PEDIATRIC CASES

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General principles in Ped. Rad.

1. Radiation Safety and Dose Reduction:

- **Children are more sensitive to radiation** than adults, so minimizing radiation exposure is crucial.
- **Use the ALARA principle** (As Low As Reasonably Achievable).
- Choose **non-ionizing imaging modalities** (e.g., ultrasound and MRI) instead of X-ray or CT scans, especially in younger patients.
- **Adjust imaging protocols:** Tailor protocols for the child's age, weight, and size (e.g., adjusting the kilovoltage (kVp) and milliampere-seconds (mAs) on radiographs or CT scans).

2- Choosing the Right Imaging Modality

- **Ultrasound (US):** Often the first-line imaging modality for pediatric patients, especially for abdominal or pelvic concerns (e.g., appendicitis, kidney anomalies). It's non-invasive, safe, and doesn't use radiation.
- **X-ray:** Fast and commonly used in trauma or bone-related issues but requires careful consideration of the radiation dose.
- **MRI:** radiation-free imaging that is particularly useful for brain, spinal cord…long scan time? sedation
- **CT Scan**: This should be used cautiously due to higher radiation exposure, but it is useful in assessing complex fractures, head trauma, or abdominal emergencies when other modalities are insufficient.

3- Anatomical Differences in Children:

- - Normal variants
- - Incomplete ossification
- - myelination

4- Technical Challenges

- Movements
- limited cooperation

5- Developmental Physiology and Imaging

- bone growth

6- Pathological Considerations

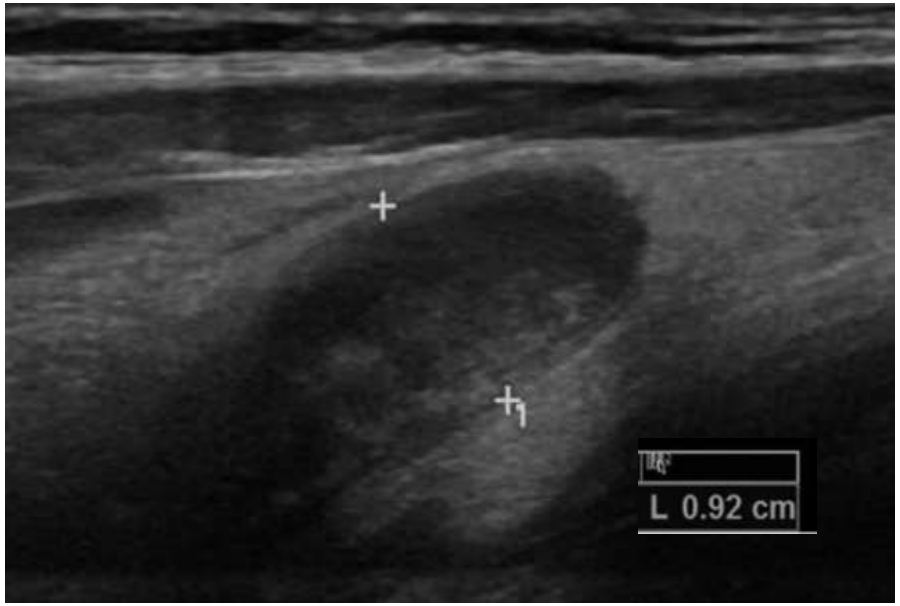
- congenital

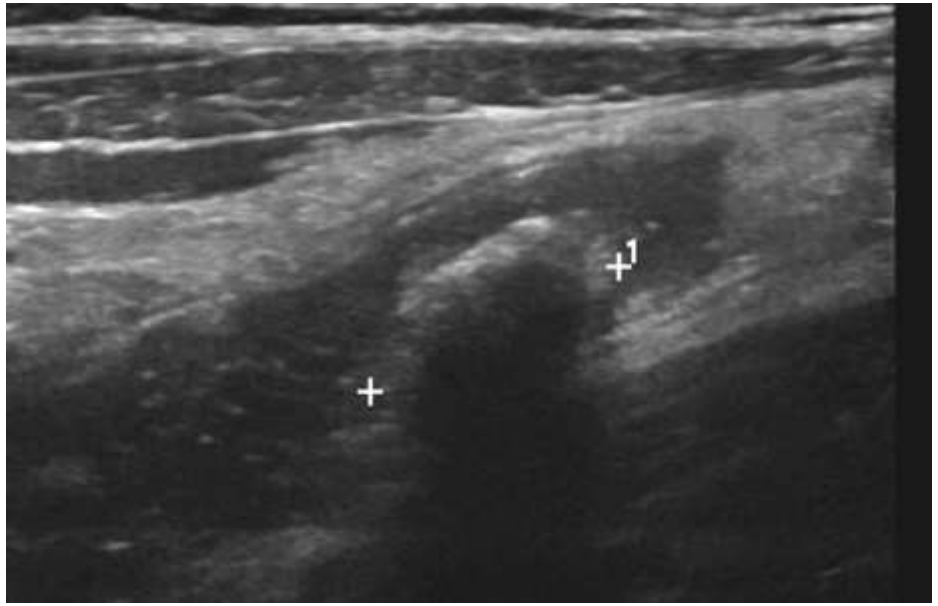
7- Parental Involvement and Communication

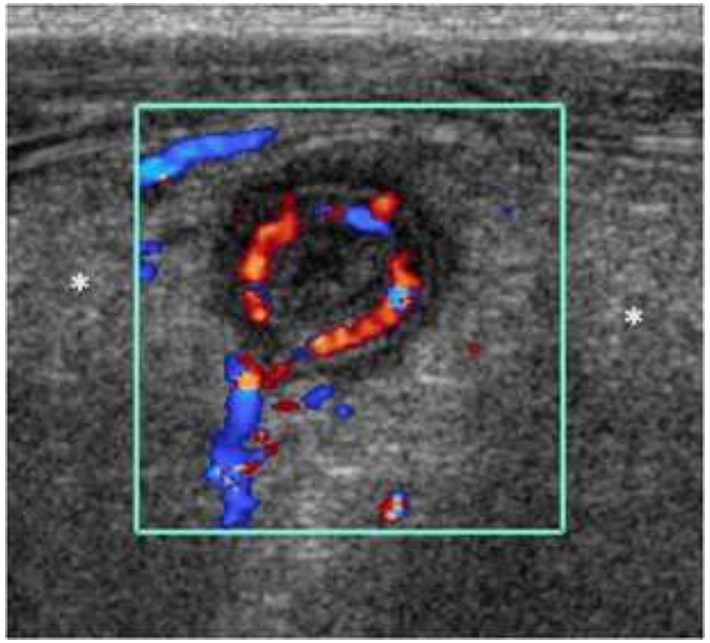
Q1

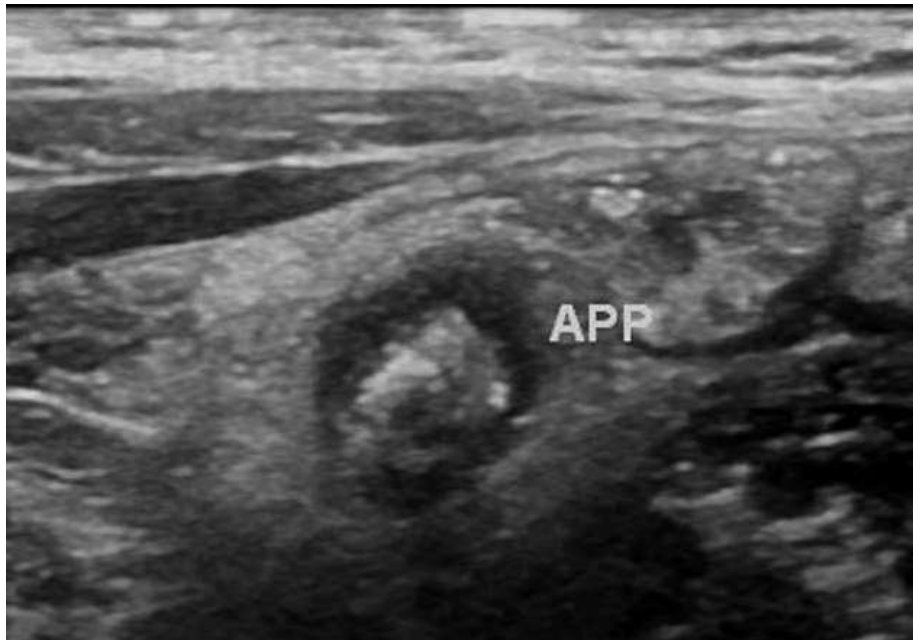
- A 7-year-old female patient presented to ER with 36 hours of abdominal pain, nausea, and loss of appetite.

- - What is your DDX?
- - What do you request imaging-wise?


L 0.92 cm



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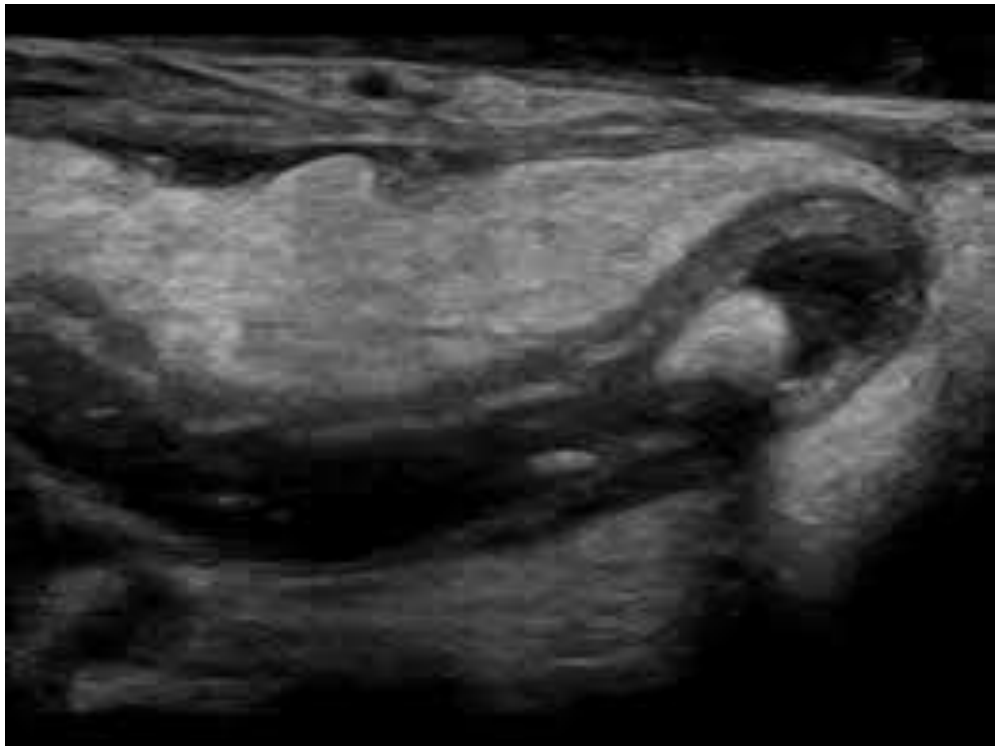
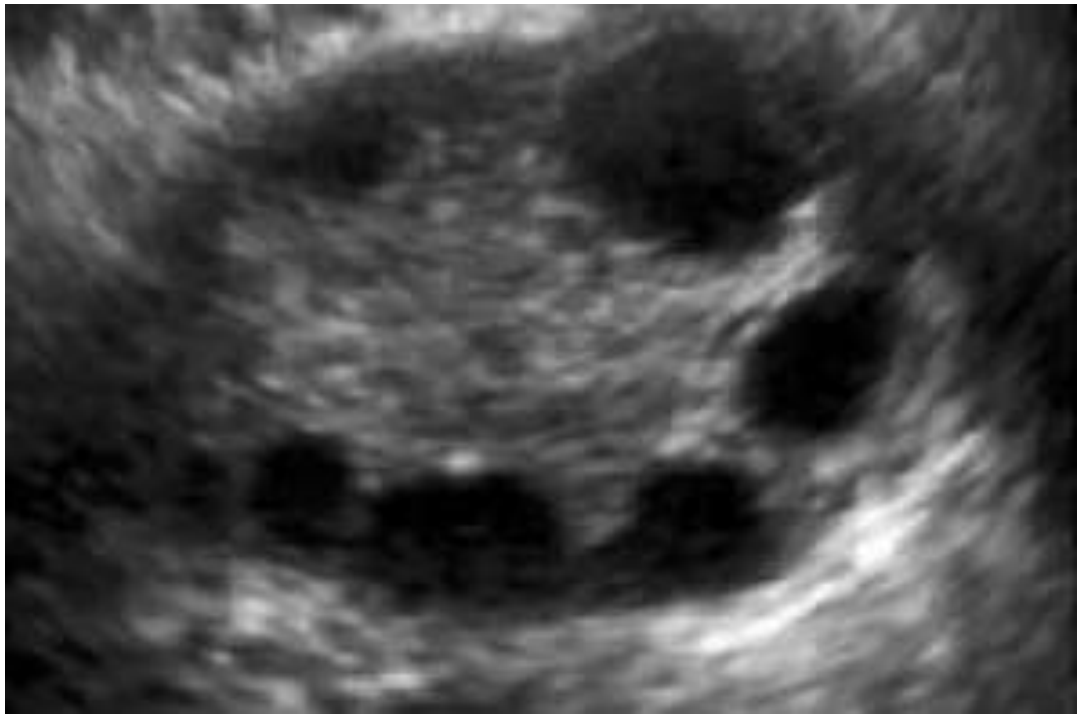


Torted Ovary

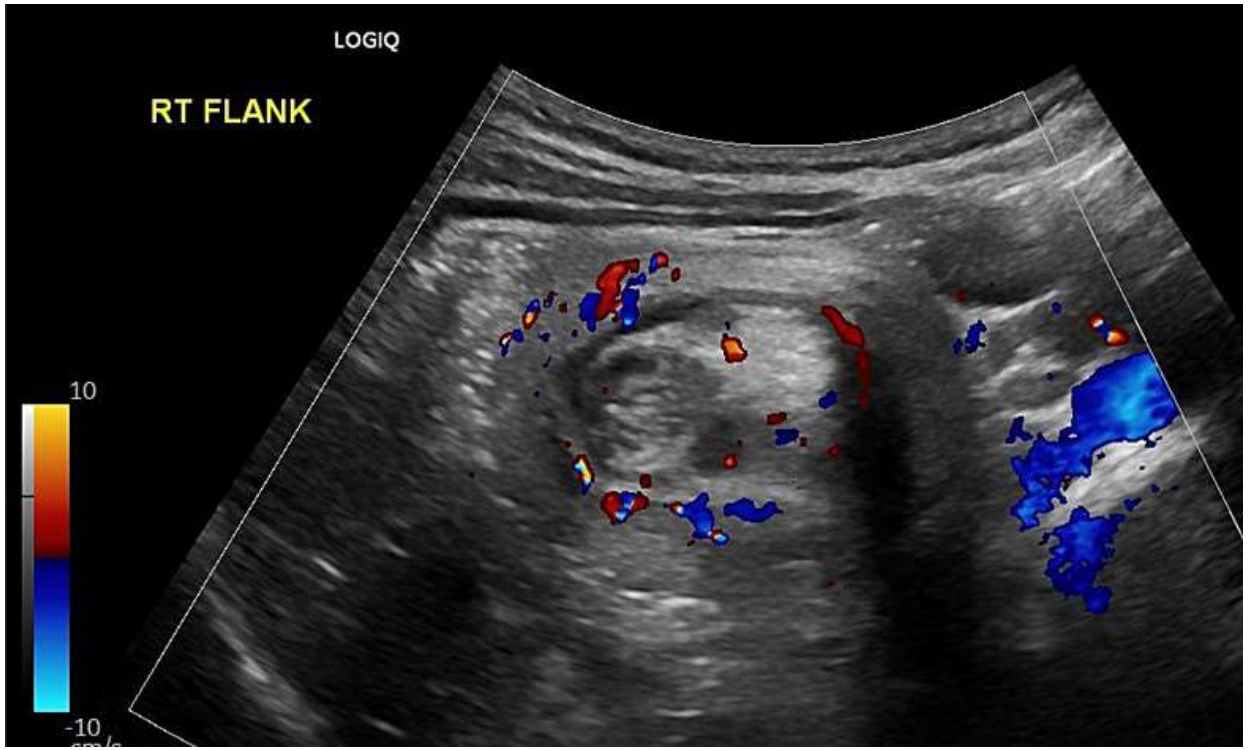


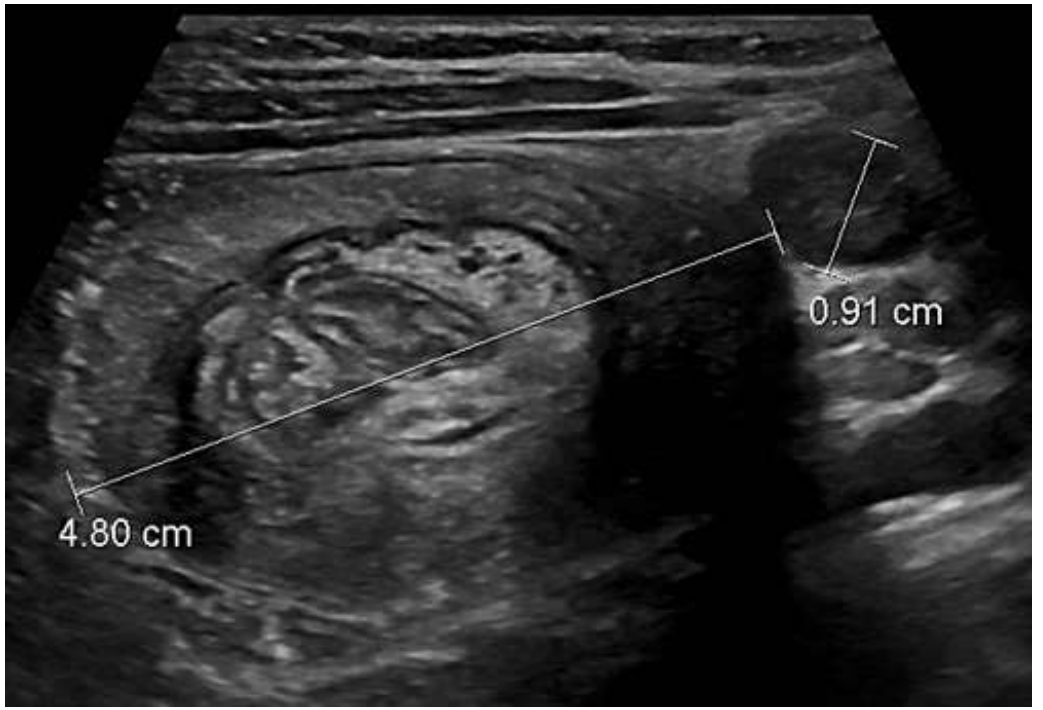
Normal Ovary

Q2

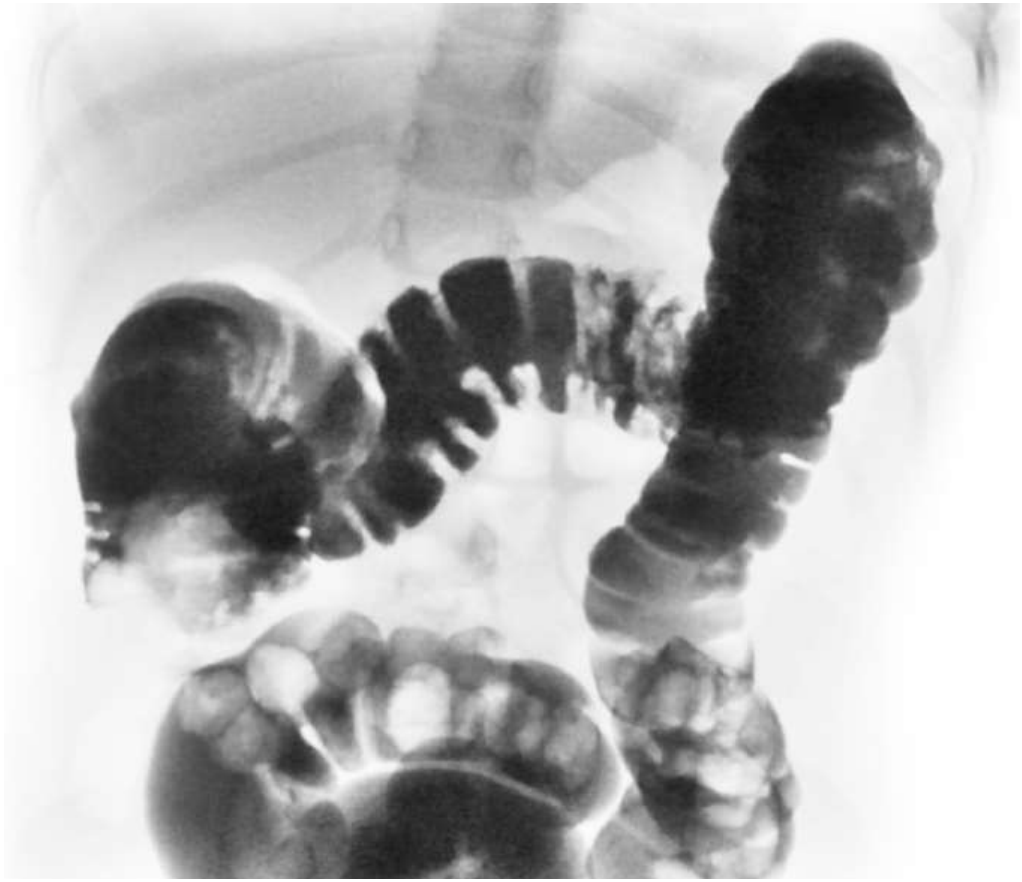
- A 2-year-old boy, recurrent, intermittent abdominal pain for the last 16 hours.

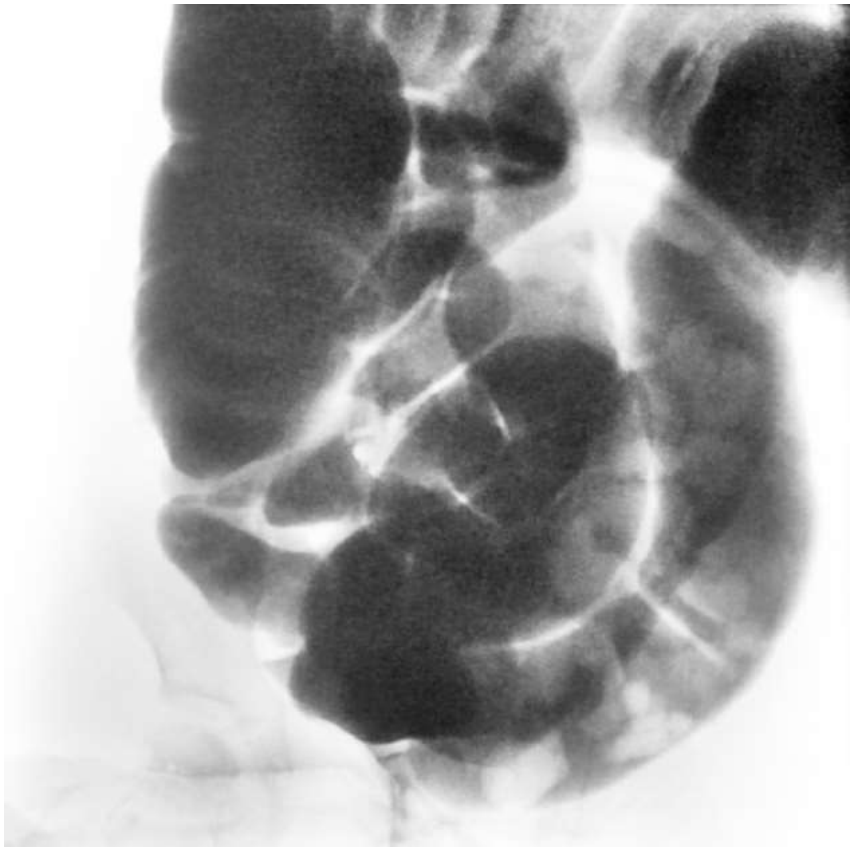
- - DDX?
- - Imaging ?

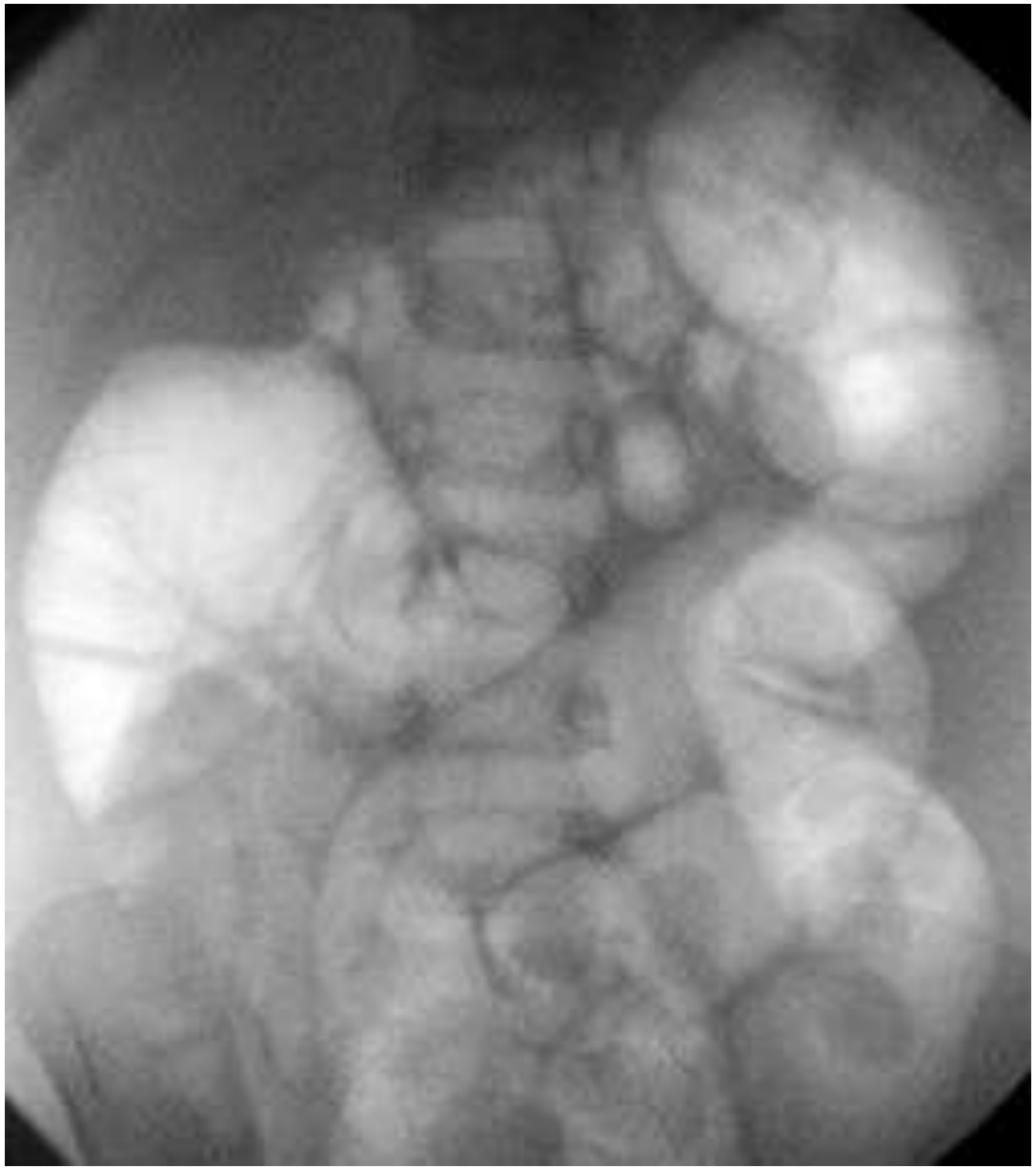

LOGIQ
RT FLANK
10
-10


0.91 cm
4.80 cm


RT FLANK



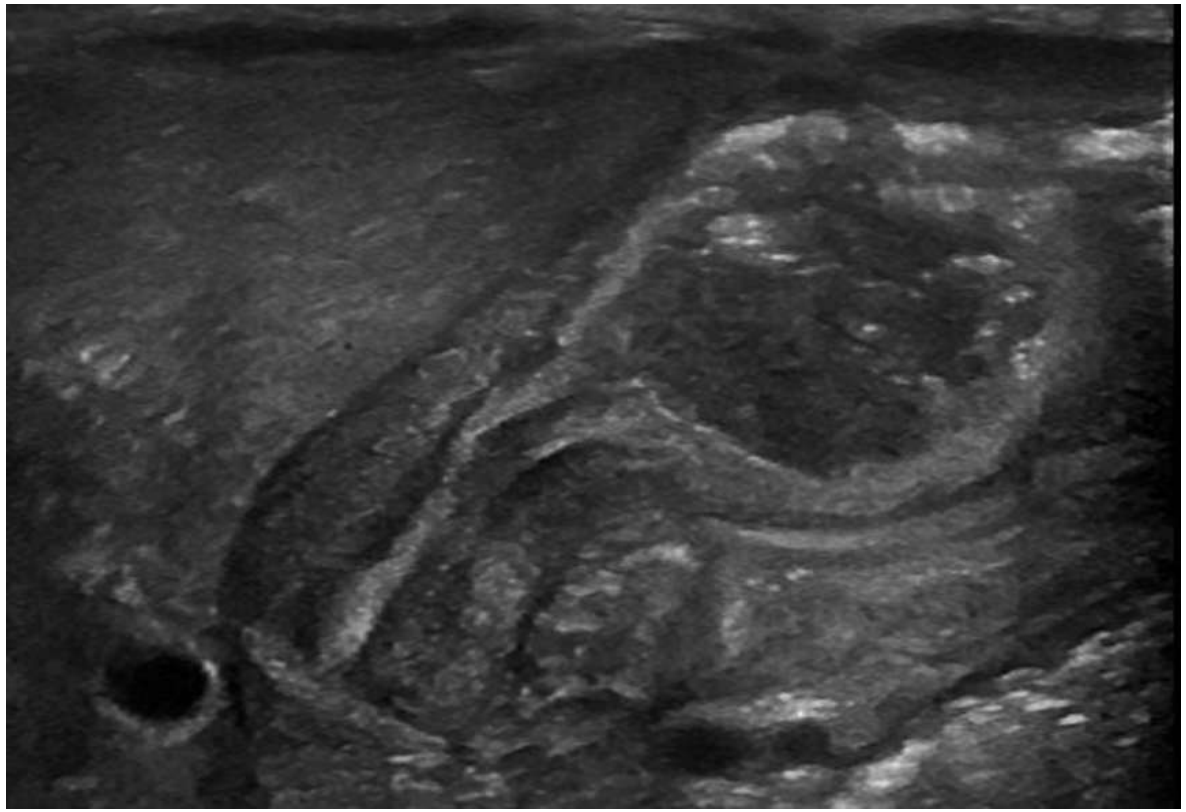


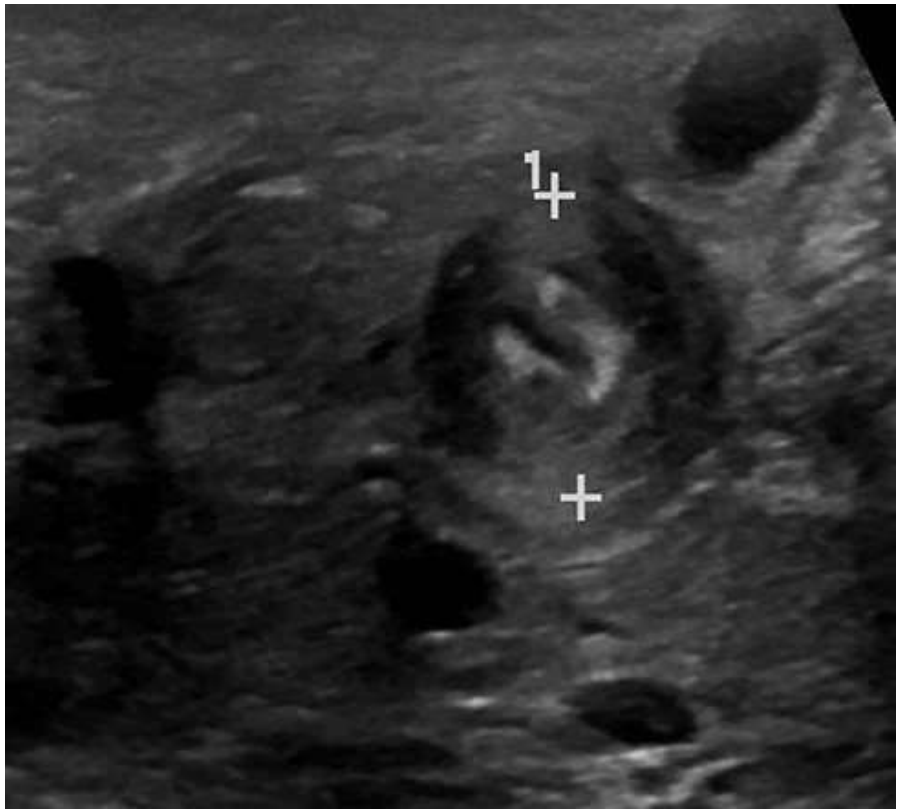


Q3

- A 5-week-old male baby, recurrent vomiting, not gaining weight?

- - Differential diagnosis?
- - Imaging?




1

Normal pylorus

Idiopathic thickening of gastric pyloric musculature ➔ progressive gastric outlet obstruction.

Pyloric stenosis is relatively common
~ 2-5 per 1000 births,

Symptoms usually begin between 3 and 12 weeks of age

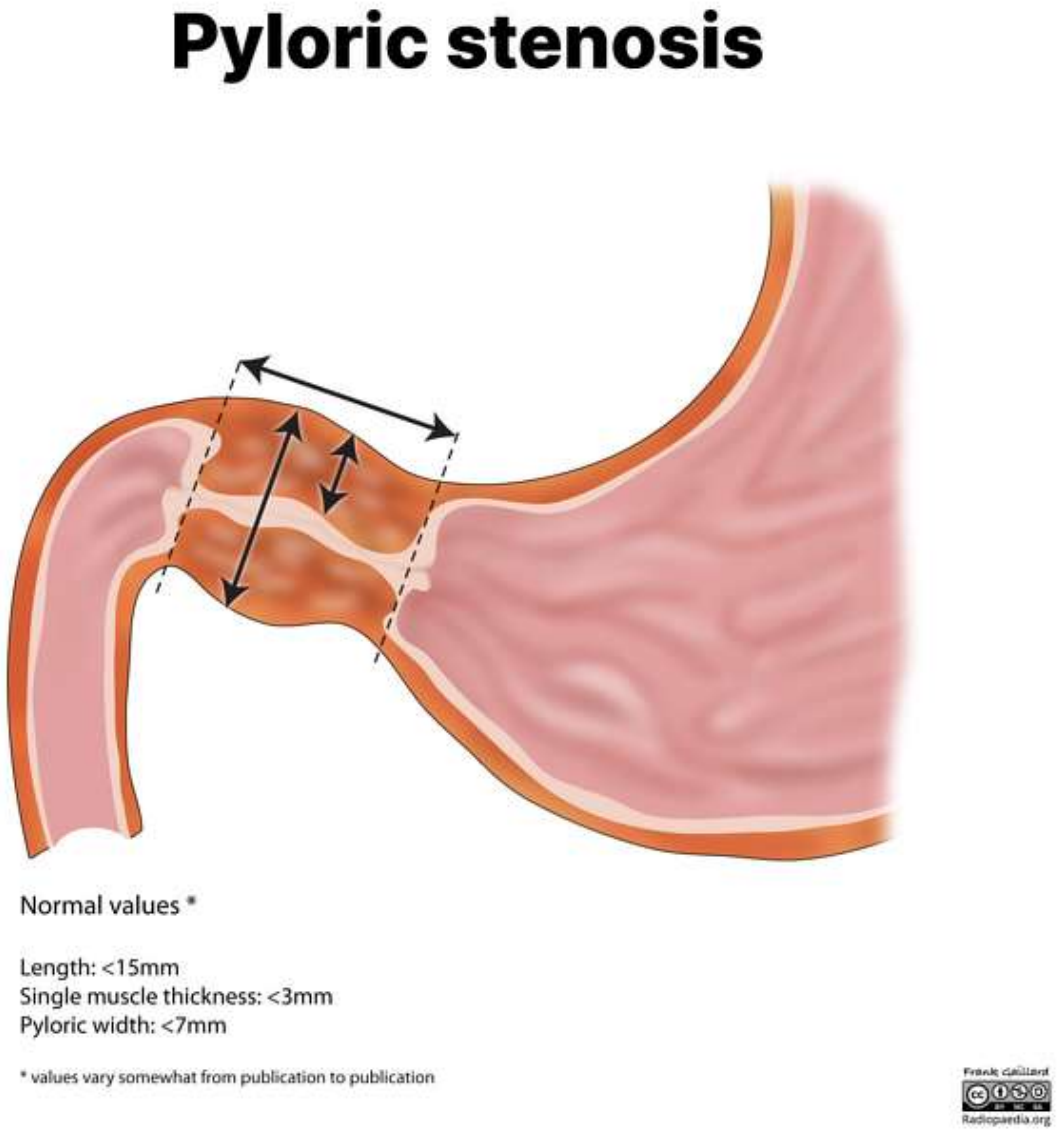
male predilection (M:F ~4:1).

More commonly seen in the **White** population, less common in India, and among Black and other Asian populations.

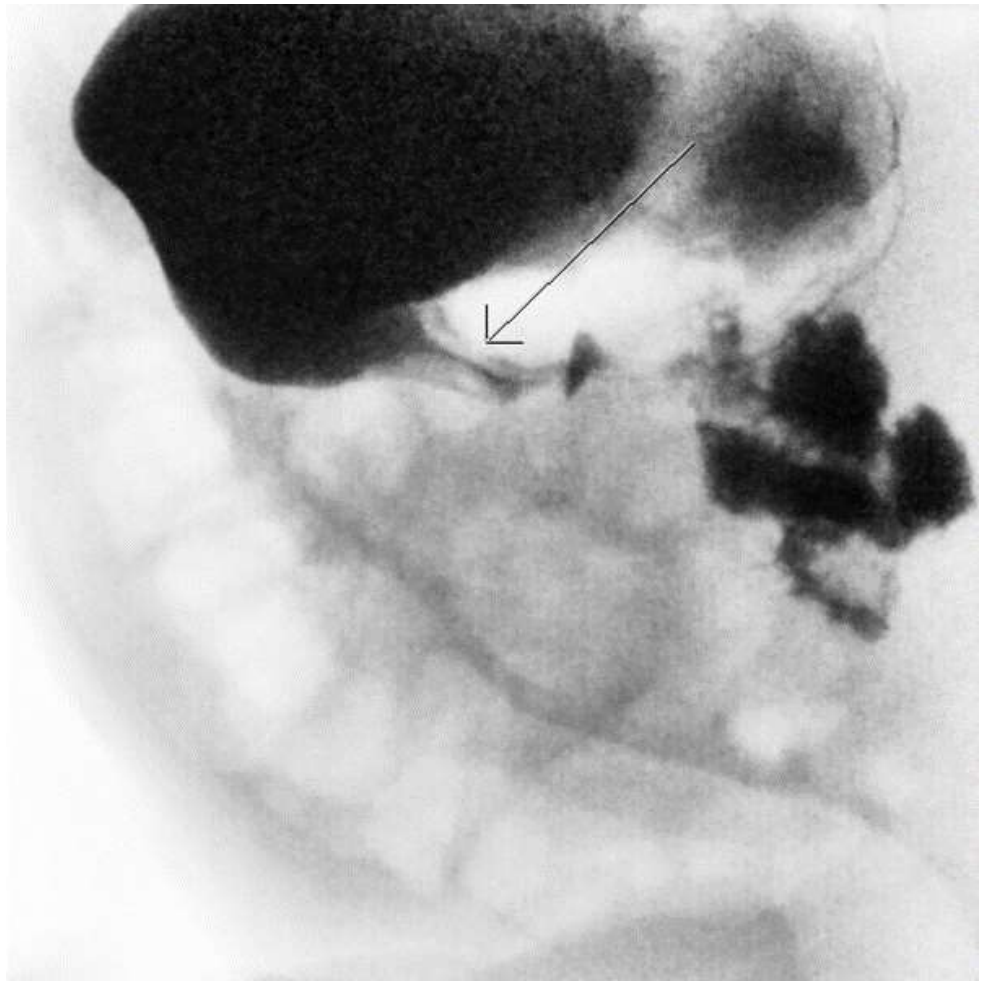
Risk factors

- **First born**

- **maternal history of pyloric stenosis**



https://radiopaedia.org/articles/pyloric-stenosis-1

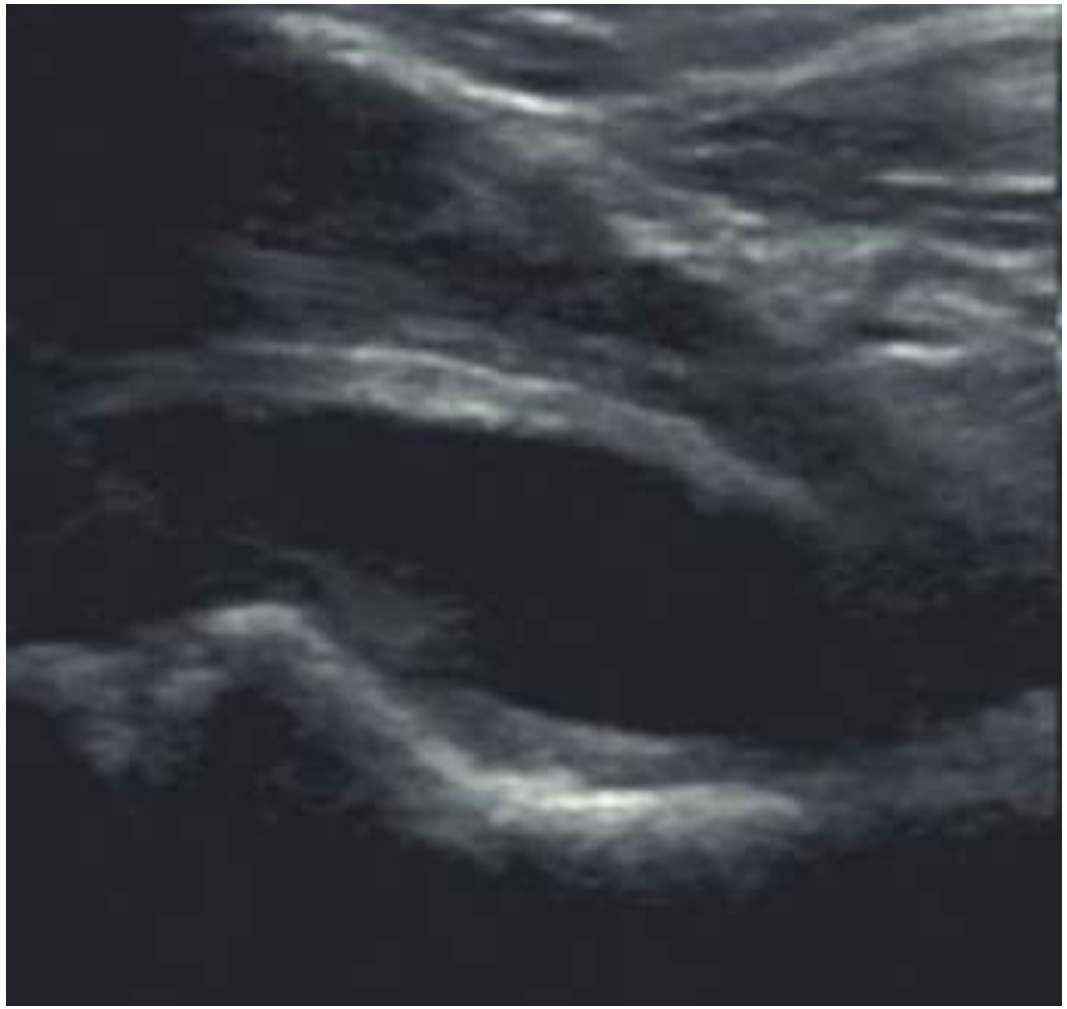


Q4

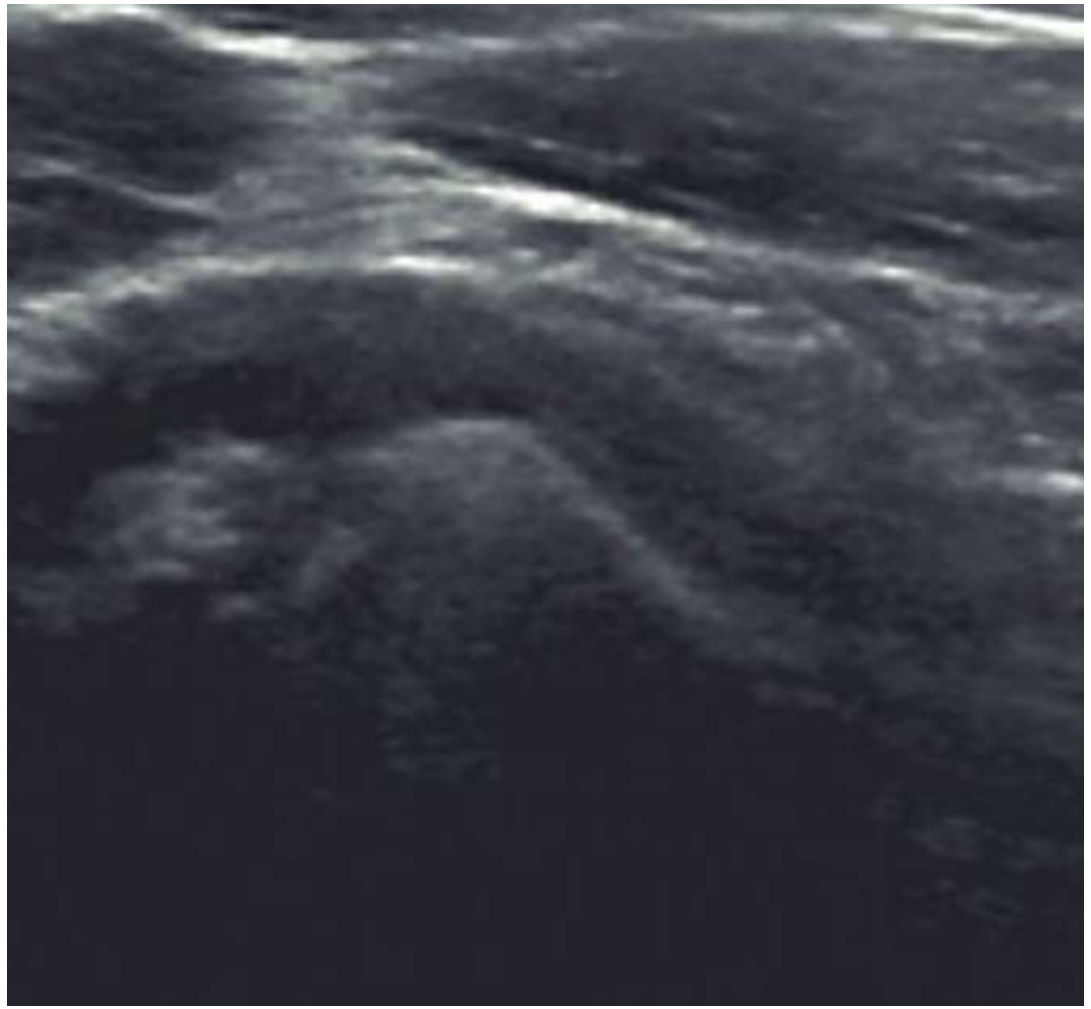
- A 5-year-old by, non-weight bearing on the right side for the last 24 hours, low-grade fever

right

left



right

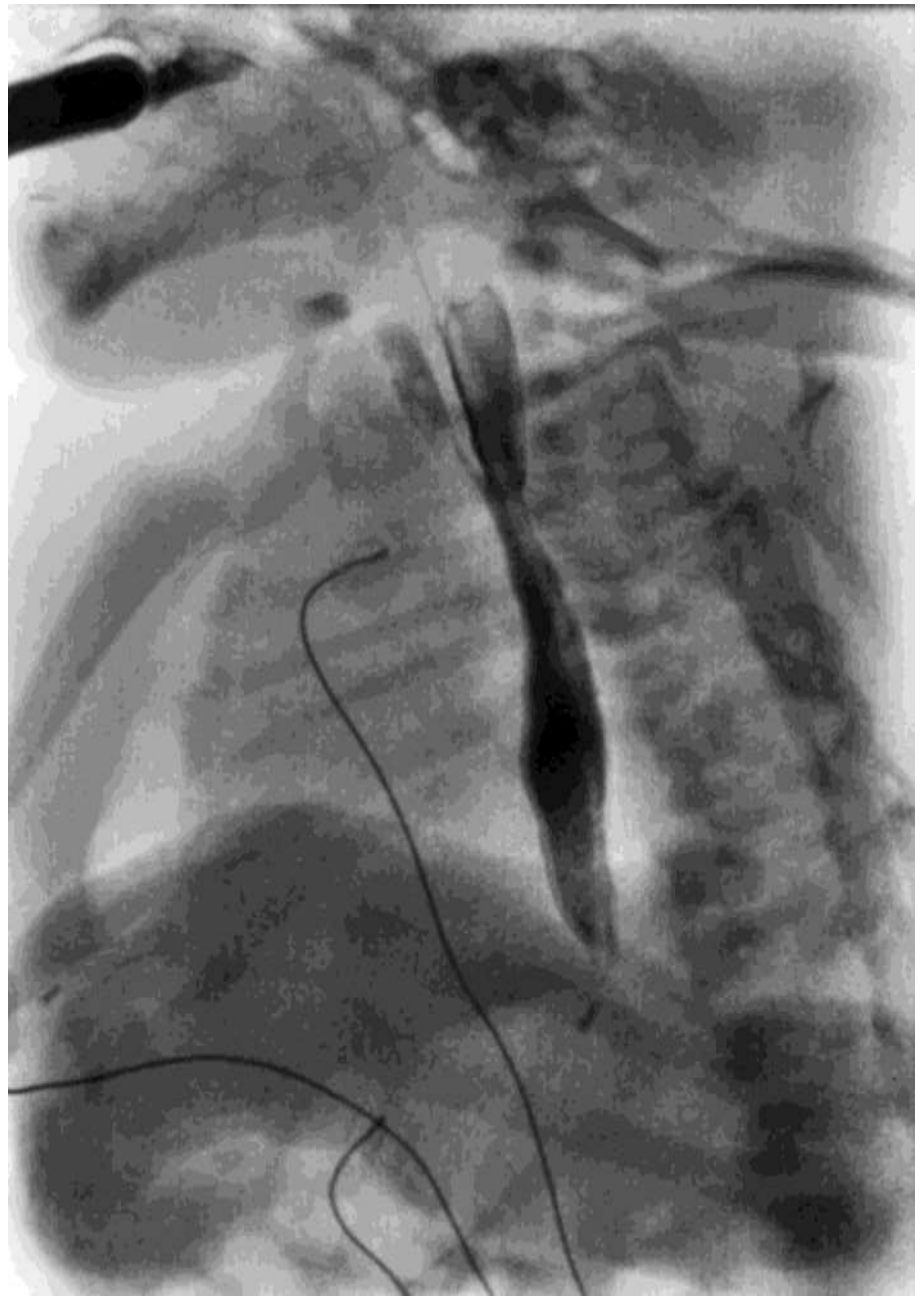


left

Q5

- A 6-week-old baby has recurrent coughing or choking while nursing or taking a bottle.
- Frothing or drooling from the mouth.
- Vomiting.
- Difficulty breathing while feeding.

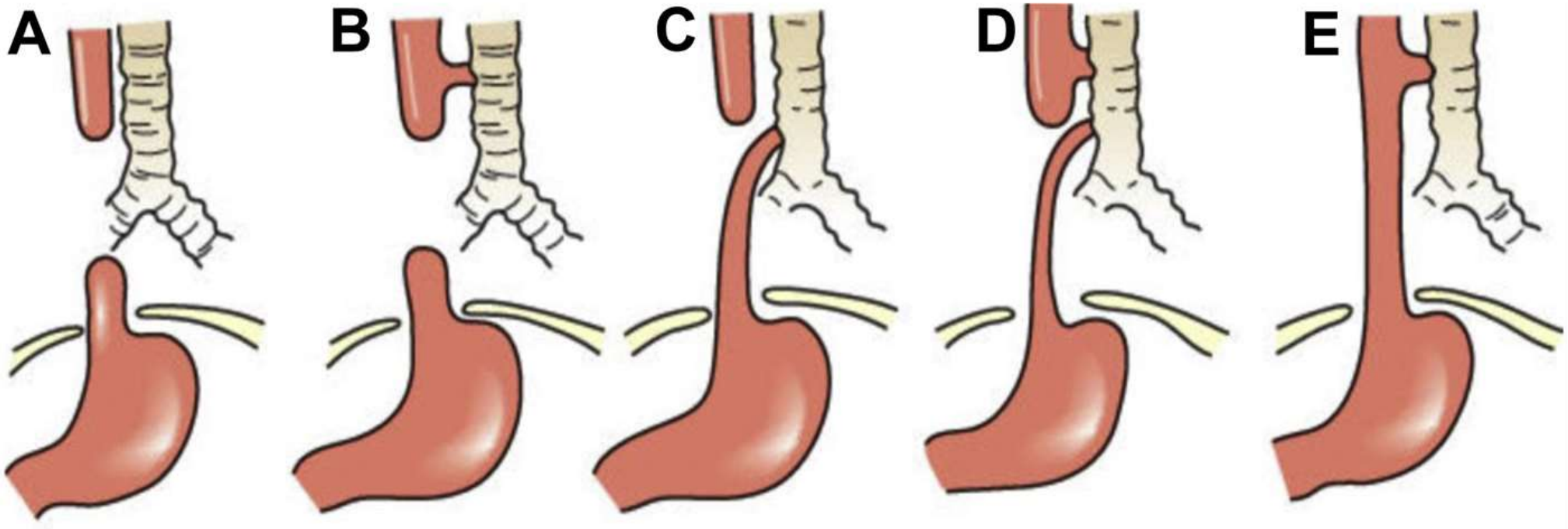
- - Differential Dx?
- - Imaging investigations?



Tracheoesophageal fistula

Isolated fistula
H-type

~4%



8%
- Atresia alone, no fistula
- Small stomach, gasless abdomen
- Usually has a long gap between the esophageal ends
- Gross type A

1%
- Proximal tracheoesophageal fistula
- No distal fistula
- Small stomach, gasless abdomen
- Often has a long gap between esophageal ends
- Gross type B

86%
- Most common abnormality
- Gross type C

1%
- Proximal and distal fistulas
- "Double Fistula"
- Gross type D

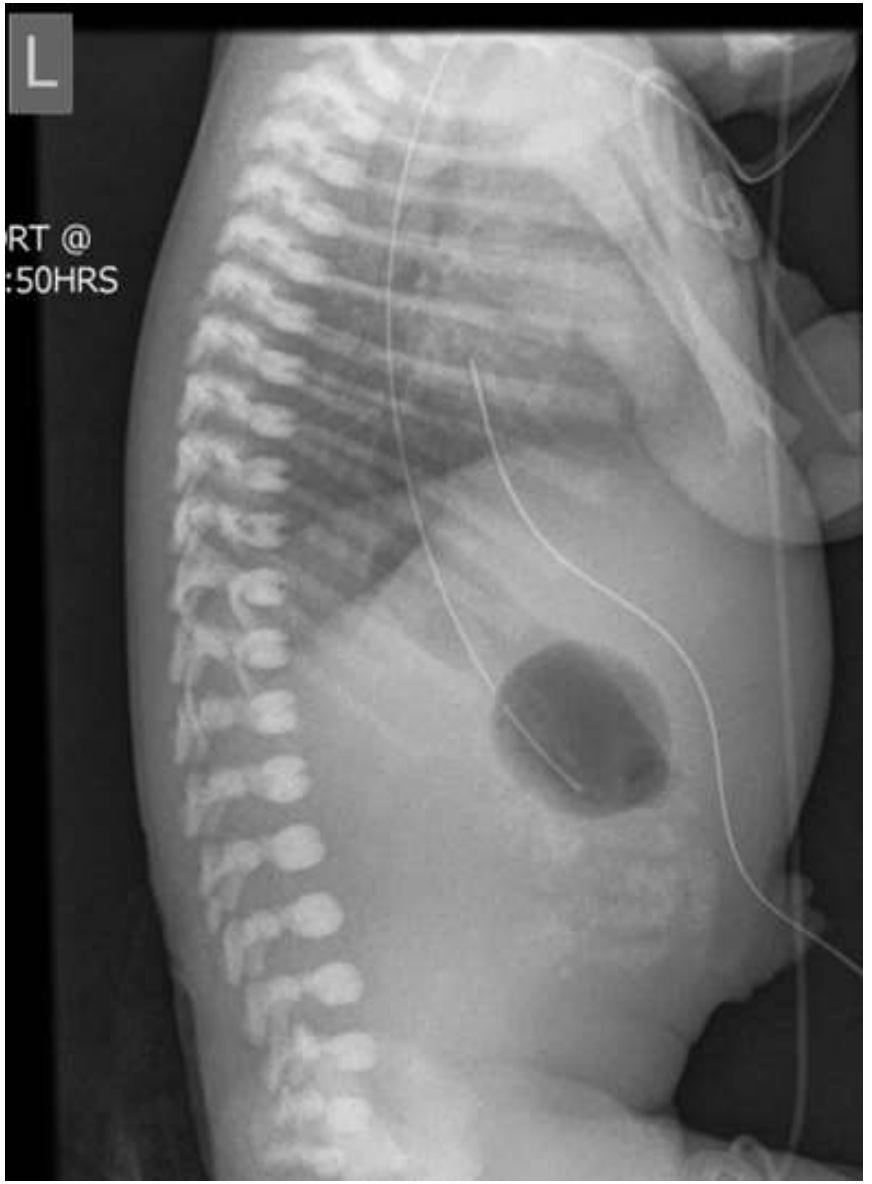
4%
- No atresia of the esophagus
- Congenital tracheoesophageal fistula
- H or N fistula
- Gross type E

VACTREL Association

- **V**ertebral
- **A**norectal
- **C**ardiac
- **Tracheoesophageal fistula**
- **R**enal
- **L**imb

Q6

- A 12-hour old baby. Paucity of gas in the abdomen. Air is seen in the stomach and proximal duodenum
- - DDX?

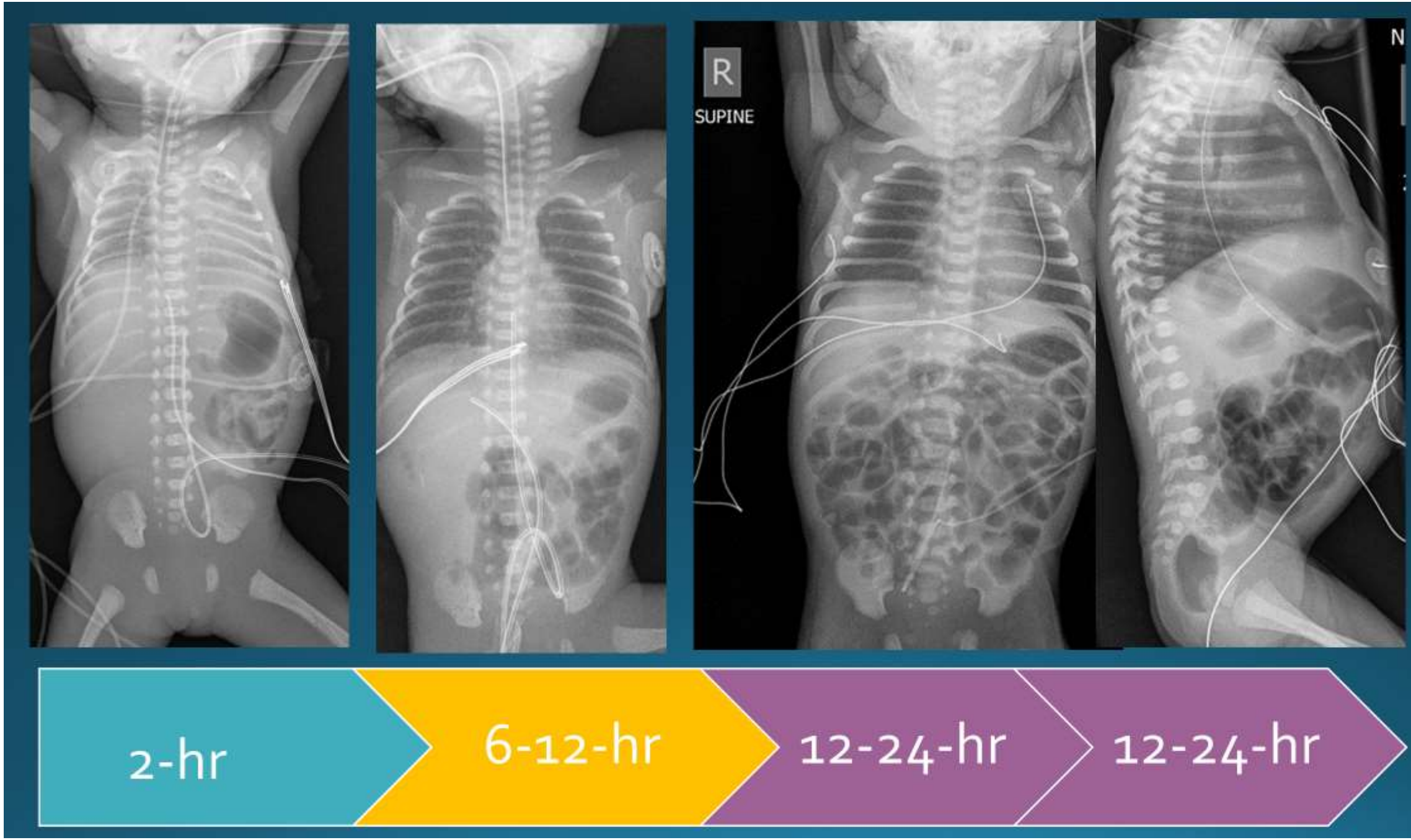

L
RT @
:50HRS

Duodenal Atresia

- **Double Bubble sign**

- Duodenal atresia

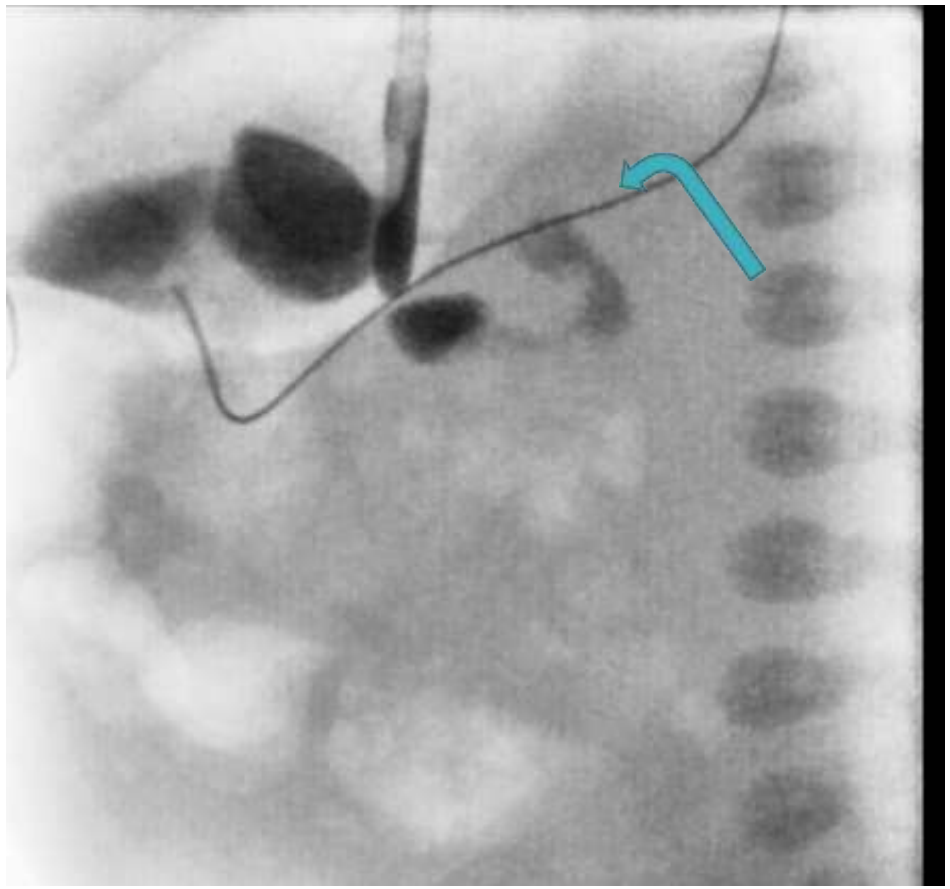
- Results from failure of recanalization of the solid duodenal tube. Most often the atresia occurs distal to Vater's ampulla


R
SUPINE
2-hr
6-12-hr
12-24-hr
12-24-hr

Q7

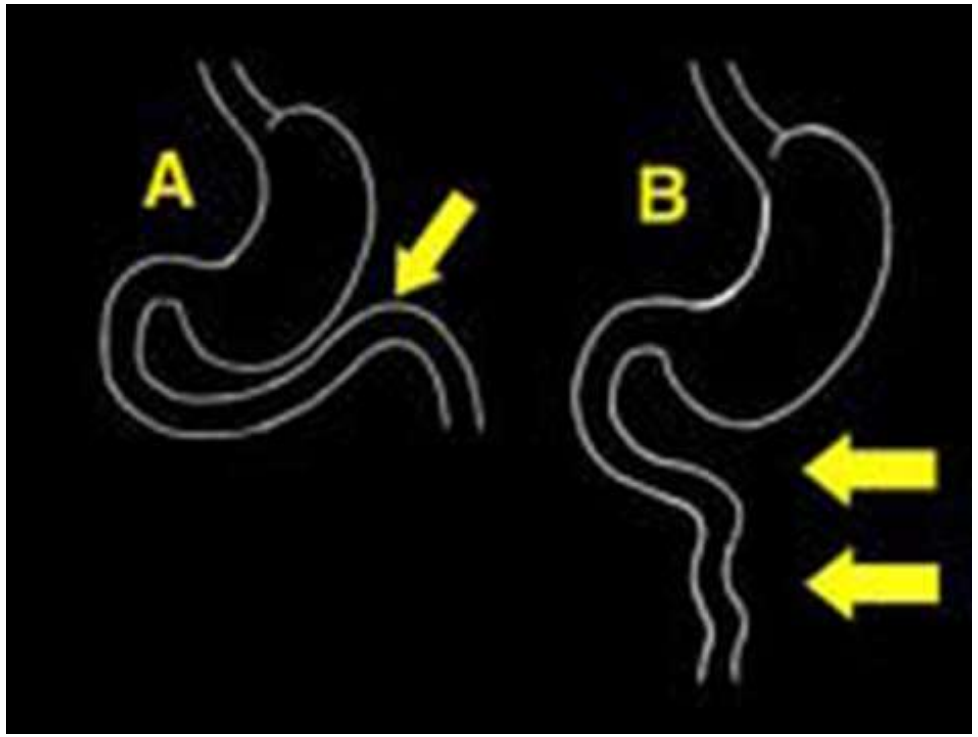
- 39 weeks, 0-day, bilious vomiting

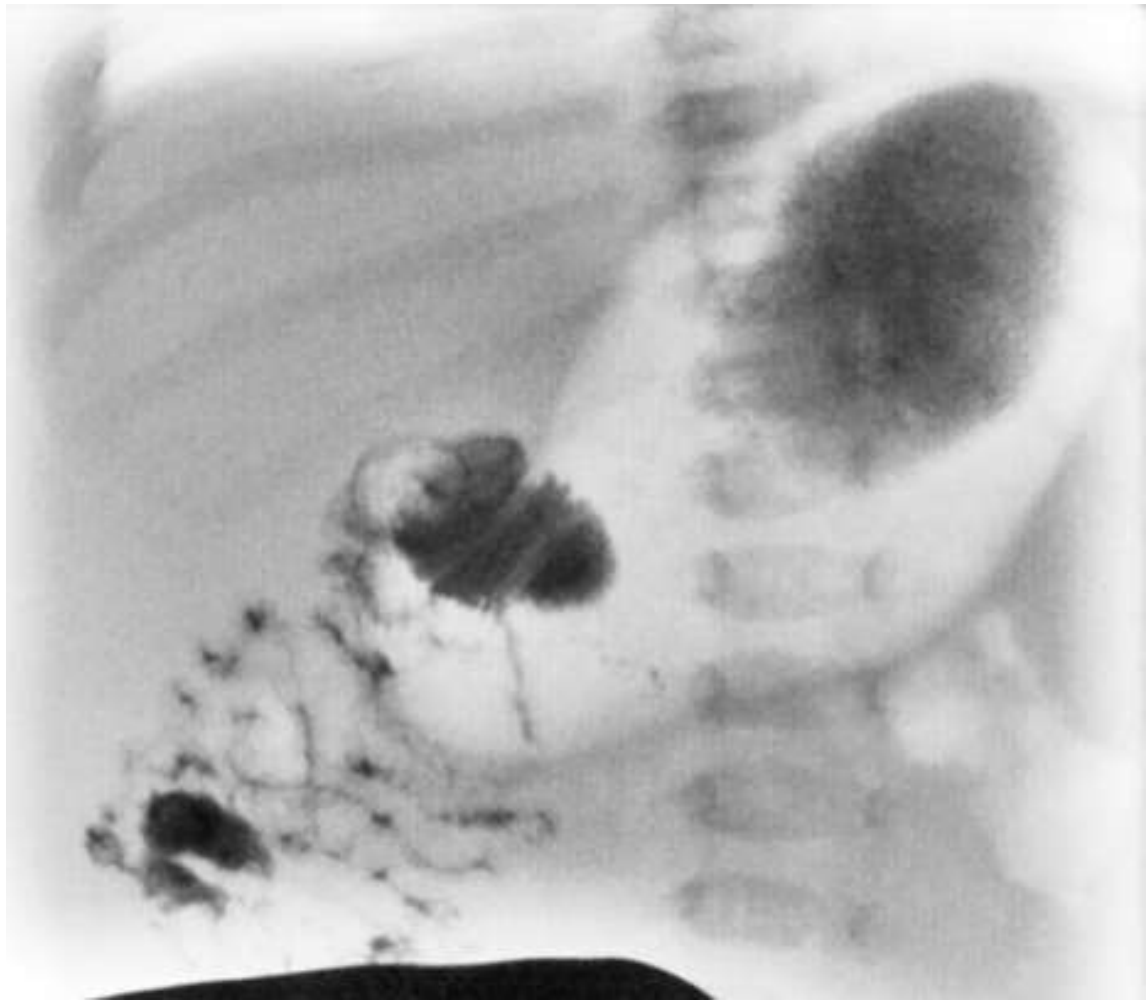

mAs kvp
mm
EI:143
EXI:
R



Upward direction of the D2

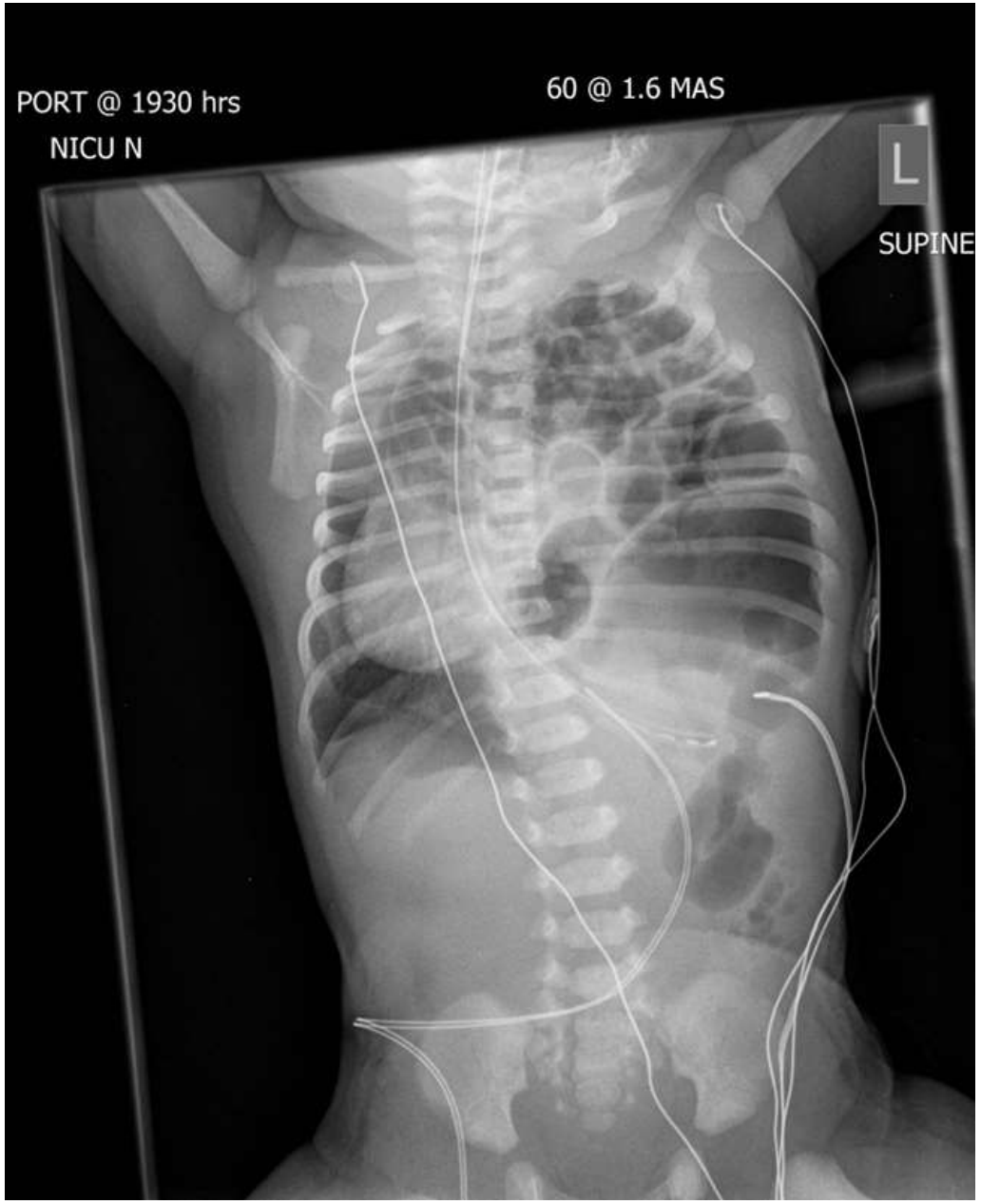
normal





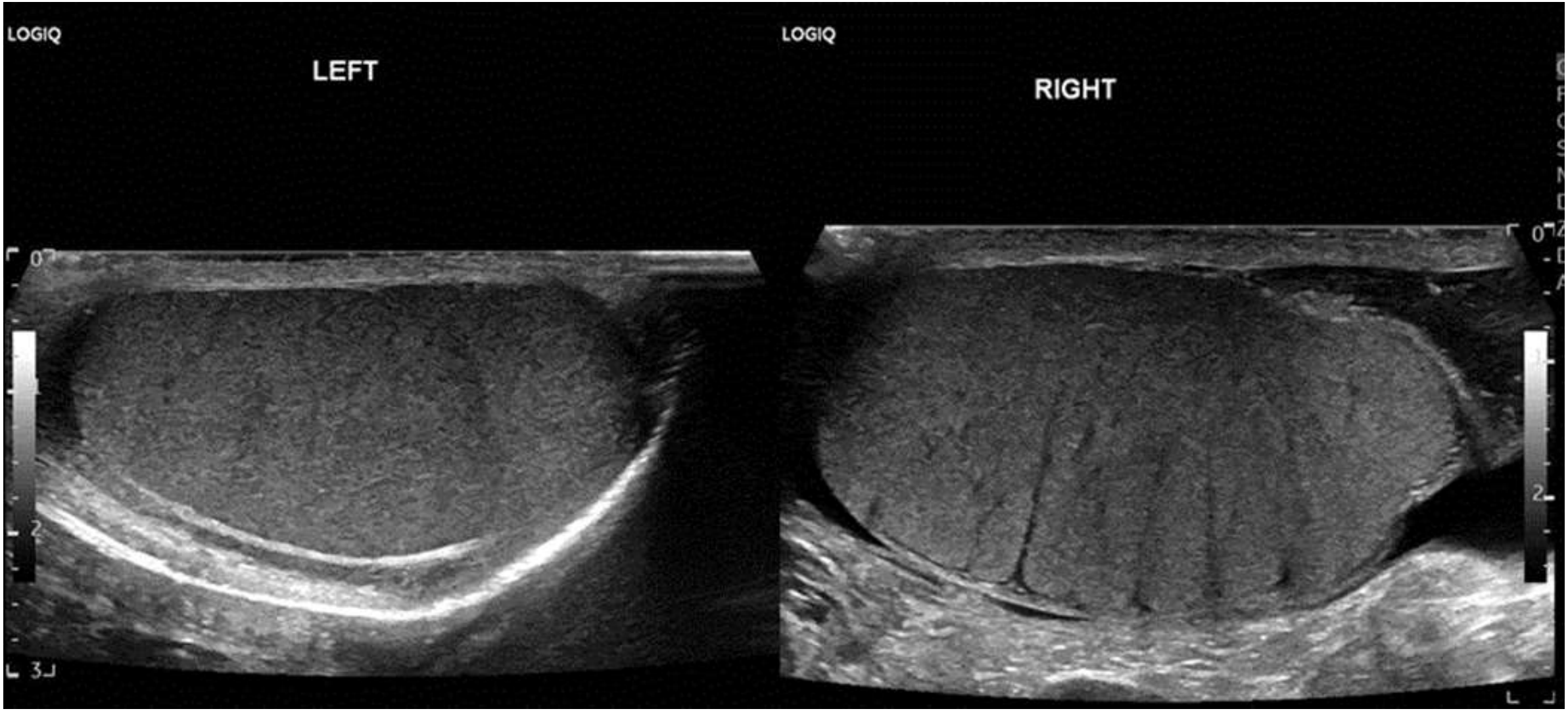
Q8

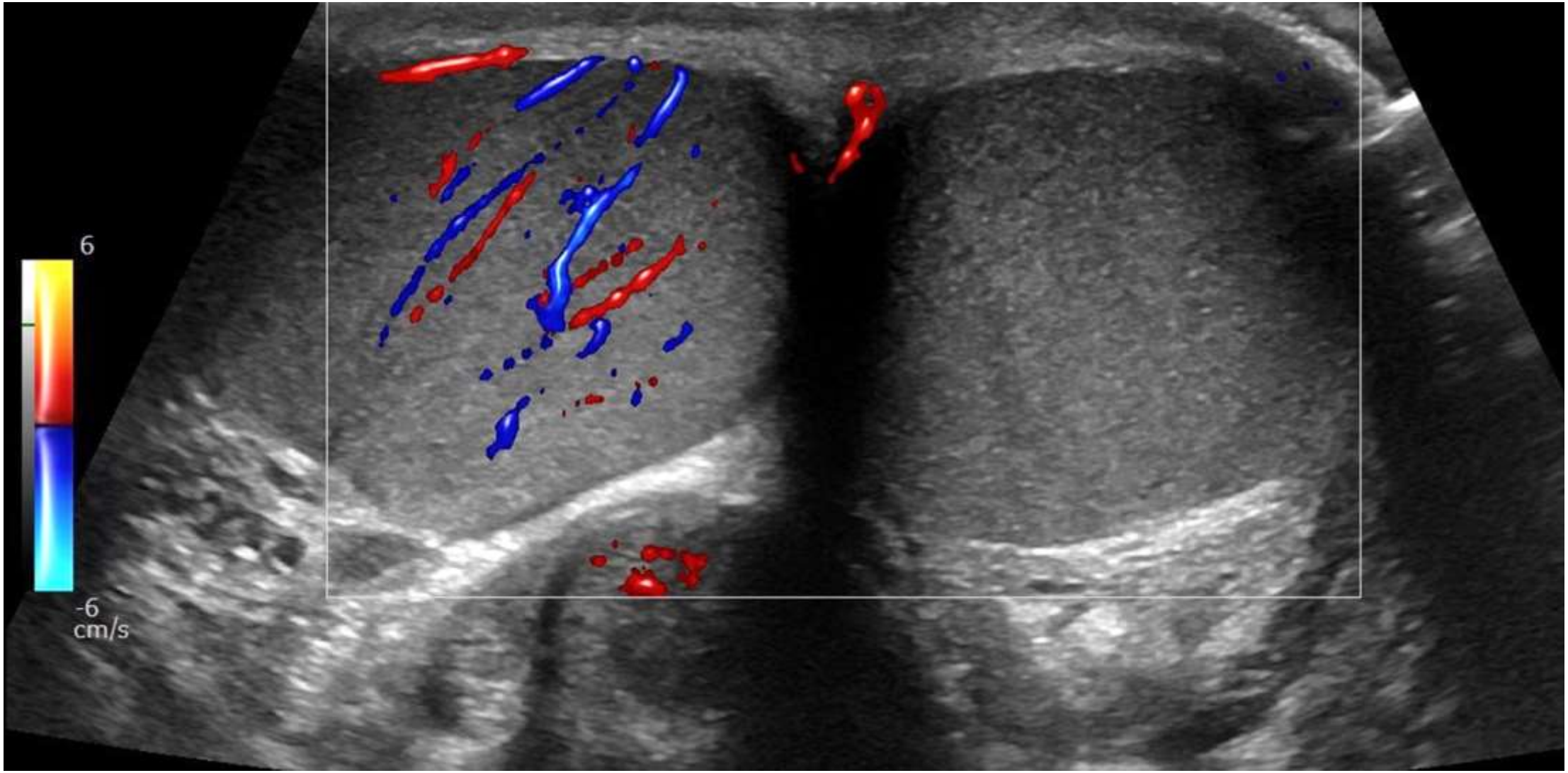
A 0- day old –
Difficulty breathing



Q9

- A 13-year-old boy, scrotal pain


LOGIQ
LEFT
LOGIQ
RIGHT


6
-6
cm/s

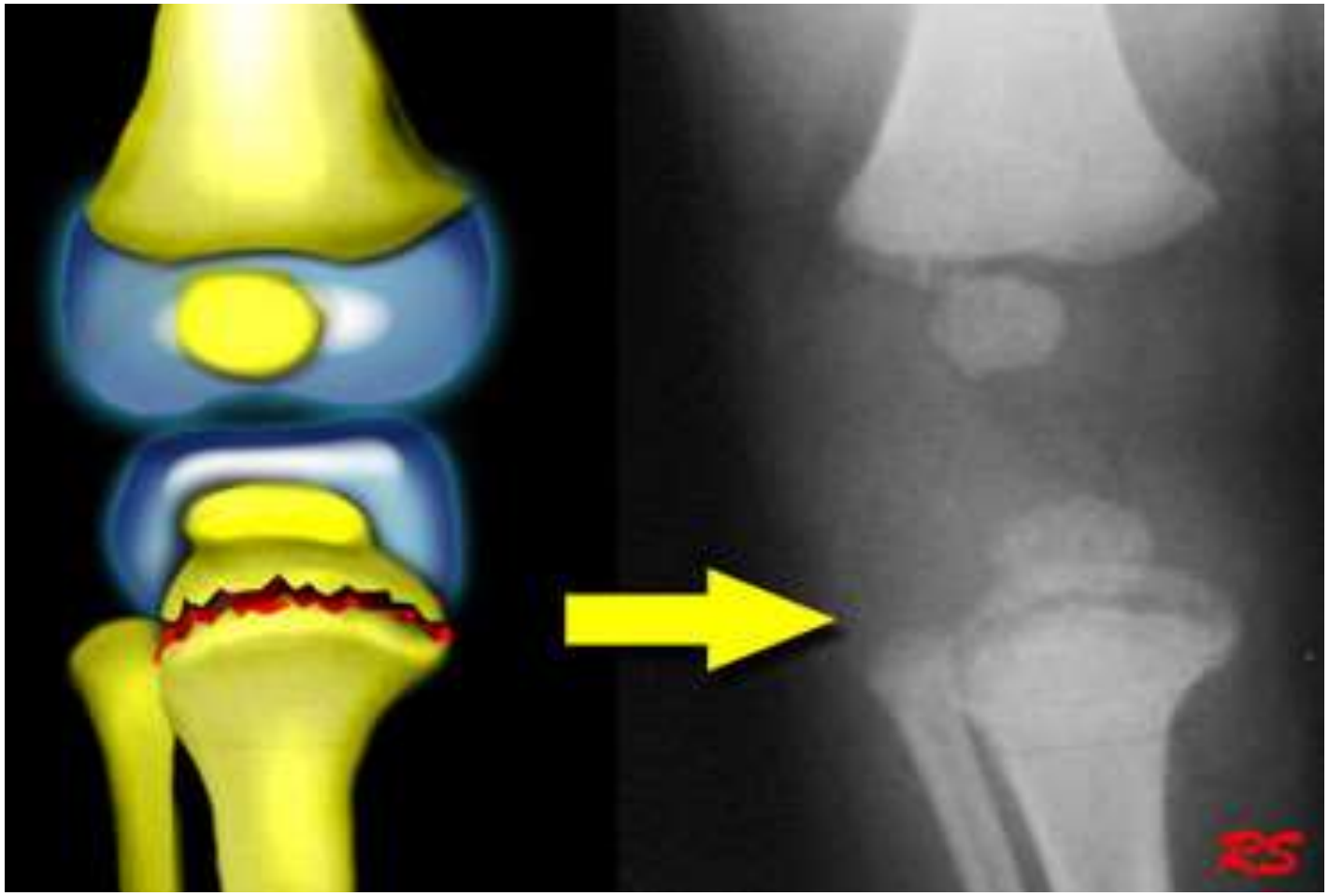
Q10

- A 3-month-old baby, cough and irritability

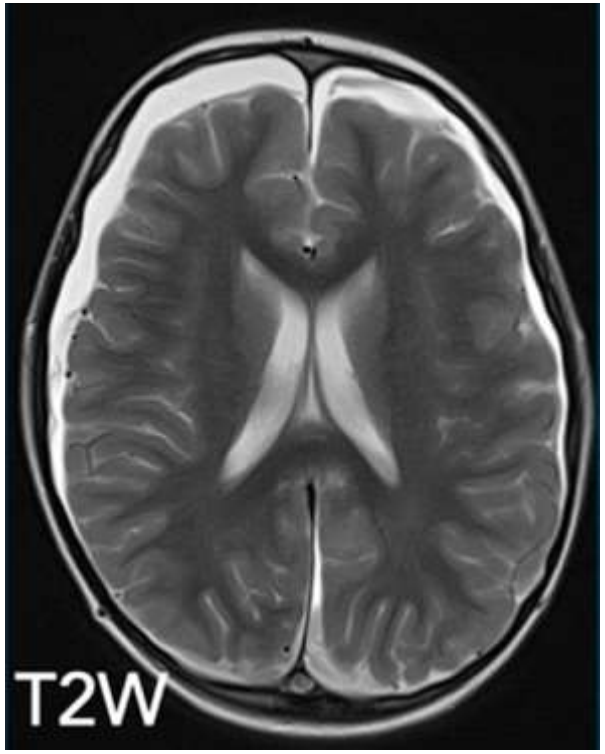
- The classical **metaphyseal corner or bucket handle fracture** is virtually pathognomonic for abuse, although a differential diagnosis does exist.

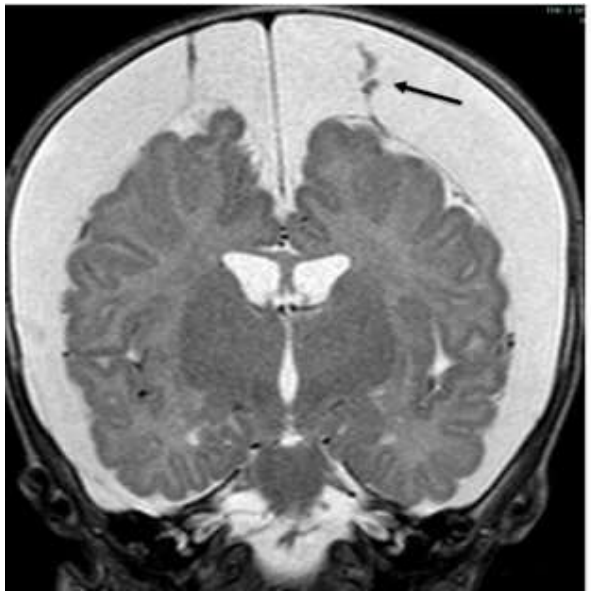
- **Rib fractures** are prevalent and highly specific for abuse in young children less than 2 years.

- Fractures of **the acromion, sternum** and **spinous processes** are so rare in accidental conditions, giving them a high specificity for abuse.



The metaphyseal lesion in abused infants: a radiologic-histopathologic studyPK Kleinman, SC Marks, and B Blackbourne, Am. J. Roentgenol., 146: 895 - 905.


T2W




a
0.47 cm


B