sequence

*Hygroma colli cysticum

*Cystic lymphangioma

Type - simple lymphangioma

- cavernous lymphangioma

- cystic lymphangioma:hygroma