Pediatric Surgical Emergencies

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Who are we?

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John Lawrence



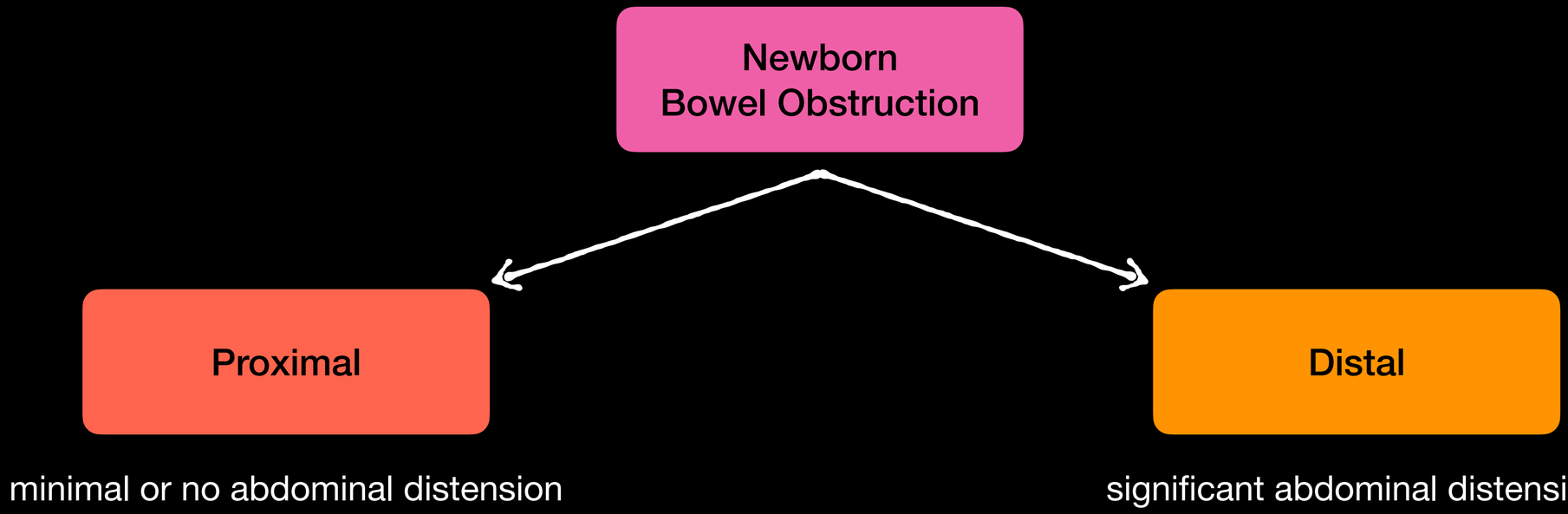
Shahrzad Joharifard

@scarzad

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Newborn Bowel Obstruction | Schema

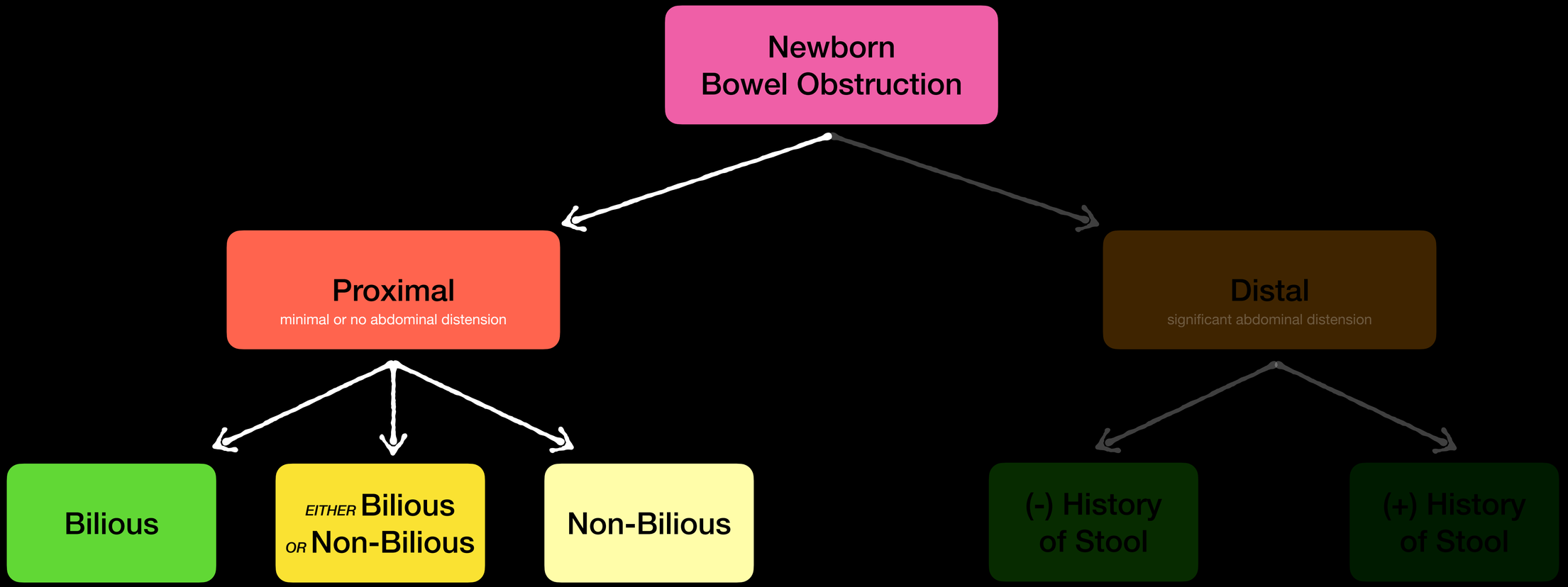
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Newborn Bowel Obstruction | Schema

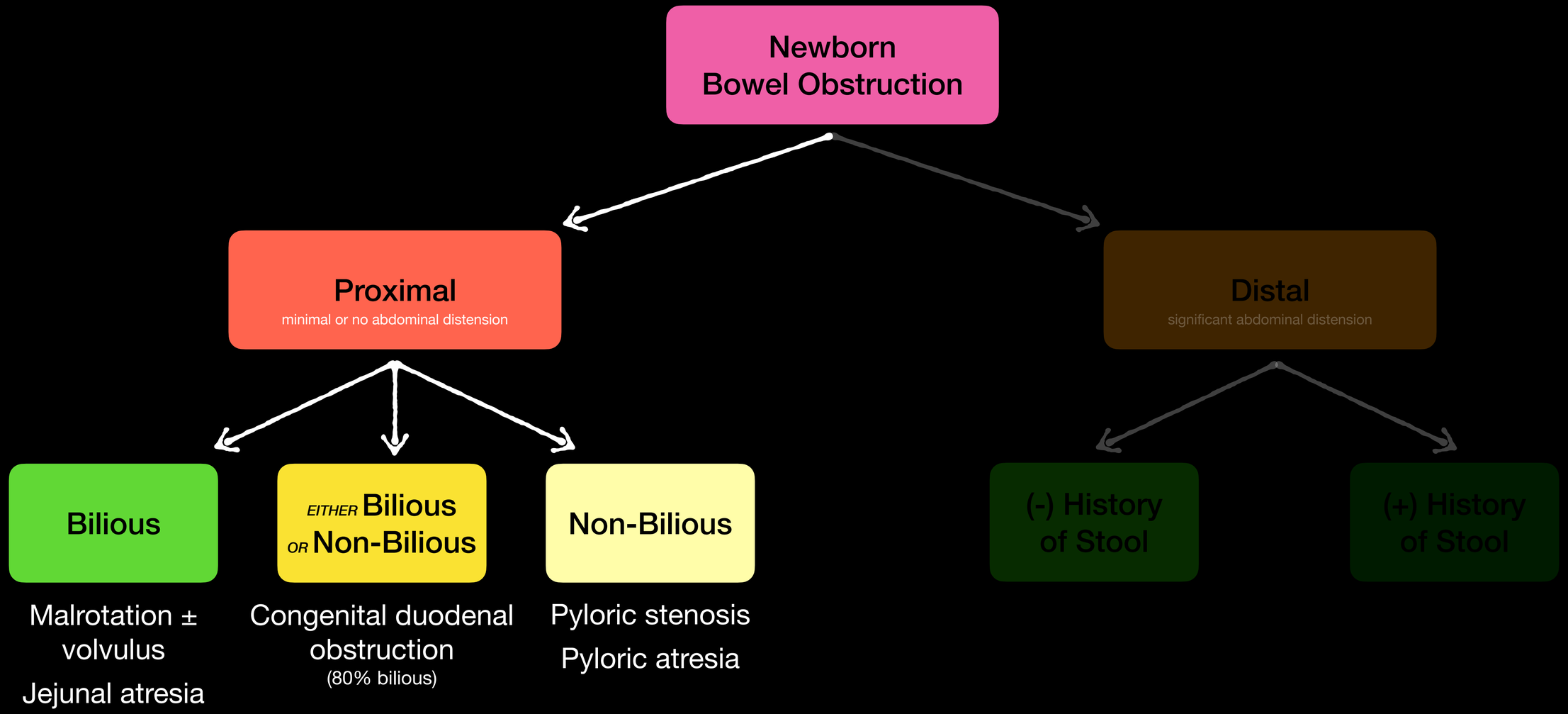
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Newborn Bowel Obstruction | Schema

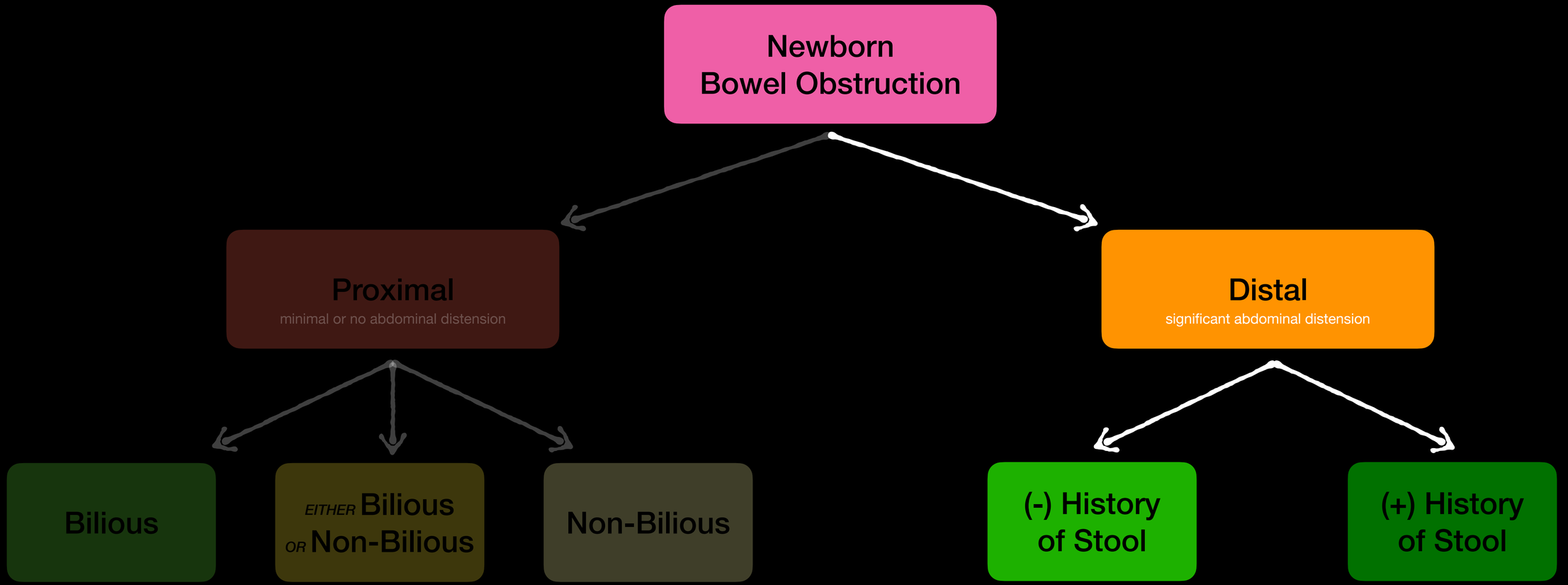
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Newborn Bowel Obstruction | Schema

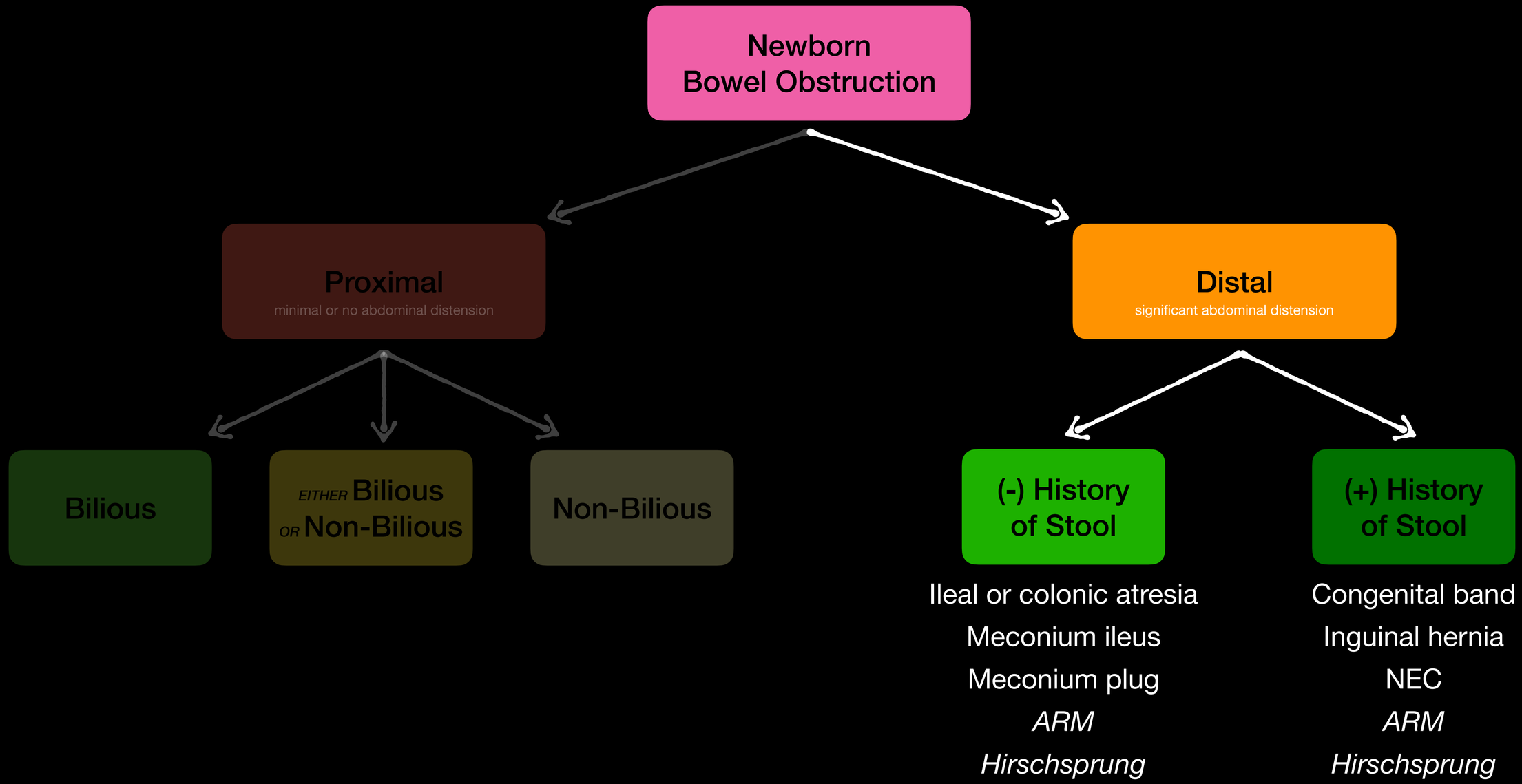
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Newborn Bowel Obstruction | Schema

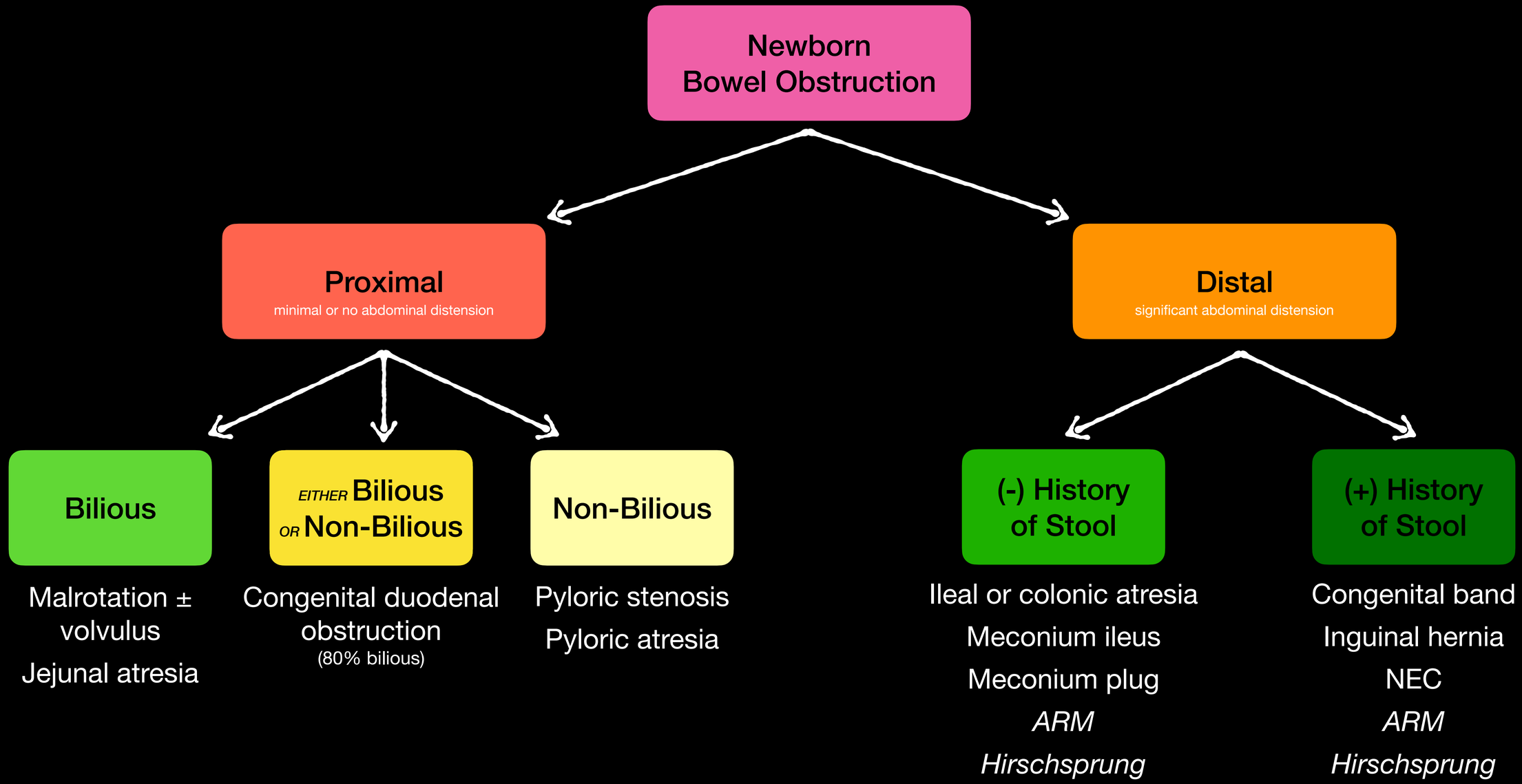
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Newborn Bowel Obstruction | Schema

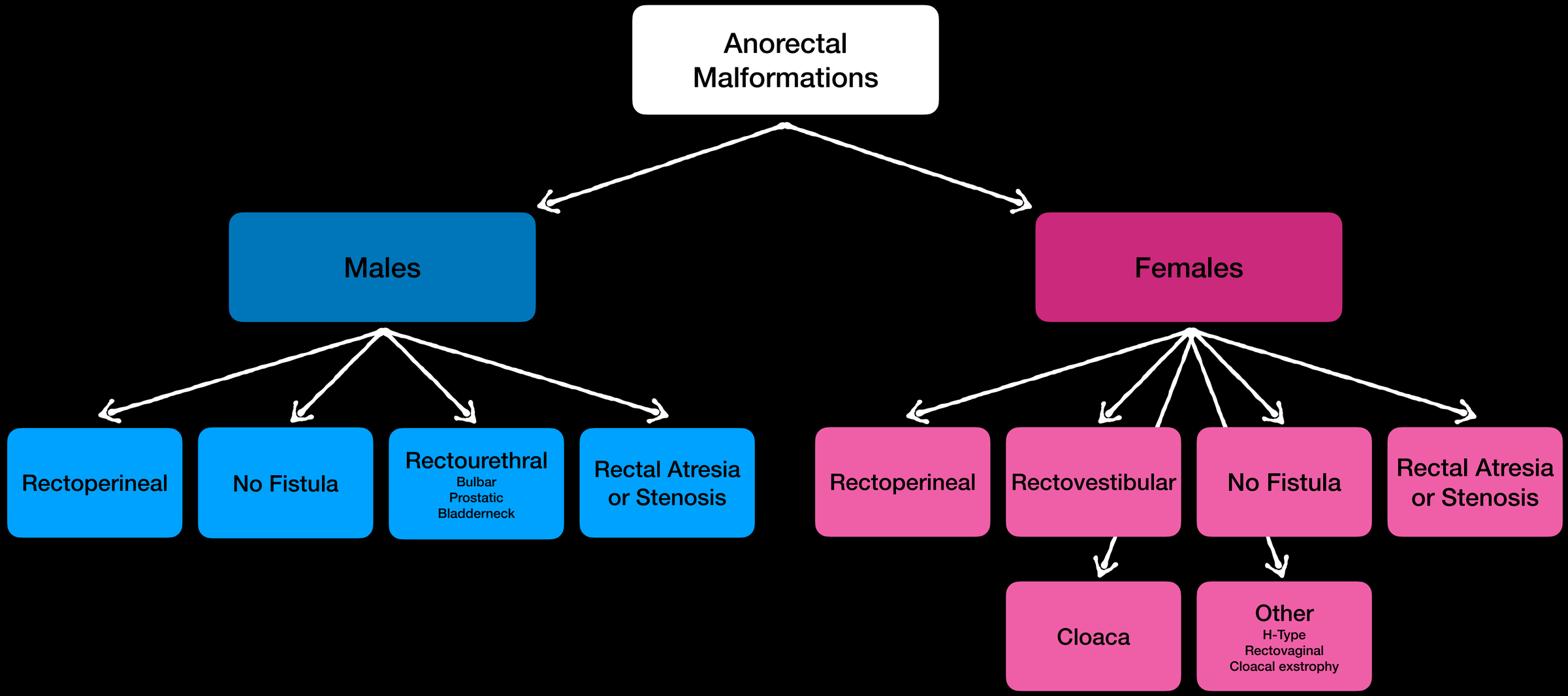
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Anorectal Malformations | Schema

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Anorectal Malformations | VACTERL

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VACTERL



V

Skeletal x-rays — especially if any concern on PEx

A

AP/lateral sacral x-ray

Spinal U/S — "as good" as MRI up until 3 mos; if any abnormality, follow up with MRI

C

Echocardiogram

Good evidence to show that normal PEx & CXR effectively rules out major CHD

TE

CXR + AXR with feeding tube in place

Rule-out concurrent EA (8%) and DA (3%)

R

Abdominal, pelvic, renal U/S

- 50% have an associated urological malformation
- 20% have hydrocolpos (females), which can lead to hydronephrosis and hydroureter

L

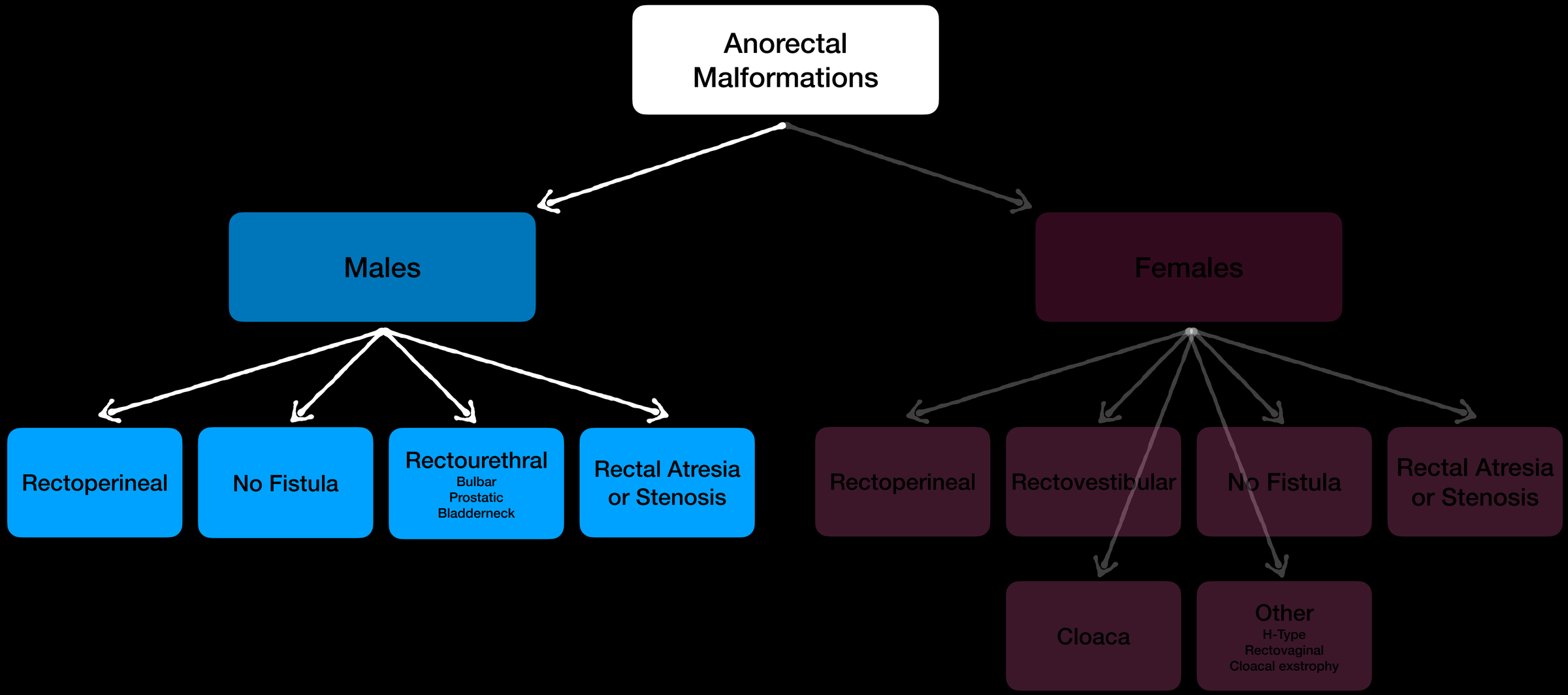
PEx and x-ray if appropriate

Labs: CBC, CMP, cross-match, ± coags

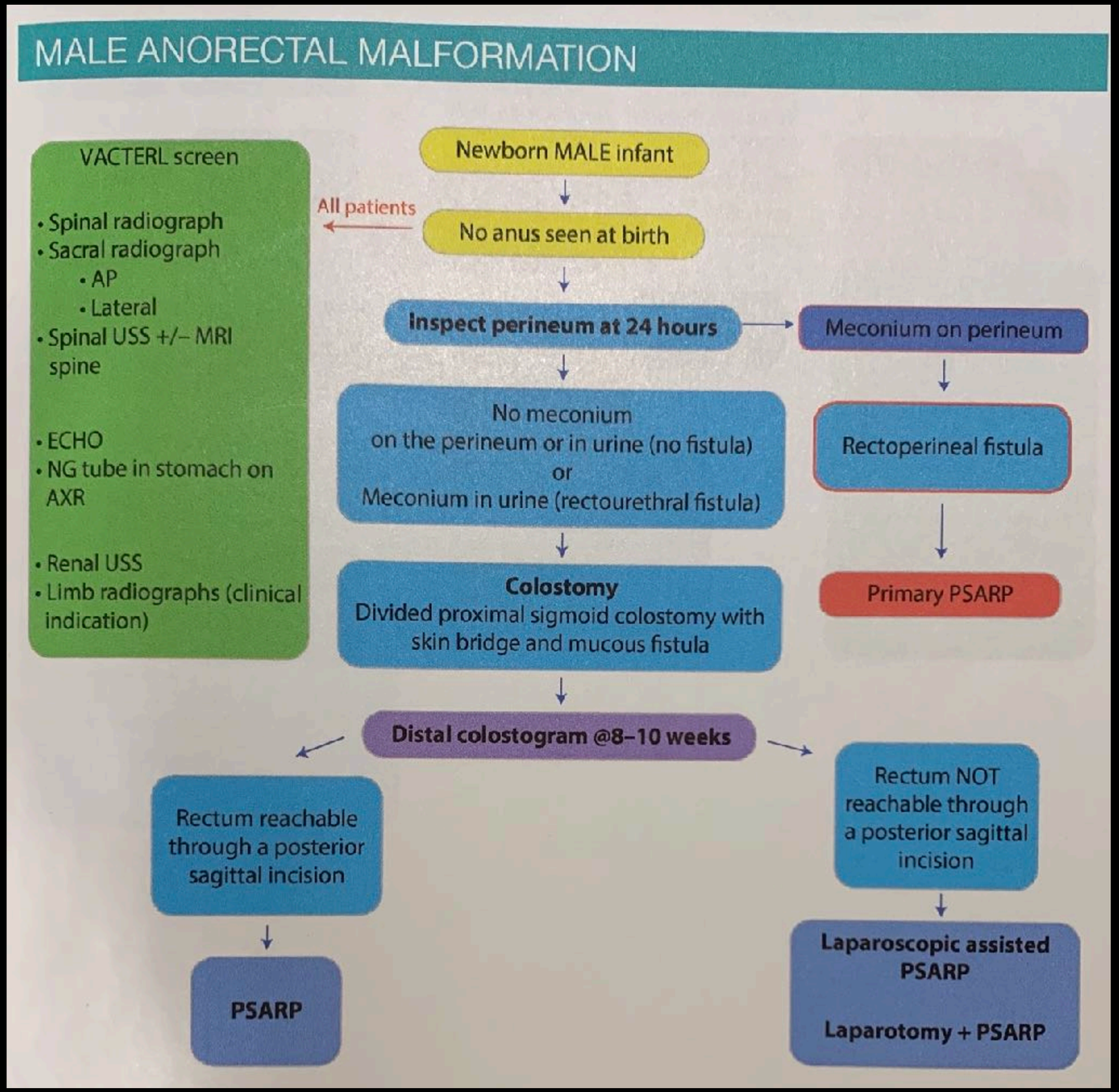
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Anorectal Malformations | Males

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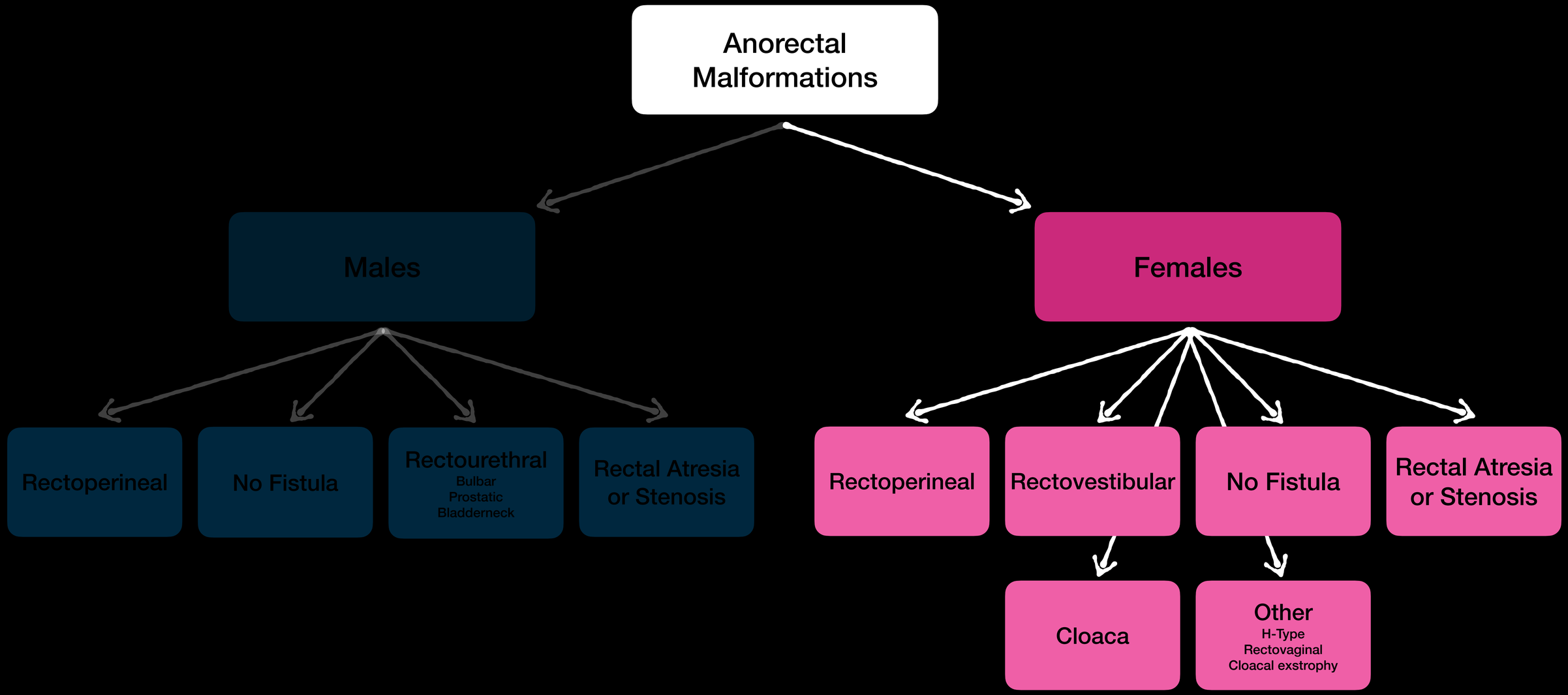
MALE ANORECTAL MALFORMATION



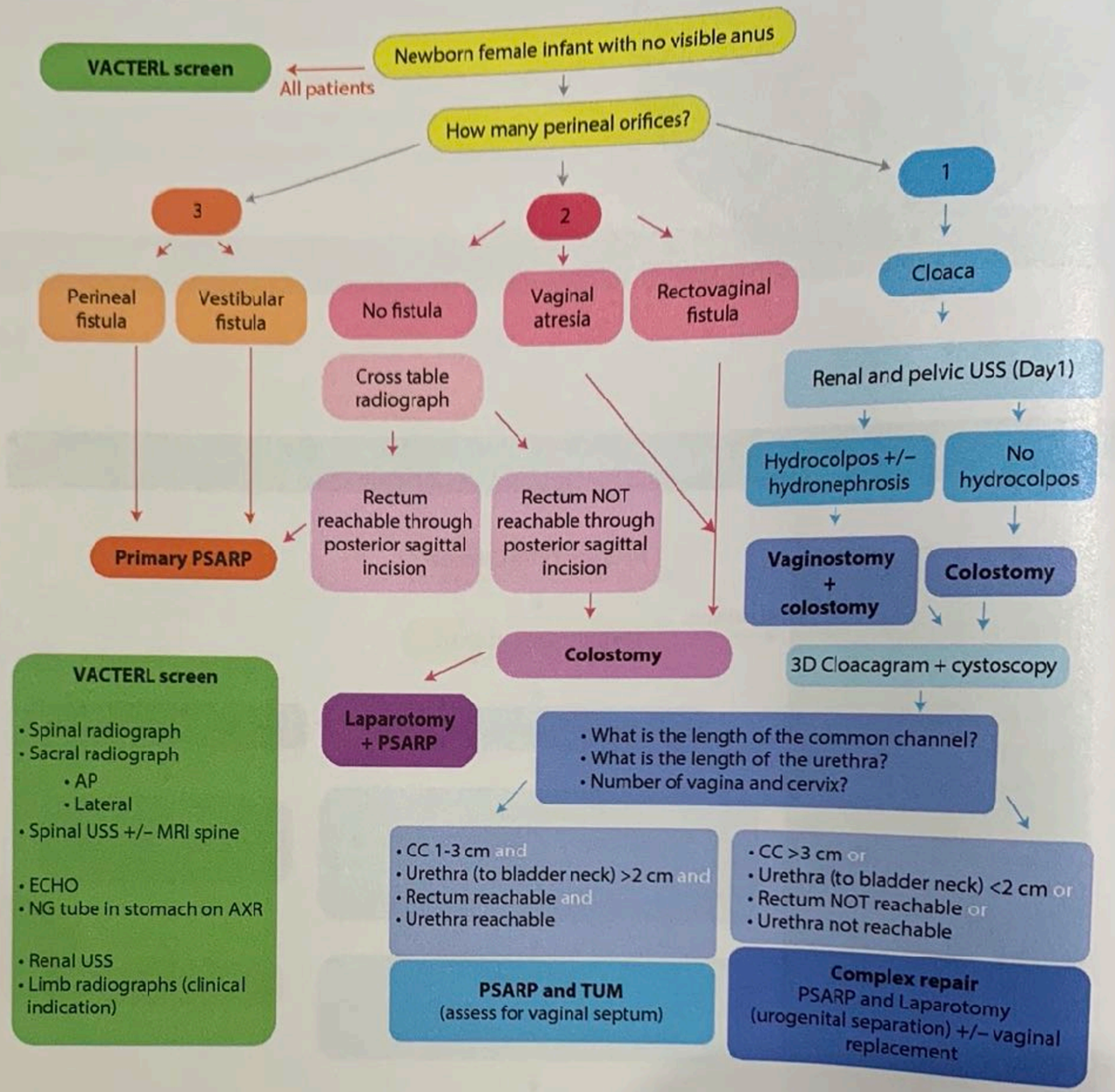
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Anorectal Malformations | Females

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FEMALE ANORECTAL MALFORMATION



SPLIT INTO GROUPS FOR CASES

Newborn Bowel Obstruction | Case 1

- A 3 day old newborn **boy** arrives in the emergency department with progressive emesis (initially milky, now bilious) and severe abdominal distension.
- An 8Fr NG tube has been inserted. An IV has been inserted and patient has received 20cc/kg of NS and has been started on D10NS at 4:2:1 rule. Triple antibiotics have been initiated.
- What are your next steps?

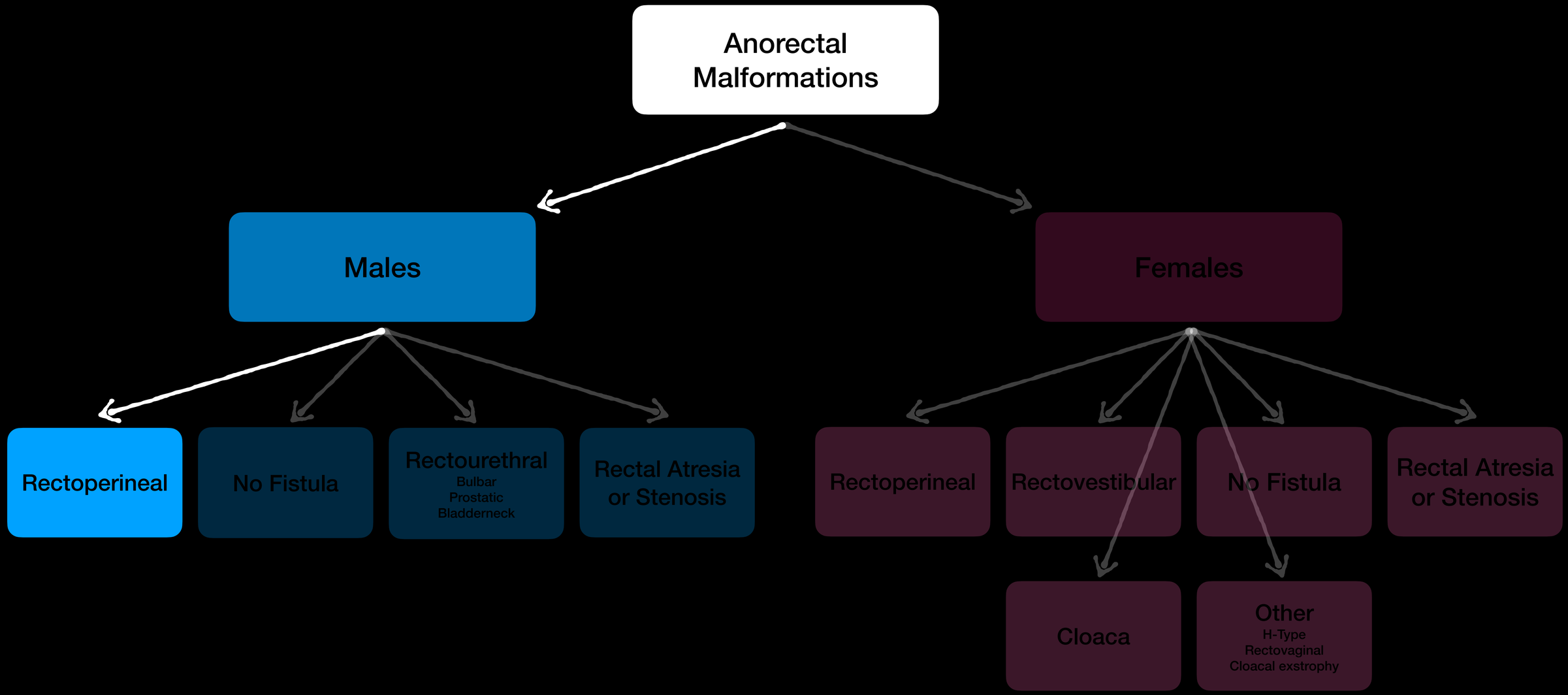




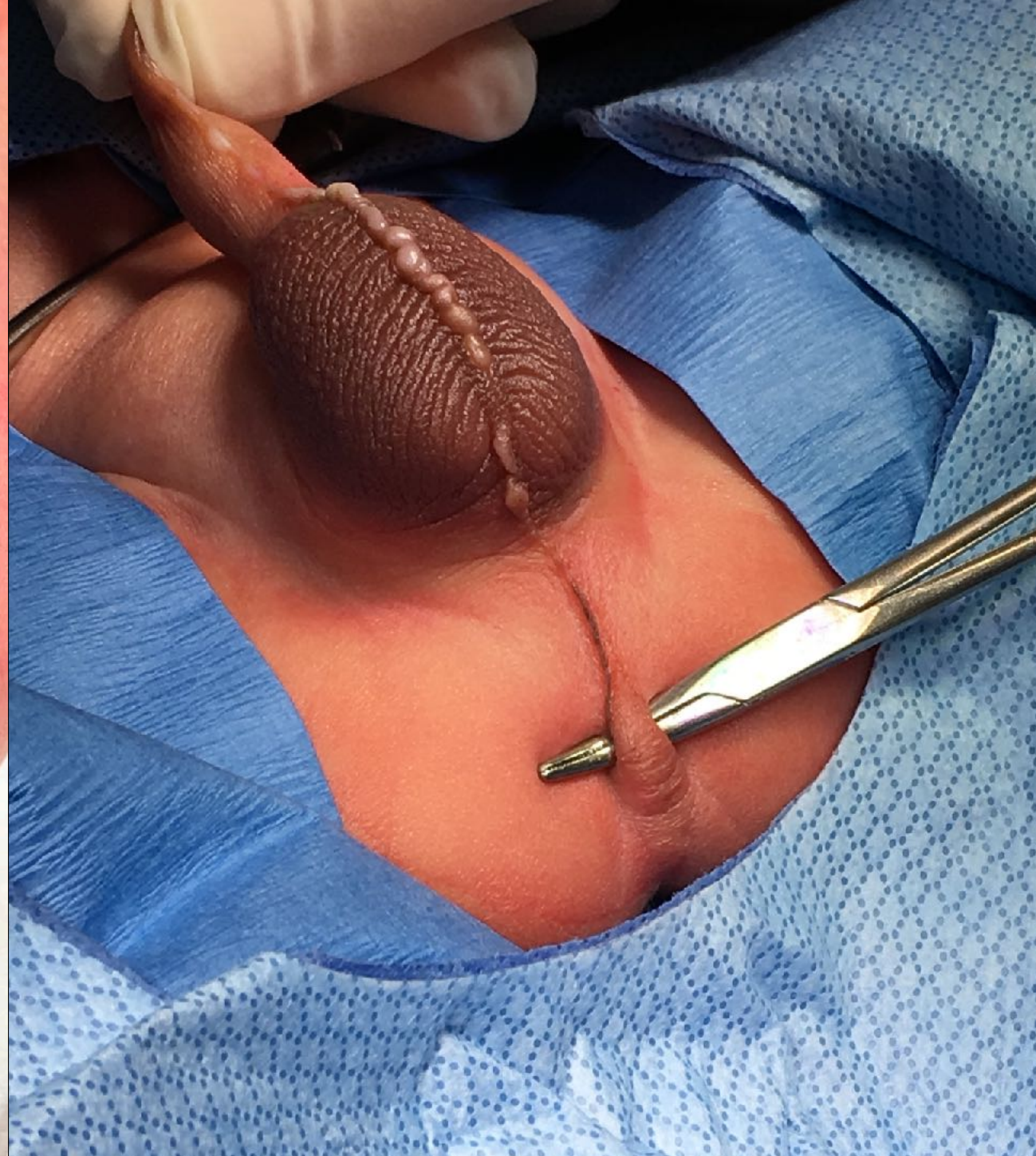
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Anorectal Malformations | Males

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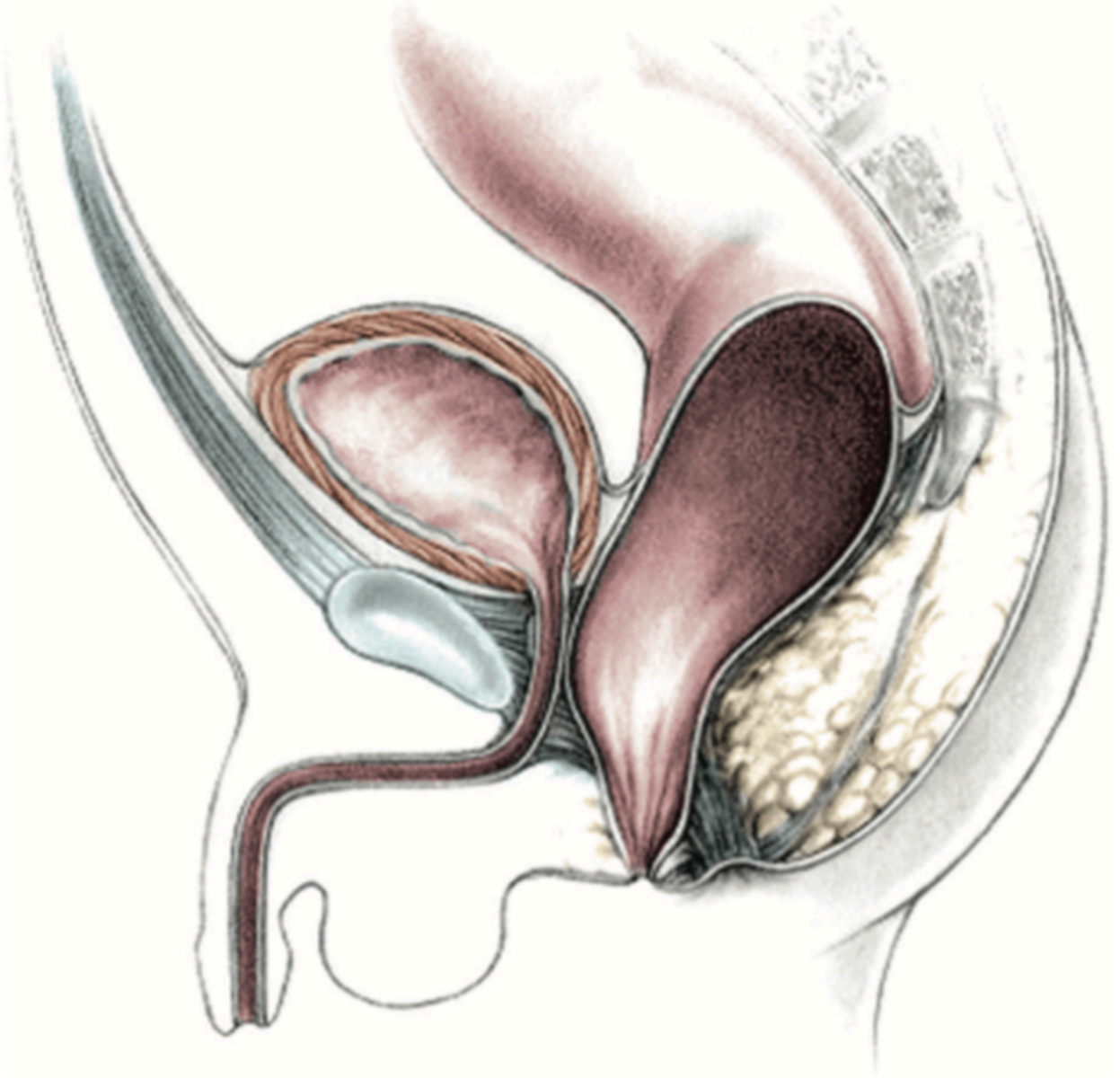


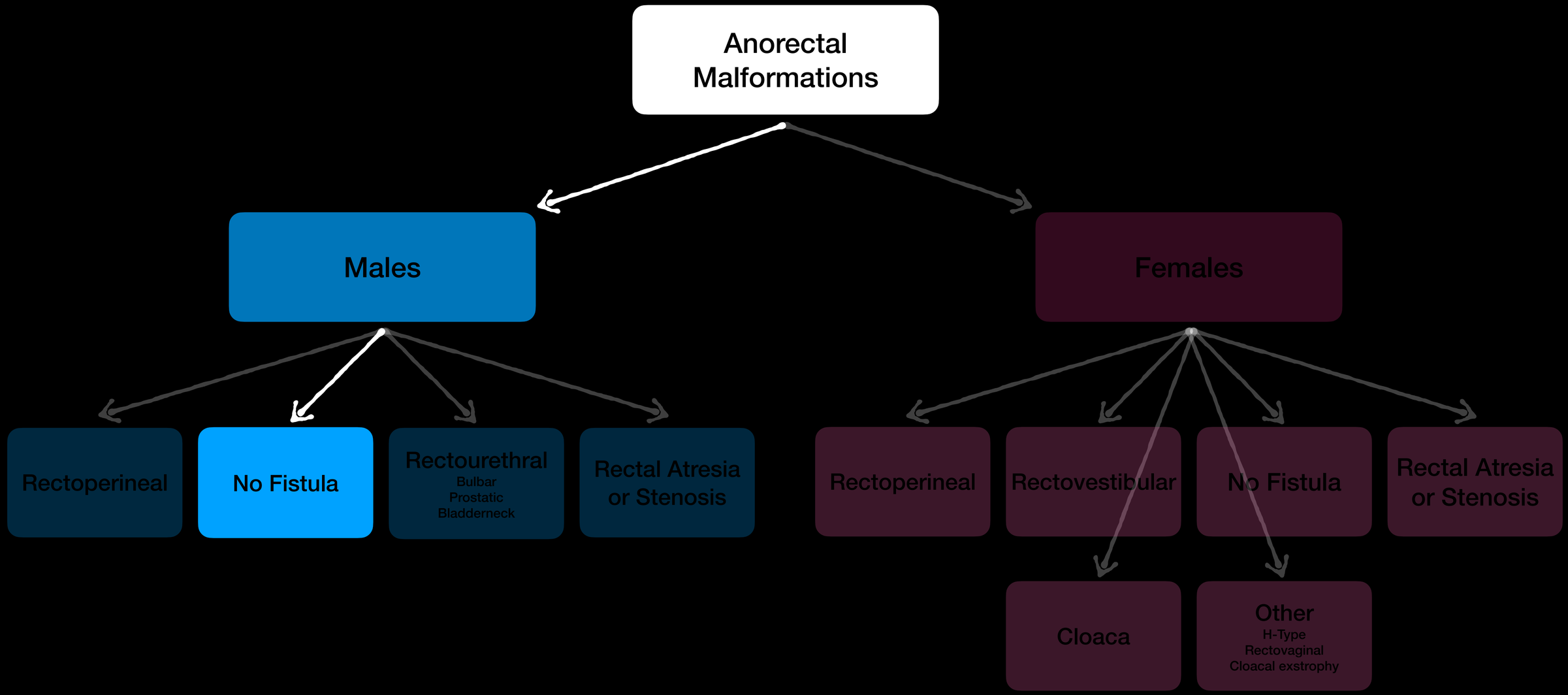
FIGURE 35-1 ■ This drawing shows the course of a perineal fistula in a male. The rectum is located within most of the muscle complex. Only the most distal aspect of the rectum is misplaced.

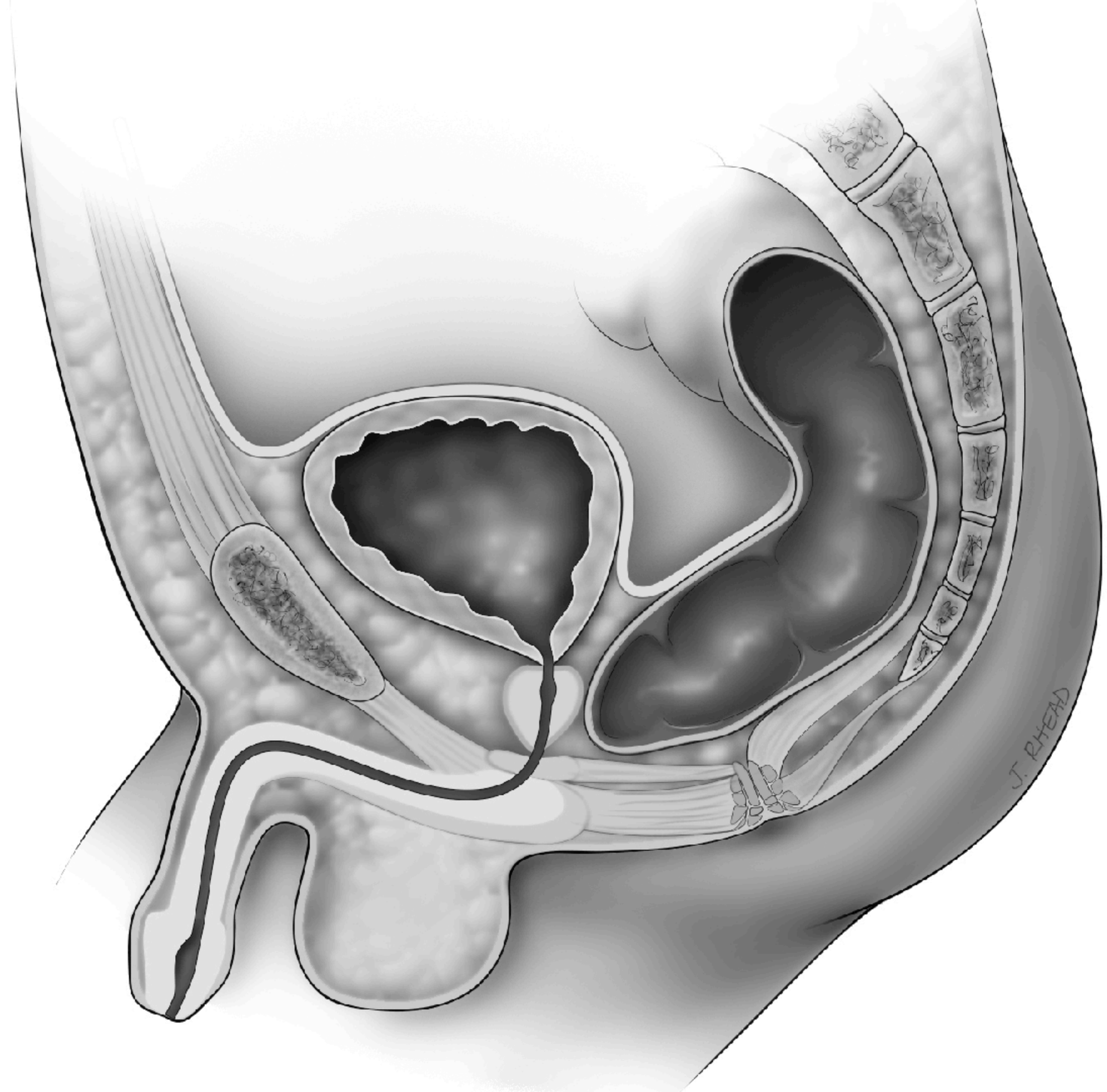


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Anorectal Malformations | Males

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Anorectal Malformations | X-Ray

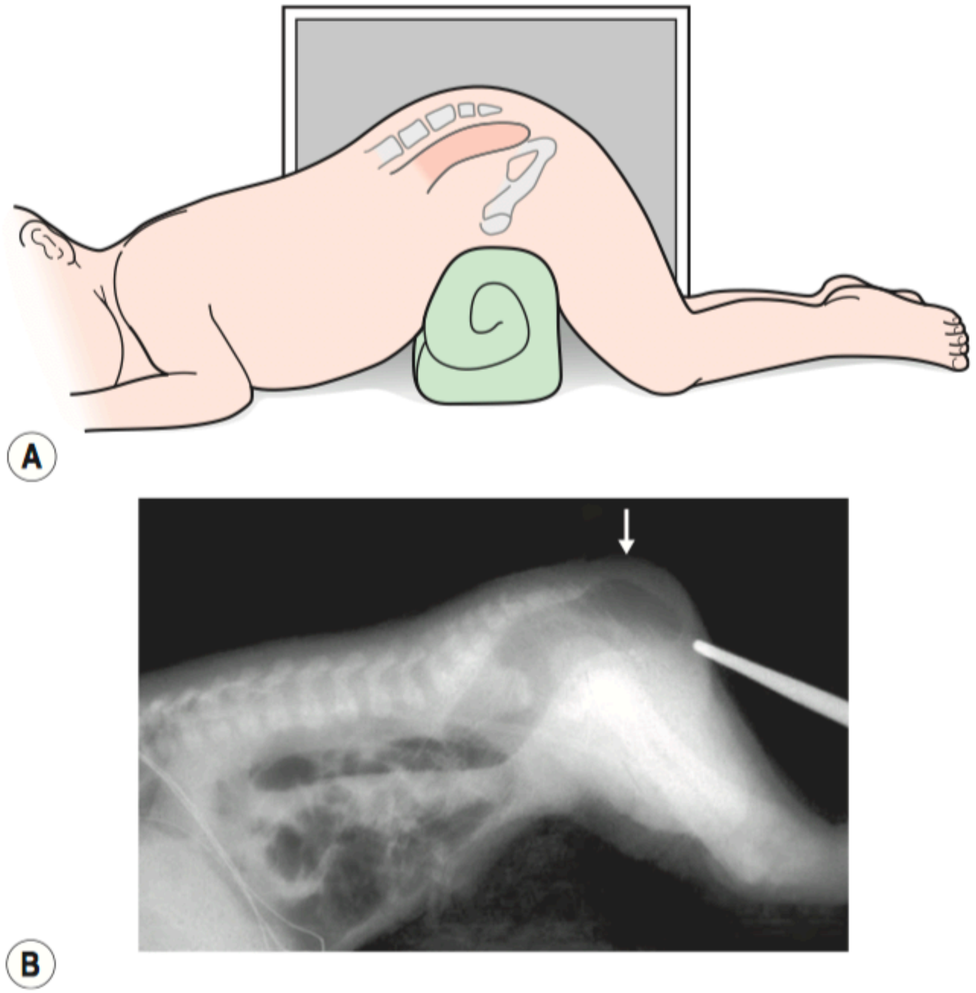
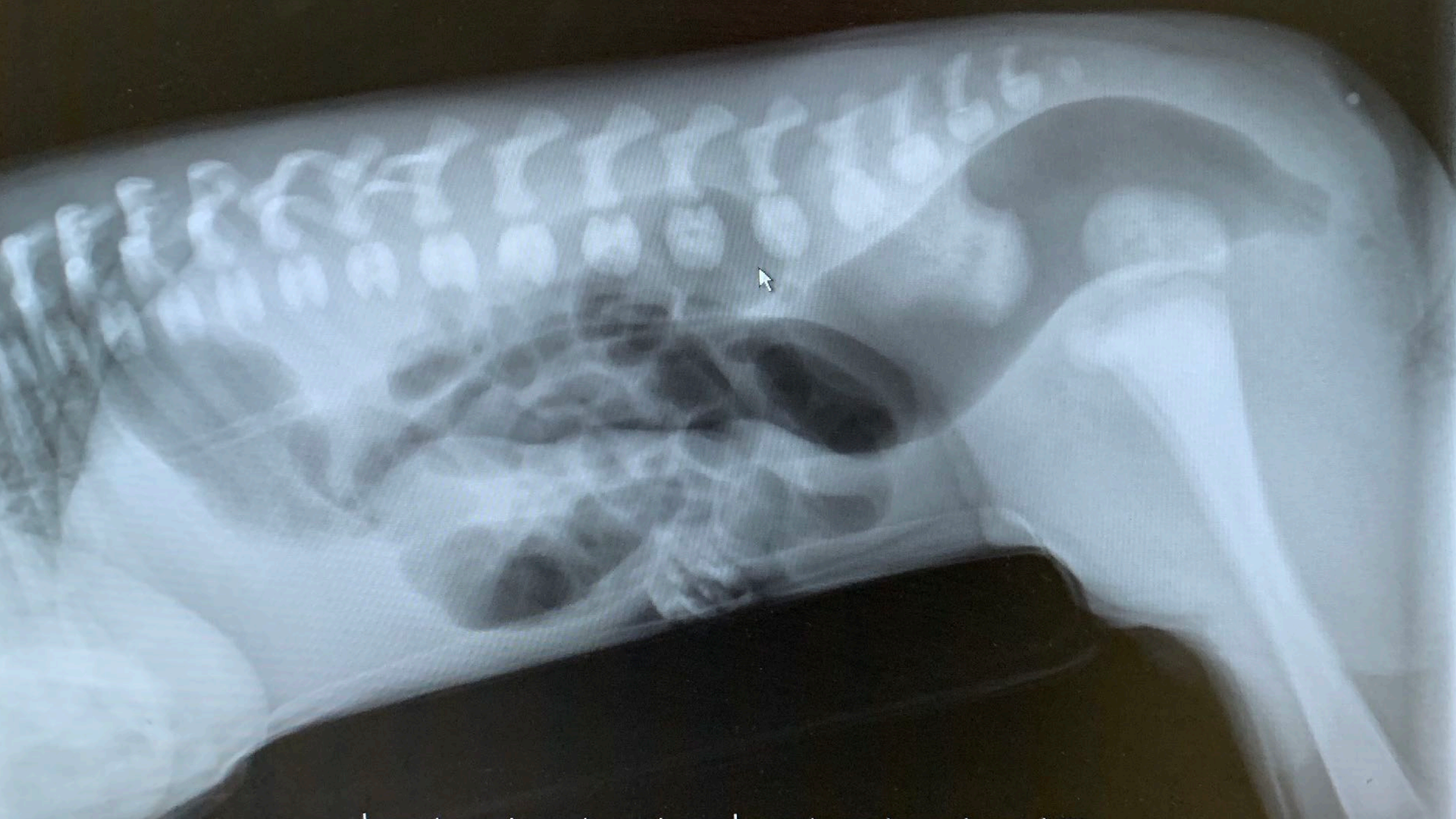


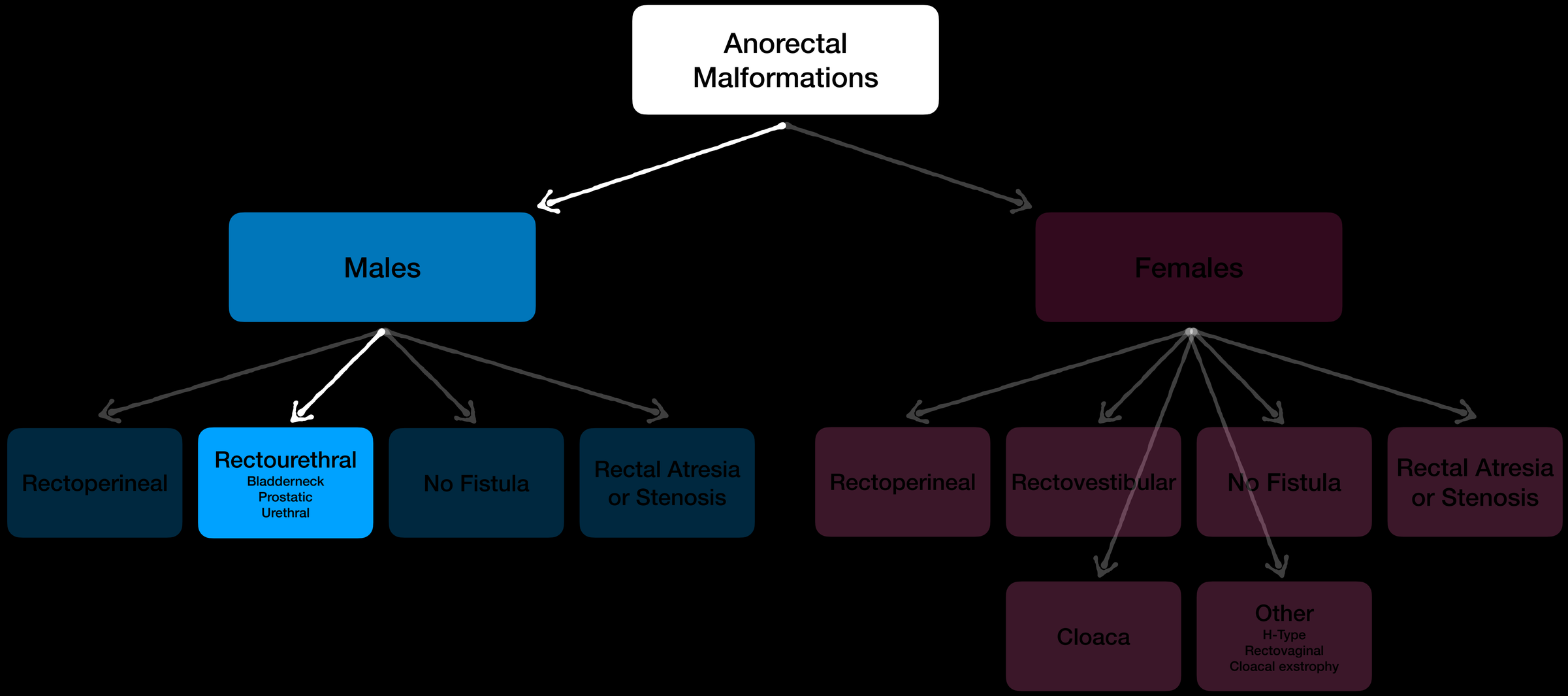
FIGURE 35-13 ■ Technique for a cross-table lateral radiograph. **(A)** A roll has been placed beneath the hips of the infant to elevate the buttocks and allow air to migrate superiorly to the end of the rectum. **(B)** Actual cross-table lateral radiograph. Air is visualized distal to the coccyx (arrow).



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Anorectal Malformations | Rectourethral

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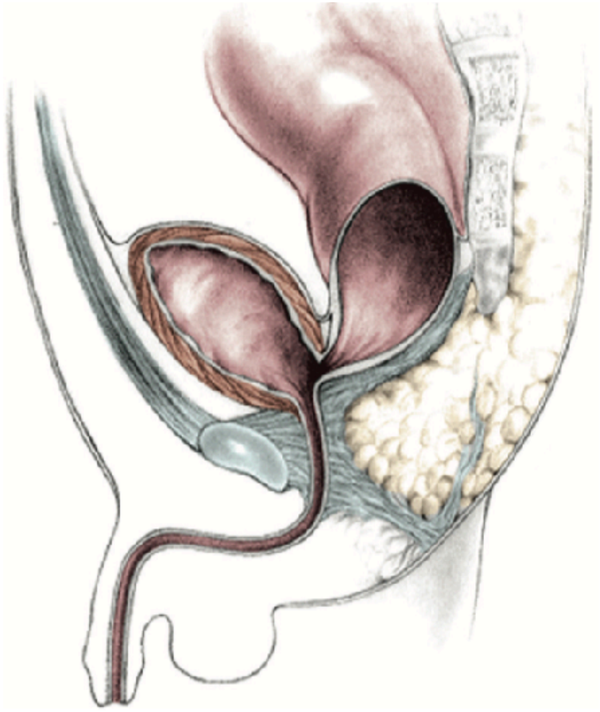
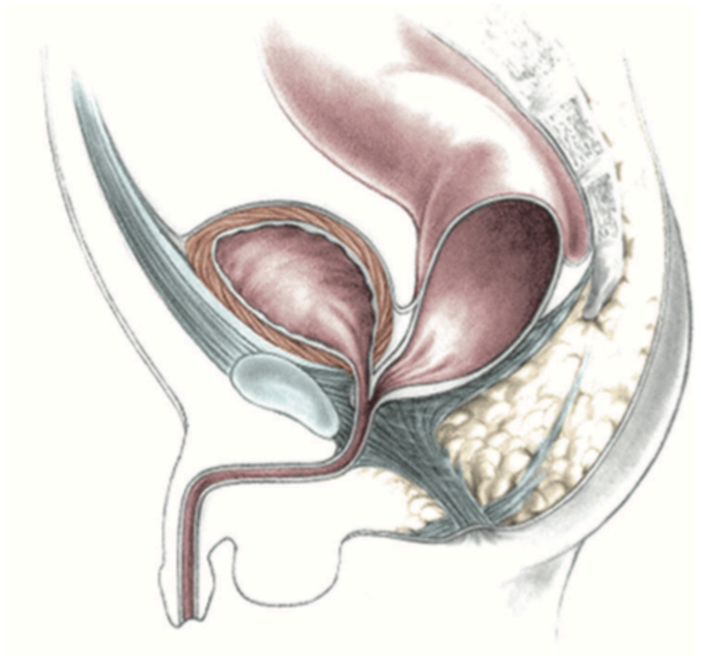
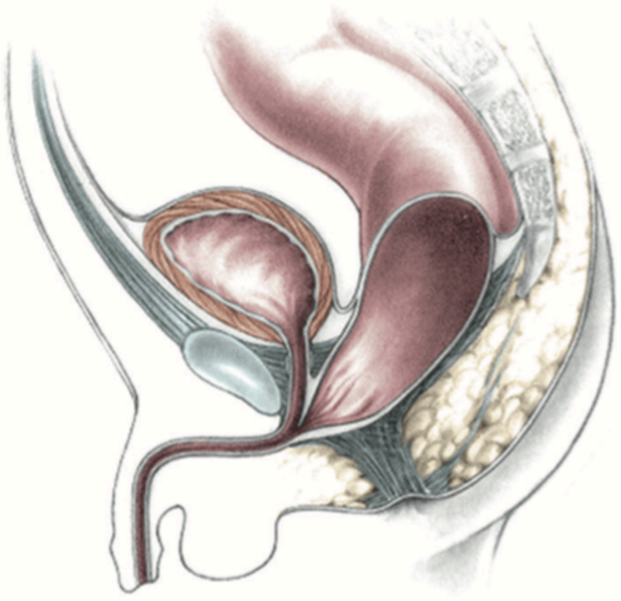


FIGURE 35-4 ■ Schematic representation of a rectobladder neck fistula. Note that the fistula enters into the bladder neck near the junction between the urethra and the bladder.



B

FIGURE 35-3 ■ Anorectal atresia with rectourethral fistulas. **(B)** rectourethroprostatic fistula.



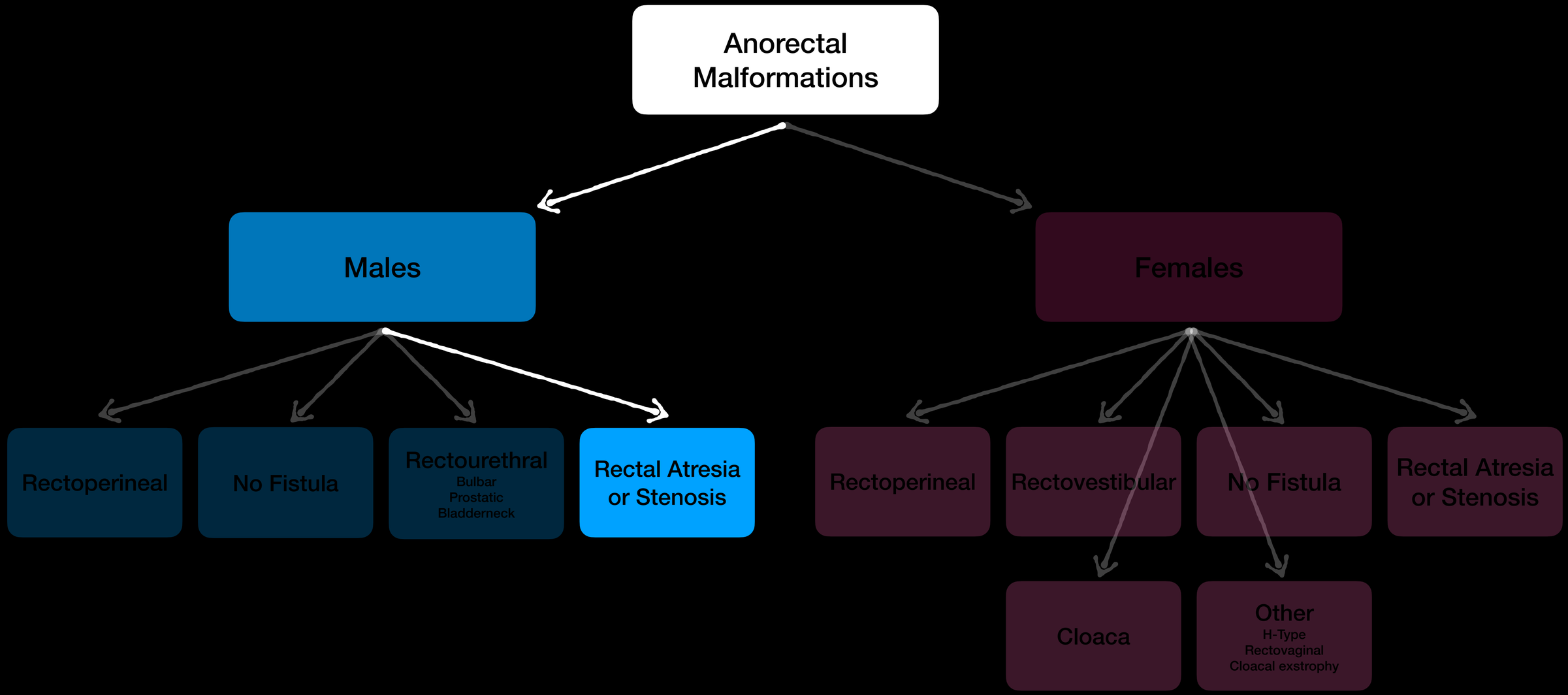
A

FIGURE 35-3 ■ Anorectal atresia with rectourethral fistulas. **(A)** Rectourethrobulbar fistula

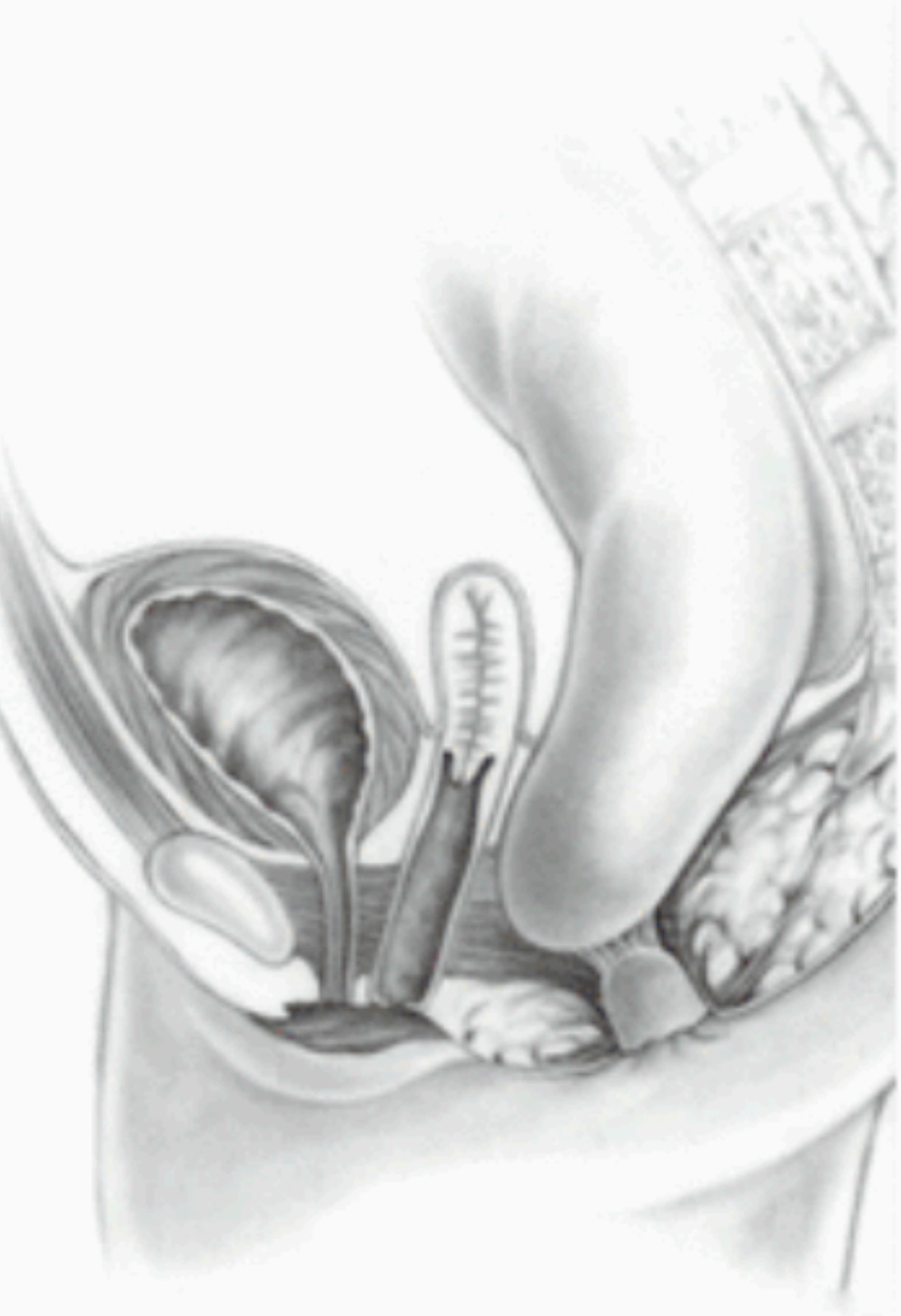
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Anorectal Malformations | Males

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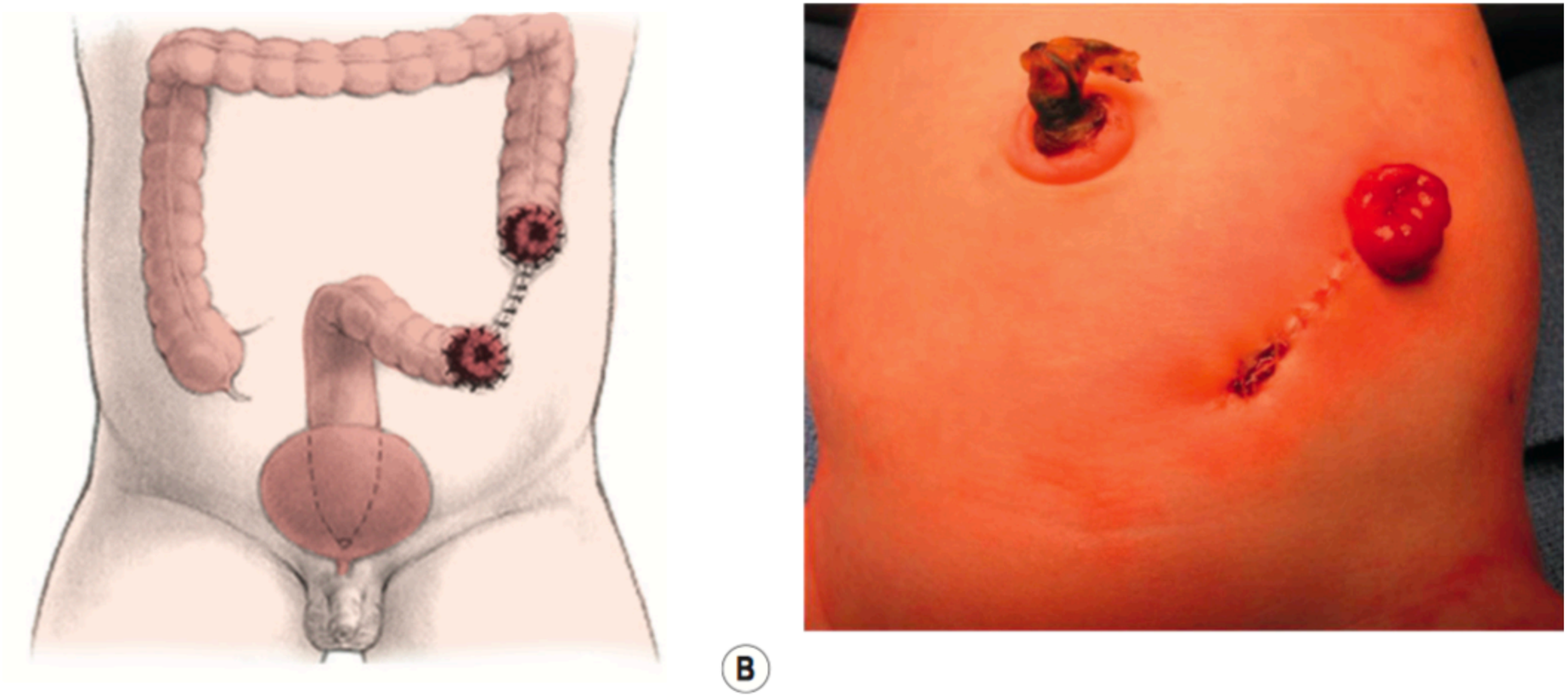

b




b




Anorectal Malformations | Colostomy



A

B

FIGURE 35-15 ■ An ideal colostomy for infants with high anorectal malformations is seen in **(A)** the drawing and **(B)** infant. Note the colostomy and mucous fistula are separated and that adequate distal colonic length remains for the subsequent rectal pull-through.

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Anorectal Malformations | Colostomy

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Anorectal Malformations | Postop

Diet

- Clear fluids (including breast milk) on POD 1-2
- Most agree to avoid formula (makes stool hard)
- Most agree no solids until POD 5

Foley

- Keep for a few days to keep diaper dry & avoid retention
- Don’t take it out too early! (no one thrilled about reinserting)
- Open system into diaper → no increased risk of UTI

Dilations

- Daily dilations starting at POD 14, especially for perineal fistulas (Peña)

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Newborn Bowel Obstruction | Case 2

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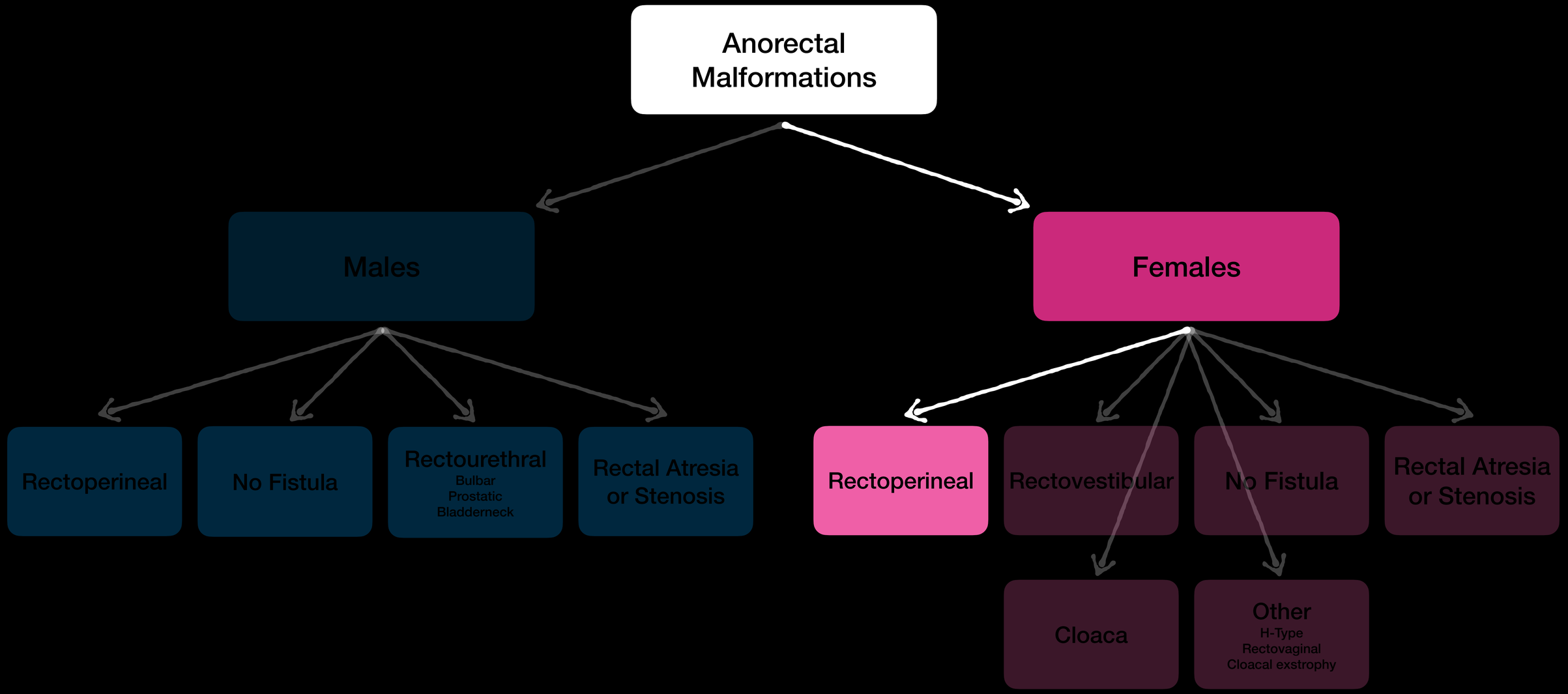
- A 3 day old newborn **girl** arrives in the emergency department with progressive emesis (initially milky, now bilious) and severe abdominal distension.
- An 8Fr NG tube has been inserted. An IV has been inserted and patient has received 20cc/kg of NS and has been started on D10NS at 4:2:1 rule. Triple antibiotics have been initiated.
- What are your next steps?

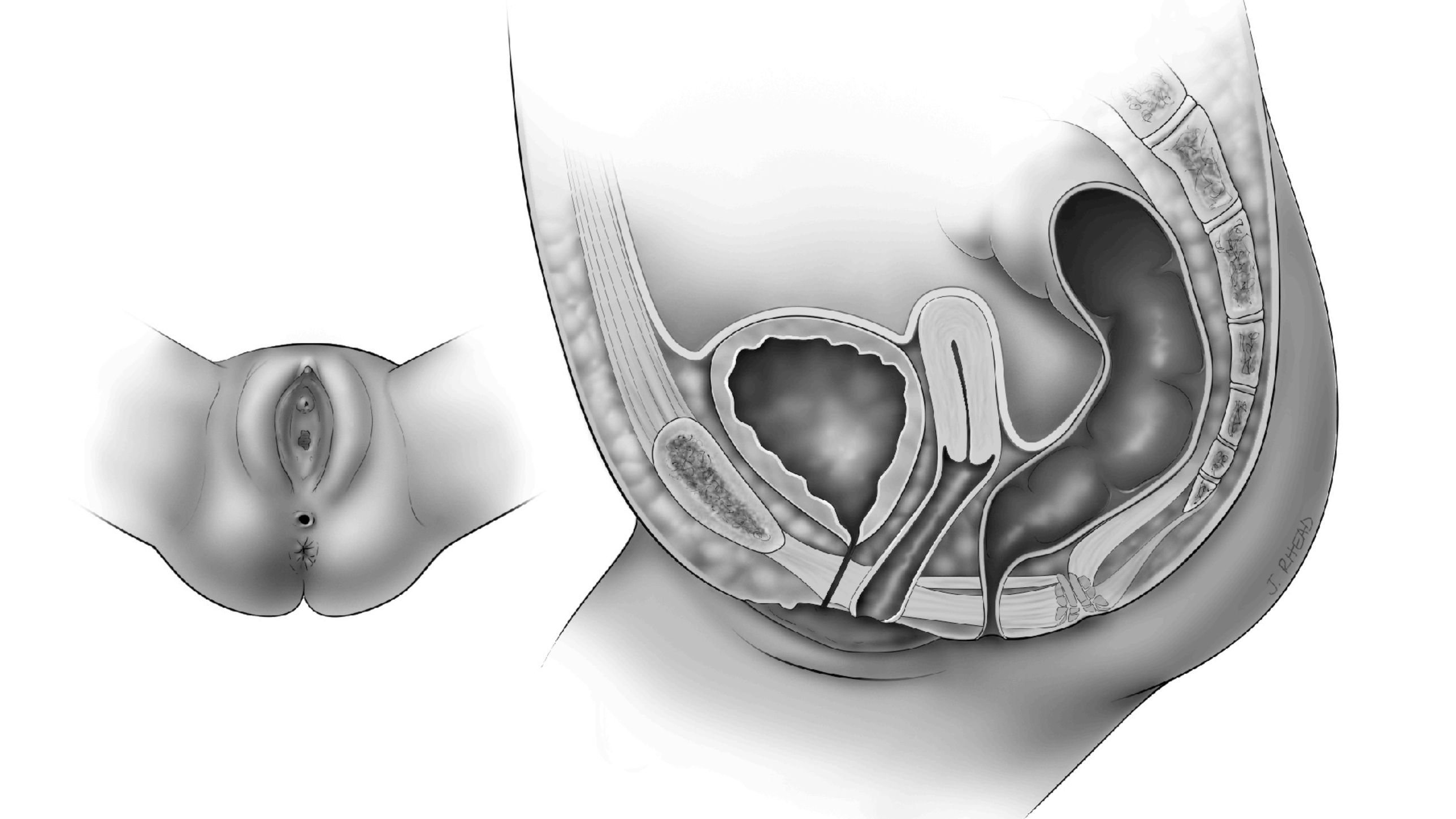


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Anorectal Malformations | Females

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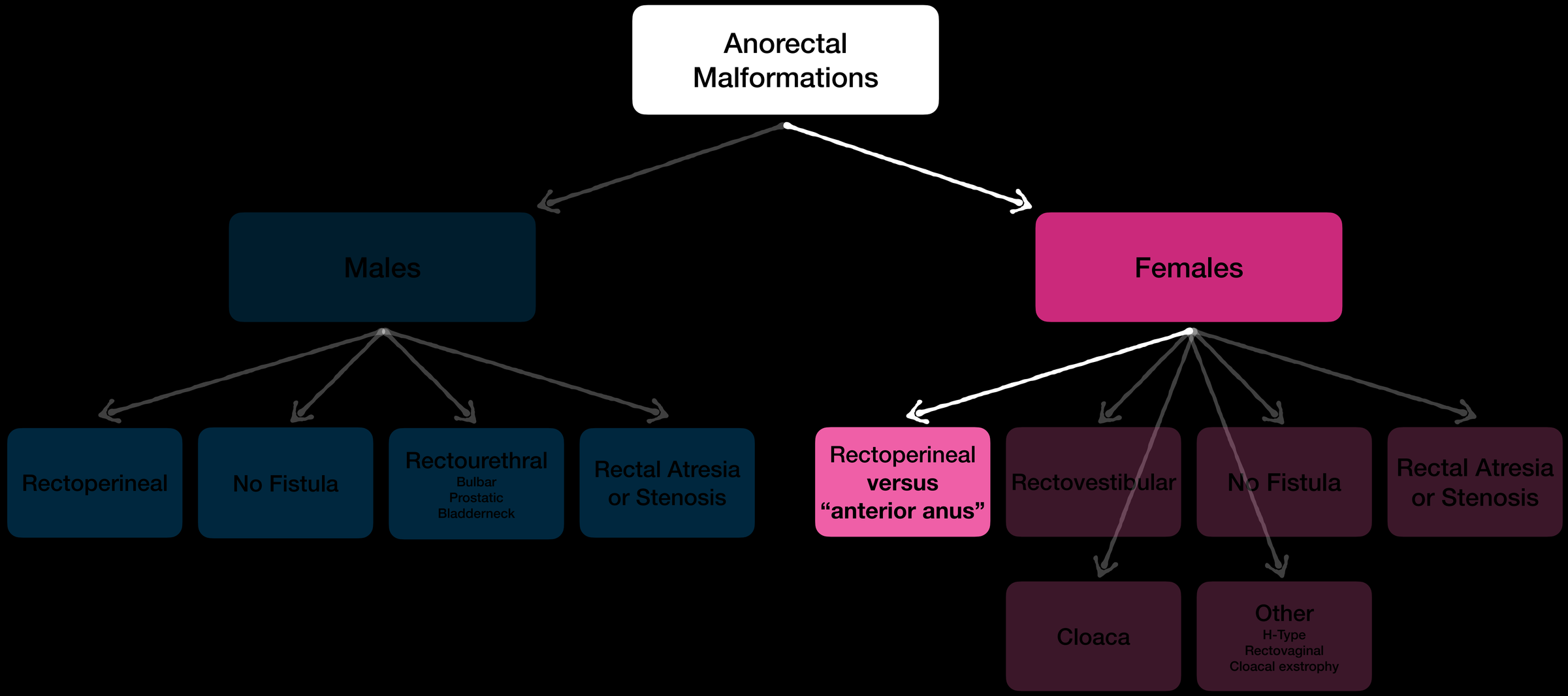



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Anorectal Malformations | Females

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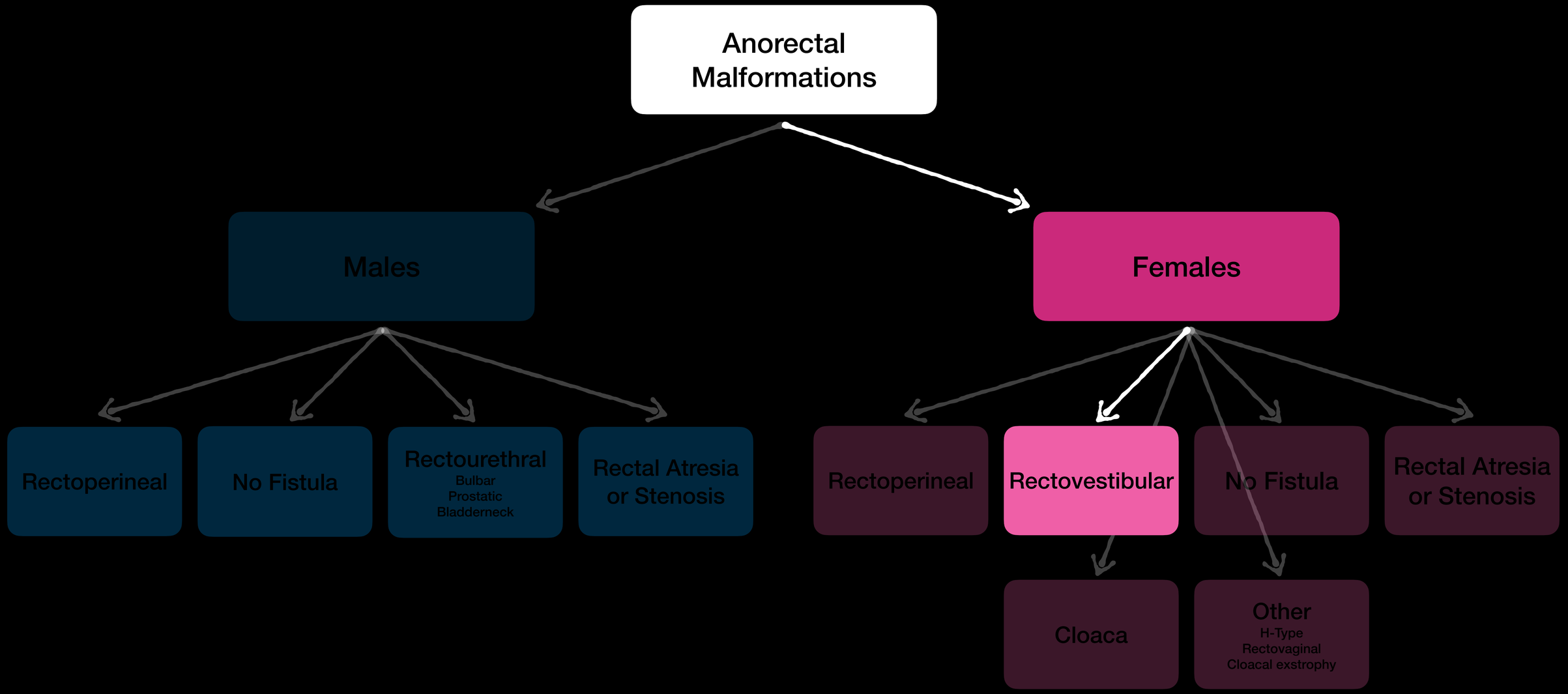


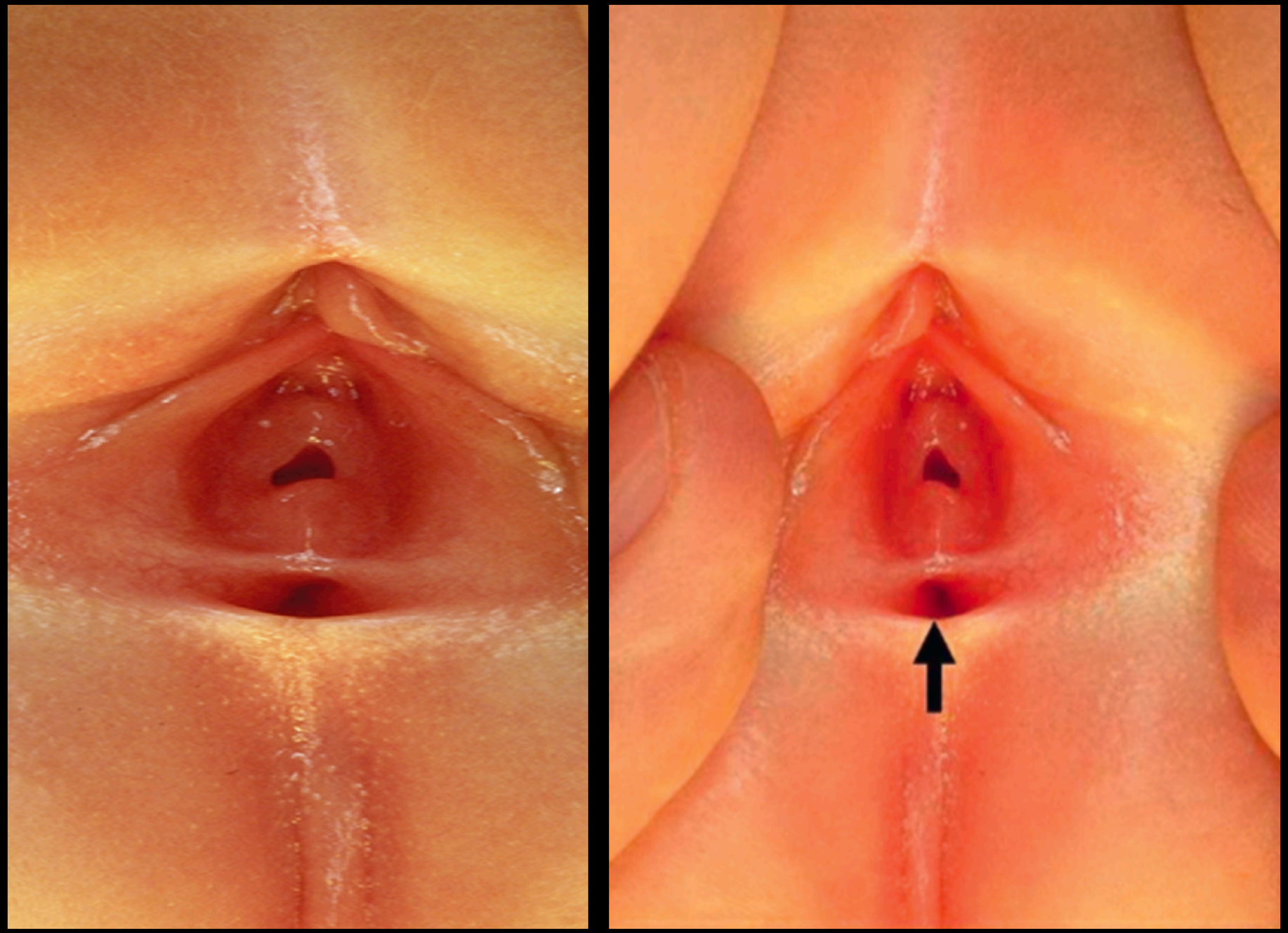


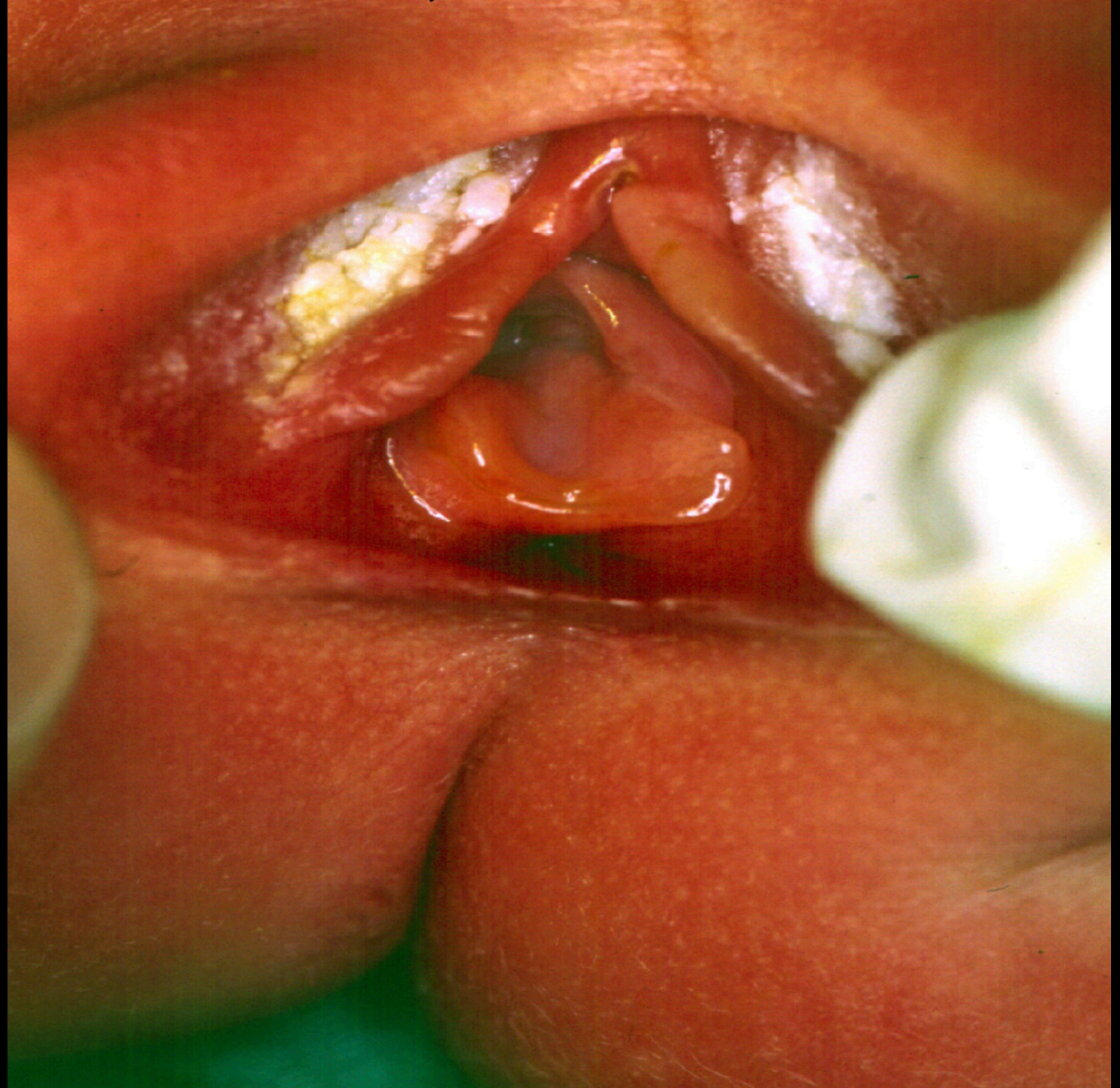
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Anorectal Malformations | Females

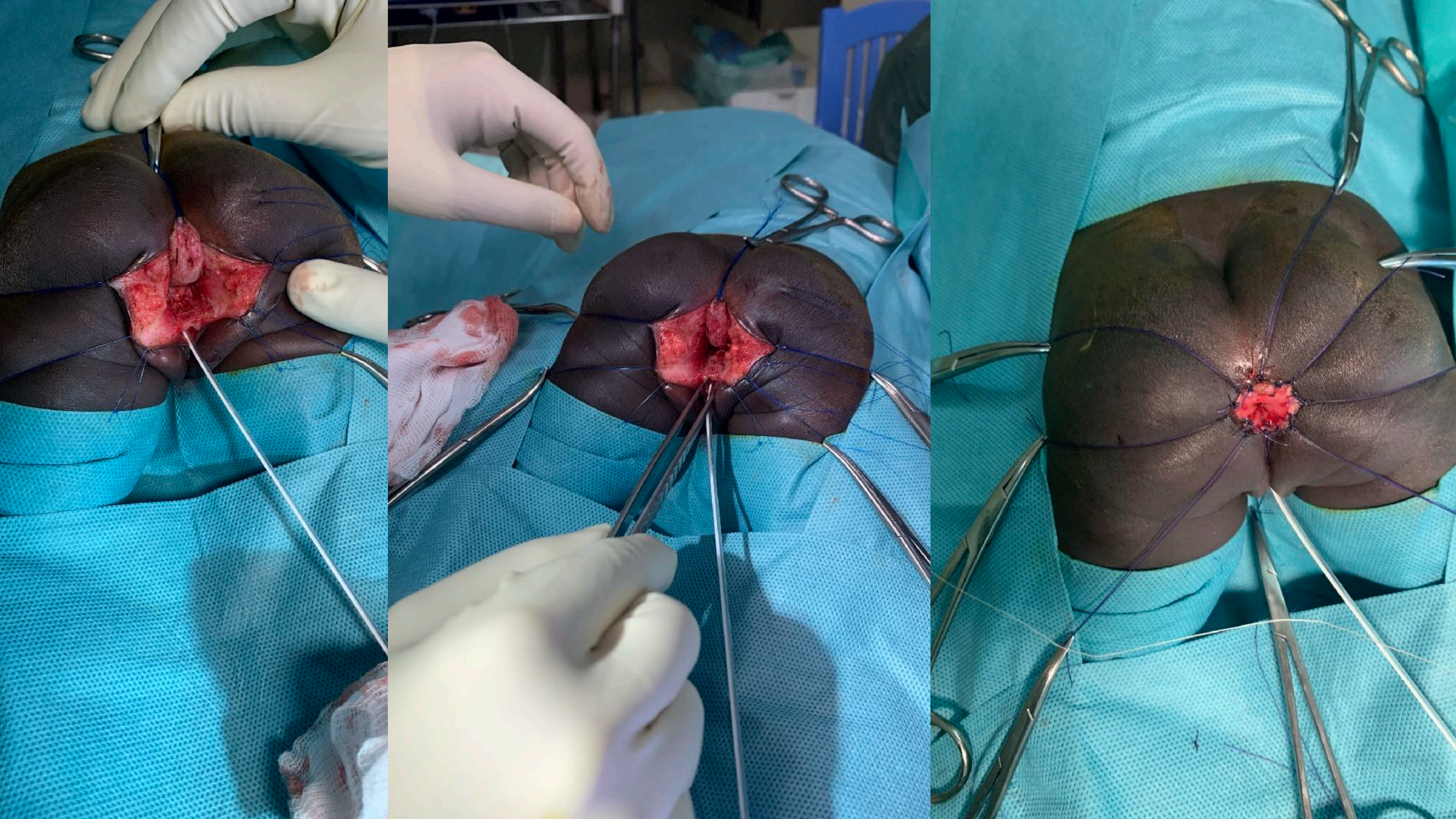
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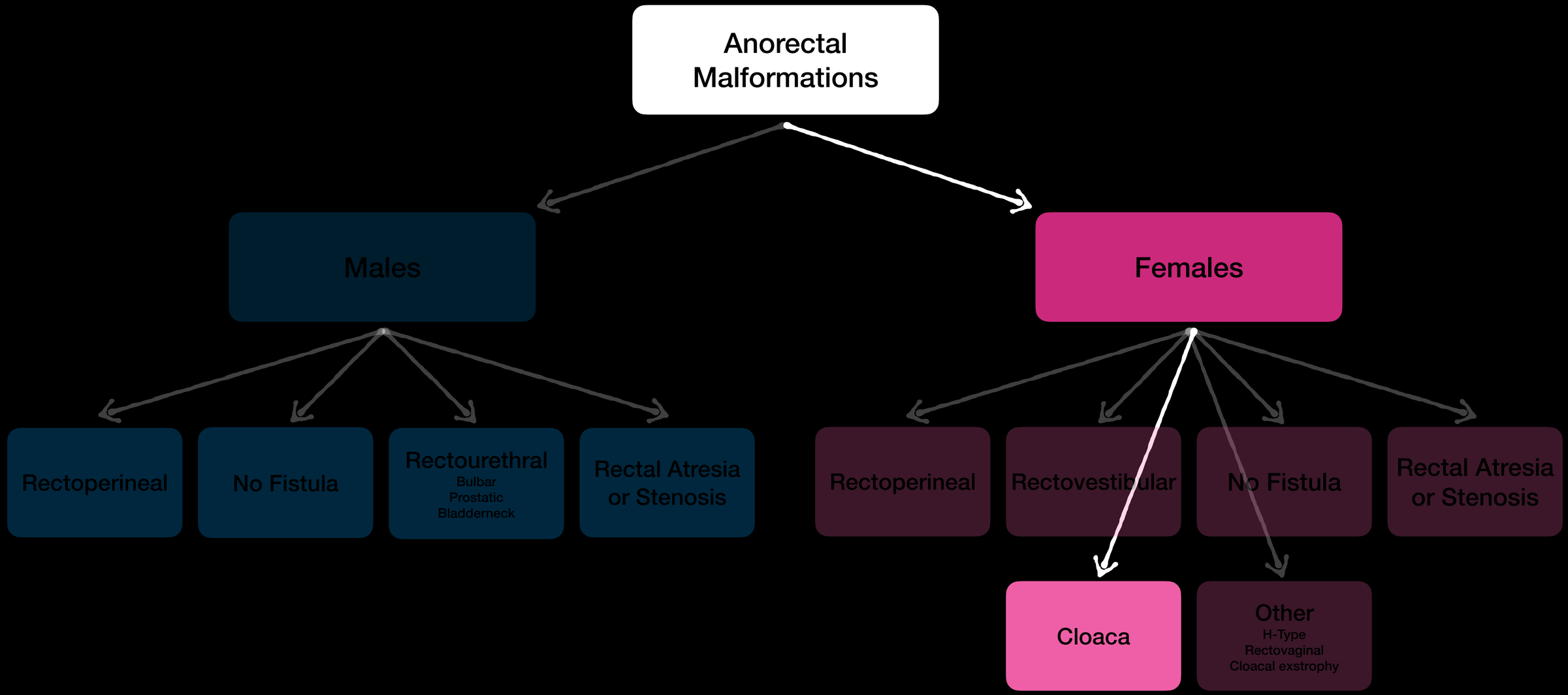


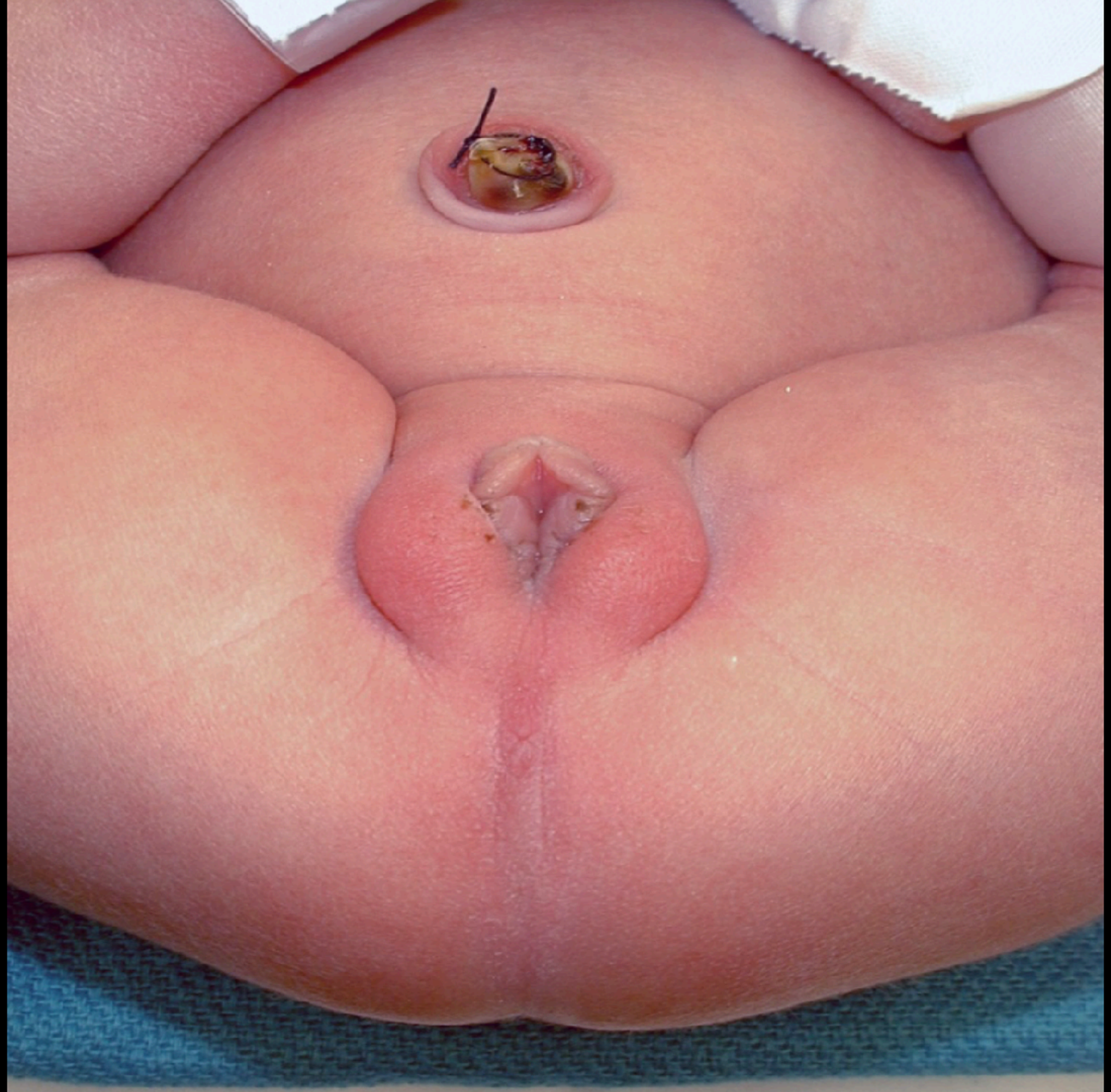


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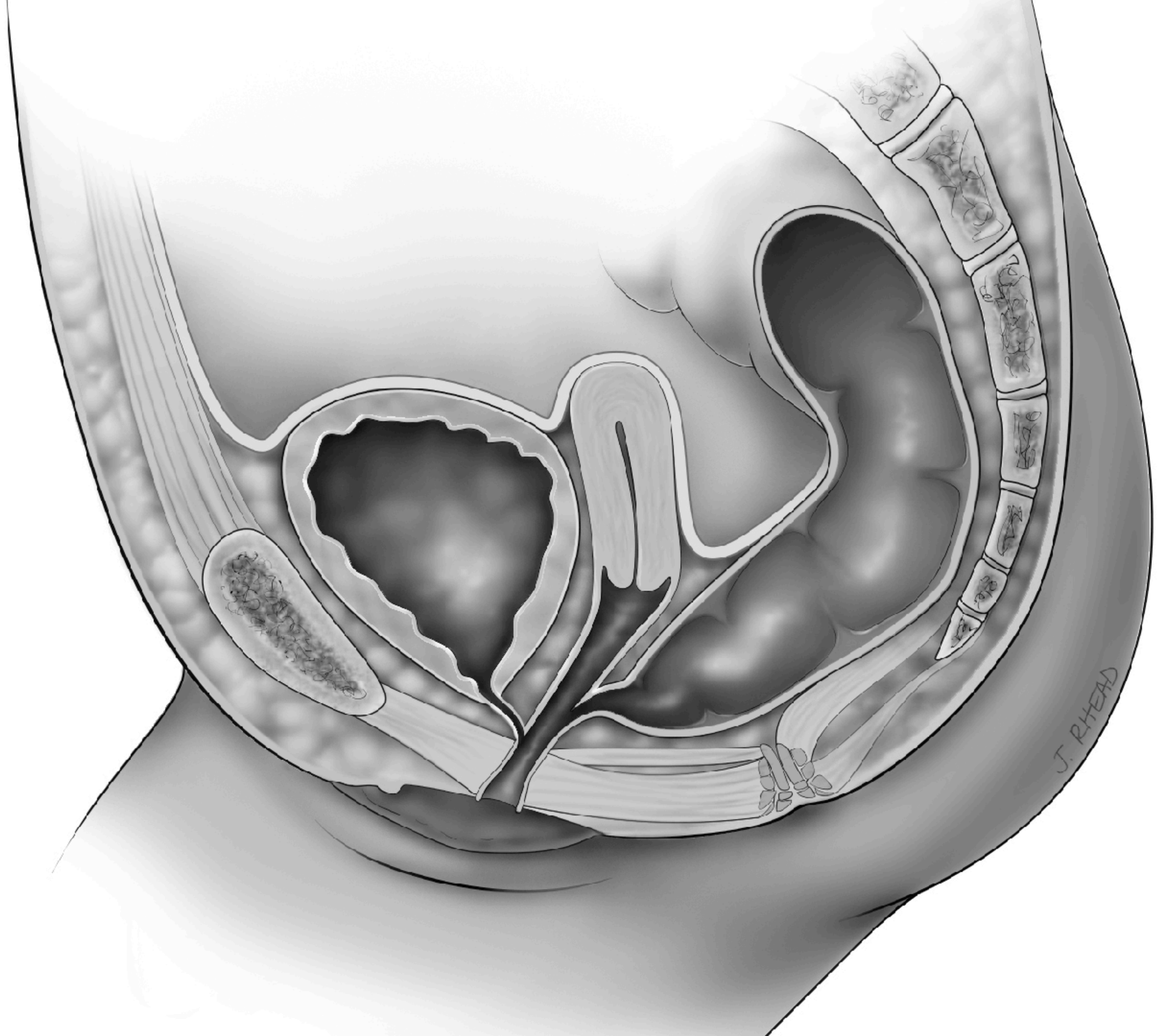
Anorectal Malformations | Schema

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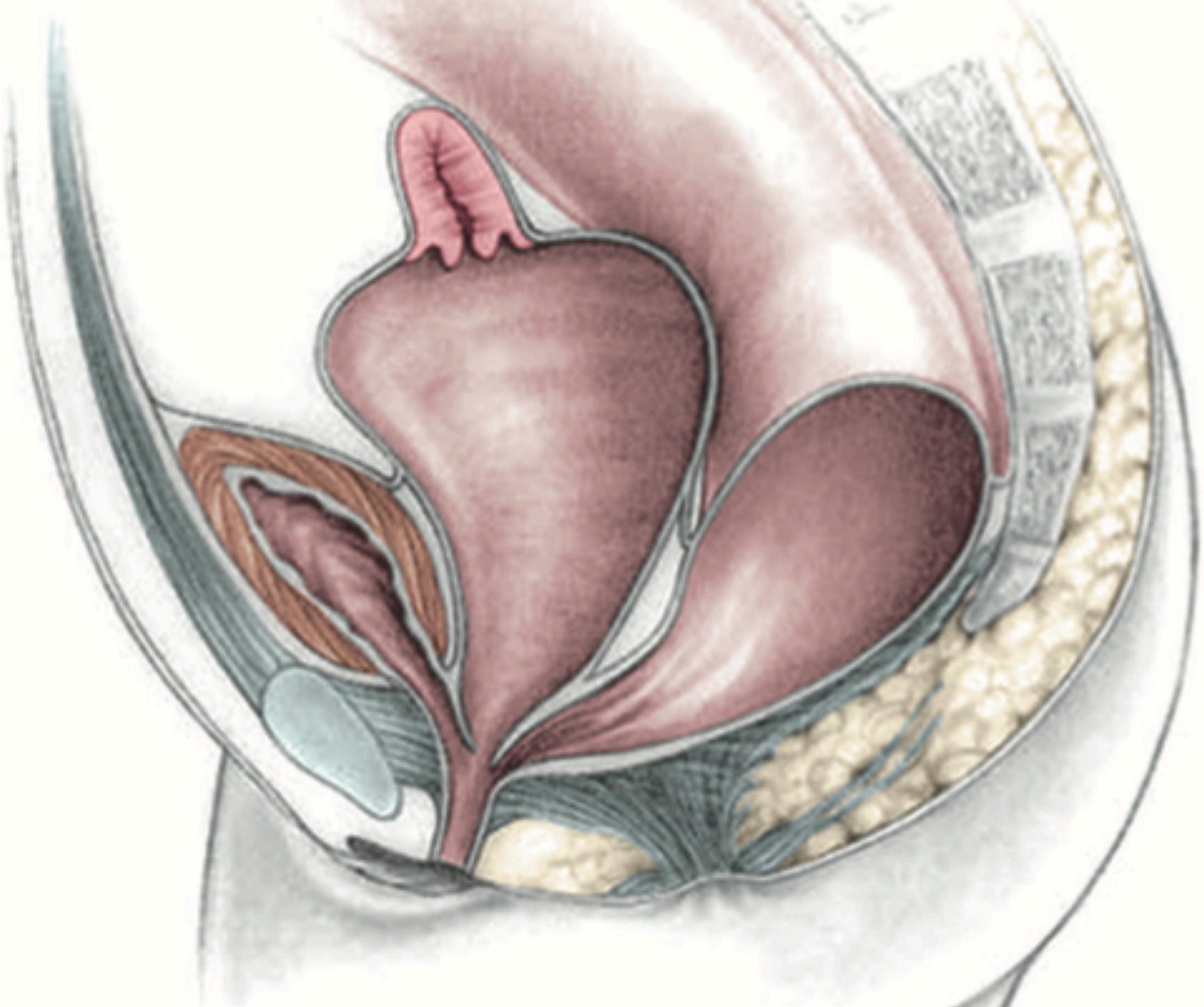





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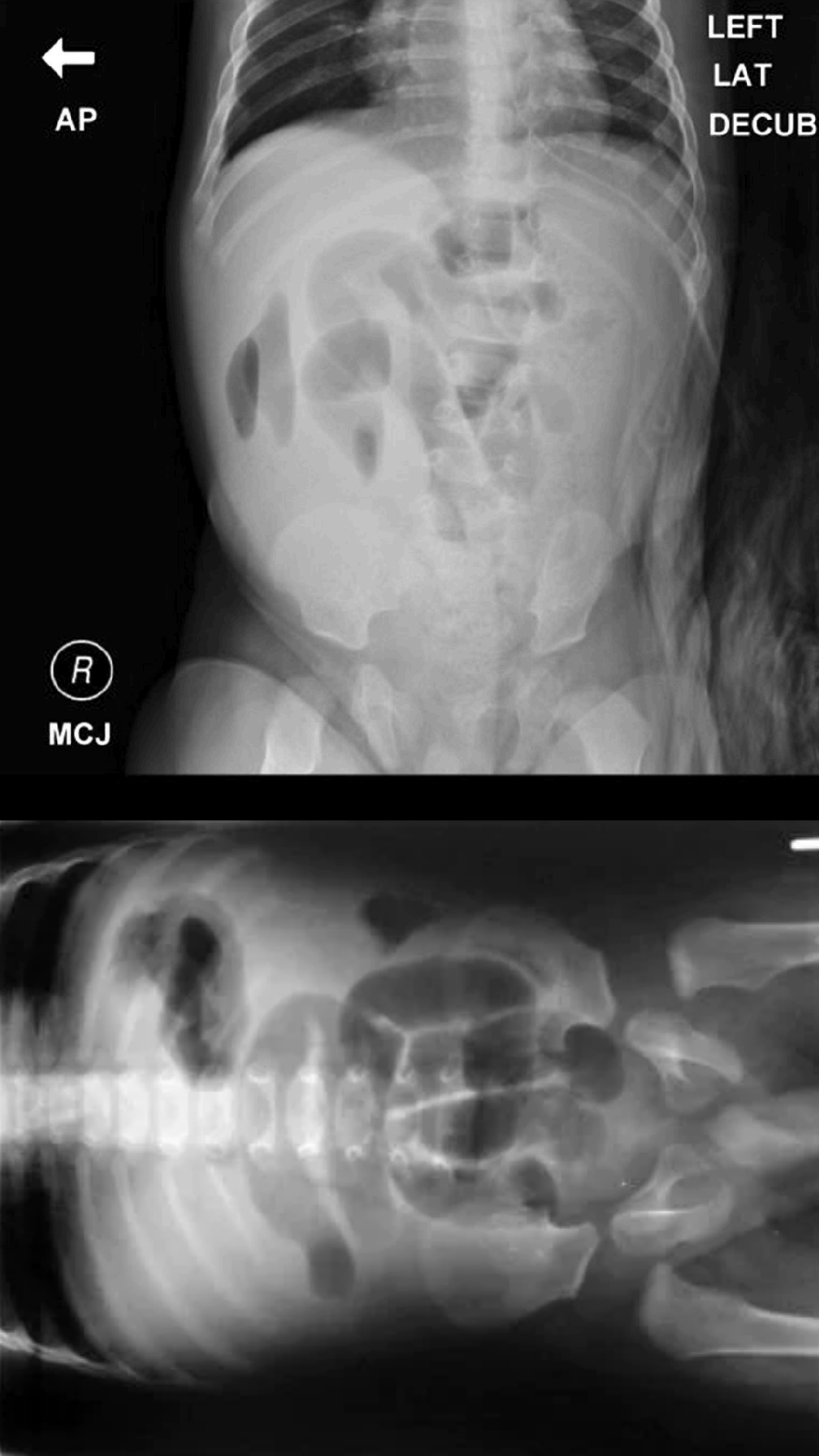






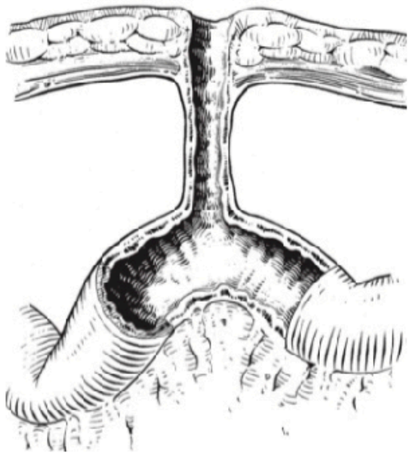
Peds Surg Emergencies | Case 3

- A 4 week old newborn arrives in the emergency department with emesis (initially milky, now bilious), abdominal distension, and obstipation.
- An 8Fr NG tube has been inserted. An IV has been inserted and patient has received 20cc/kg of NS and has been started on D5NS at 4:2:1 rule. Triple antibiotics have been initiated.
- What are your next steps?

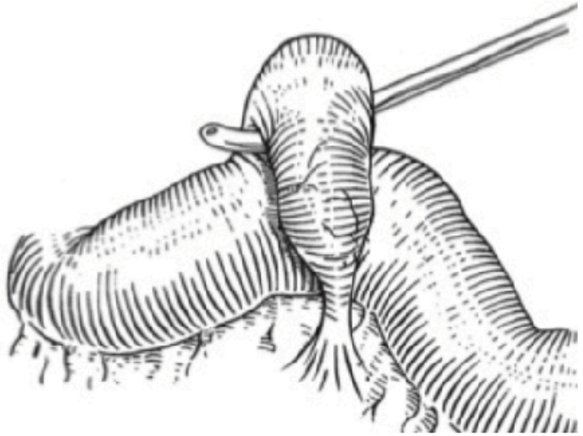

AP
LEFT
LAT
DECUB
R
MCJ

Meckel's & Obstruction

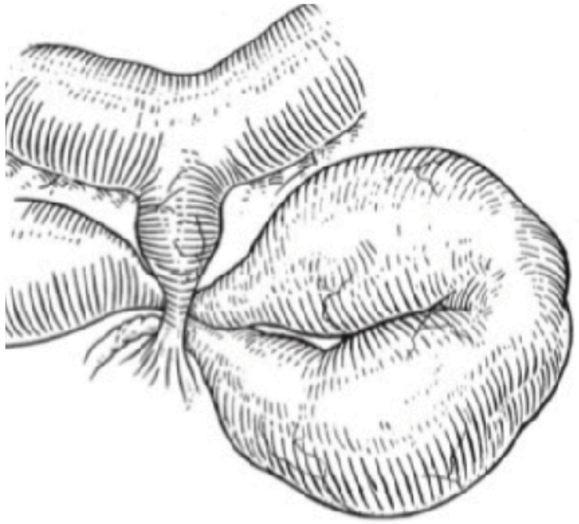
- Presentations of Meckel's diverticulum: bleeding = 50%, diverticulitis = 15%, obstruction = 15%, patent omphalomesenteric duct = 15%
- Causes of obstruction:
  - Intussusception with Meckel's as lead point
  - Volvulus around Meckel's attached to abdominal wall
  - Internal hernia due to Meckel's congenital band
  - Abscess/adhesions due to perforated Meckel's diverticulitis
  - Heavy and large Meckel's causing kink/volvulus
  - Incarcerated Littré hernia

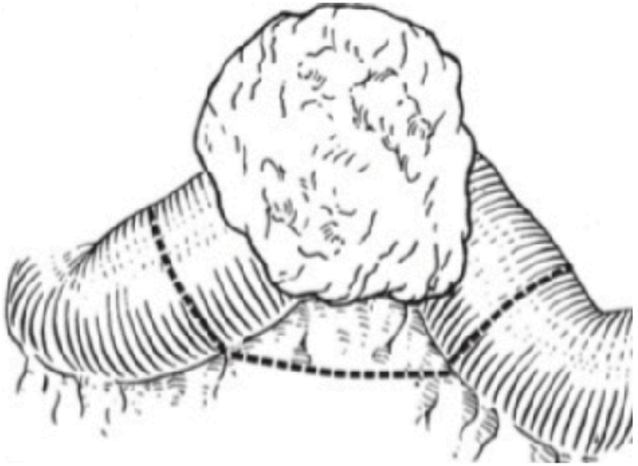






3 The Meckel's diverticulum is often bound down by remnants of the vitelline vessels from its apex and is adherent to the mesentery of the ileum. (Division of the vessels at the apex of the peritoneal fold reveals its typical antimesenteric origin.) Loops of bowel can be trapped beneath this band, producing a closed loop obstruction.





Peds Surg Emergencies | Case 4

- A 14 year old child arrives in the emergency department with emesis (initially food, now bilious), abdominal distension, and obstipation.
- An 14Fr NG tube has been inserted. An IV has been inserted and patient has received 20cc/kg of NS and has been started on D5NS at 4:2:1 rule. Ceftriaxone and flagyl have been initiated.
- What are your next steps?

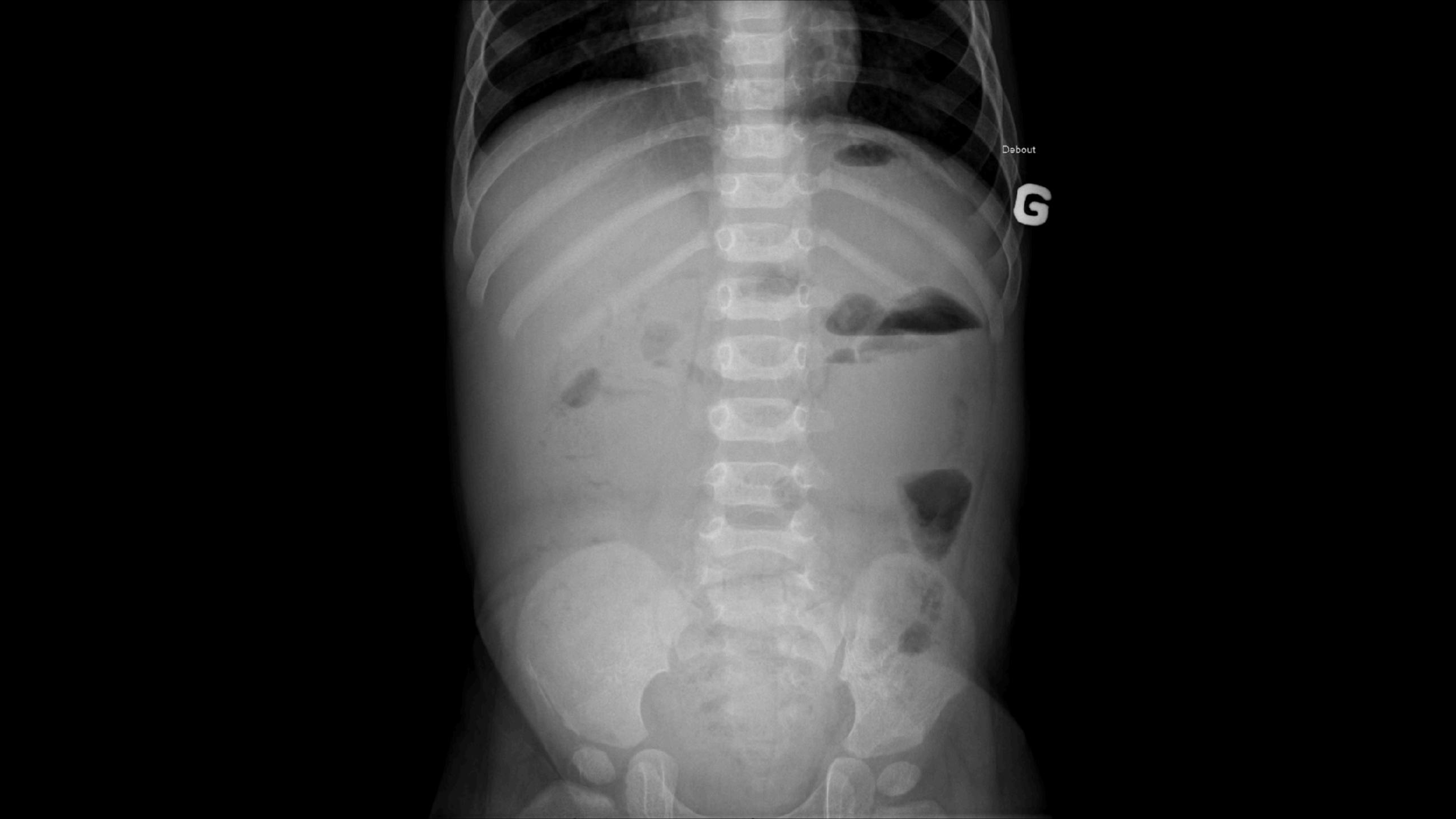


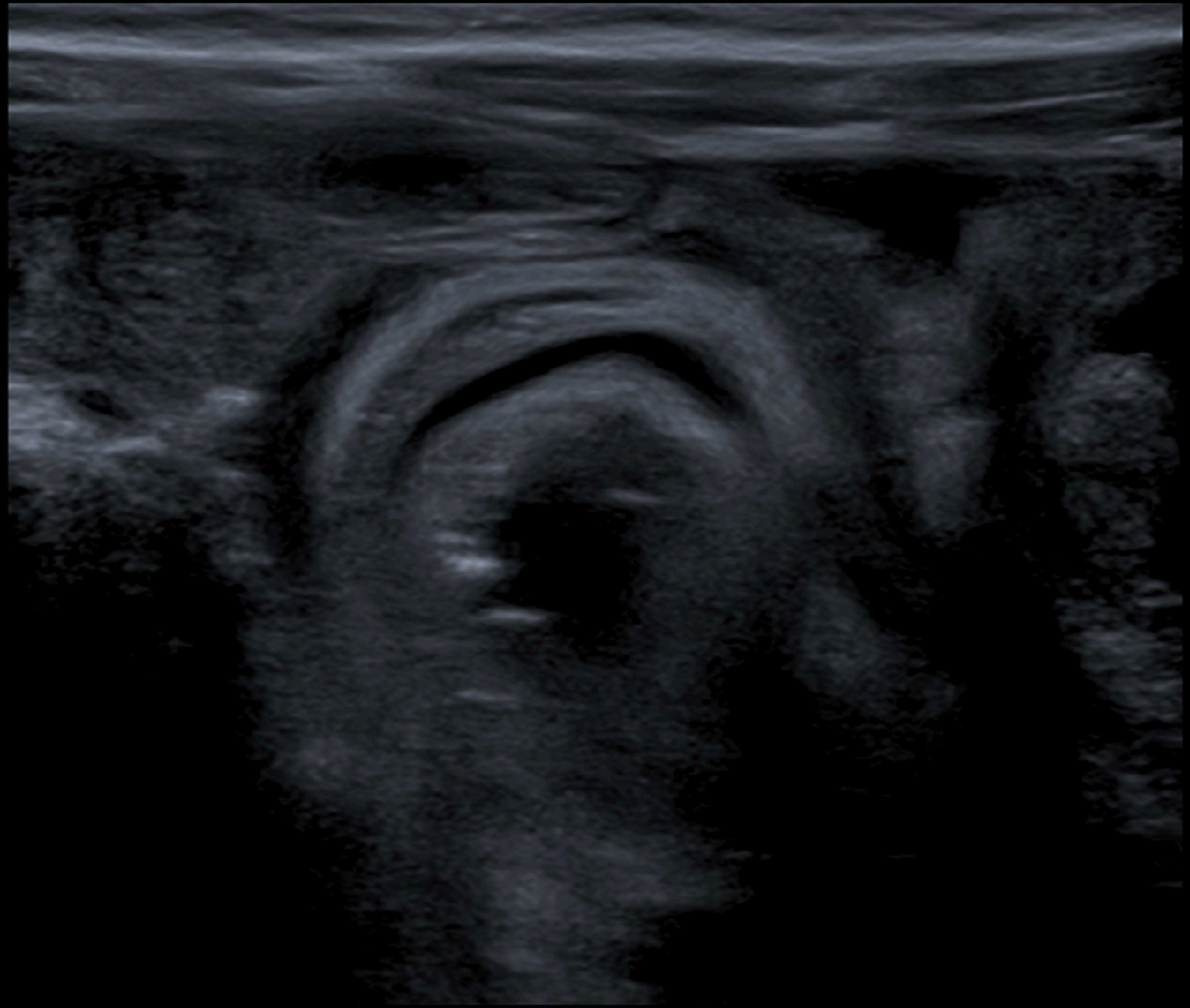
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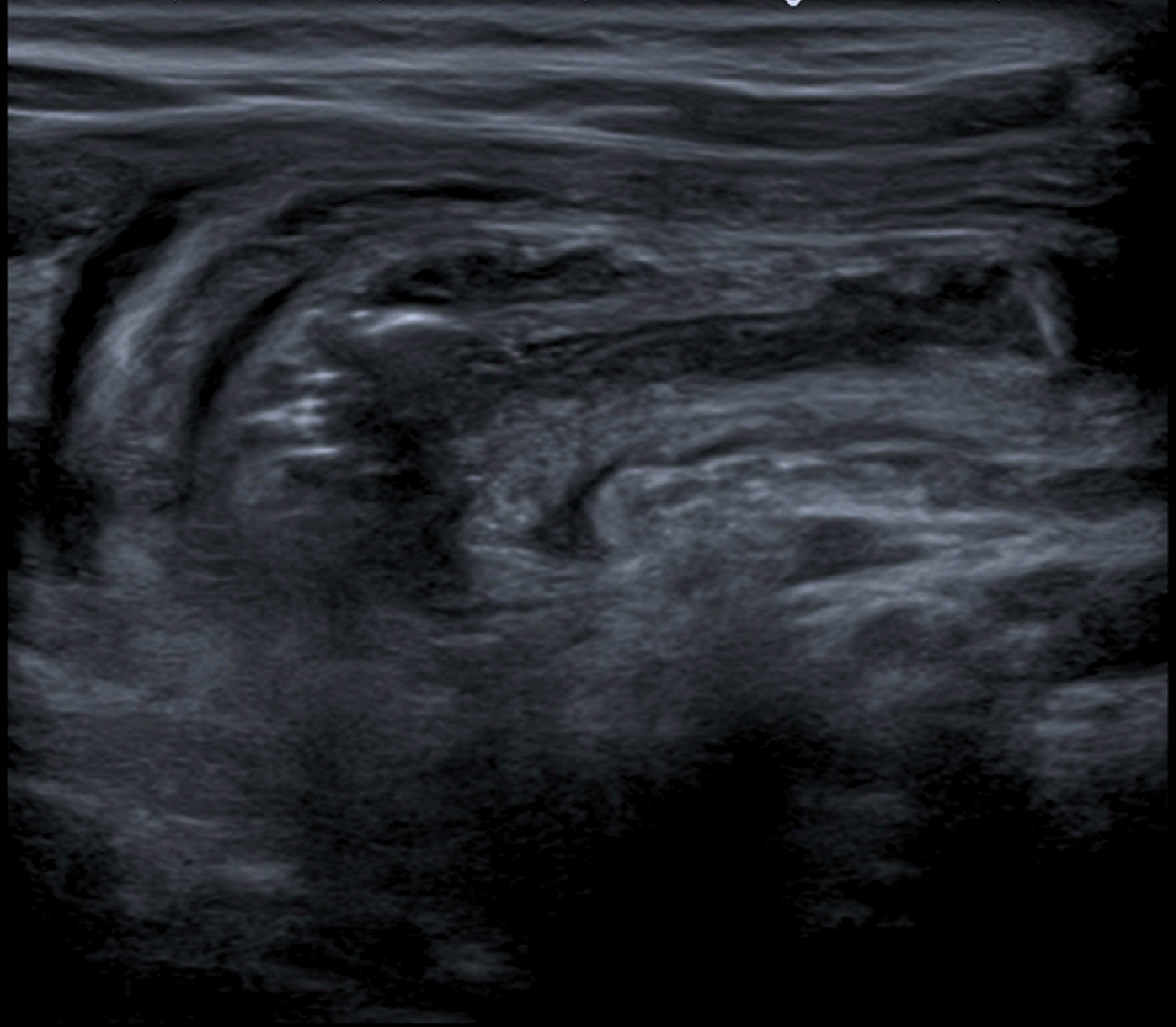
Peds Surg Emergencies | Case 5

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- A 2 year old arrives in the emergency department with crampy abdominal pain for several days, emesis (initially milky, now bilious), and abdominal distension. Initially, he had some reddish loose bowel movements, but he has not passed flatus or stool in 24+ hours.
- An 12Fr NG tube has been inserted. An IV has been inserted and patient has received 20cc/kg of NS and has been started on D5NS at 4:2:1 rule. Triple antibiotics have been initiated.
- On physical exam, you perform a DRE and there is a mass felt at the tip of your finger.
- What are your next steps?


Debout
G





Intussusception

- Most common 4-9 months old
- >75% “primary” or “idiopathic” without identifiable lead point
  - Generally attributed to hypertrophic Peyer’s patches within bowel wall
  - Often secondary to URTI or gastroenteritis (adenovirus > rotavirus = >50% of cases)
- ~25% “secondary” due to an identifiable lead point
  - Increasing frequency with age

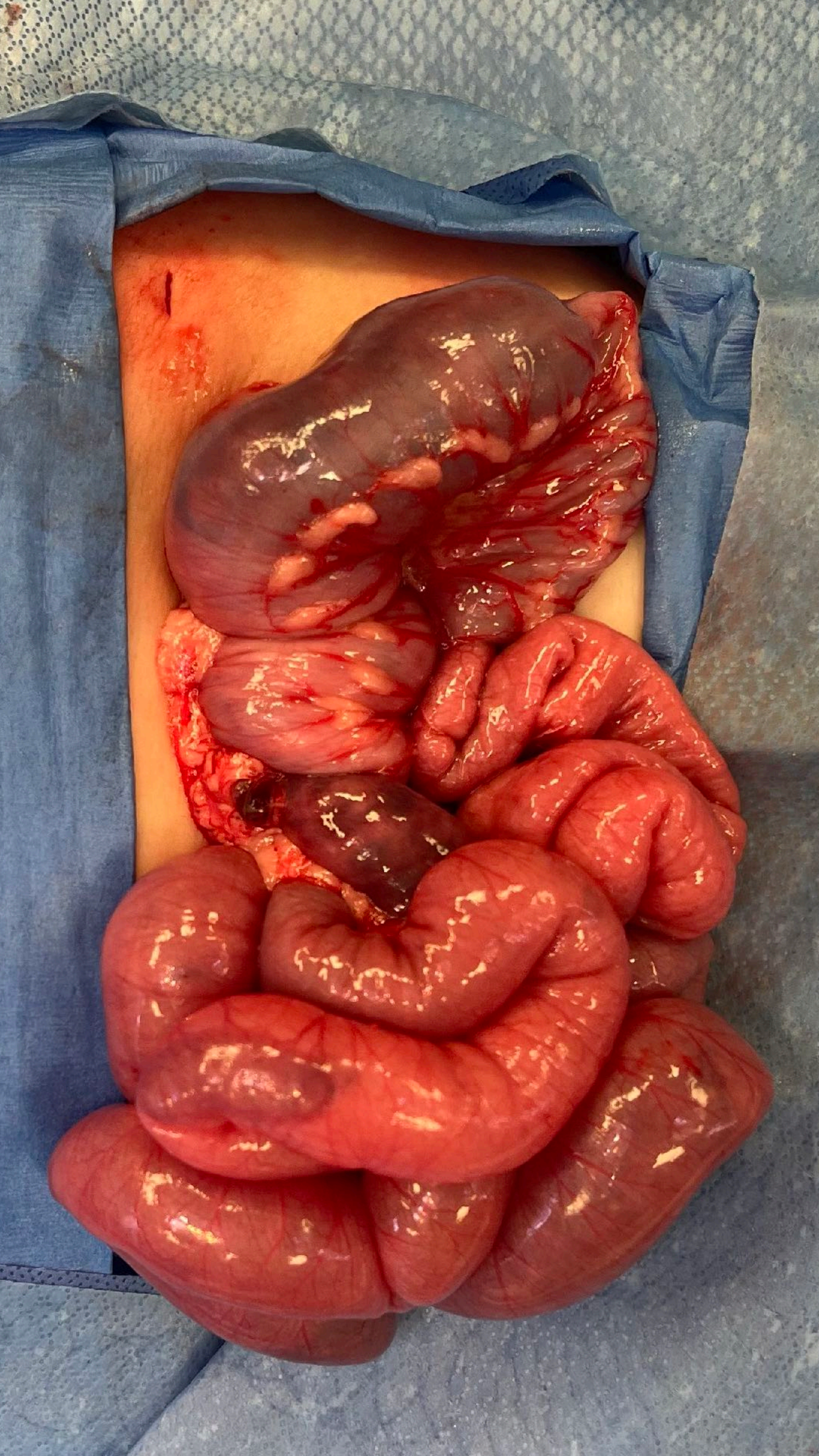
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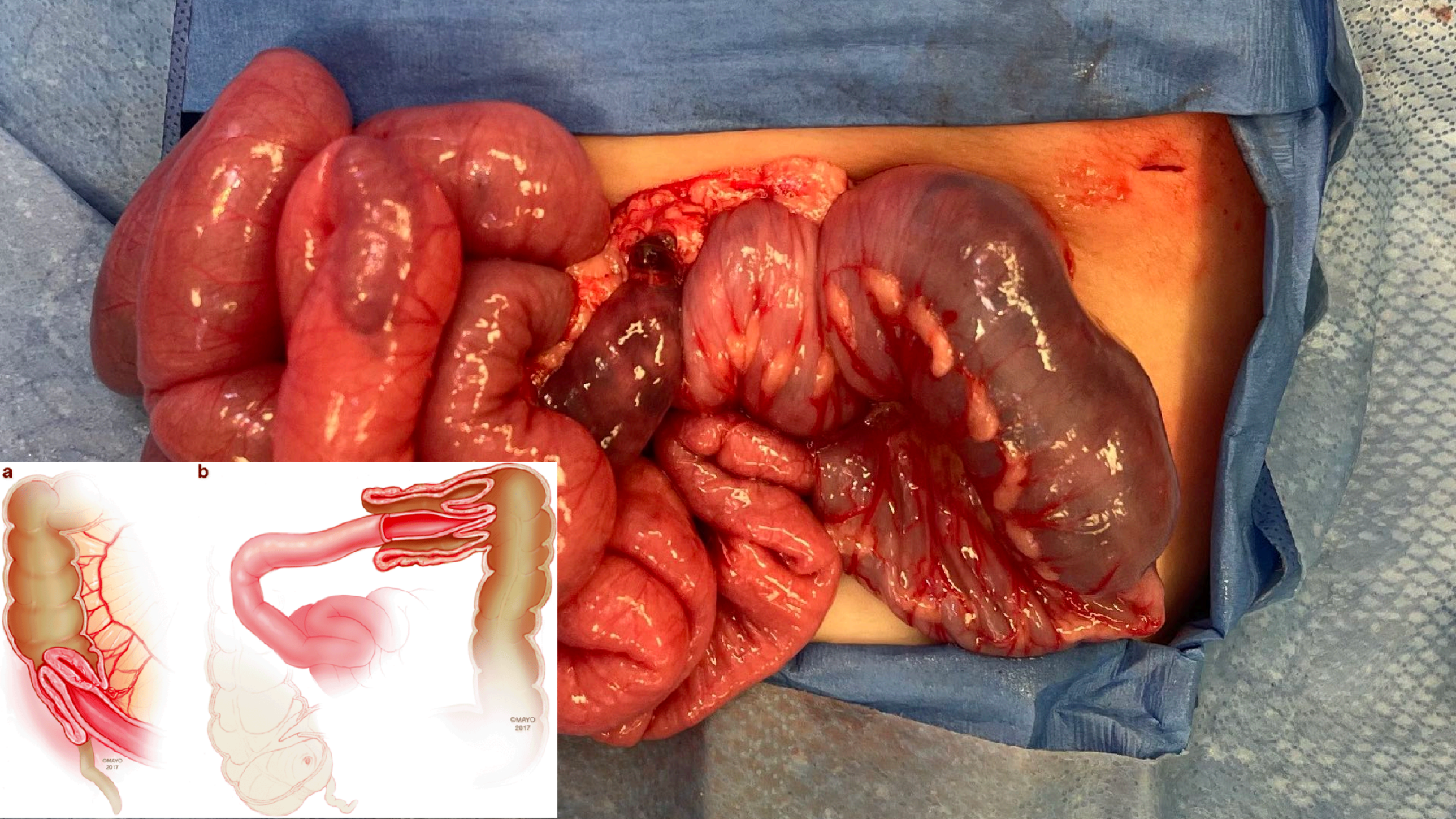
Intussusception Lead Points

BC Children's Hospital

- **Meckel's diverticulum**
- **Polyp**
- **Intestinal duplication**
- Henoch-Schonlein Purpura (HSP) vasculitis
- Appendix
- Hemangioma or other vascular malformation
- Foreign body
- Parasite (i.e. ascaris)
- Inspissated stool in cystic fibrosis
- Lipoma
- Neuroendocrine tumour
- Lymphoma





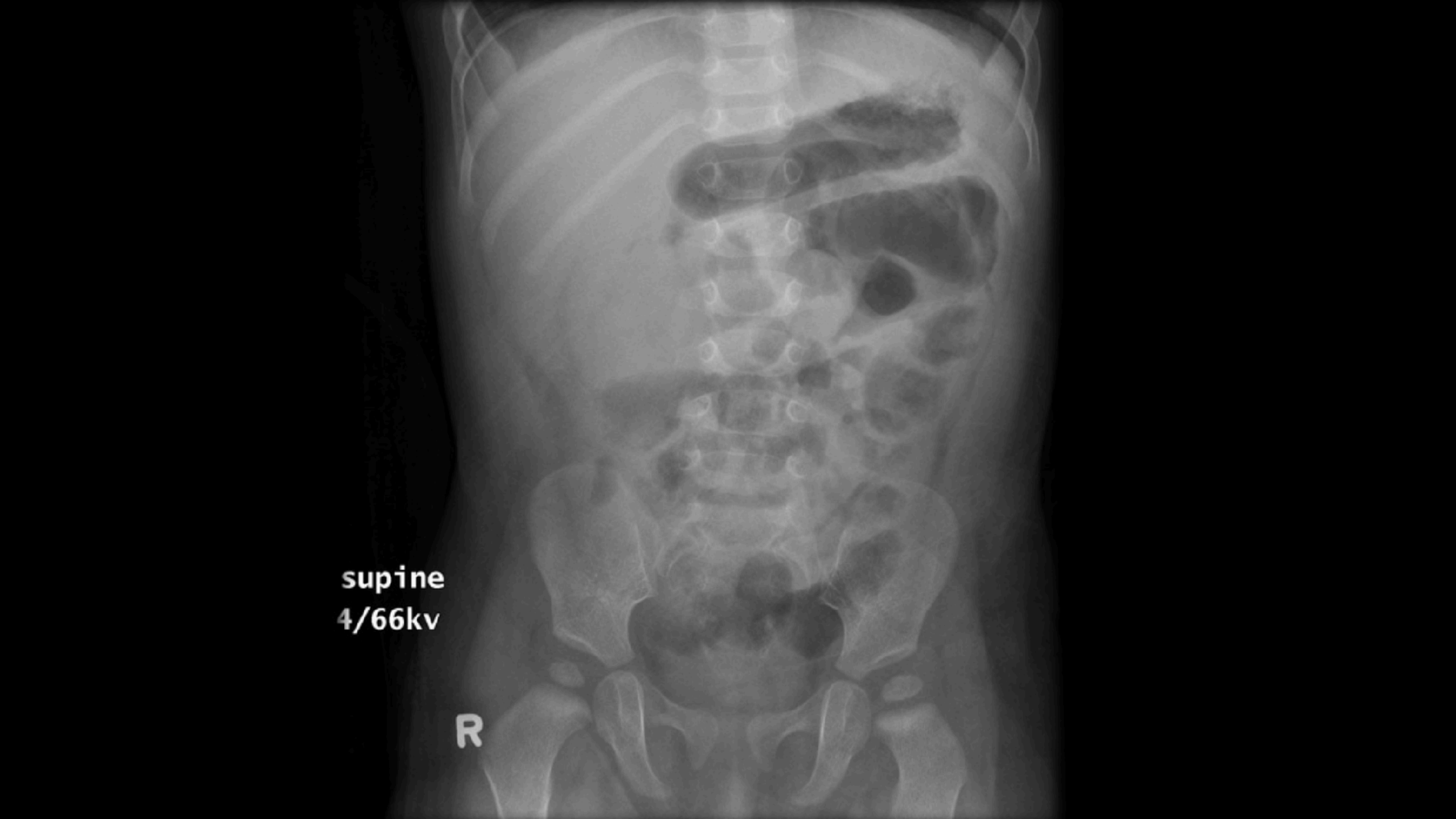

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Peds Surg Emergencies | Case 6

BC Children's Hospital

- A 10 year arrives in the emergency department with crampy abdominal pain for several days, emesis (initially food, now bilious), progressive abdominal distension, and obstipation.
- An 12Fr NG tube has been inserted. An IV has been inserted and patient has received 20cc/kg of NS and has been started on D5NS at 4:2:1 rule. Ceftriaxone and flagyl have been initiated.
- What are your next steps?


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Peds Surg Emergencies | Case 7

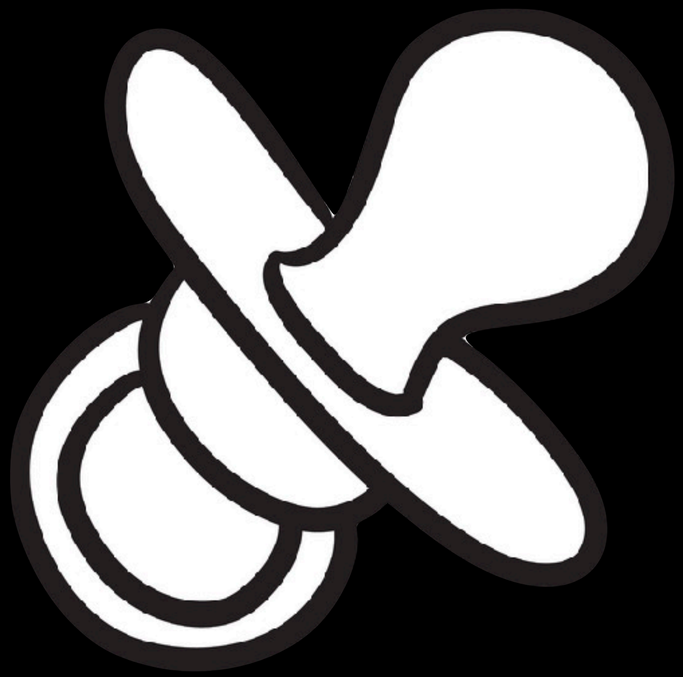
- A 4 week old newborn arrives in the emergency department with emesis (initially milky, now bilious), abdominal distension, and obstipation.
- An 8Fr NG tube has been inserted. An IV has been inserted and patient has received 20cc/kg of NS and has been started on D5NS at 4:2:1 rule. Triple antibiotics have been initiated.
- What are your next steps?

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Inguinal Hernia | Reduction

BC Children's Hospital



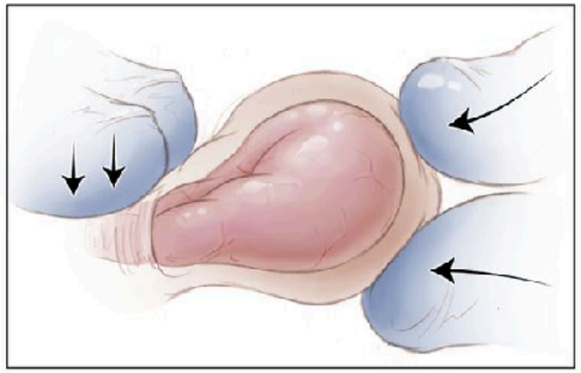




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Inguinal Hernia | Reduction

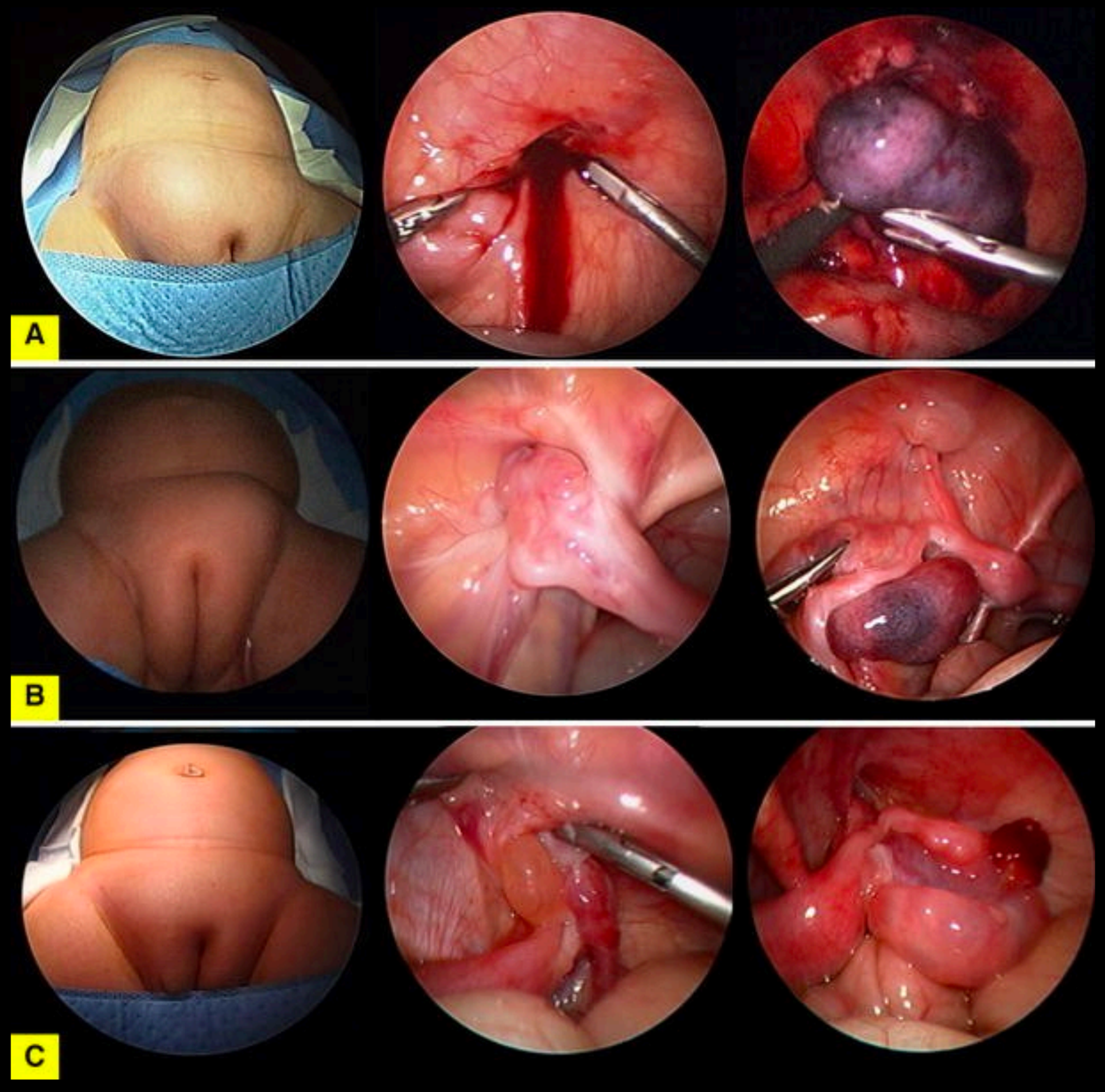
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Inguinal Hernias | Female Incarceration

BC Children's Hospital



Inguinal Hernias | Basics

- Almost all pediatric inguinal hernias are **indirect**
- Occur in 1-5% of children → but up to 30% of premature babies
- More common in boys
- 60% right-sided, 30% left-sided, 10% bilateral
  - Right testicle descends after left testicle during 8th month of gestation
  - Bilateral more common in females, pts presenting with left-sided hernias, premies, history of undescended testicle, and young age at presentation

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Inguinal Hernias | Photos

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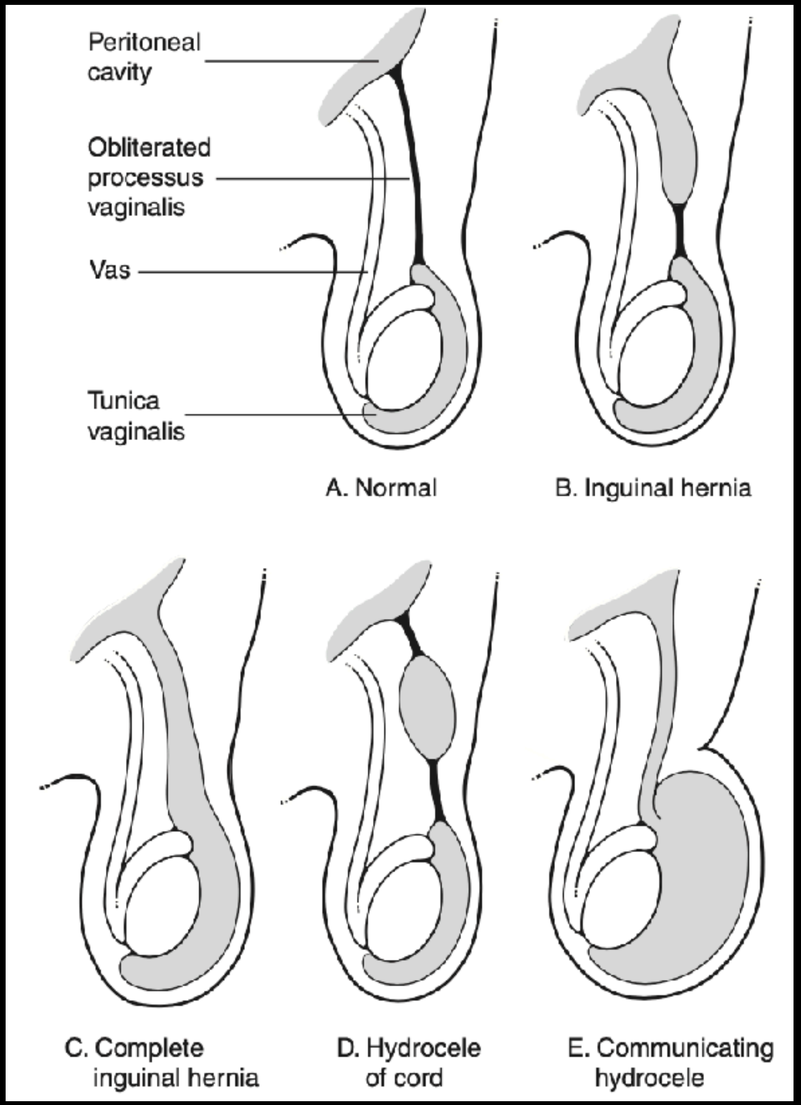






Inguinal Hernias vs Hydroceles

- Communicating hydrocele = inguinal hernia!
- Differentiate communicating vs. non-communicating hydrocele based on **history**
  - Communicating hydroceles treated as inguinal hernias
  - Non-communicating hydroceles should resolve by 1 year old



Inguinal Hernias vs Hydroceles

- Incarcerated hernia vs. non-communicating hydrocele (or hydrocele of the cord) can be a diagnostic dilemma
- Ways to differentiate:
  - History and exam → not always helpful
  - Transillumination → but in a baby, you can transilluminate bowel!
  - AXR
  - Ultrasound



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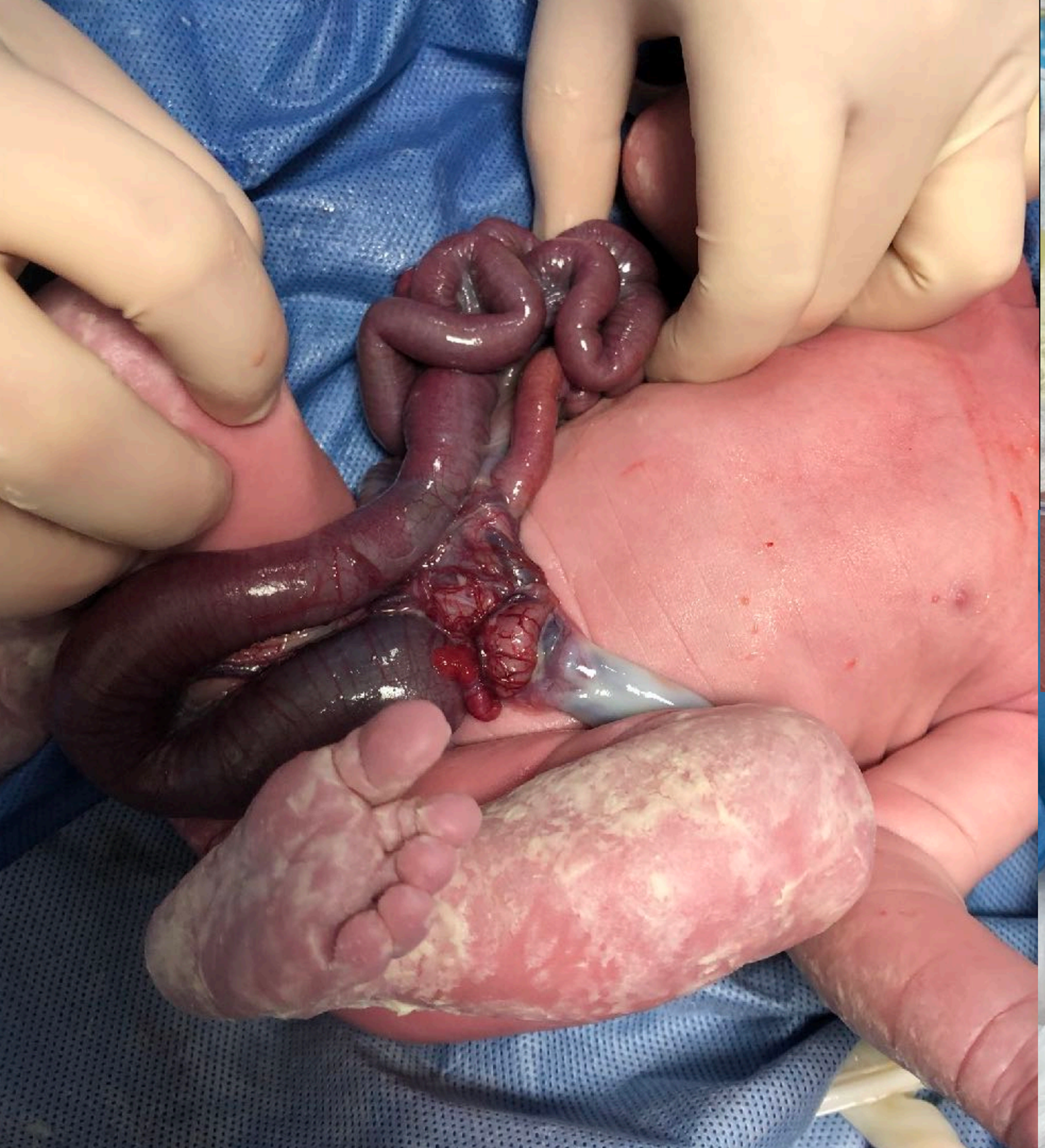
Peds Surg Emergencies | Case 8

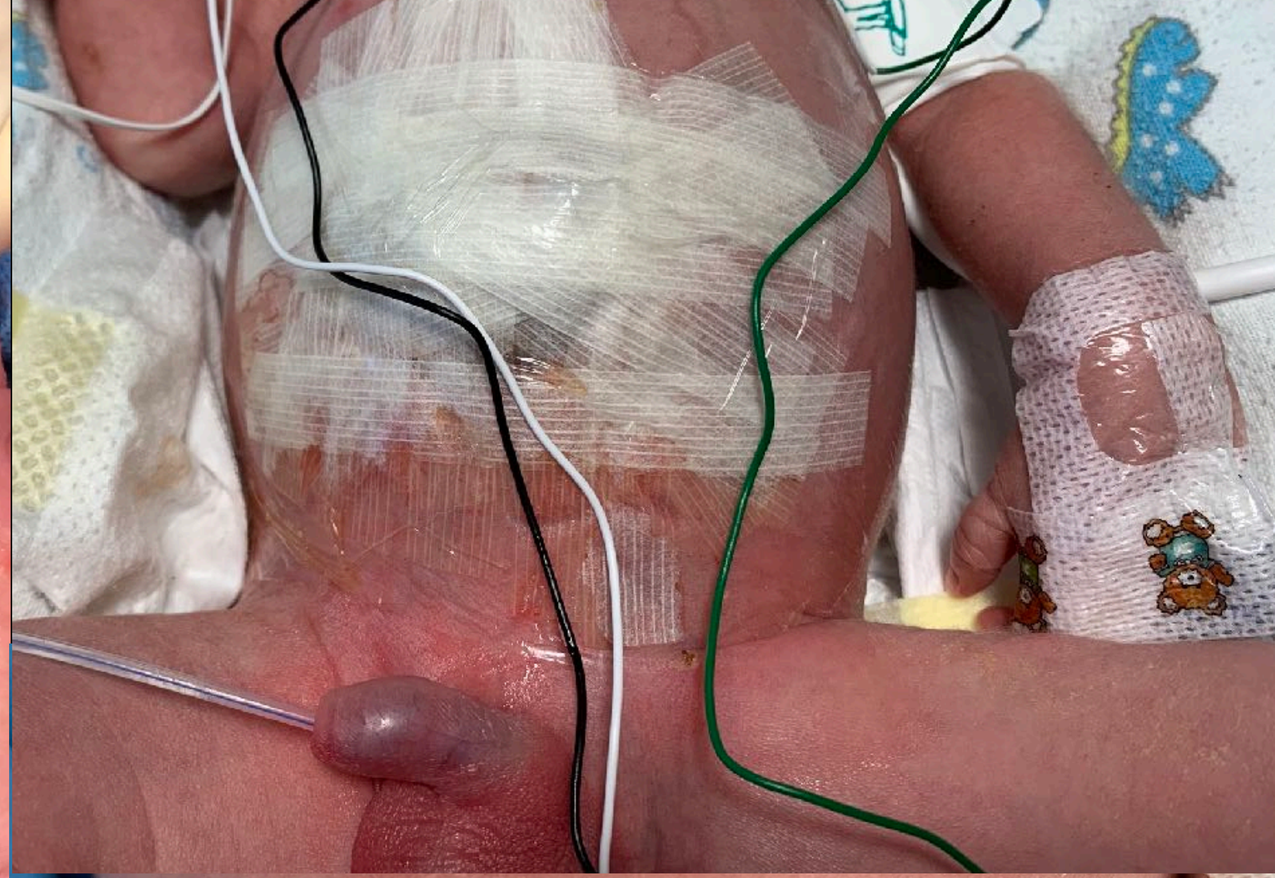
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- You are called to the delivery room to assess a newborn baby with “their bowel outside of their body.” The nurse tells you the bowel is floating freely.
- What is your differential diagnosis? What is the most likely diagnosis?
- After assessing the baby, what are your next steps?


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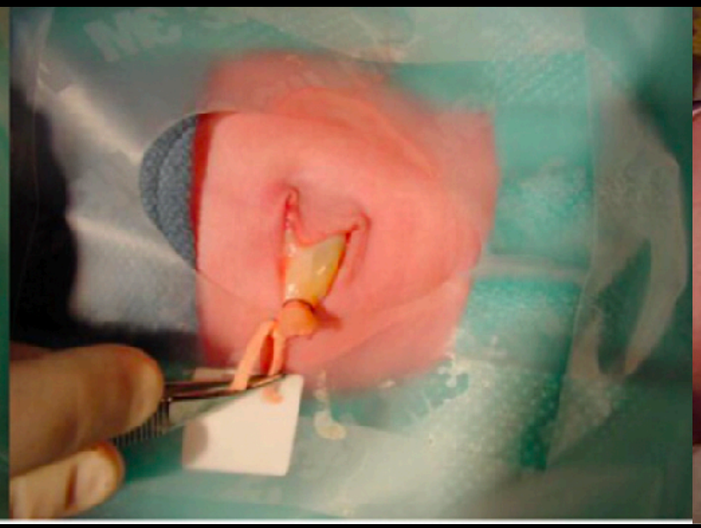
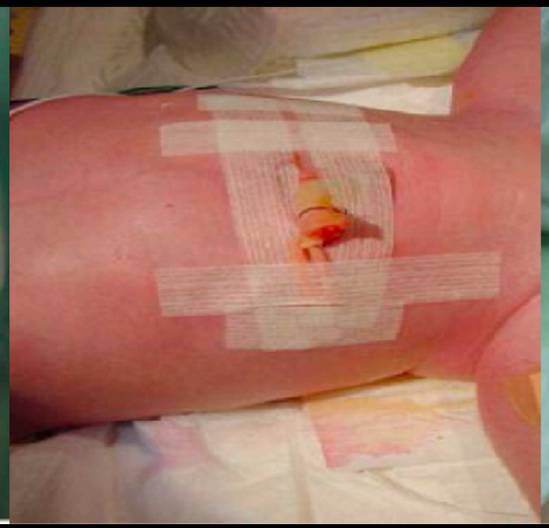




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Gastroschisis Sutureless Closure

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Peds Surg Emergencies | Case 9

BC Children's Hospital

- You are called to the delivery room to assess a newborn baby with “their bowel outside of their body.” The nurse tells you there is a covering over the bowel.
- What is your differential diagnosis? What is the most likely diagnosis?
- After assessing the baby, what are your next steps?













