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ABDOMINAL X RAYS FOR DIAGNOSIS OF PEDIATRIC SURGICAL CONDITIONS

SPEAKER
Dr Prashant Jain

CHAIRPERSONS
Dr Anurag Krishna, Dr Pinaki, Dr Prem Ganeshan, Dr Ashish Prasad

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Dr Prashant Jain

- Senior Director - Paediatric Surgery & Coordinator Paediatric Super Specialties
- Centre for Child Health at BLK-Max Super Speciality Hospital, New Delhi

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Dr Anurag Krishna

- Chairman - Paediatrics & Paediatric Surgery
- Paediatric (Ped) Surgery, Paediatric (Ped) Urology at Max Healthcare

•British Government Technical Cooperation Training Programme Fellowship at the Royal Manchester Children's Hospital, Manchester, UK
•M.Ch (Paediatric Surgery), All India Institute of Medical Sciences (AIIMS), New Delhi
•MS (General Surgery), All India Institute of Medical Sciences (AIIMS), New Delhi
•MBBS, All India Institute of Medical Sciences (AIIMS), New Delhi

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Dr Ashish Prasad

Senior Consultant - Paediatric Surgery & Paediatric Urology

Centre For Child Health, Robotic Surgery, Paediatric Surgery & Paediatric Urology, Paediatric Urology

BLK-Max Super Speciality Hospital, Delhi

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Dr Pinaki Ranjan Debnath

- MS MCh(Paeds Surg) FRCS (UK) MNAMS, FIMSA, PGDHHM
- Fellowship in Adult & Pediatric Liver Transplant

- **Professor & Head**
- **Pediatric Surgery**
- **ABVIMS & DR RML HOSPITAL**

- AFFILIATIONS

- Professor Pediatric Surgery
- GGSIPU, DELHI

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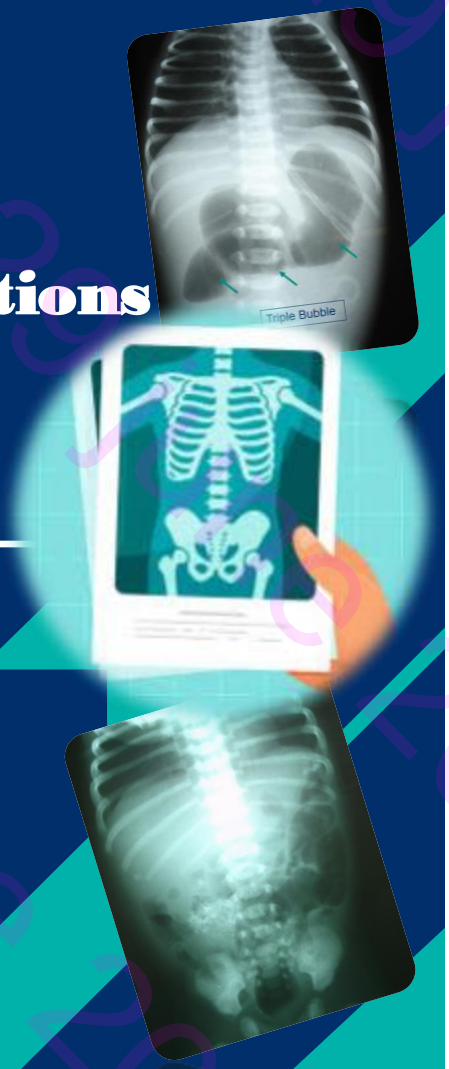
Abdominal X-Rays: Diagnosing Pediatric Surgical Conditions



Dr Prashant Jain

Sr Director
Pediatric surgery & Pediatric Urology
BLK Max Superspeciality Hospital , New Delhi
Max Superspeciality Hospital, Dwarka

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Abdominal X-Rays: Frontline Imaging Modality

- Accessible and Non-Invasive Tool
- Helps in deciding the next imaging modality
- Limited role of advance imaging
- Minimises Radiation

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Abdominal X-Rays:Interpretation is crucial

Early Diagnosis

Early Intervention

Improved Outcome

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- Structured approach
  - Name/ID/Date/Time
  - Previous X-ray

- *Anatomy*
- *Understand the pathology*
- *Clinical correlation*
- *Differential*

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Abdominal Xray: Simple Algorithm

I. Gas (Intraluminal/Extraluminal)
II. Solid Organs
III. Osseous and Soft Tissue Shadow (mass or cyst)
IV. Tubes and Lines

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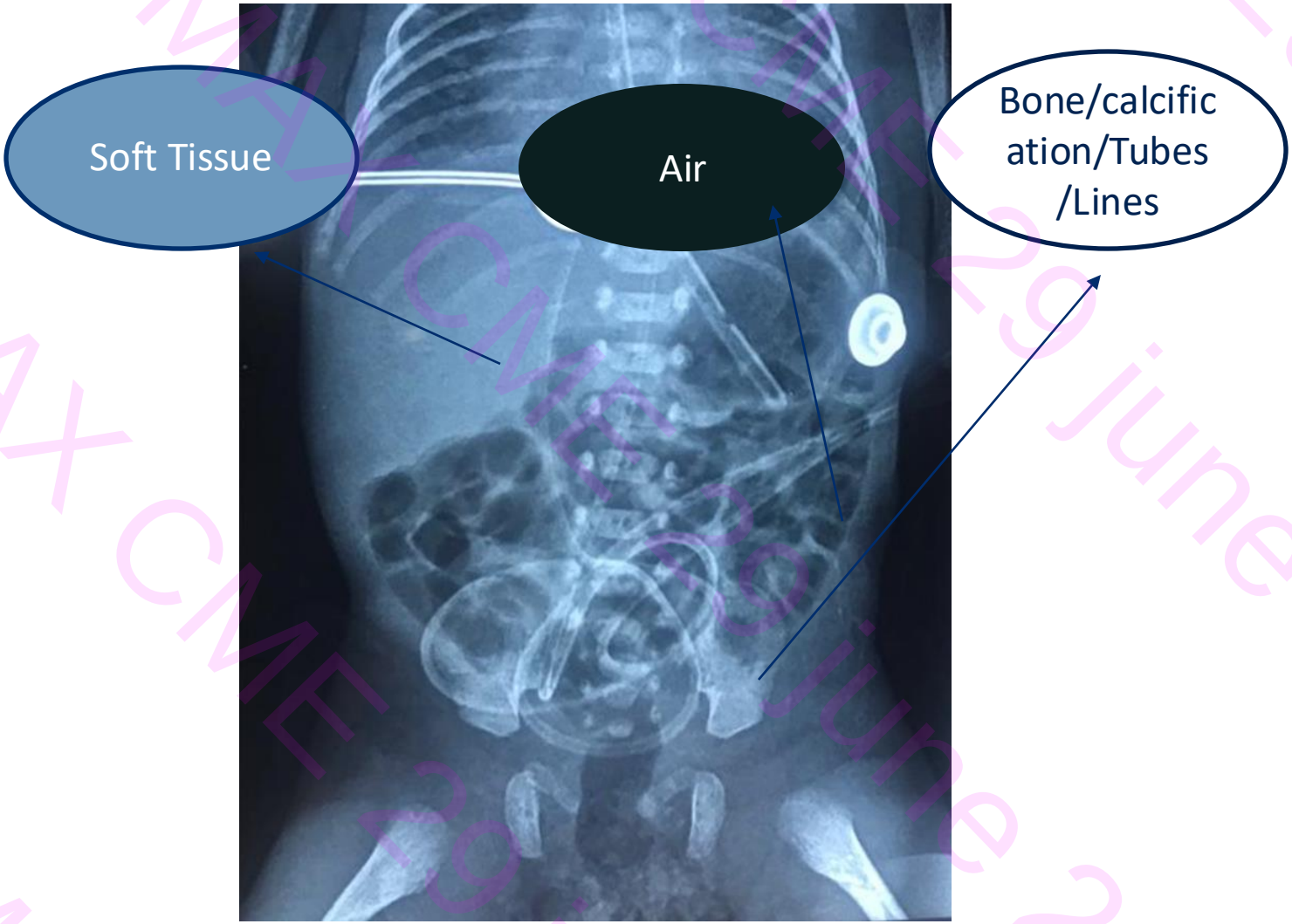
Density



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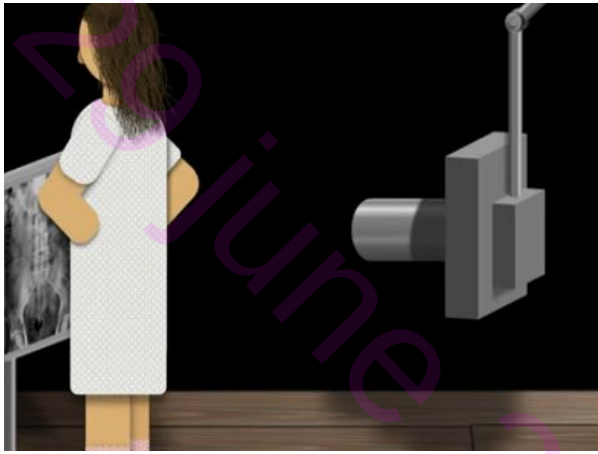
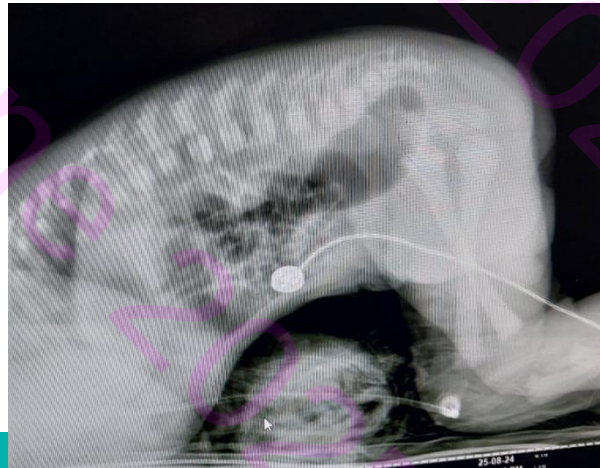
Types of Views

- Supine film
- Erect film
- Prone cross-table lateral view
- Decubitus film
- Films after injecting air.





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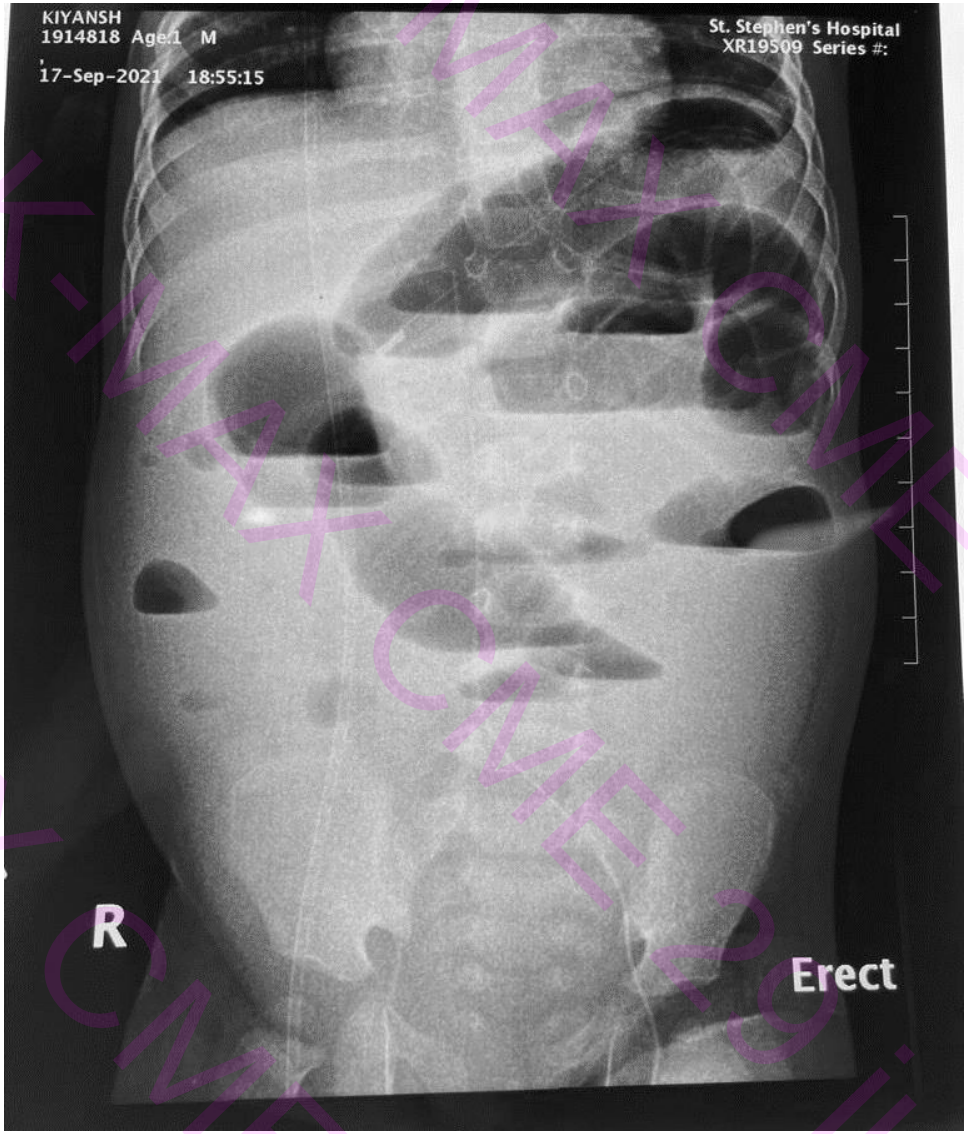
Why Erect Film??



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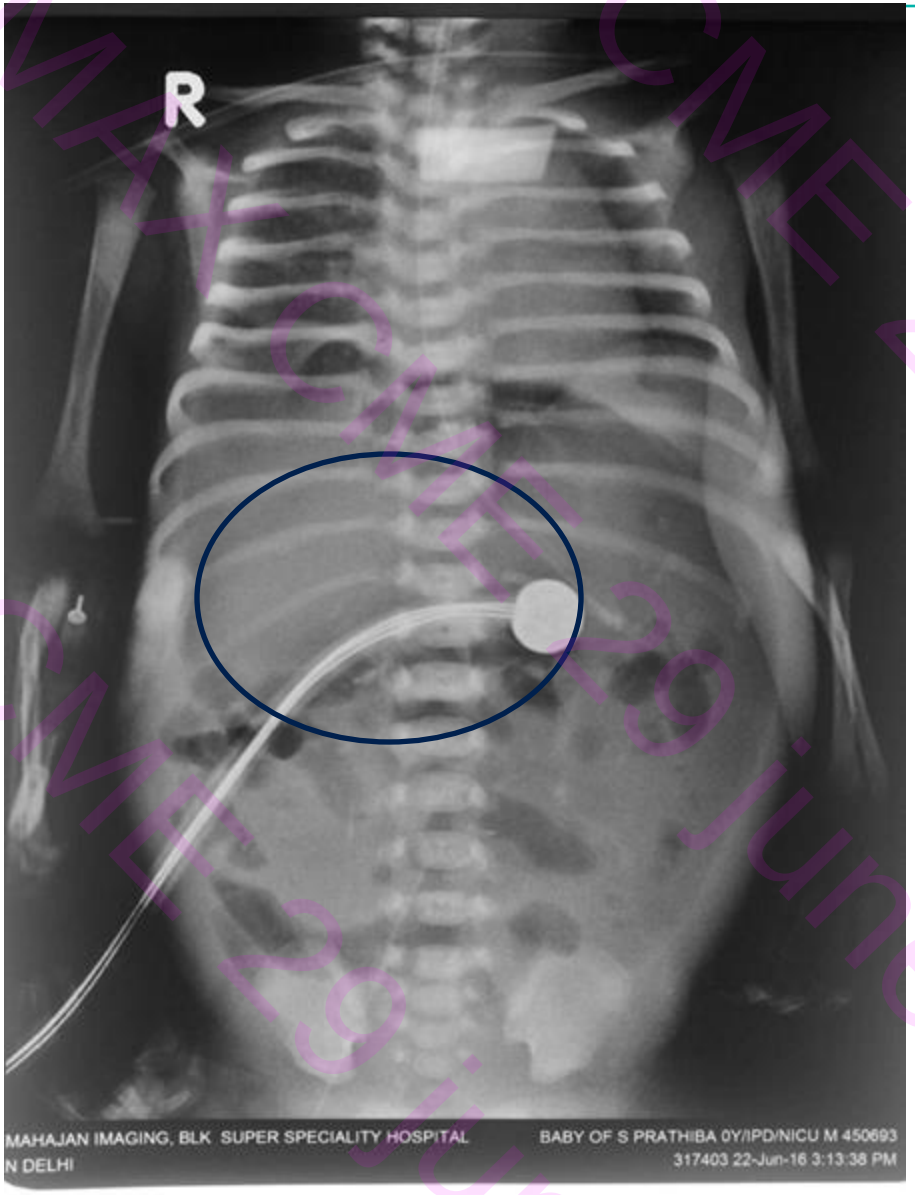
Supine film



HYPERLUCENT LIVER SIGN

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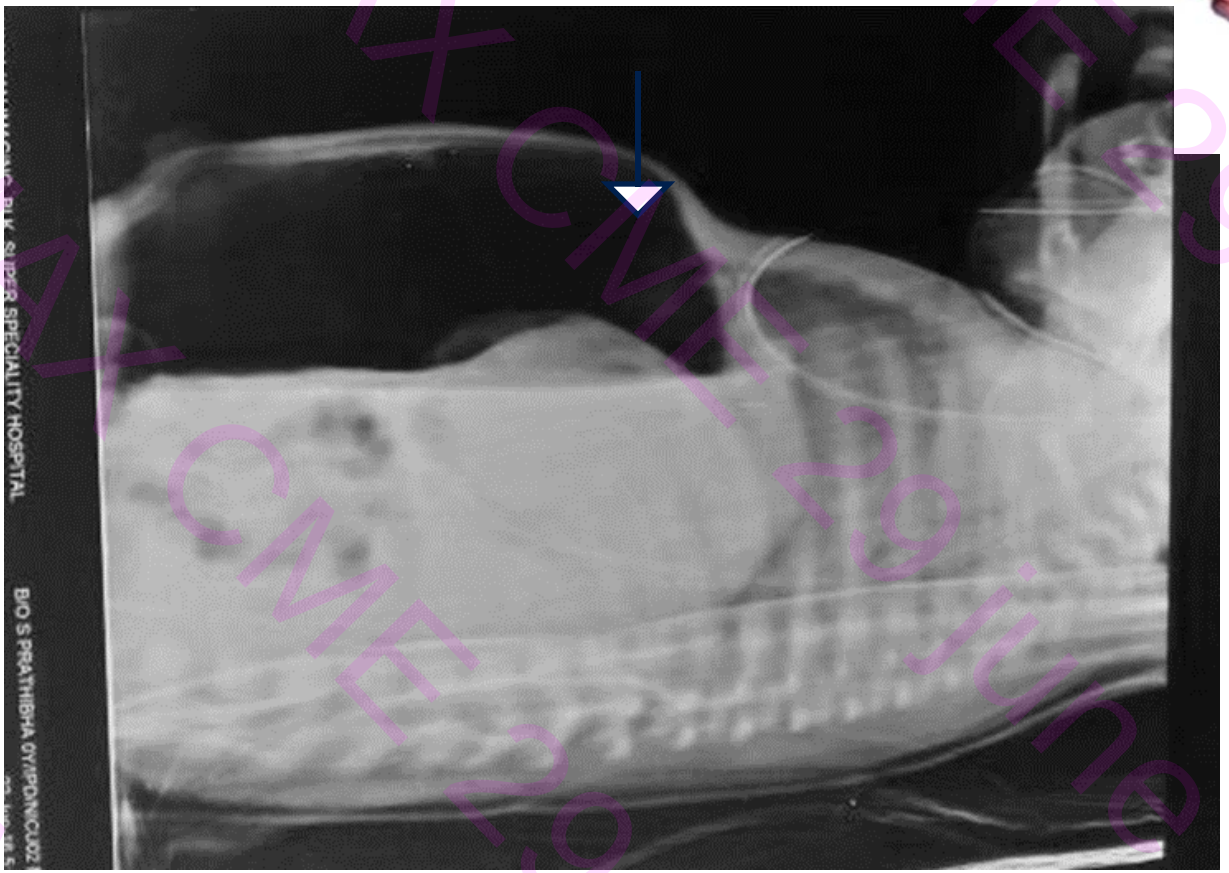
Lateral Decubitus



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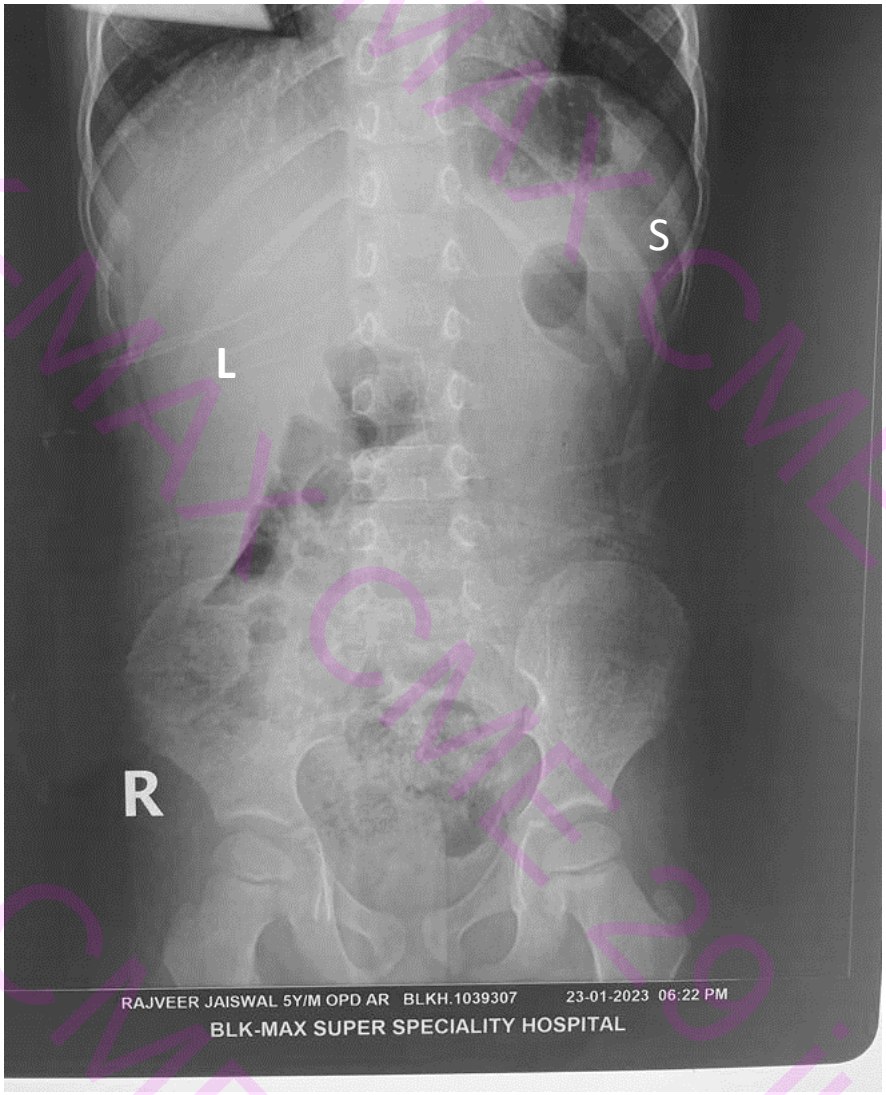
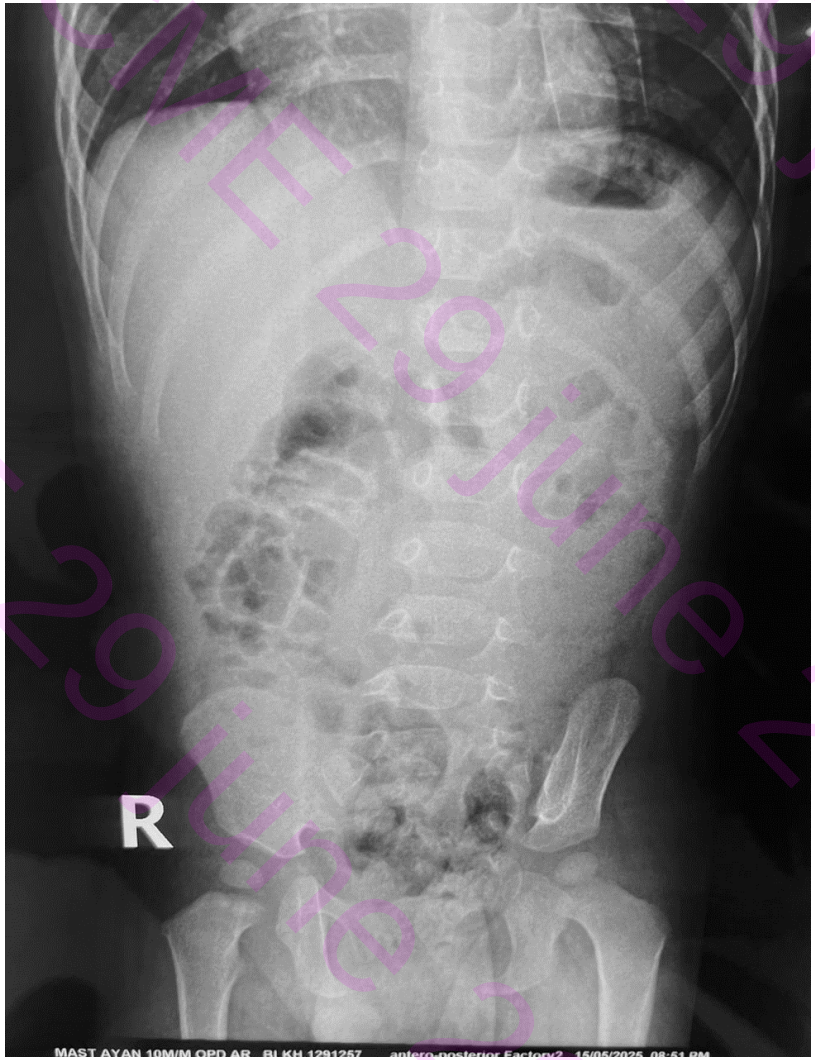
Normal Skiagram





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1. Bowel Gas

- Focal distension
- Abnormal distribution
- High Vs Low obstruction
- Paucity/too little
- Air –Fluid levels

Extraluminal Gas

- Pneumoperitoneum/Pneumotos
- Portal venous gas

Uniform distribution of gas
Honey Comb Pattern

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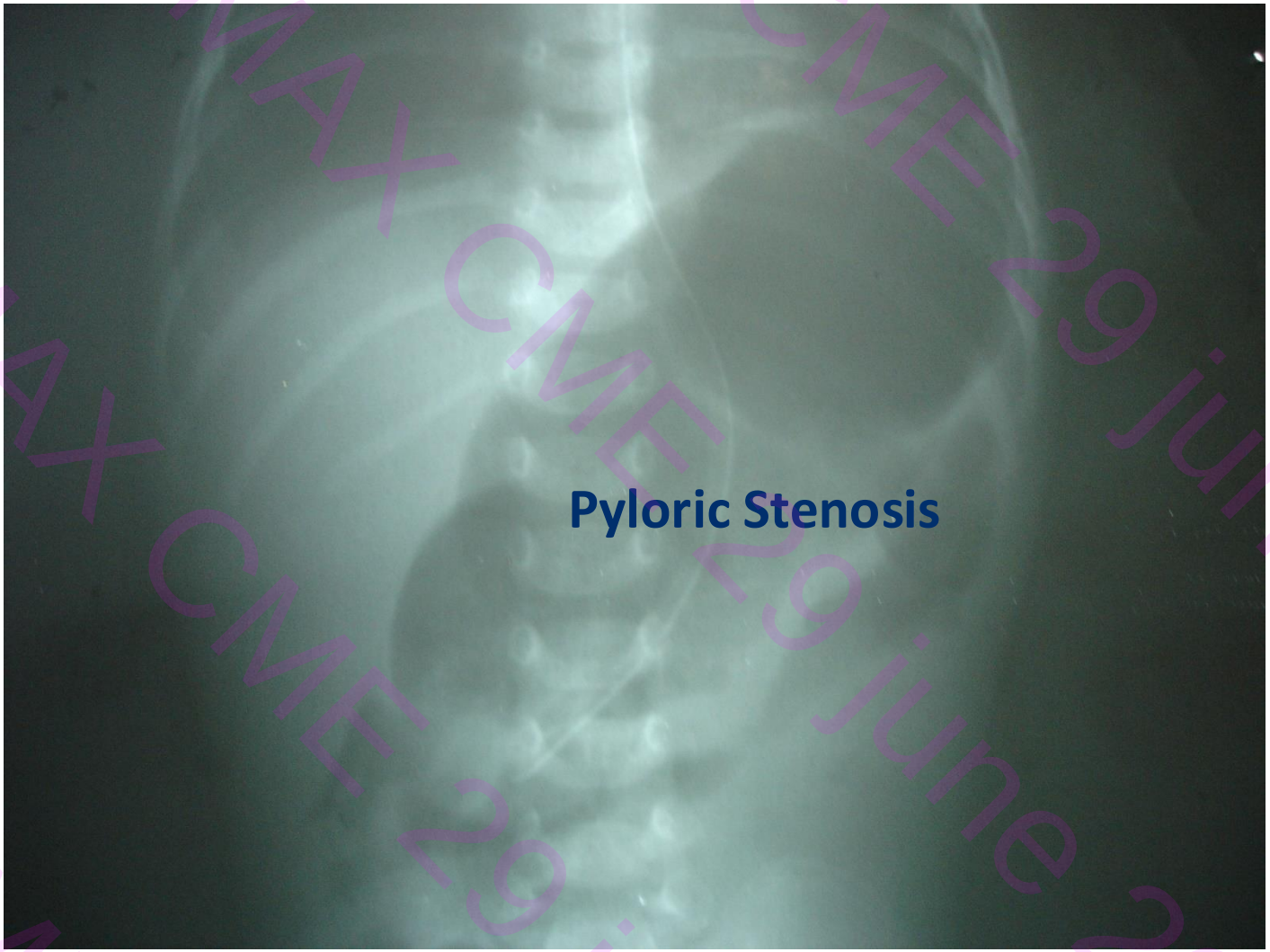
Focal Dilatation



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Intestinal Obstruction Vs Ileus

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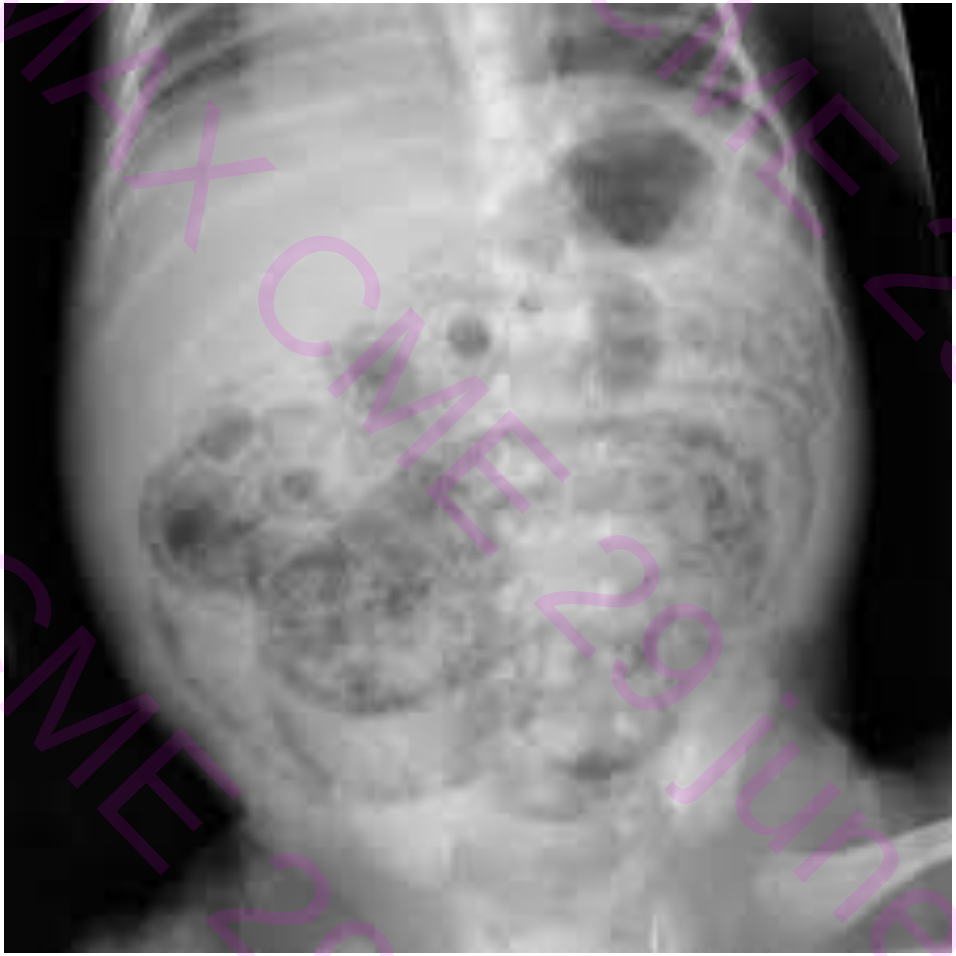

Extra Luminal Air
Pneumotosis Intestinalis

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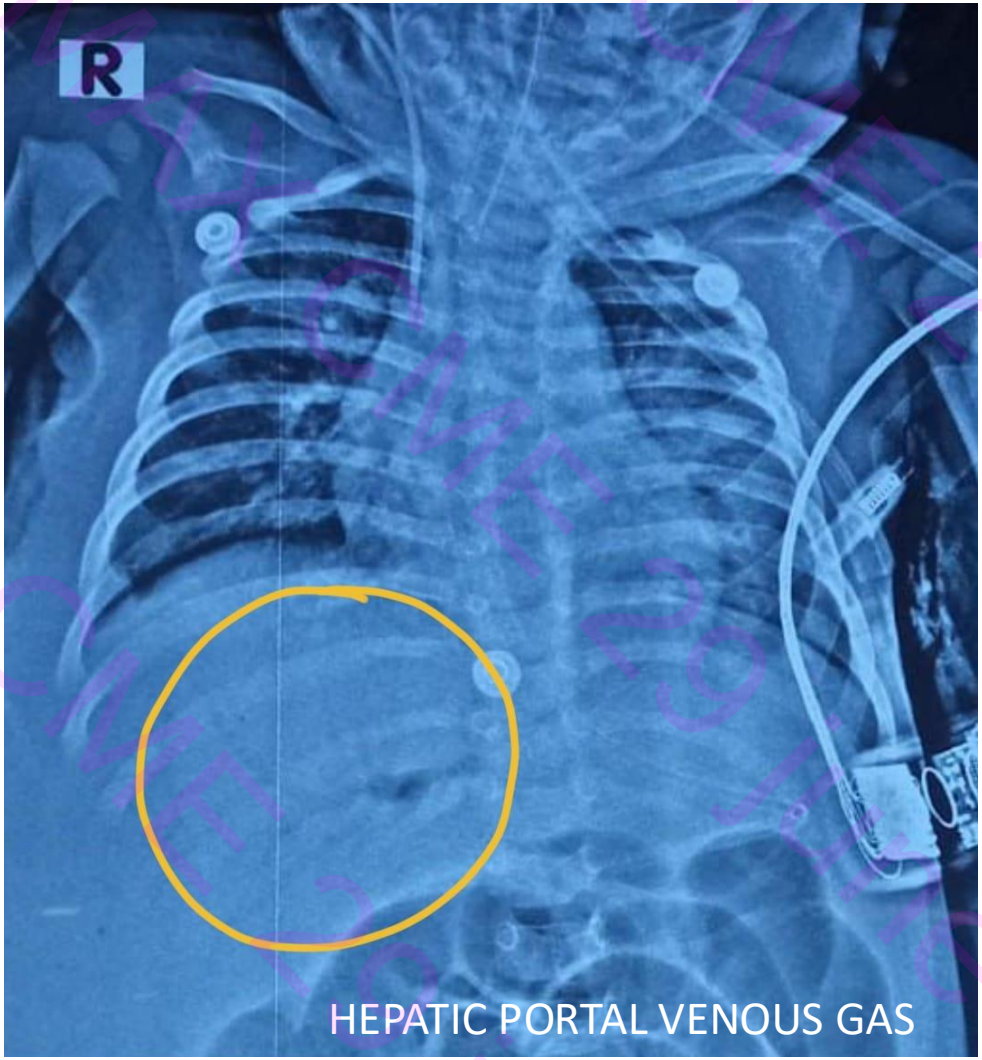
Extra Luminal Air



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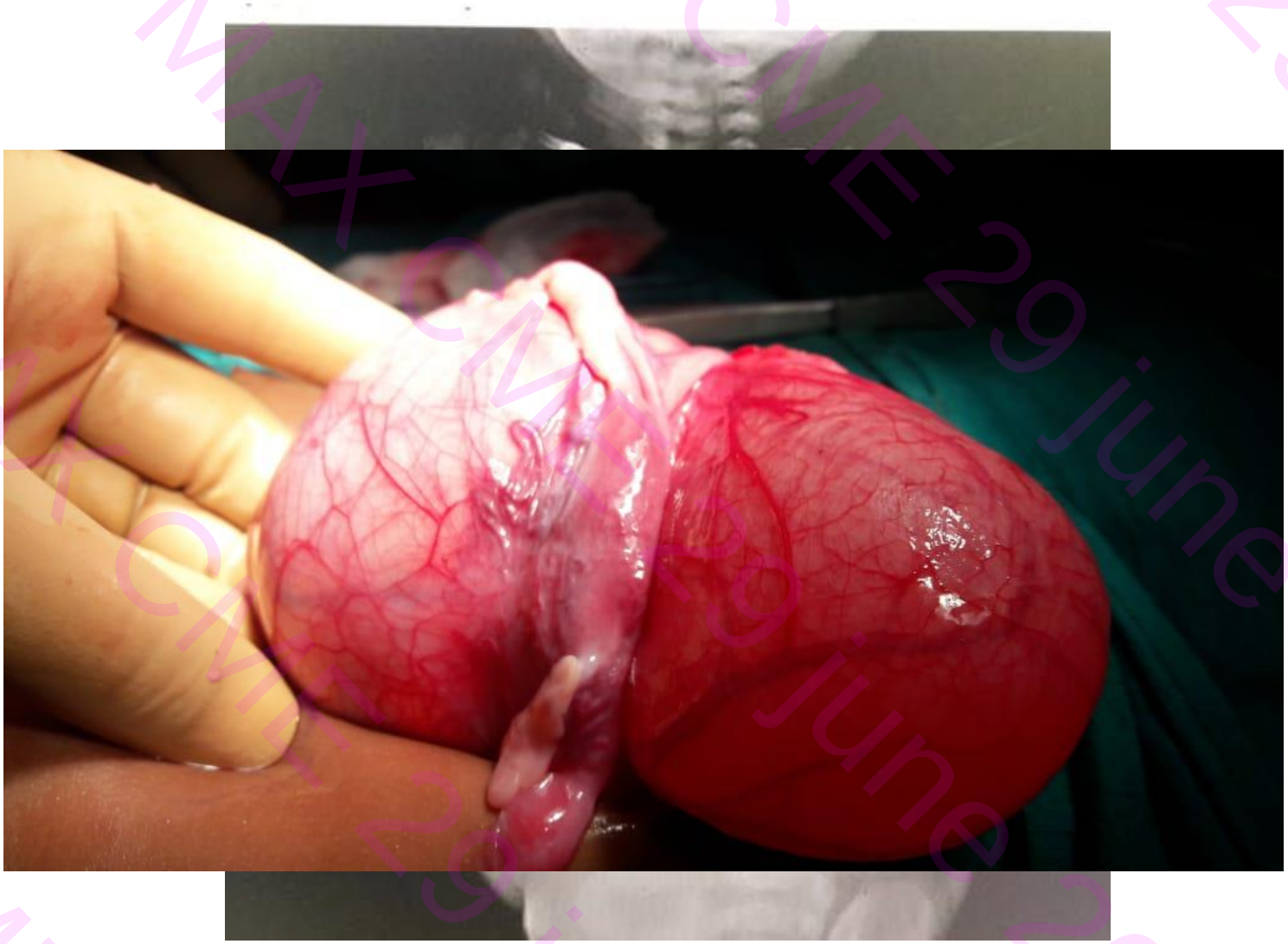
2.Osseous and Soft Tissue Shadow (mass or cyst)



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Tubes and Lines

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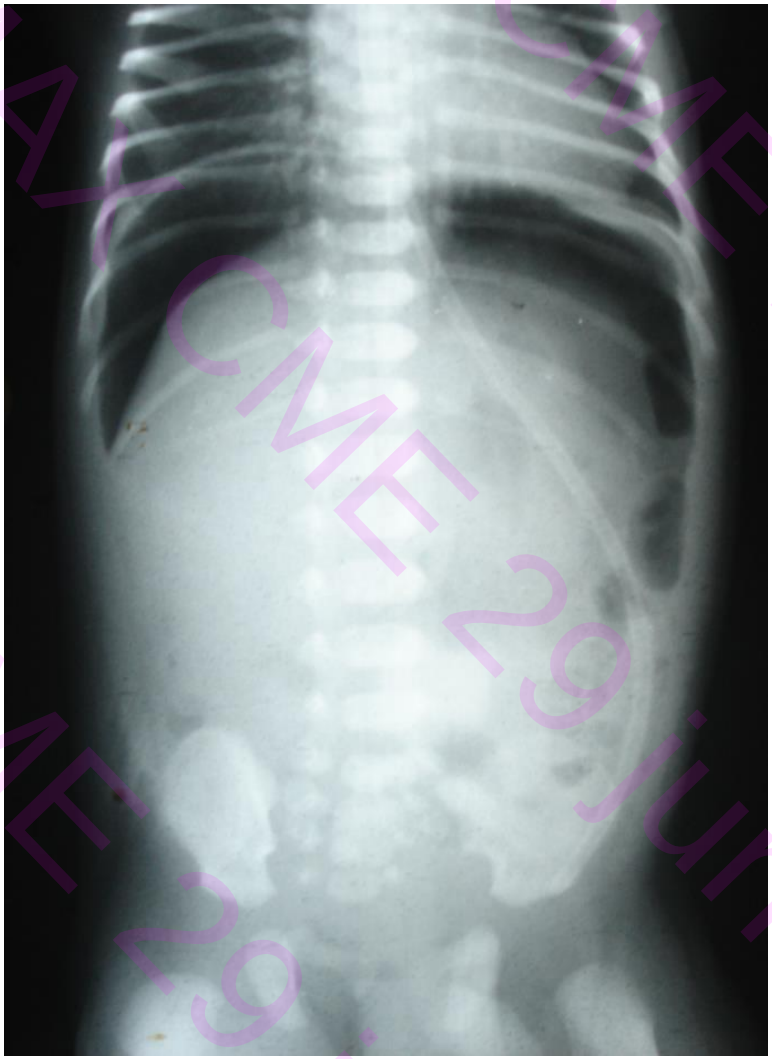

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Neonatal Intestinal obstruction

- **Gastric Outlet Obstruction** — Pyloric Atresia
- **Duodenal** — **Duodenal Atresia** **Malrotation** Annular Pancreas
- **Jejuno-Ileal** — **Jejunal, leal Atresia** **Meconium illeus**, TCA
- **Colonic** — **Hirschsprung's Disease** **Anorectal Malformation** Colonic atresia

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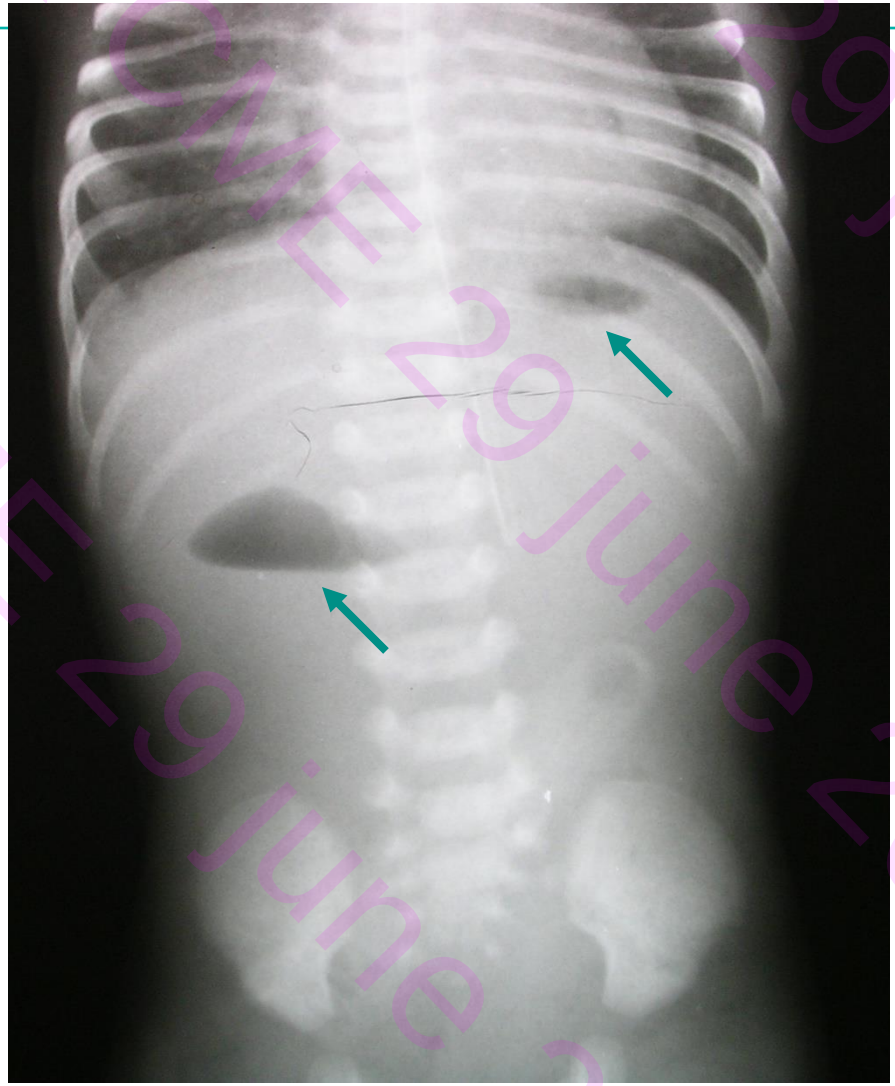
Newborn with Bilious Vomiting

- Bilious vomiting/aspirates
- No abdominal distension
- Antenatal H/O of Polyhydramnios
- D/D: Duodenal obstruction/Malrotation with volvulus



Double Bubble
No gas distally

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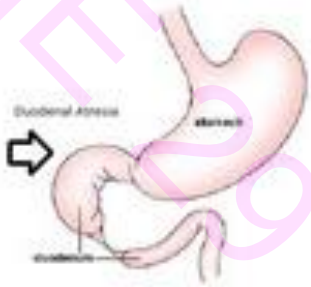
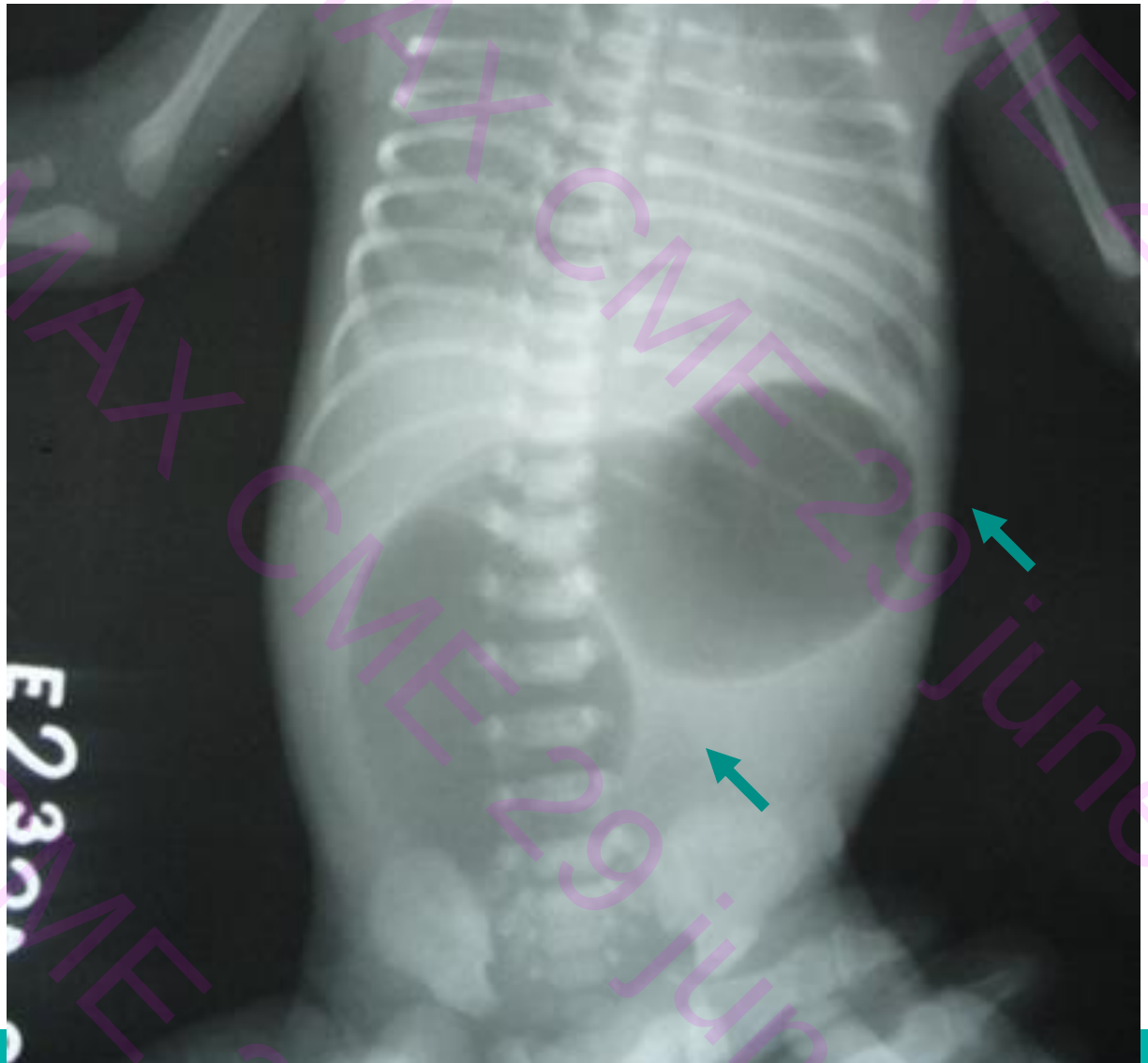
Xray with air contrast





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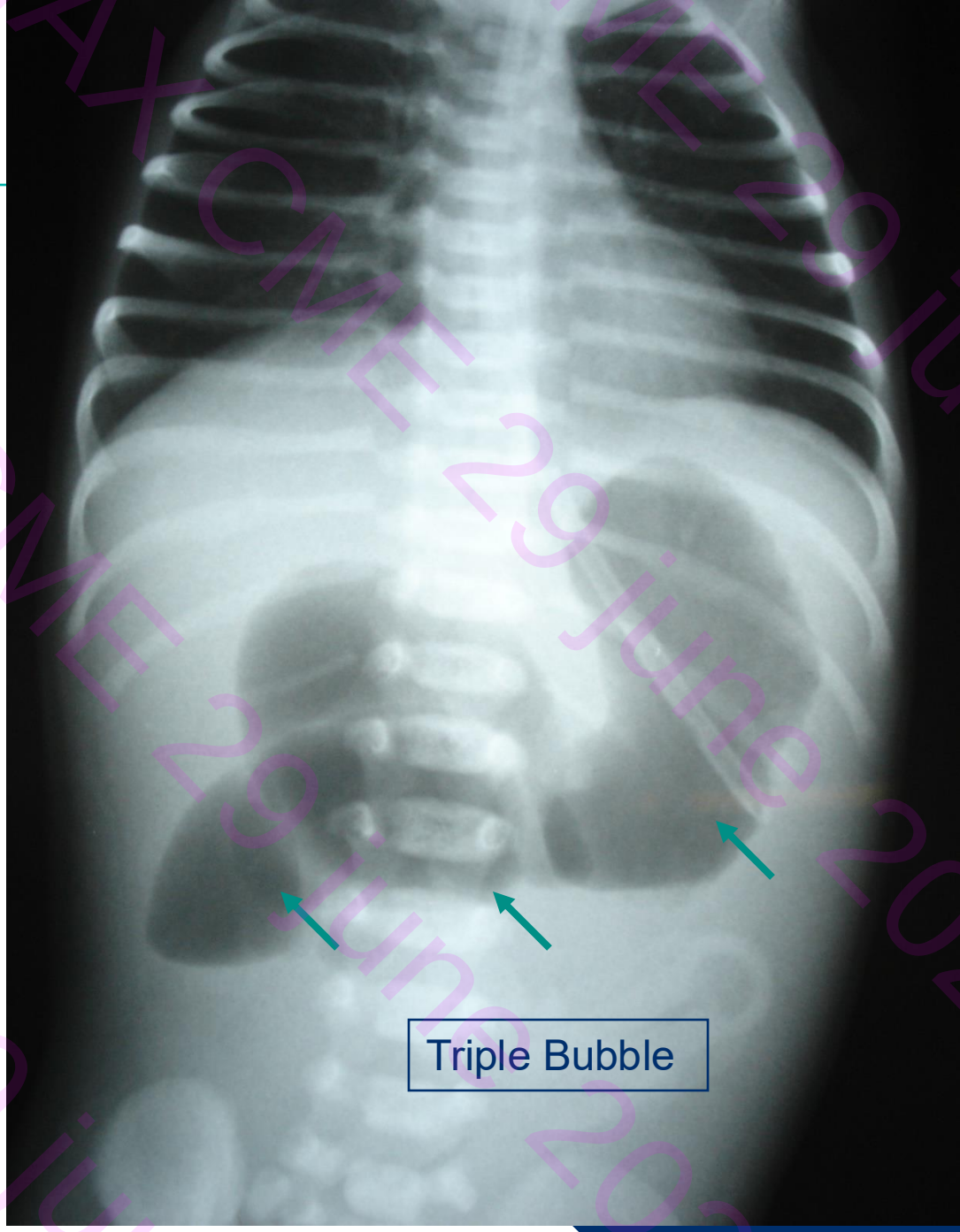
- Bilious vomiting/aspirates
- Mild upper abdominal distension
- Antenatal H/O of Polyhydramnios
- D/D: Jejunal Atresia



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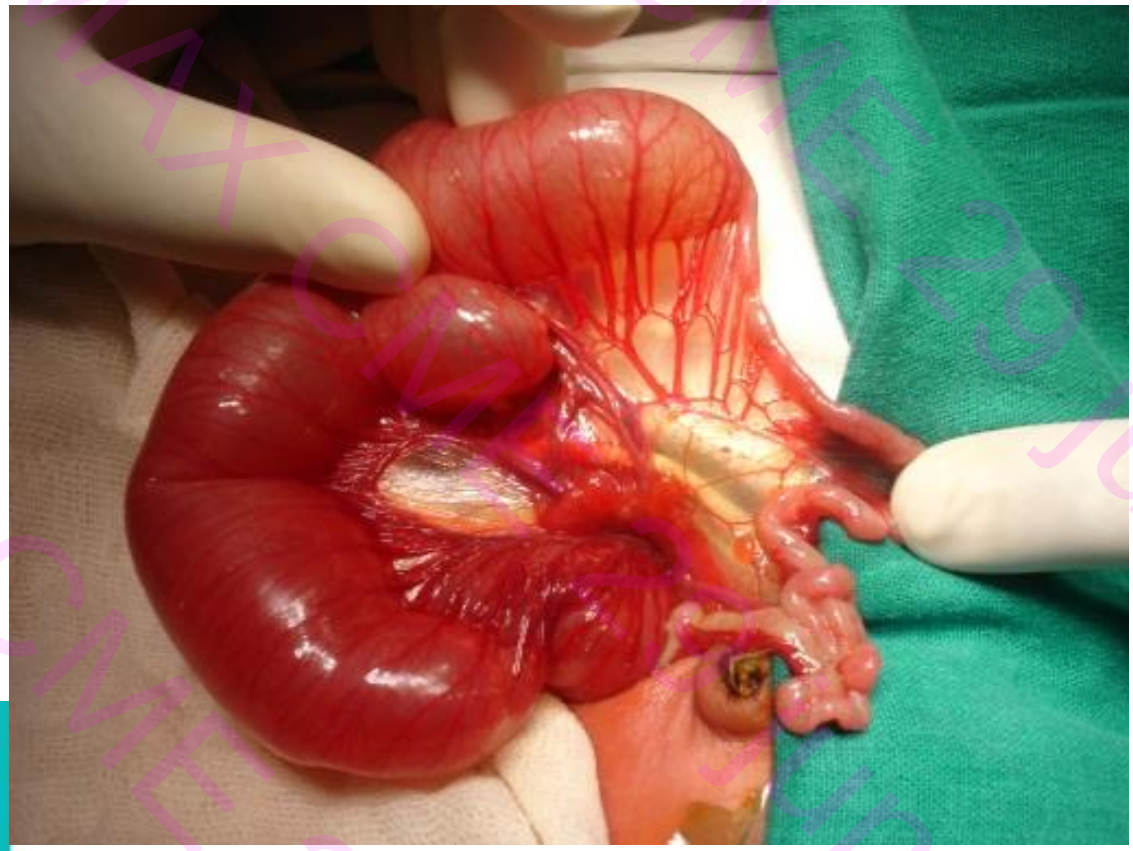

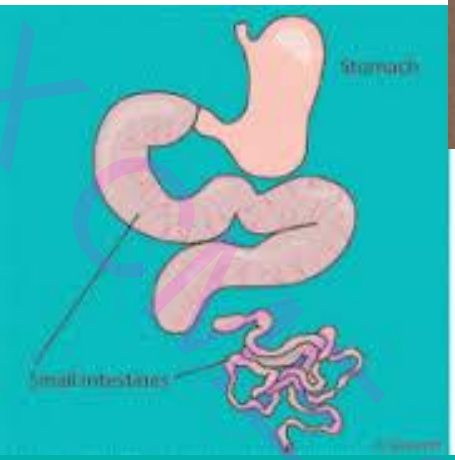

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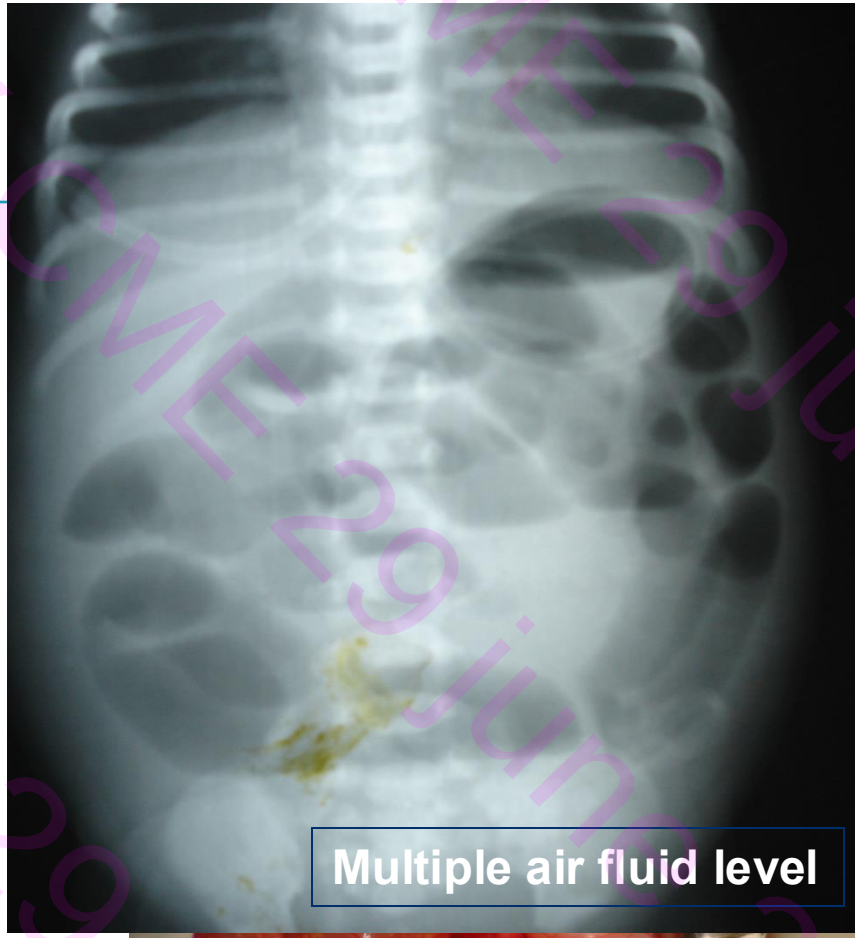
- Bilious vomiting/aspirates
- Progressive abdominal distension
- Antenatal H/O of Polyhydramnios

D/D

- **Ileal Atresia**
- **Hirschsprung's Disease**
- **Meconium Ileus**
- **NEC**
- **Septic Ileus**


Multiple air fluid level


Ileal Atresia

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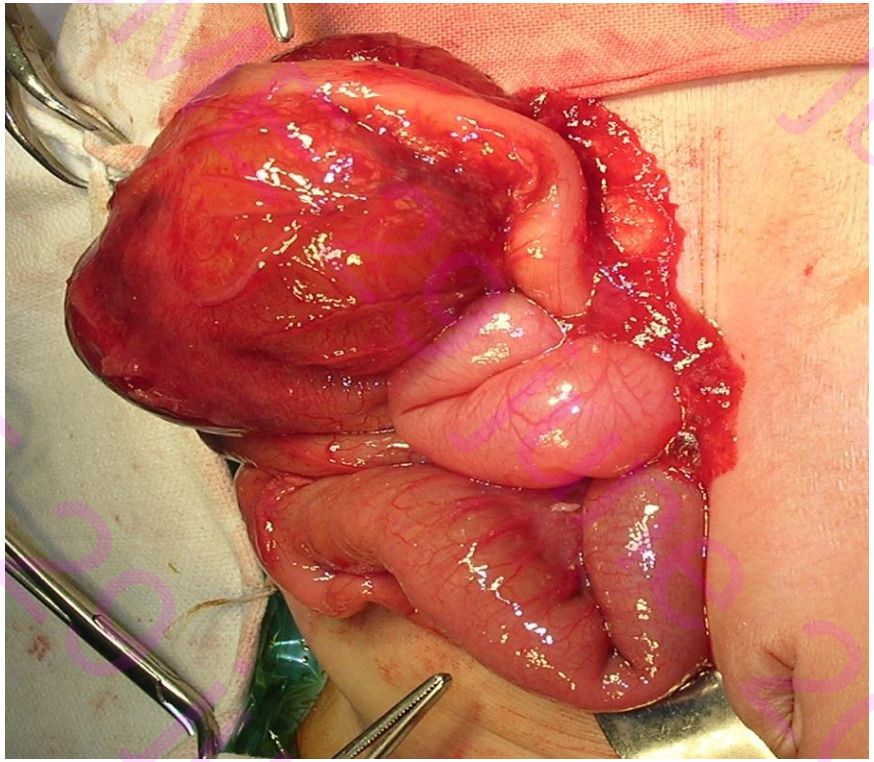

Colonic Atresia

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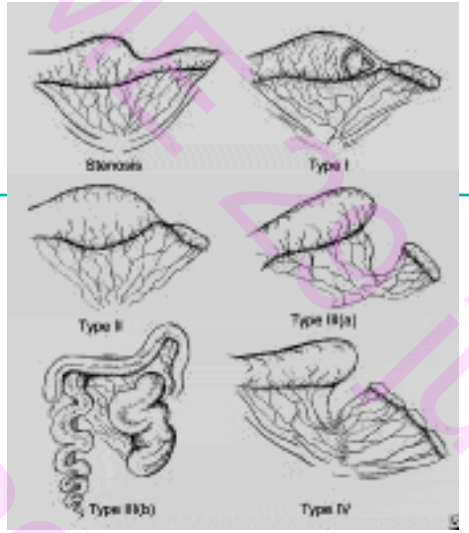
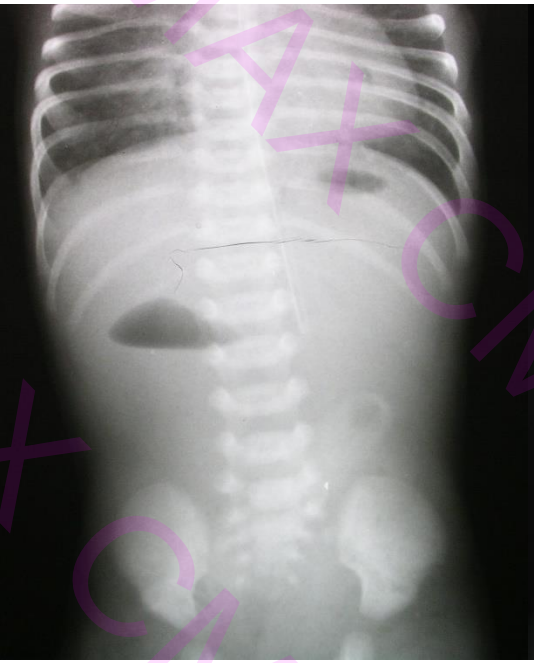
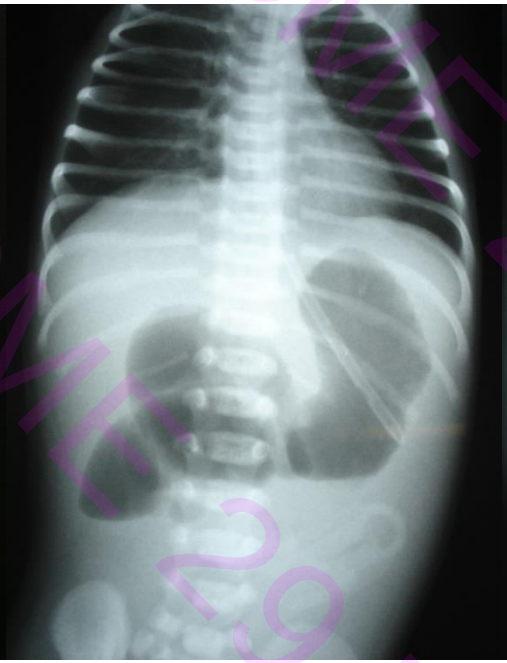
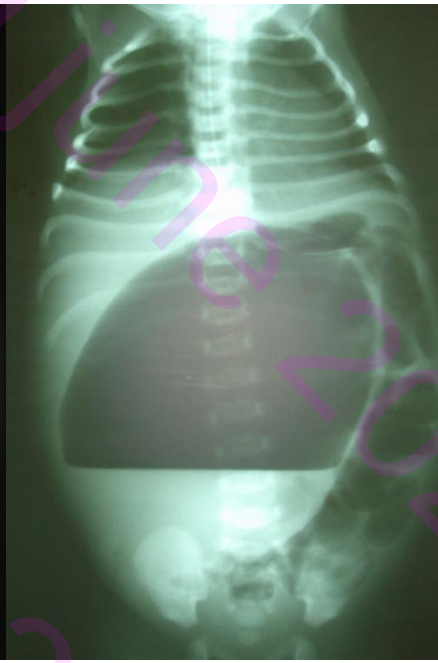
Intestinal Atresia









Duodenal **Jejunal** **Ileal** **Colonic**

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- Bilious vomiting/aspirates
- Mild upper abdominal distensio
- D/D

  1)Malrotation

  2) Duodenal web with perforation

Double Bubble with
Paucity of gas distally

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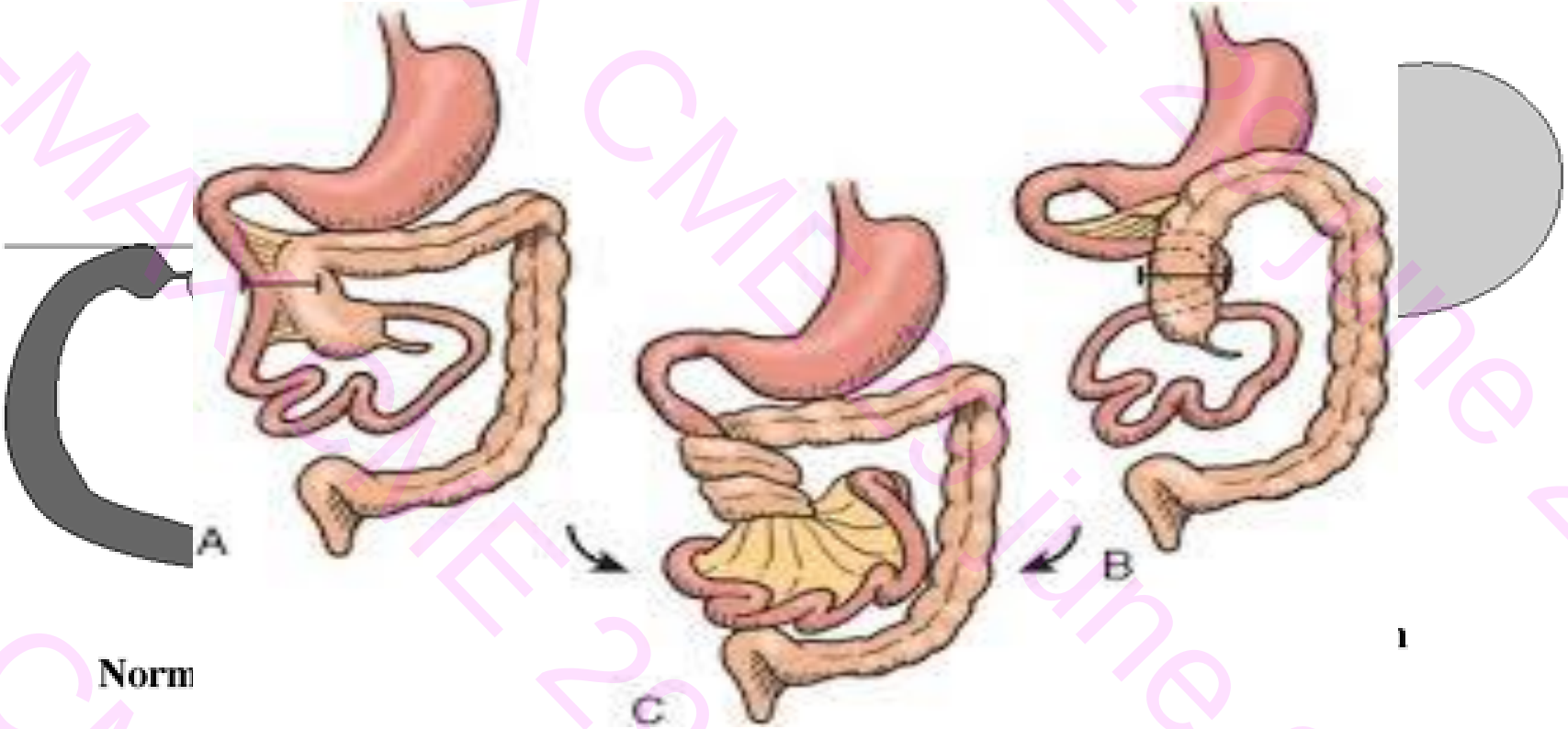

Norm

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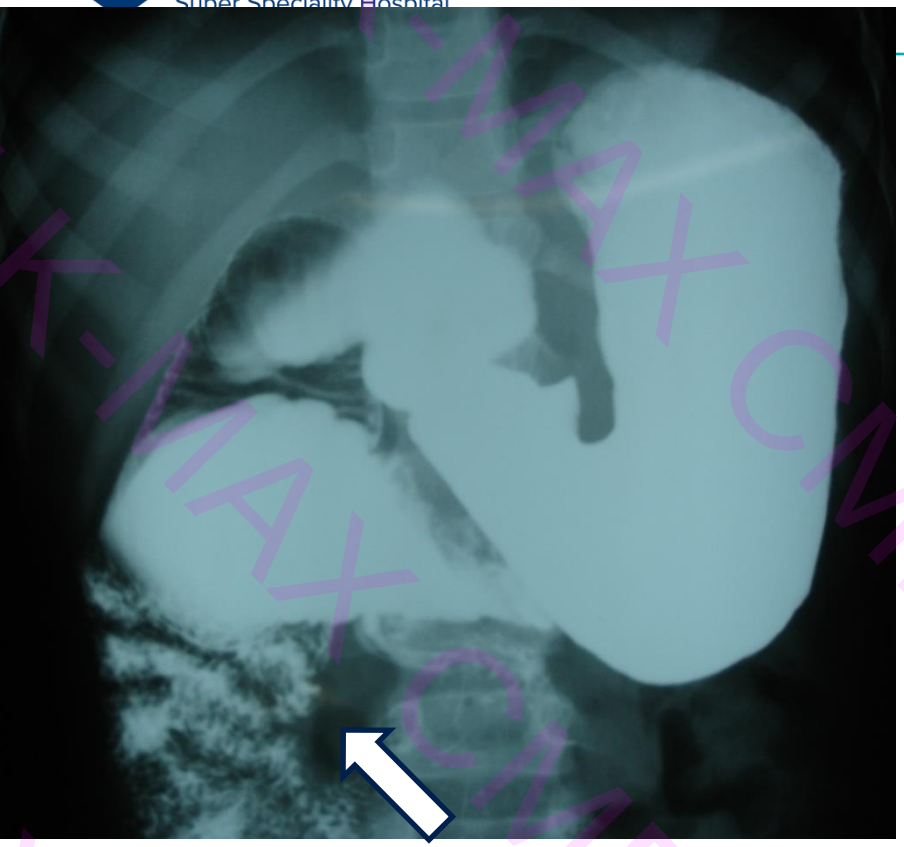

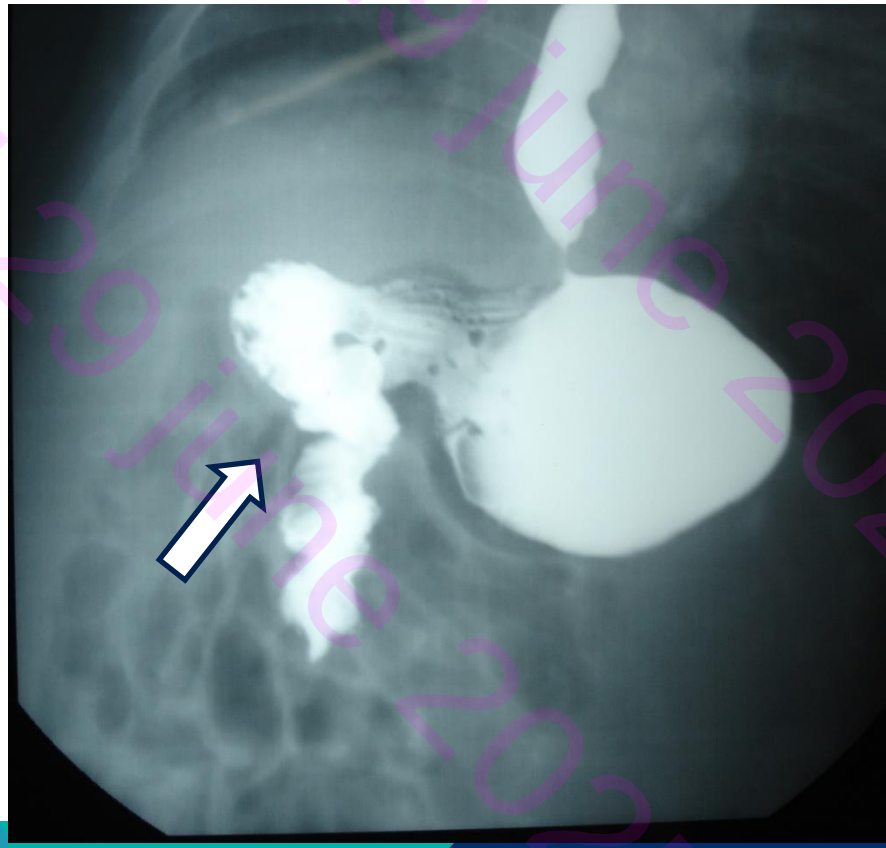

- X-Ray
- Upper GI study
- USG

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MALROTATION WITH MID GUT VOLVULUS

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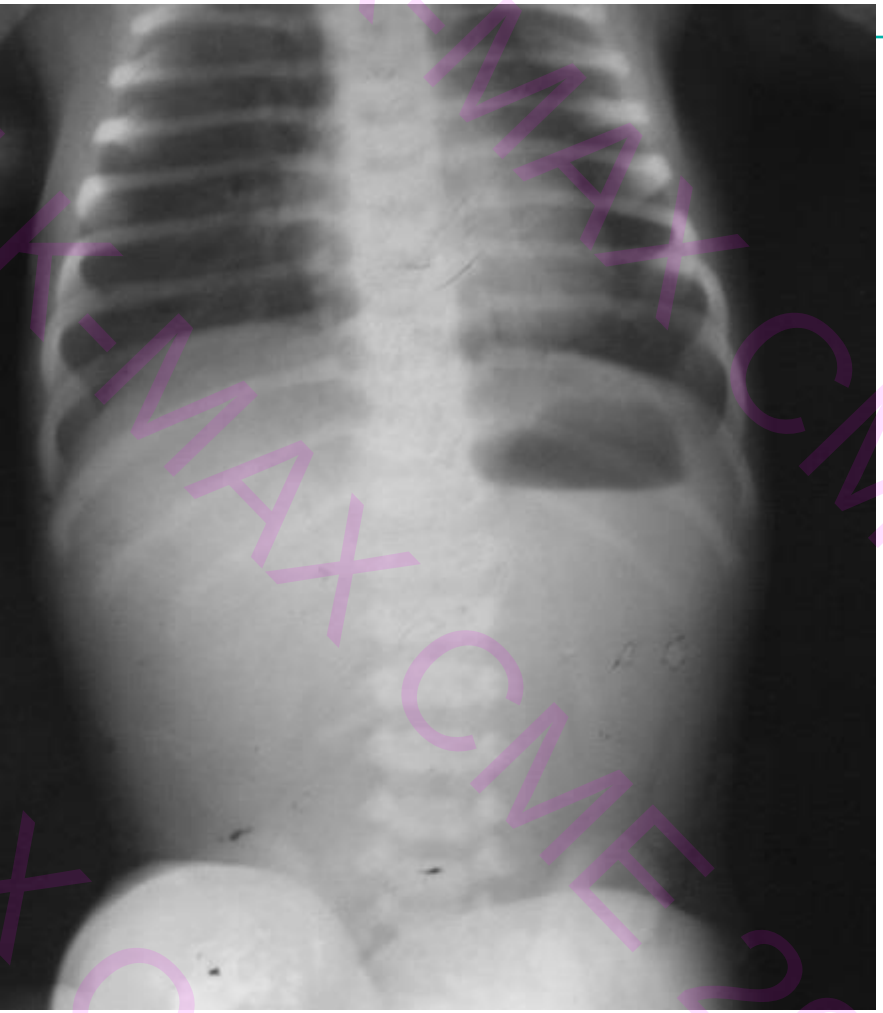
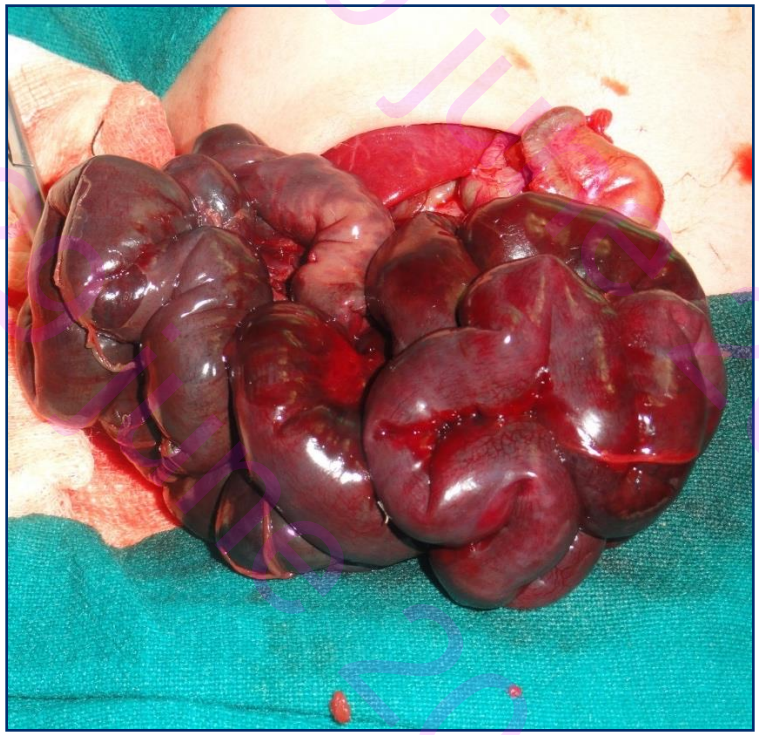
Malrotation is a TRUE SURGICAL EMERGE





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Day 3
Progressive increase in abdominal distension

- Ileal atresia
- Hirschsprung's Disease
- Meconium Ileus
- NEC

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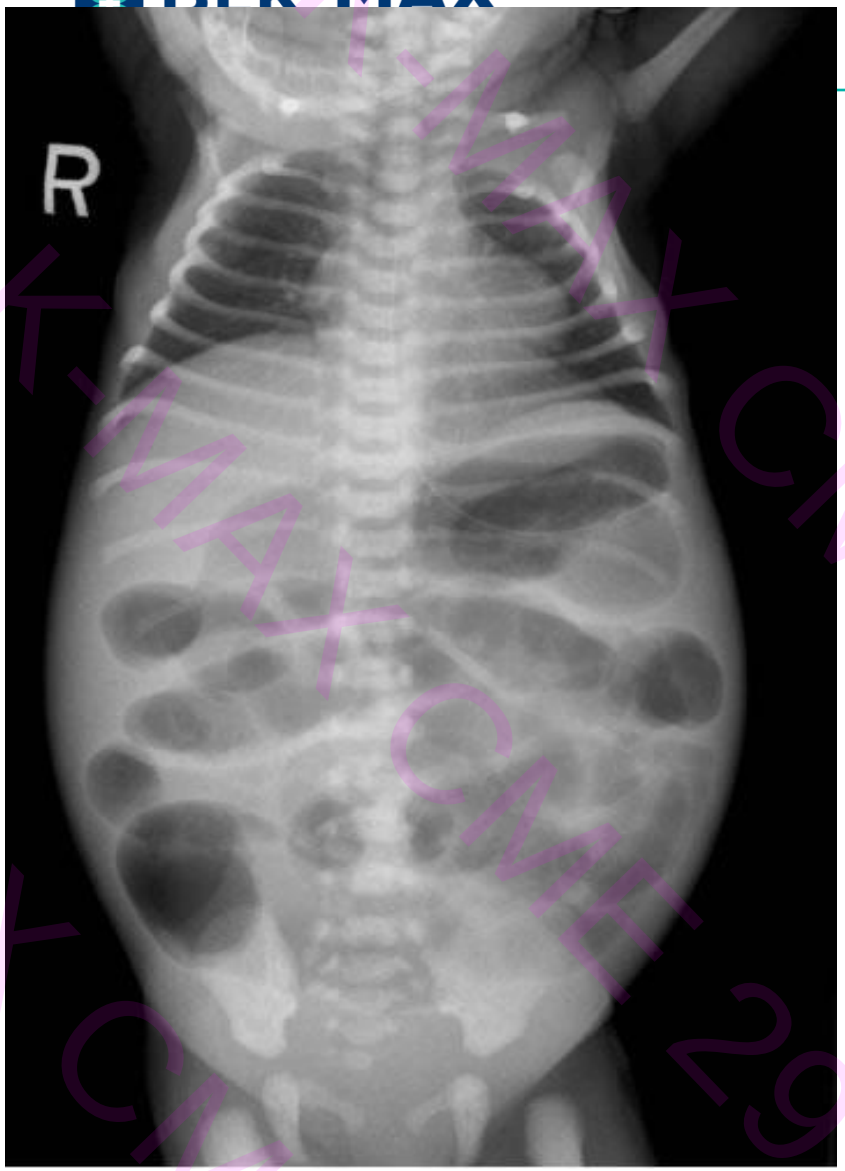

Hirschsprung's Disease

MICROCOLON

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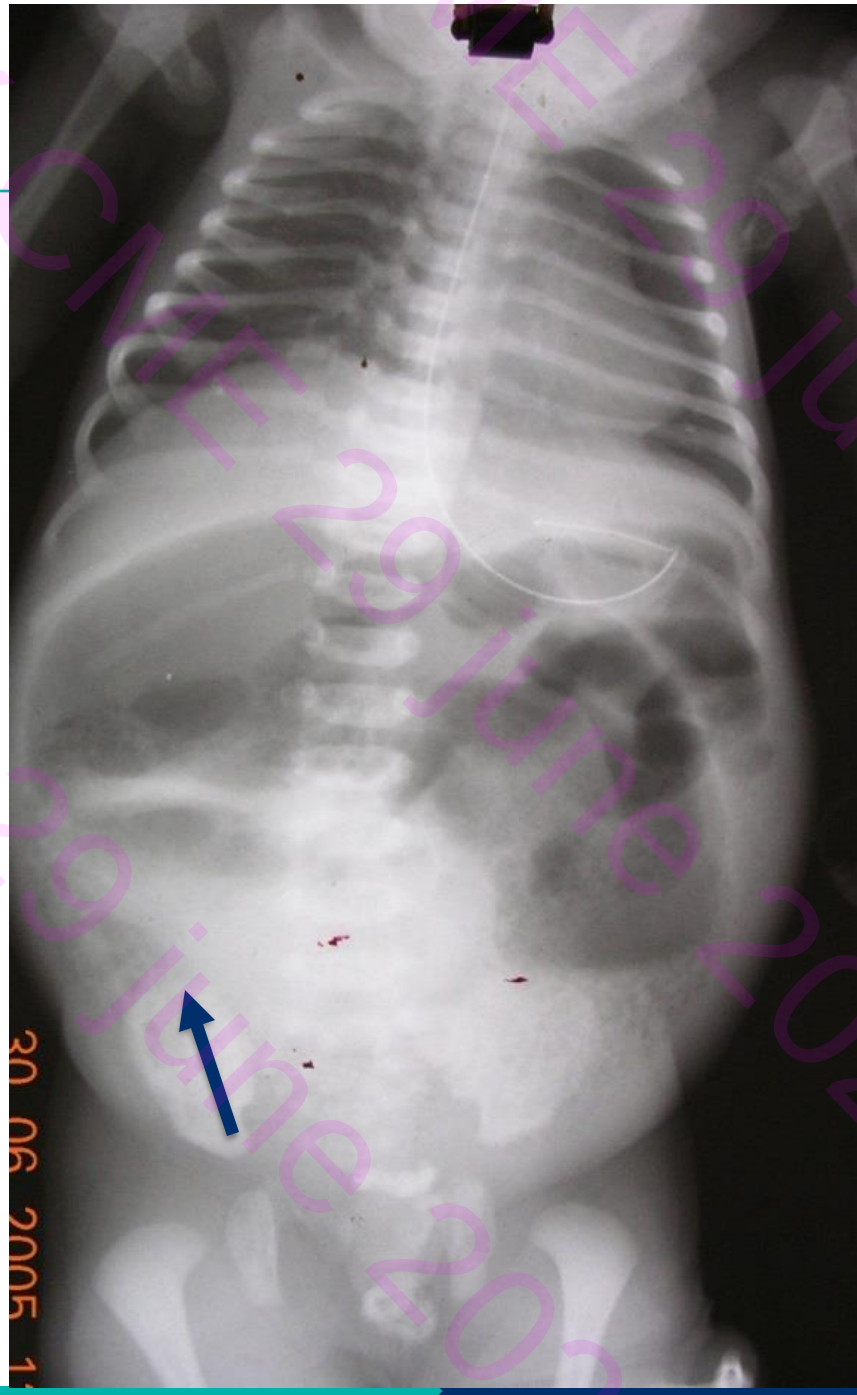
- Abdominal distension from birth
- Bilious Aspirates
- Not passed Meconium
- Antenatal scan: Echogenic and dilated bowel



Meconium Ileus

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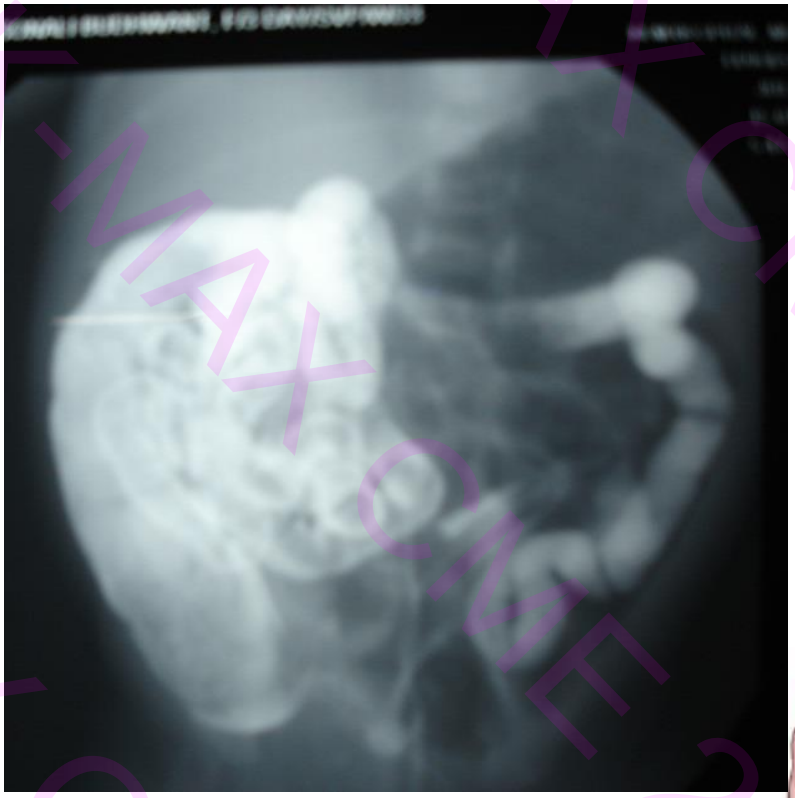
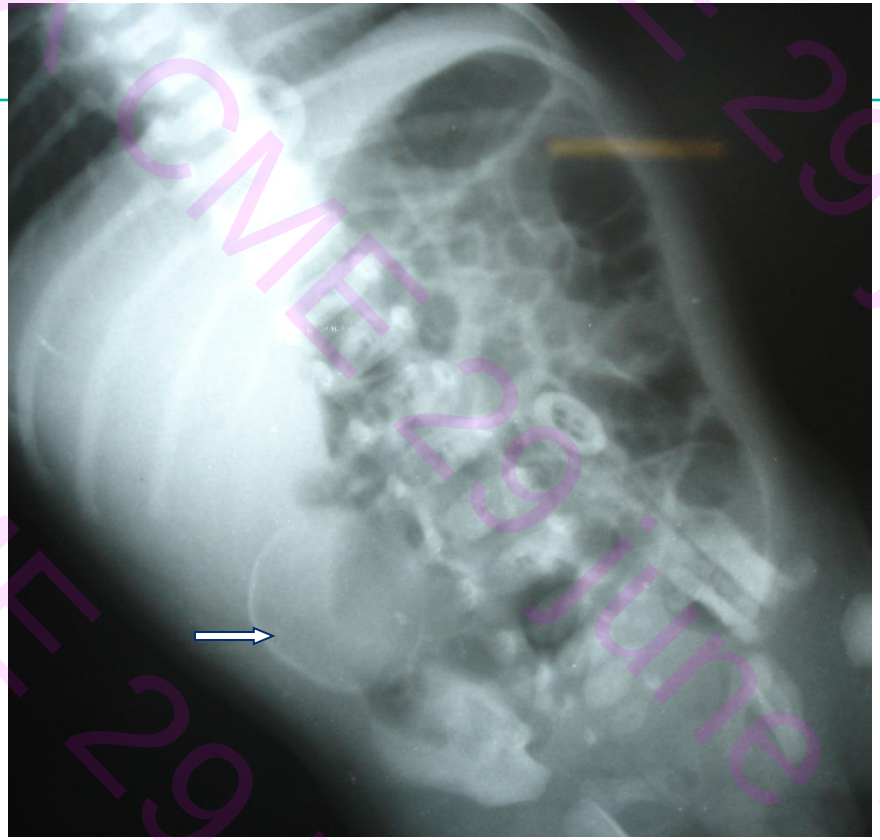
Meconium Ileus

- Gastrograffin (**Sodium Diatrizoate**)Enema:
  Diagnostic + Therapeutic





Calcification secondary to antenatal perforation

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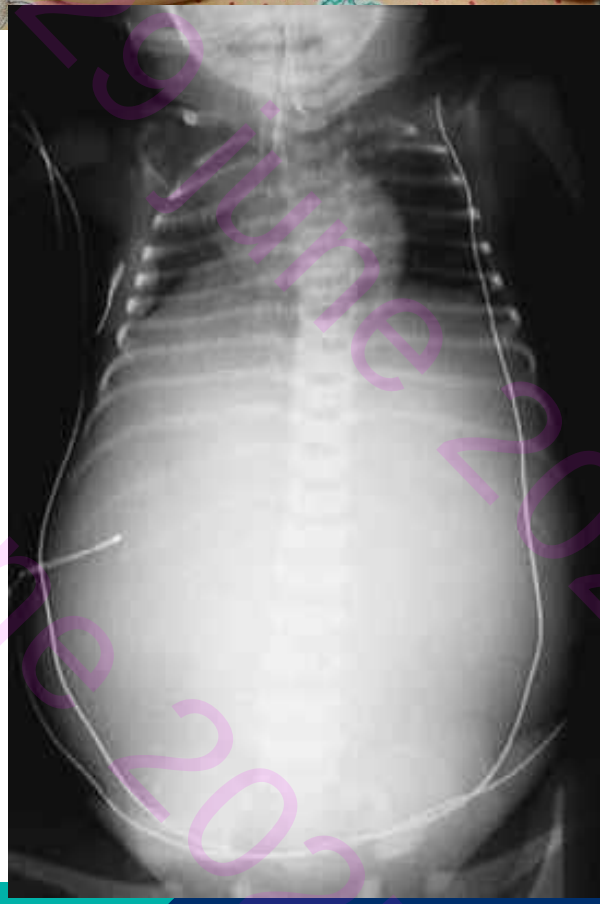
Abdominal distension since birth

- Meconium ileus
- Meconium peritonitis/ascites
- Abdominal lump
- Ascites



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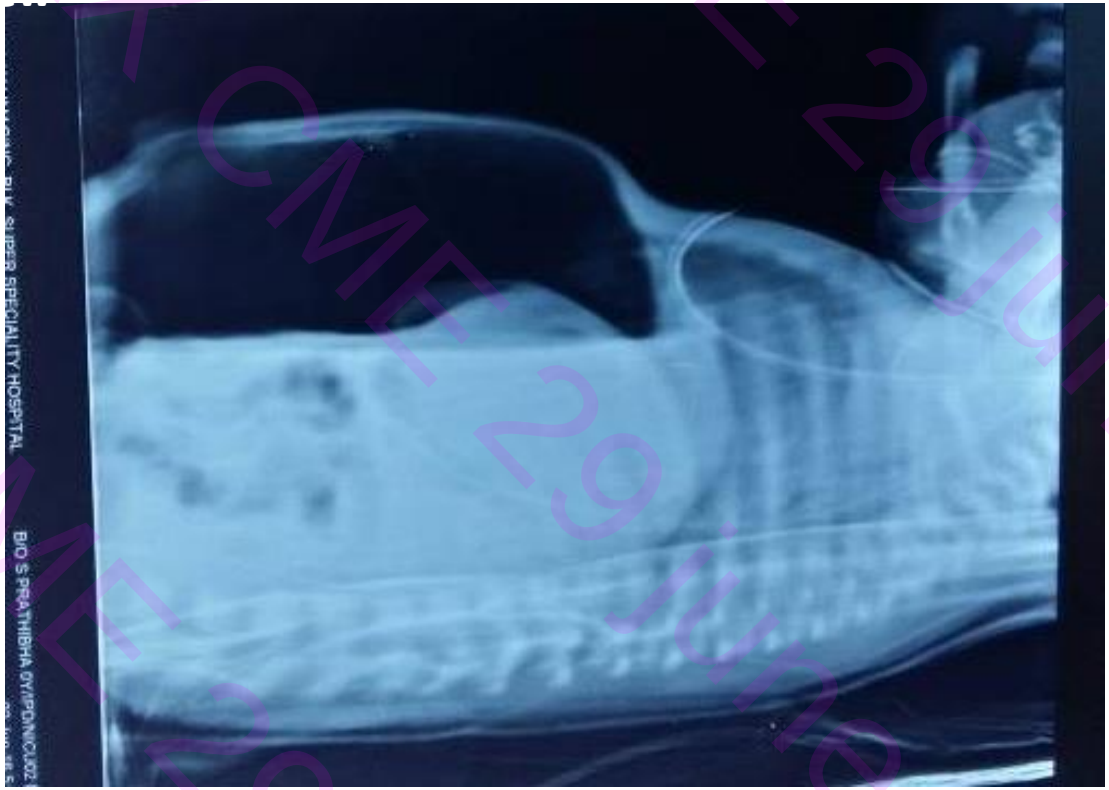
Newborn with Acute Abdomen

Lateral Decubitus Film



Pneumoperitoneum

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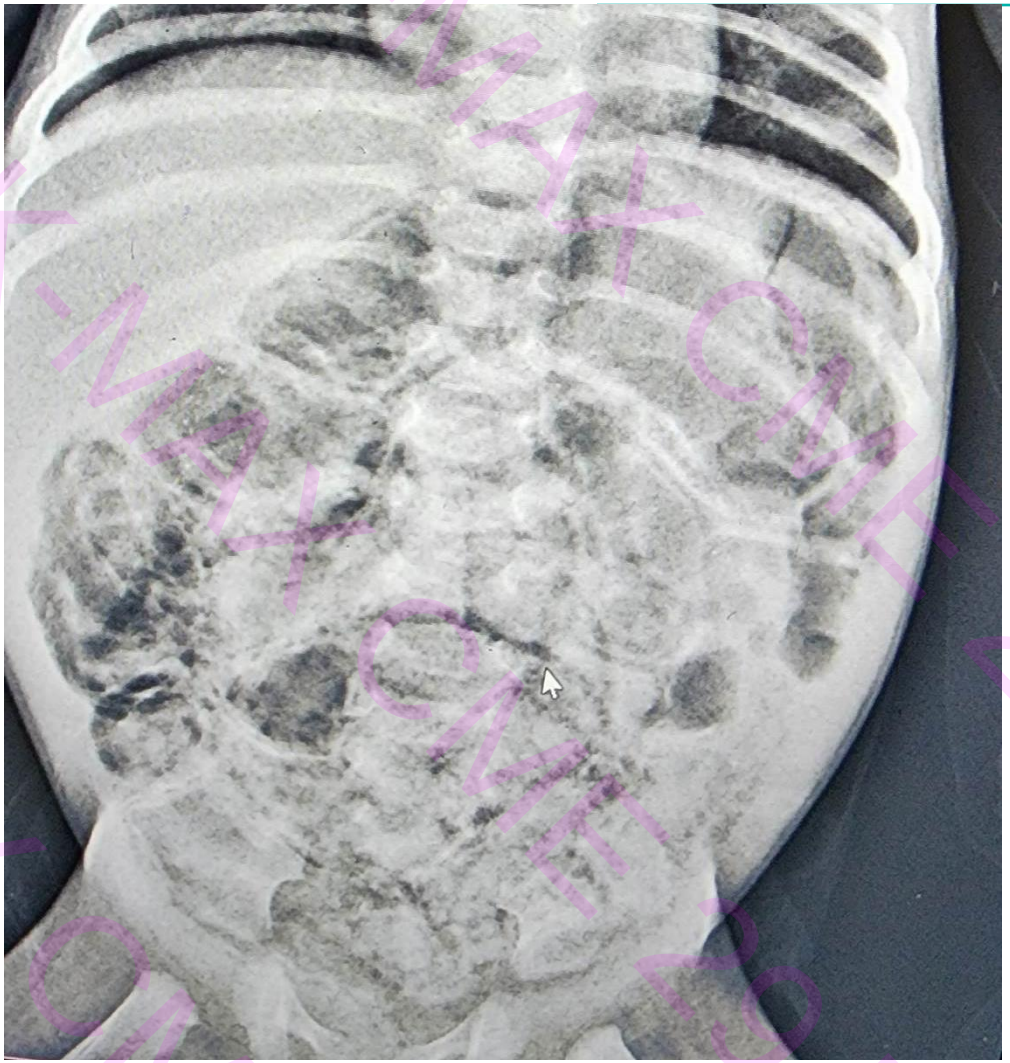
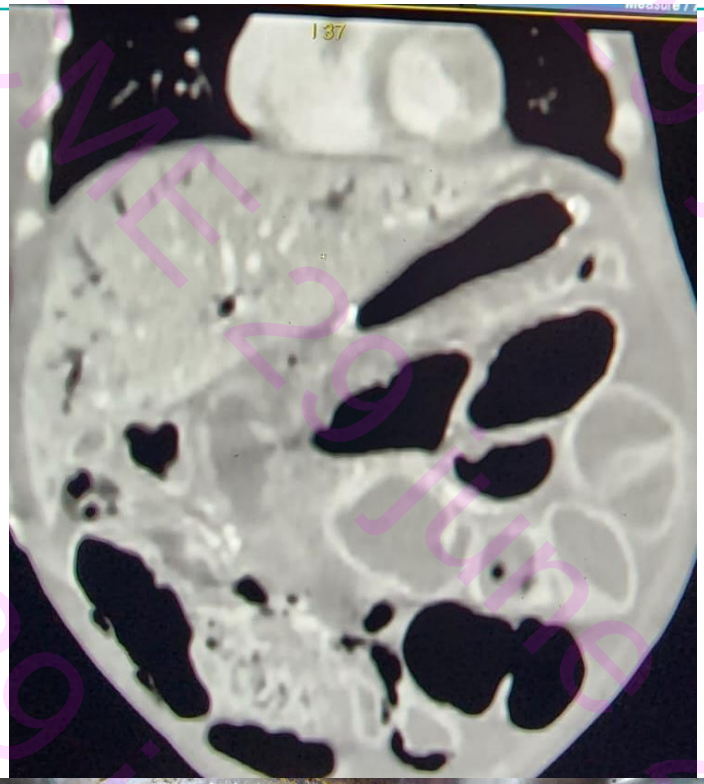
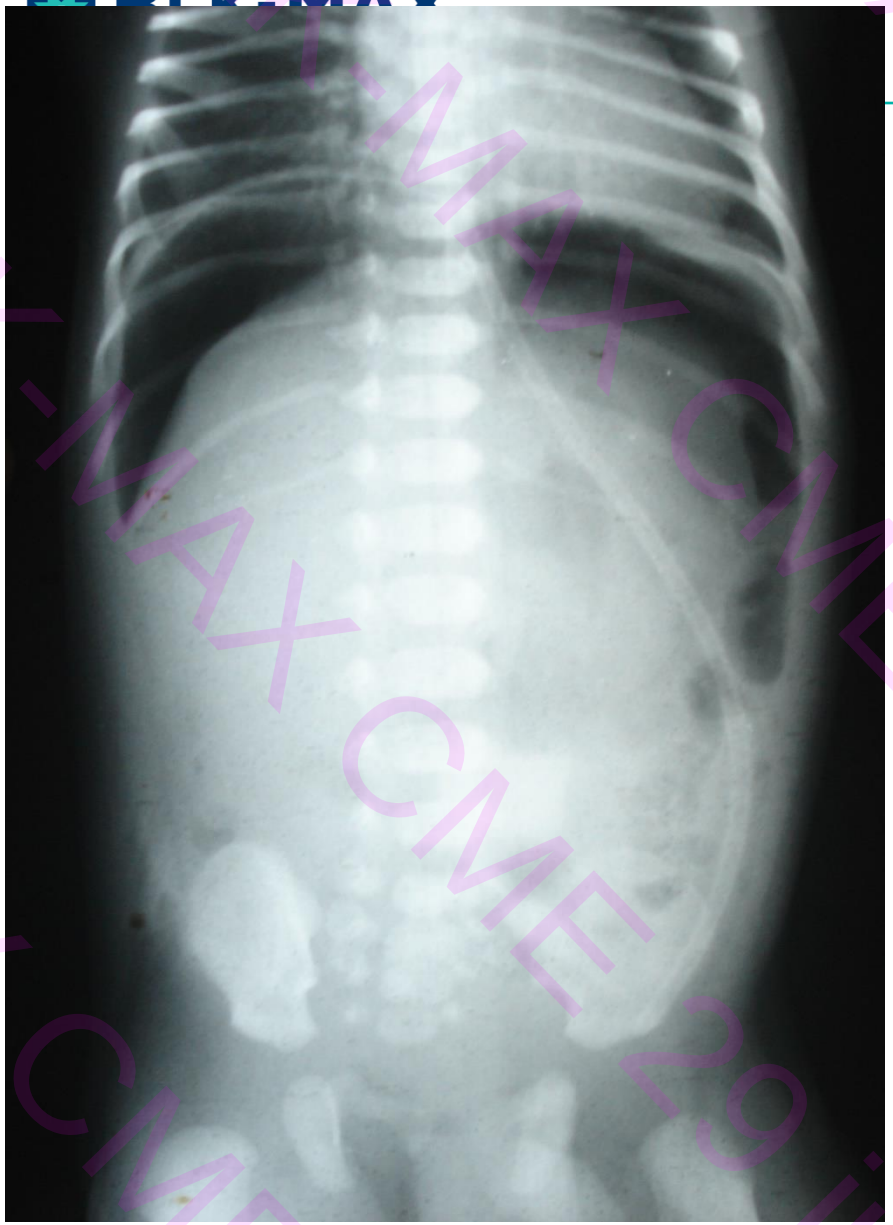
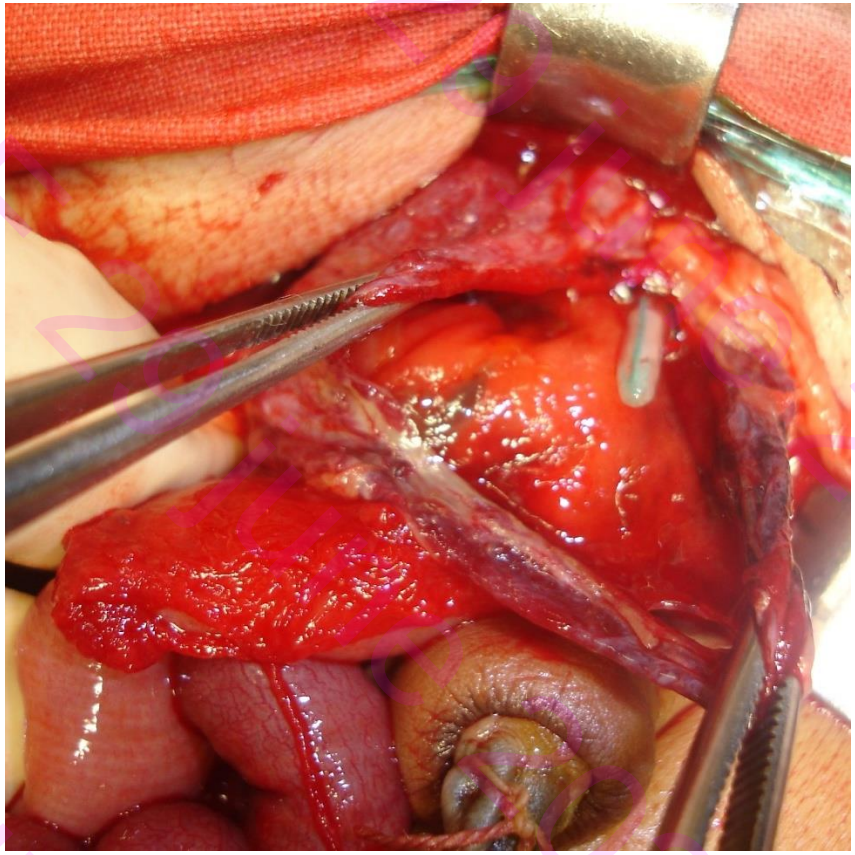
Necrotising Enterocolitis









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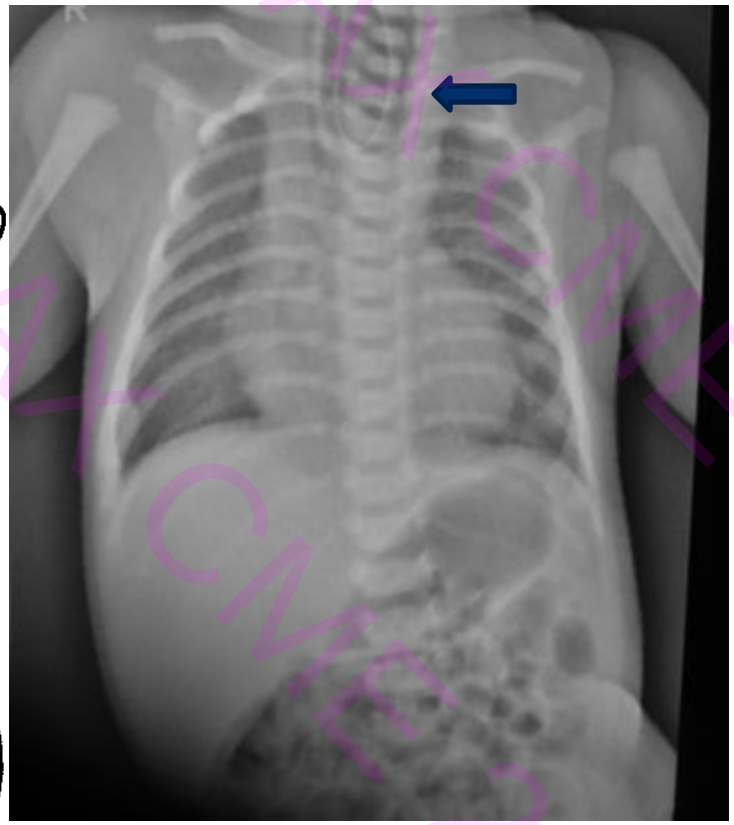
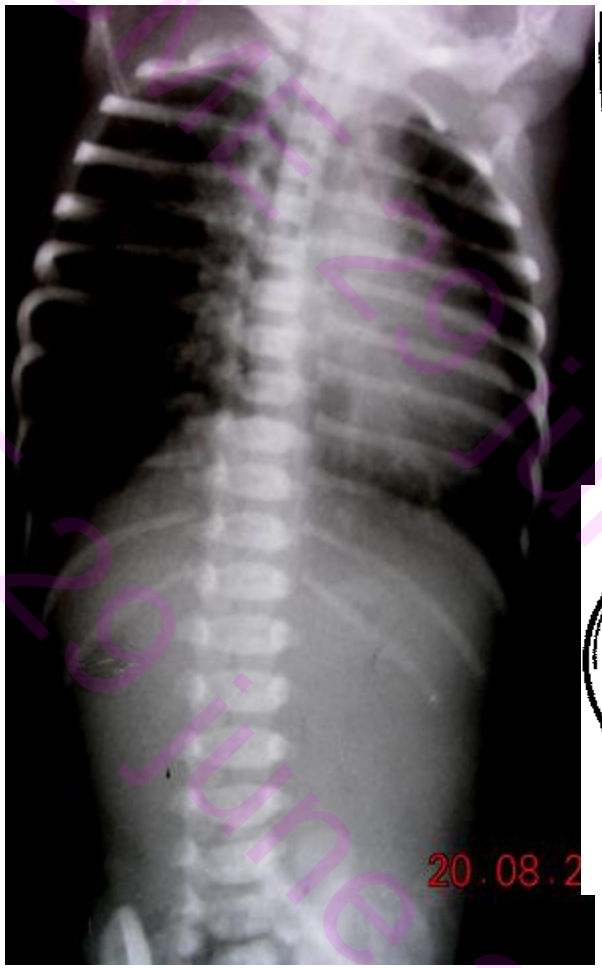
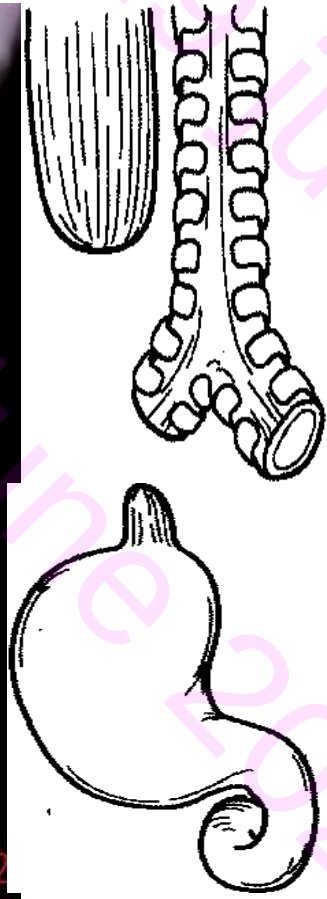
Tracheo-Esophageal Fistula



Type C With Fistula





Type A (Pure Atresia)

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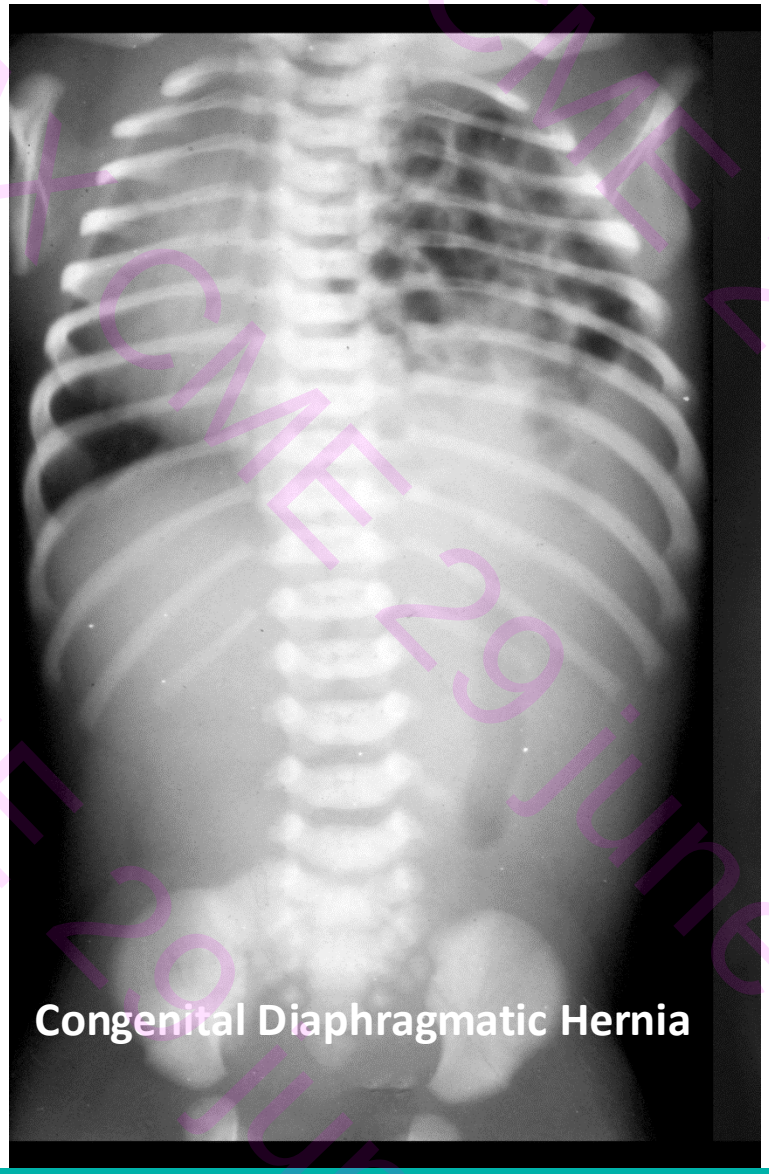
Gasless Abdomen: Also look for chest



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To conclude……

- X-ray Abdomen is a basic yet powerful tool in acute pediatric and neonatal abdomen
- Interpretation needs orderly approach
- Avoid subtle but important findings
- Interpret abnormal bowel gas pattern
- Additional contrast study can be more informative

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Thank You

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Department Of Pediatric Surgery and Pediatric Urology
BLK-MAX Superspeciality Hospital, New Delhi, India.

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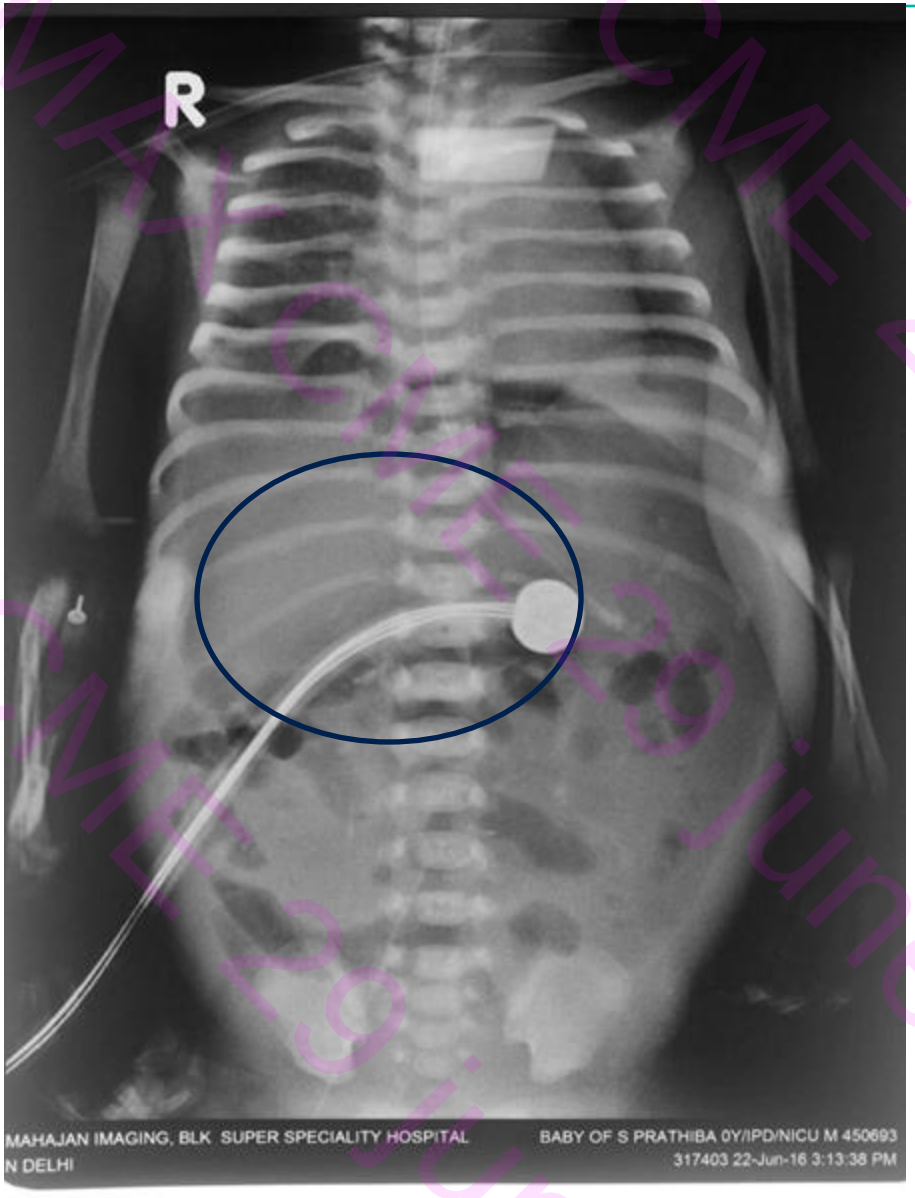
QUIZ



HYPERLUCENT LIVER SIGN

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Quiz

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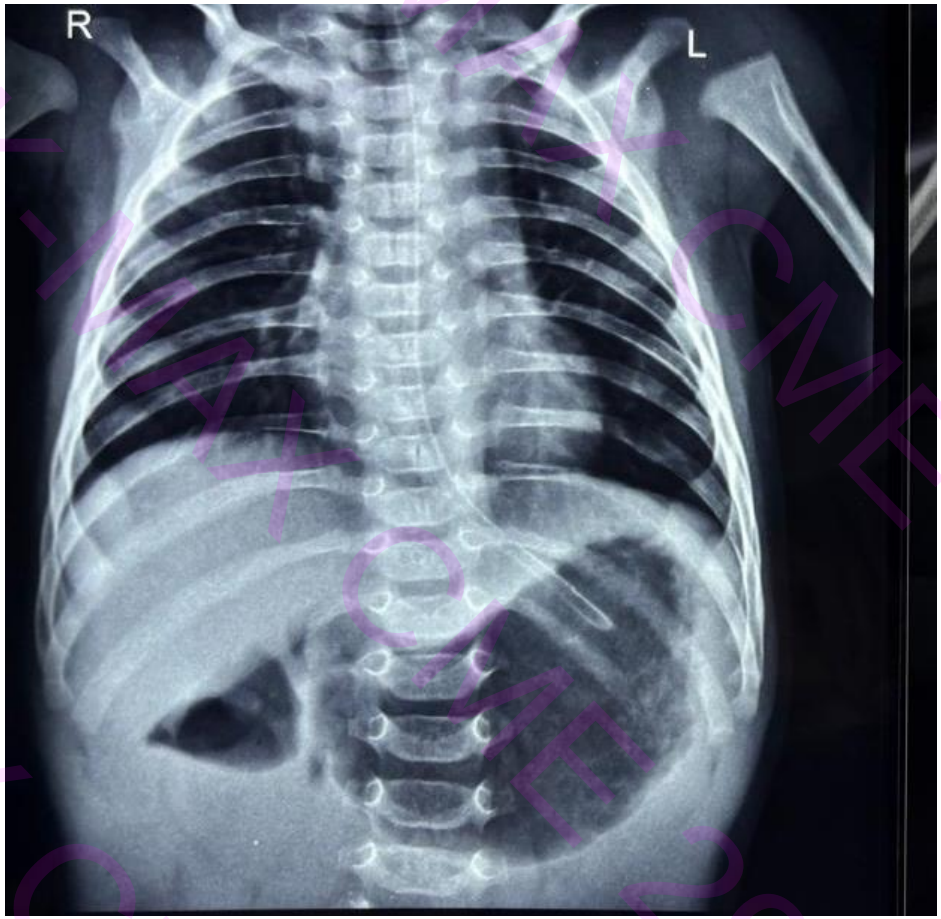

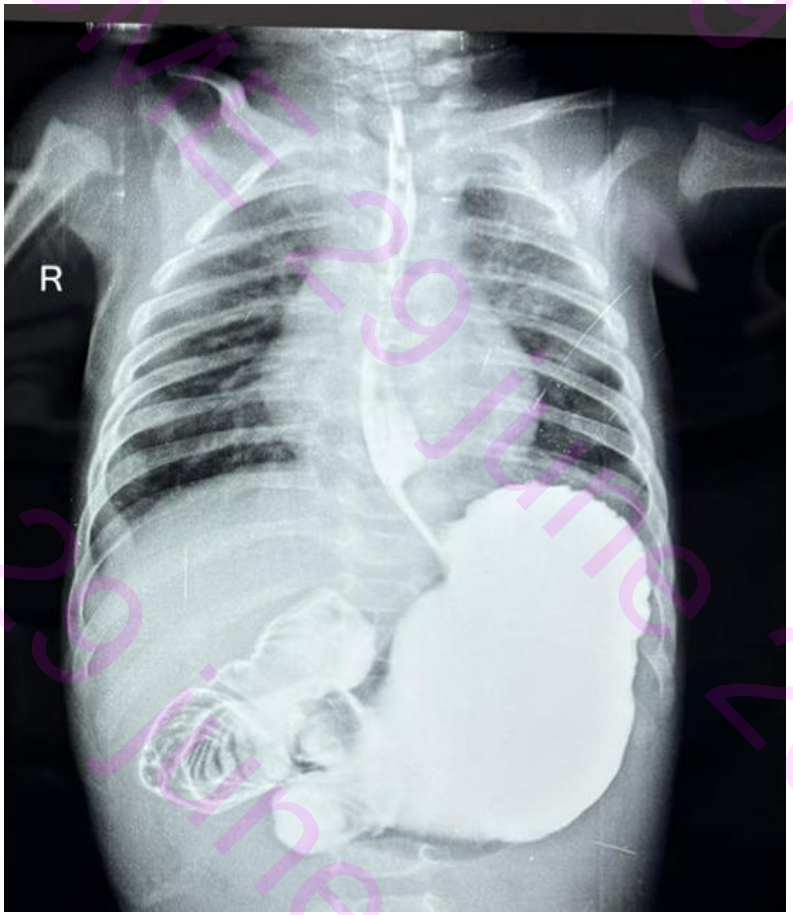

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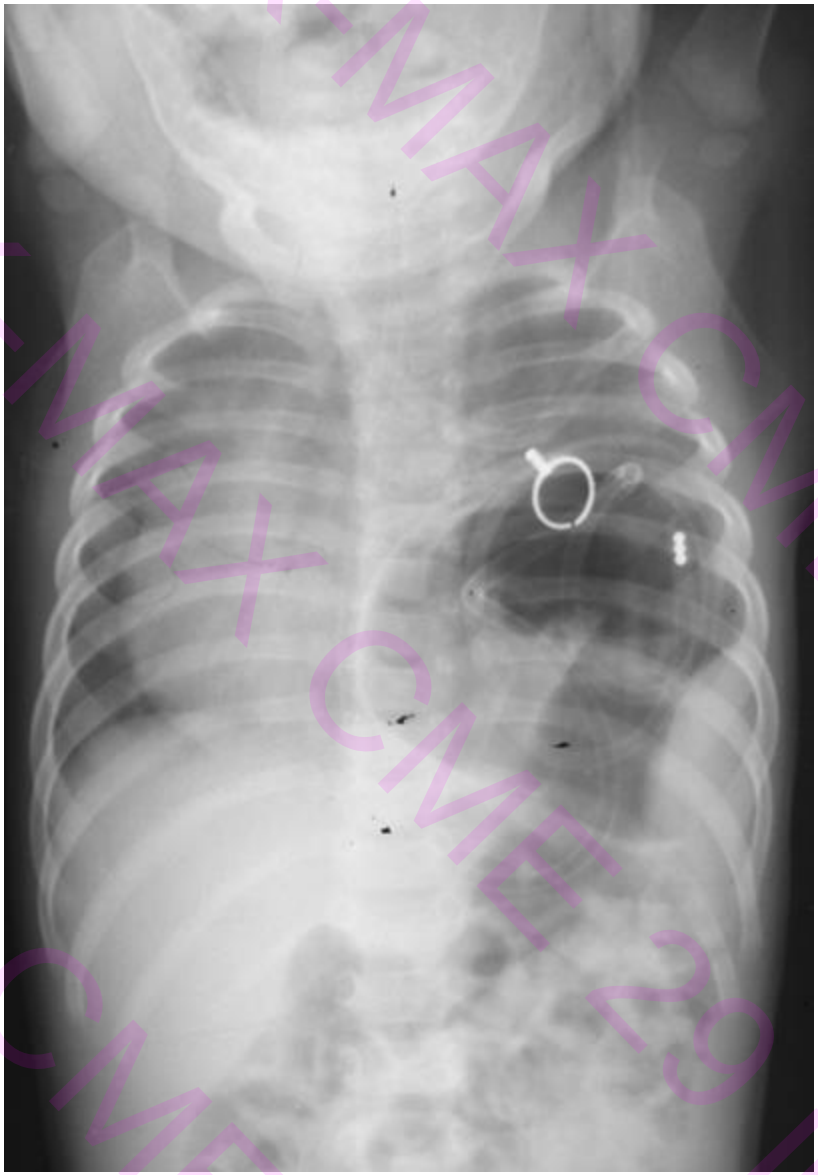
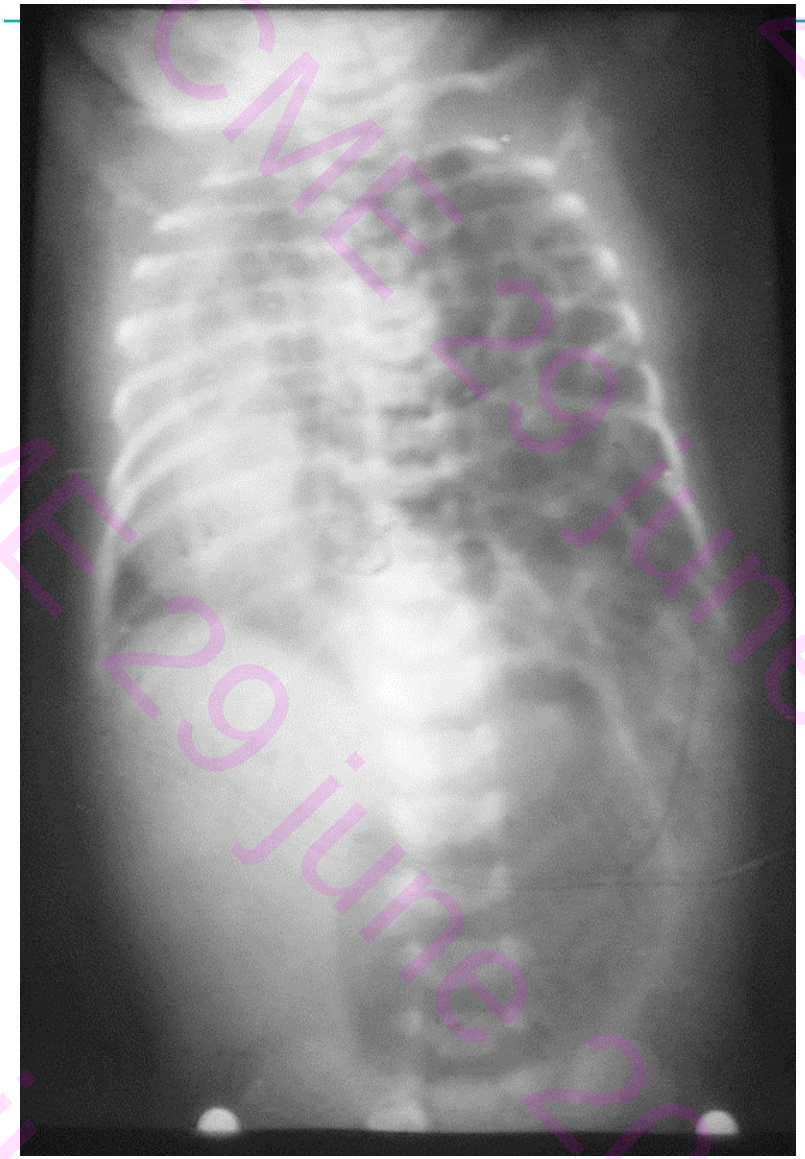
Congenital Diaphragmatic Hernia





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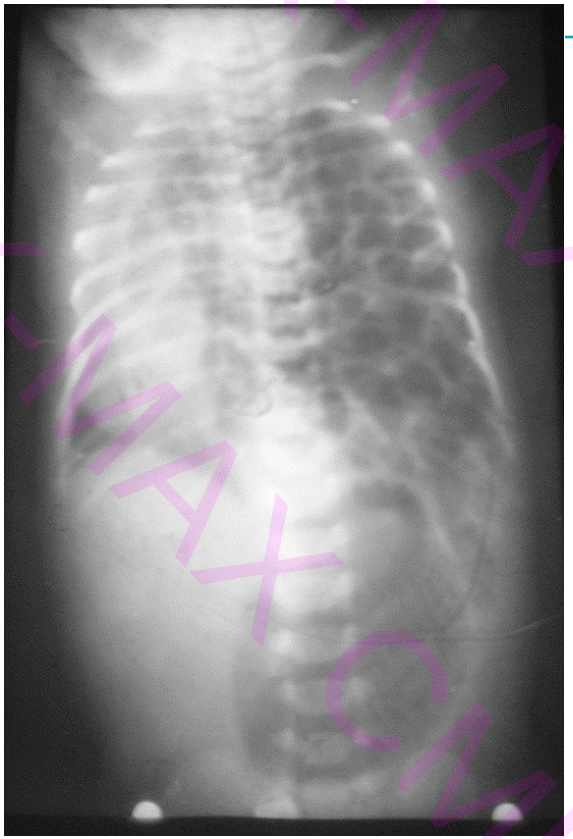

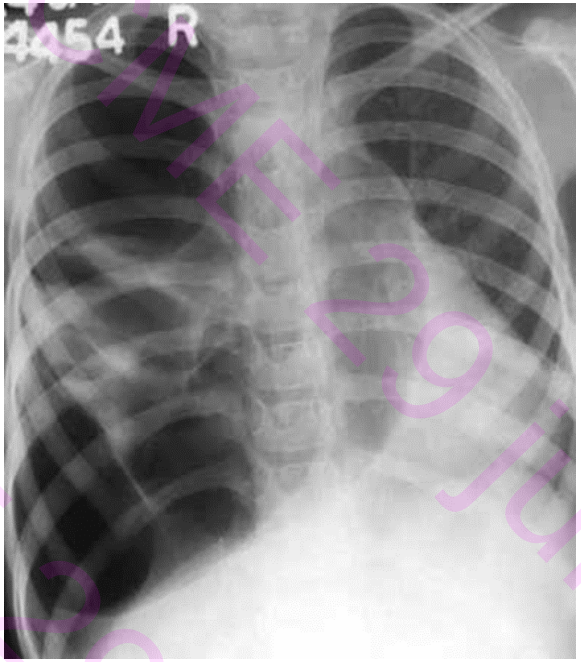

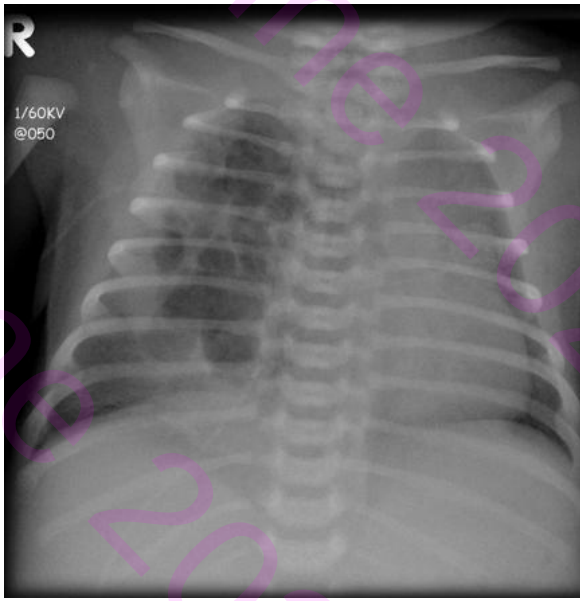

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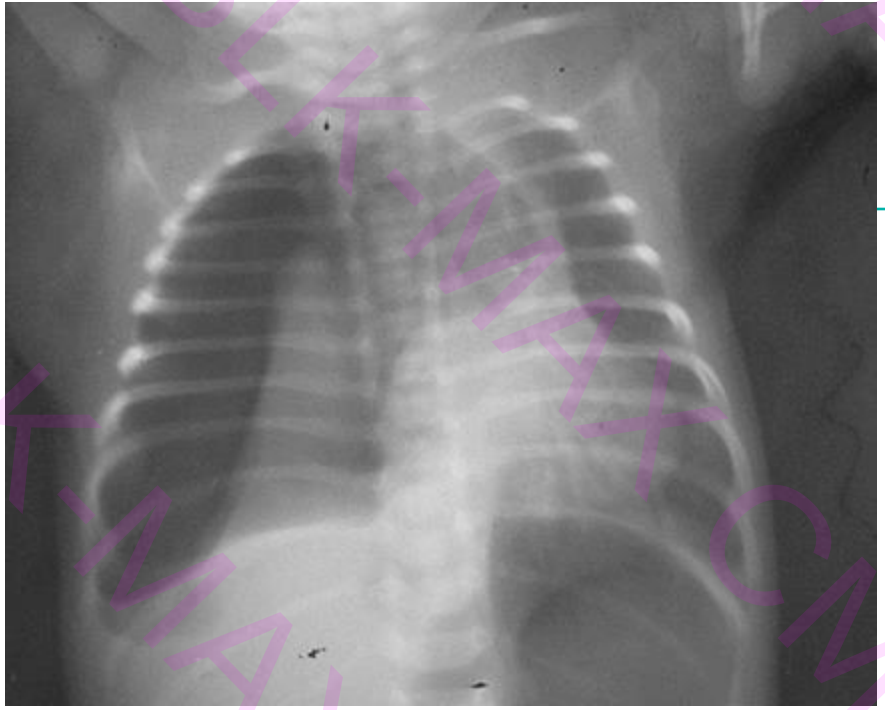
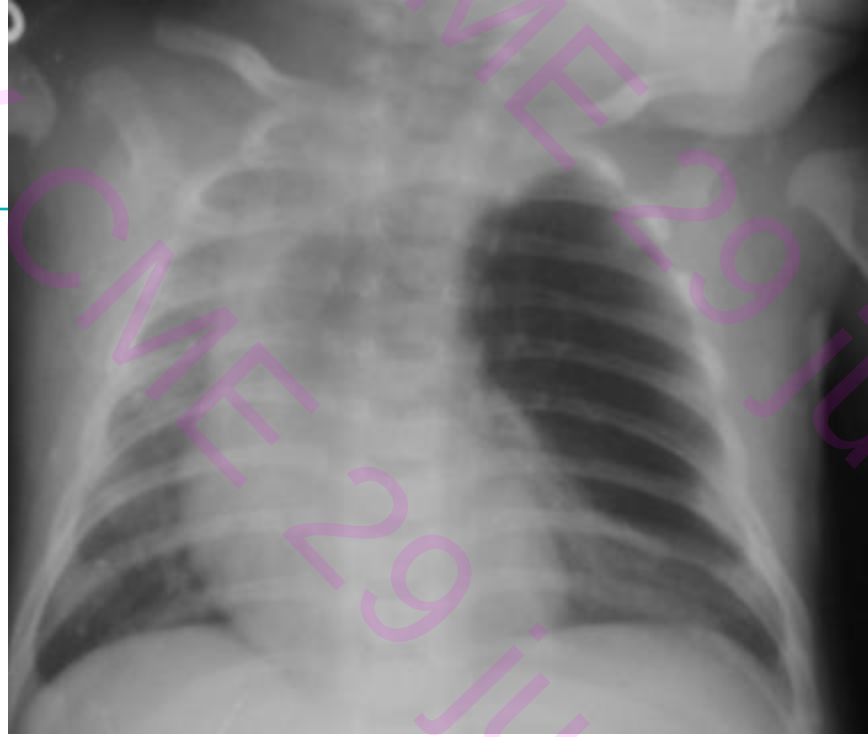
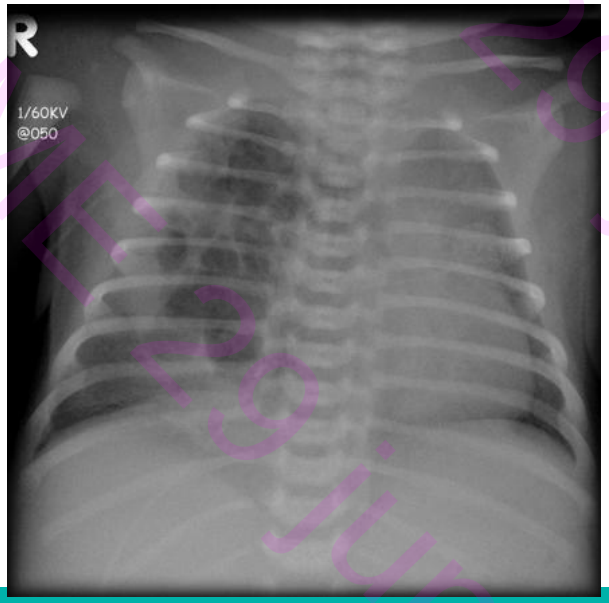


Pneumothorax



Congenital Lobar Emphysem



Cystic Adenomatoid Malformation

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