Pitfalls of the Pediatric Chest and Abdomen
SPR 2017

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No Disclosures
Errors in Diagnostic Radiology
based on Taylor, et. al. Pediatr Rad 2011

Cognitive

Faulty information processing
  Faulty interpretation
  Premature conclusion
  Over interpretation
  Faulty context
  Failure to order follow-up

Faulty data accumulation

Faulty knowledge

Perceptual

Systemic

Unavoidable

JPS - just plain stupid* (my addition)
A “lost” masterpiece...

“Principles and Pitfalls in Pediatric Chest and Abdomen”

by

Harry J. Potter, MD. PhD.
Agenda

10 (+) cases:

• Imaging findings

• Diagnosis and discussion of pitfall

• Potter’s Principle
Case 1: Full term newborn (day 1) with tachypnea
Possible diagnoses

Pneumonia
Congestive heart failure
Surfactant deficiency
Pulmonary hemorrhage
Retained fetal lung liquid
What would you do next?

1. CT scan
2. MRI
3. US
4. Lateral decubitus
5. Repeat CXR in 24 hours
24 hours later...

**Diagnosis:**
Congenital lobar hyperinflation

**Pitfall:**
Retained fetal lung liquid mimics RDS/pneumonia/etc
Potter’s Principle #1

Everything changes with time. Sometimes you just have to wait and see.
Case 2:

Newborn with respiratory distress and abdominal distension s/p resuscitation in D.R.
Possible diagnoses

Perforated hollow viscus
Cystic pulmonary malformation
Post-mortem radiograph
Right sided diaphragmatic hernia
Diagnosis: Right congenital diaphragmatic hernia

Pitfall:
- pulmonary hypoplasia
- pneumothorax
- pneumoperitoneum
- NOT bowel perforation
More examples of “air” pitfalls

Left antero-medial pneumothorax
Anterior junction line
Thoracic “football” sign

Sign of bilateral pneumothorax in infants
Fatal air embolism to heart
NOT mediastinal or pericardial air
Potter’s Principle # 2

Air is an excellent contrast medium.

...ubiquitous, non-toxic (sometimes), cost efficient!
Case # 3: 4 month old with noisy breathing
What's your diagnosis?

1. Adenopathy
2. Azygous vein
3. Lymphoma
4. Vascular ring
5. Normal

Next step...?
Diagnosis: Double aortic arch
Potter’s Principle # 3

The trachea is an important key to the diagnosis of pediatric chest disease.
Case # 4: 2 month female routine follow-up
6 weeks s/p truncus repair

Something wrong?

What do you want to see next?
Review old studies

2 weeks post surgery  6 weeks post surgery
Truncus arteriosus type 1
Diagnosis:

Pseudo-aneurysm of right ventricular outflow tract with dehiscence of repair (not good!)
Principle # 4

Prior examinations (especially pre-op) are valuable and may significantly alter your interpretation.
Case # 5: 13 y.o. female, weight loss and decreased appetite

Achalasia

What's missing?
No gastric air bubble - why?

Achalasia
Potter's Principle # 5

It's not so easy to recognize what's missing.
Cases # 6 and 7: Common look alikes

Pneumoperitoneum

Retroperitoneal fat
Cases # 8 and 9: More look alikes

Meconium peritonitis

Wet diaper artifact (urine, NOT poop)
Potter’s Principle # 6
Normal can be just as confusing as abnormal.
Case #10: 5 month old with abdominal distension

US for intussusception?

Neuroblastoma
Case # 11: 6 y.o. with abdominal pain and fever

Diagnosis:
Left lower lobe pneumonia

Pitfall:
Tunnel vision
Potter’s Principle # 7

Abdominal symptoms may be due to pathology in the chest - look everywhere.
Final case

Neonate with many problems

Next day - what's new?

“The bones and soft tissues are normal.”

Are they really normal?
Diagnosis:
Fracture/dislocation C 5/6 with spinal cord injury (distraction injury - probably birth trauma)

Outcome: poor prognosis
Pt died.

Pitfall: What do we learn from this case?

Make no assumptions until you’ve carefully looked at everything.
Potter’s Principle # 8

Suspect the unexpected.
Last Principle

More is not always better.
Pitfalls of the Pediatric Chest and Abdomen

Thank you