Lateral Chest: Underused and Overlooked
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1. Adding an upright lateral view is most likely to be helpful when evaluating:
   A. a pneumothorax.
   B. the aortic arch.
   C. pulmonary edema.
   D. the chest wall.

   Correct Answer: B

Rationale
In patients with a symptomatic aortic arch anomaly the frontal CXR was normal in 10%. Frontal and lateral view showed at least one finding in all patients. Answer A is incorrect. While a cross-table lateral may be useful in showing anterior pleural air, the upright lateral is much less sensitive to the presence of a pneumothorax than the frontal view. Answer C is incorrect. The lateral view can be more accurate than the frontal view in assessing heart size, and may show Kerley B lines not seen on the frontal view, but the lateral usually confirms findings seen on the frontal view rather than providing new information. Answer D is incorrect. The lateral view can demonstrate chest wall abnormalities, but these are usually seen on frontal view or rarely of significance.

Reference

2. Does adding a lateral view affect radiation risk?
   A. Yes, it triples the risk.
   B. No, risk does not change.
   C. Yes, the risk doubles.
   D. Potentially. It depends on patient size.

   Correct Answer: B

Rationale
While the lateral view requires a higher radiation dose than the frontal view, the risk is too low to measure and impossible to calculate accurately. When the risk is this low, there is no meaningful increase in risk when a lateral radiograph is added to a frontal. Answers A, C, and D are incorrect. There is no meaningful increase in risk when the risk is near zero and the risk cannot be estimated accurately.

Reference
1. Hendee WR. Radiology 2013; 267:326-327
3. Which stage of embryonic lung development would be expected to be present in this infant born at 27 weeks gestational age?
   A. Pseudoglandular
   B. Canalicular
   C. Saccular
   D. Alveolar

   Correct Answer: C

Rationale
Saccular. This stage is characterized by thinning of the interstitium and differentiation of type I and II pneumocytes. Answer A is incorrect. The pseudoglandular stage occurs during weeks 5-17 of pregnancy and is characterized by epithelial tubes lined with cuboidal epithelial cells which mimic exocrine gland tissue. Answer B is incorrect. The canalicular stage occurs during weeks 16-25 of pregnancy and is characterized by increased diameter and length of the respiratory tree and associated angiogenesis and vascularization. Answer D is incorrect. The alveolar stage occurs in the last few weeks of pregnancy and continues postnatally. It is characterized by the development of alveolar ducts and sacs from the terminal sacs.

Reference

4. Which of the following is used to diagnosis bronchopulmonary dysplasia according to national consensus criteria established in 2001?
   A. Positive pressure ventilation requirement during the first 2 weeks of life for a minimum of 2 days
   B. Development of coarse interstitial markings, pulmonary hyperinflation, and cystic changes by radiography
   C. Presence of pulmonary hypertension based on hemodynamic assessment on echocardiogram
   D. Physiologic information determined by gestational age at birth and stratified according to severity based on oxygen requirement

   Correct Answer: D

Rationale
Answer A is incorrect. “Positive pressure ventilation requirement during the first 2 weeks of life for a minimum of 2 days” was a criterion in older definitions of bronchopulmonary dysplasia but is not current. Answer B is incorrect. Radiographic findings no longer factor into newer definitions of bronchopulmonary dysplasia. Answer C is incorrect. Echocardiogram findings do not factor into the diagnosis of bronchopulmonary dysplasia

Reference
5. A full-term neonate delivered vaginally after steroid therapy for preterm labor develops progressive hypoxemia unresponsive to exogenous surfactant administration. A previous sibling died as a neonate. Tracheal aspirates are non-hemorrhagic, tests for infection are initially negative but later reveal RSV, and echocardiography shows a small PDA. Serial chest radiographs are performed. What is the most likely diagnosis?

A. Neonatal pneumonia
B. Pulmonary edema
C. Pulmonary hemorrhage
D. Genetic surfactant disorder

Correct Answer: D

Rationale
Radiographic findings of diffuse hazy granular pulmonary opacities in a full-term neonate with respiratory distress syndrome unresponsive to exogenous surfactant therapy and a history of sibling neonatal death are consistent with a genetic disorder of surfactant production or metabolism. This case was attributable to autosomal recessive pathogenic Surfactant Protein B mutations. The radiographic findings closely resemble those of surfactant deficiency of prematurity. Pulmonary edema, hemorrhage, or infection may have similar radiographic findings, but are typically less diffuse and accompanied by corroborating clinical signs.

References

6. A 5-week-old full-term infant of a diabetic mother presents with mild respiratory distress during feeds. There is history of a 10-day stay in the NICU for persistent pulmonary hypertension of the newborn, but the baby was never intubated or subjected to positive-pressure ventilation. Now there is biventricular hypertrophy on echocardiography. Chest radiography and CT are performed. What is the most likely diagnosis?

A. Congenital diaphragmatic hernia
B. Congenital cystadenomatoid malformation
C. Persistent cystic pulmonary interstitial emphysema
D. Aspiration pneumonia with post-infectious pneumatoceles

Correct Answer: C

Rationale
The finding of a line-and-dot pattern of pulmonary vessels surrounded by cystic lucencies is characteristic of persistent cystic pulmonary interstitial emphysema. Although unusual, this can present with only mild symptoms and without a history of positive-pressure ventilation. The cystic lucencies can resemble herniated bowel loops, a congenital cystic lung malformation, or post-infectious pneumatoceles.
Recognition of pulmonary vessels traversing the cystic lucencies, intervening normal lung parenchyma, normal positioning of the bowel, and absence of a prenatal lung mass or postnatal infection help establish the correct diagnosis.

References

5 Things Every Ped Rad Should Know About IR
Manraj Heran MD

7. With respect to endovascular therapies for management of acute ischemic stroke due to large vessel occlusion, which of the following can be used?
   A. Stent-assisted thrombectomy
   B. Aspiration thrombectomy
   C. Carotid/vertebral revascularization
   D. Any combination of the above

   Correct Answer: D

Rationale
Most correct answer is D. Option A is correct. In the five randomized control trials (RCT) summarized in the Lancet paper, stent-assisted thrombectomy was proven to result in faster and better recanalization rates than techniques used in trials prior to 2015. Option B is correct. Though several publications previously demonstrated efficacy of aspiration thrombectomy for emergency revascularization of large vessel occlusion (ELVO), the ASTER trial is the first prospective, randomized controlled trial demonstrating no significant difference in recanalization rate and safety using either thrombectomy technique. Option C is correct. All five of the RCT summarized in the Lancet paper included management of patients presenting with carotid vascular disease requiring revascularization, either with angioplasty alone, or with stent-assisted angioplasty. Option D is the most correct. ELVO may require any combination of options A-C for successful revascularization in the setting of acute ischemic stroke.

References
4. ASTER Trial (Adapt versus StEnt Retriever): International Stroke Conference (February, 2017). Comparison of safety and efficacy of Penumbra aspiration system used frontline as part of the ADAPT technique versus stent retrievers (pending publication)
8. Which of the following ARE NOT examples of interventional oncology techniques which can be offered to pediatric patients:
   A. Yttrium-90 radioablation
   B. OK-432 sclerotherapy
   C. Intra-arterial chemoinfusion
   D. Cementoplasty

   **Correct Answer: A**

   **Rationale**
   The incorrect answer is B. Option A is correct. Yttrium-90 brachytherapy is a widely accepted method of managing hepatic malignancies (primary and secondary) in the adult setting. Reports of its use in the pediatric setting have now also been published. Option B is incorrect. OK-432 (picibanil) is a lyophilized mixture of group A Streptococcus pyogenes, now produced through recombinant technology. It is an agent used for sclerotherapy of a variety of lesions, most commonly macrocystic lymphatic malformations. It is not classically used for management of pediatric oncologic conditions. Option C is correct. Intra-arterial chemoinfusion serves as a widely accepted technique in interventional oncology, often combined with transarterial embolization. Recently, there have been significant advances made in the management of retinoblastoma through intra-ophthalmic infusion of chemotherapeutic agents. Option D is correct. Although not typically considered an option in the pediatric setting, cementoplasty has a proven role in managing malignancy-based pain in the appendicular and axial skeleton in adults, and can, in selected settings, be considered an option in children.

   **References**