Normal fetal face and neck

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Disclosure

• I have no disclosures
Goals & objectives

• Become familiar with the anatomic assessment of the fetal face / neck

• Refresh some basic Embryology
  – Understand frequent associations of malformations
  – Guide search patterns
Background on facial abnormalities

• Important themselves

• May also indicate an underlying problem
  – Chromosome abnormality
  – Syndromic conditions
Background on facial abnormalities

• Assessment of the face is always included in all standard fetal anatomic surveys

• If you found other anomalies recheck the face

• And conversely, if you see facial anomalies look for other systemic defects
US facial survey

2D US: Images of the fetal face can be accomplished in coronal, sagittal and axial planes.
US facial survey

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US facial survey

• Auricles
  – Position
  – Shape
  – Size
  • (subjective / normograms for fetal ear dimensions
US facial / neck survey
US facial survey
US facial survey
US facial and neck survey

- Fetal MRI frequently in search for additional information
  - CNS
  - Airway
  - Helping in challenging cases

- Help counseling / planning delivery / neonatal treatment
• Evaluation of the orbits
Fetal MRI assessment

- Bony orbits
  - IOD / BOD

32w GA fetus
Fetal MRI assessment

• Bony orbits
  – IOD / BOD

32w GA fetus
Fetal MRI assessment

- Bony orbits
  - IOD / BOD

- Intraorbital content
  - Globe (OD)
  - Lens
• Evaluation of the orbits

• Evaluation of the ears
Fetal MRI assessment

Sagittal image of the auricle on SSFP sequence

auricles, external auditory canals, fluid filled middle ear and inner ear structures
Fetal MRI assessment

Absent bilateral auricles (anotia) + External Auditory Canals (aural atresia)

Normal bilateral ears + External Auditory Canals
• Evaluation of the orbits

• Evaluation of the ears

• Evaluation of the mid / lower face
Basic Embryology

• 1\textsuperscript{st} and 2\textsuperscript{nd} branchial arches are involved in the development of the ear (1\textsuperscript{st} arch also in the face)

• Hypoplasias and abnormal development
  – Otomandibular dysplasias (AKA branchial arch syndromes)
Basic Embryology

• The face results from the development of five buds (frontonasal process and 1st branchial arch).

• If the processes do not mold together: **facial cleft**, at that boundary.
Basic Embryology

- The ear starts forming in the lower neck (6\textsuperscript{th} week).
- With the development of the mandible, the ears ascend.

Normal level of the ear in relation to the outer canthi of the eyes
Basic Embryology

- Mandibular hypoplasia would lead to impaired ascent (Ear malposition):

  Micrognathia + Low set - ears
Mandibular index calculation

Paladini D, et al Obstet Gynecol 1999 93:382–386:
AP mandible length / BPD x100 (21% or < is significant micrognathia)
Mandibular index calculation

Normal anatomy

Facial cleft
Normal anatomy

Cleft palate, intact lip
• Evaluation of the orbits
• Evaluation of the ears
• Evaluation of the mid / lower face
• Evaluation of the airway
Fetal MRI assessment
Cervical teratoma
LT Choanal atresia
CHARGE association

Nasopharyngeal mass
Congenital salivary gland anlage tumor
Anatomic Search Pattern in the presence of a facial anomaly

- Look for other facial defects:
  - Orbital
  - Clefts
  - Hypoplasias [face, ear, eyes], (branchial arch syndrome?)

- Look for brain malformations

- Other systemic malformations? (Genetic / chromosomal ?)

- Airway
Thank You!

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