Pediatric Urology tutorial

Antenatal hydronephrosis and GU anomalies

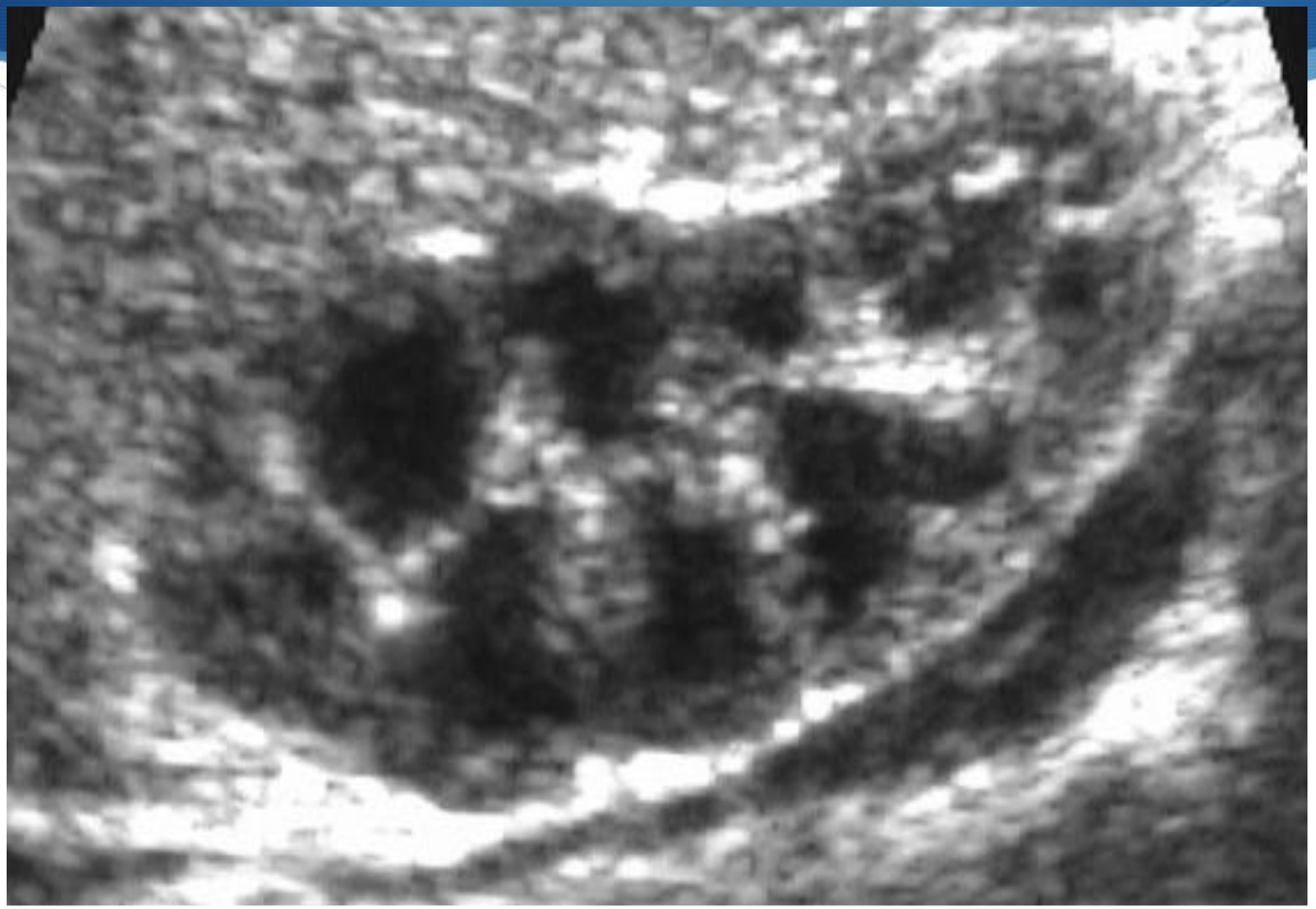
Surgery 453

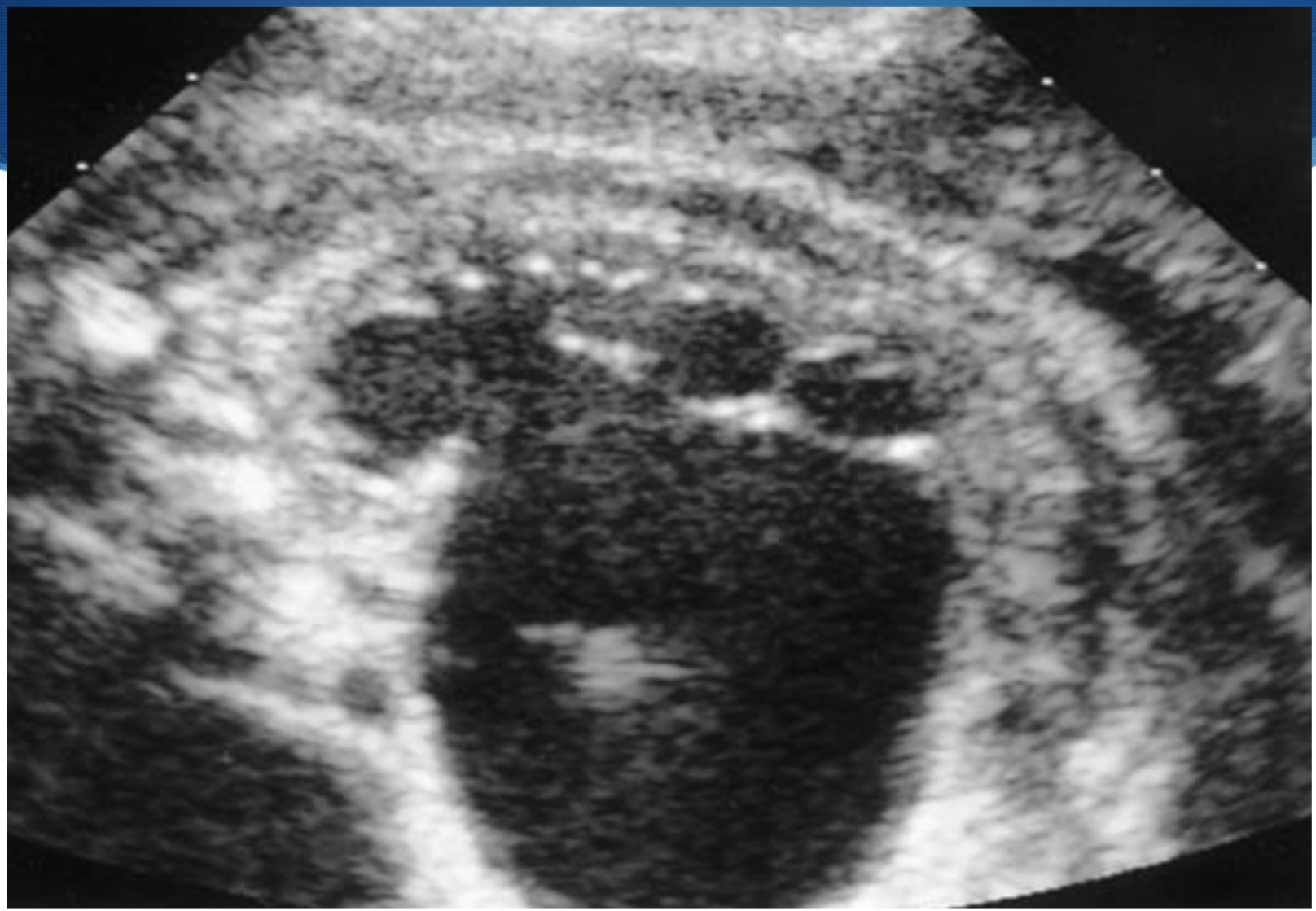
Antenatal Hydronephrosis

- Definition of hydronephrosis?

- Antenatal ?

Normal Antenatal Renal US





- You have 2 days old boy diagnosed bilateral hydronephrosis on antenatal US, what the possible causes?

- If this was unilateral , what are the possible causes?

POSTNATAL EVALUATION AND MANAGEMENT

History

- Maternal health
- Maternal PMHx & FmHx: GU anomalies, course of pregnancy, DM, Meds
- Previous pregnancies: siblings w/ VUR, hydro
- Gender of the child
- Voiding (1st void , straining, wetting the diaper)
- EtOH, drug use

Pre-natal U/S

- Gender of fetus
- Single vs. multiple
- AF volume
- Kidneys: degree of hydro, variation in hydro b/w exams, unilateral/bilateral hydro.
- Ureters: hydroureter
- Bladder: presence, fullness, size, thickness, emptying
- Urethra: dilated posterior urethra
- Other abnormalities
- Overall growth and development

Oligohydramnios

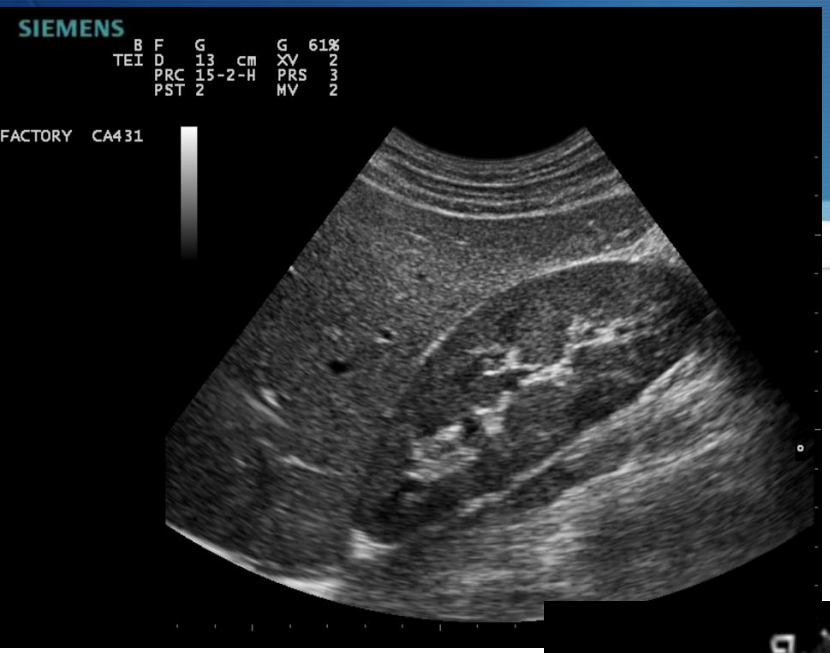
- OLIGOHYDRAMNIOS = amniotic fluid <500cc (pocket <2cm)
- Before 16-18 wks, most of AF is a placental transudate
- By 20-22 wks, most of AF is fetal urine (urine production starts at ~12 wks)
- Oligohydramnios that develops only after 18-20 weeks likely represents GU tract obstruction or abnormal renal development.

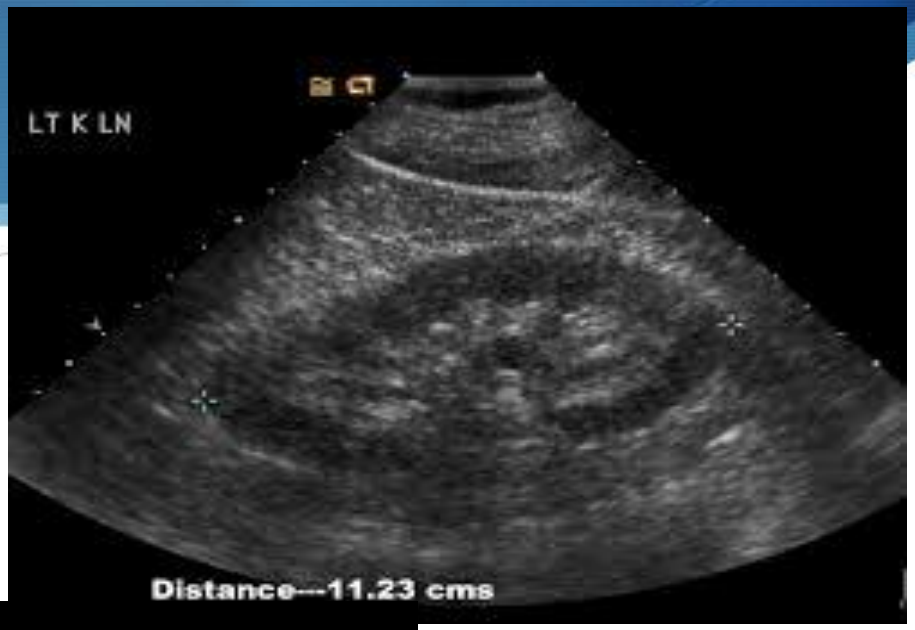
Investigations

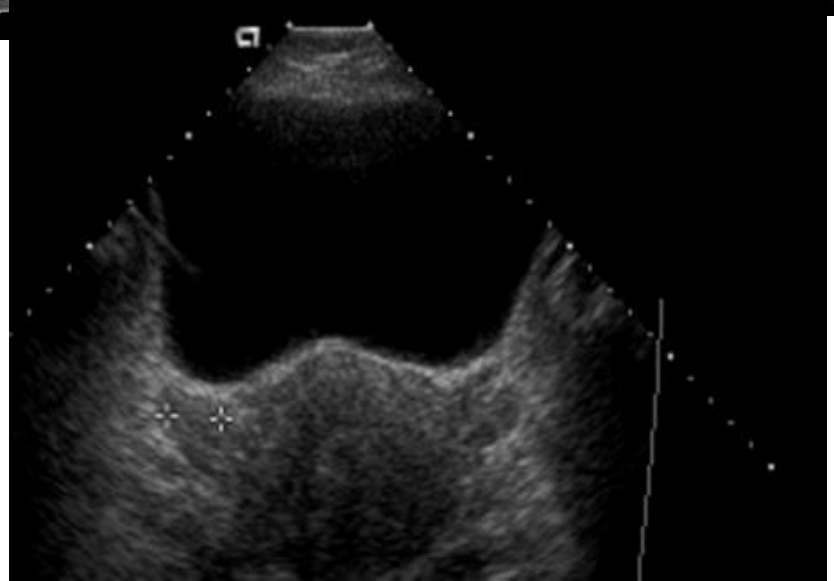
- US
- VCUG
- Nuclear scan

No IVP

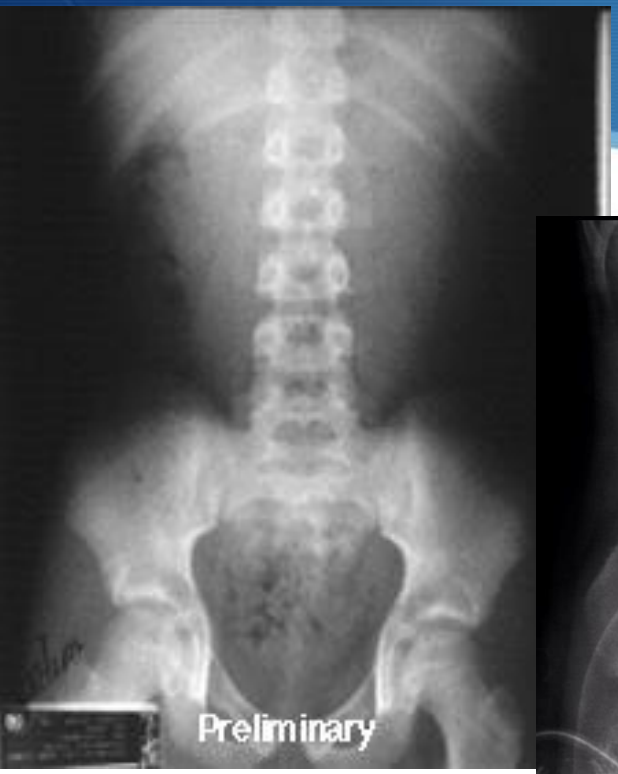
Normal Renal & Bladder US

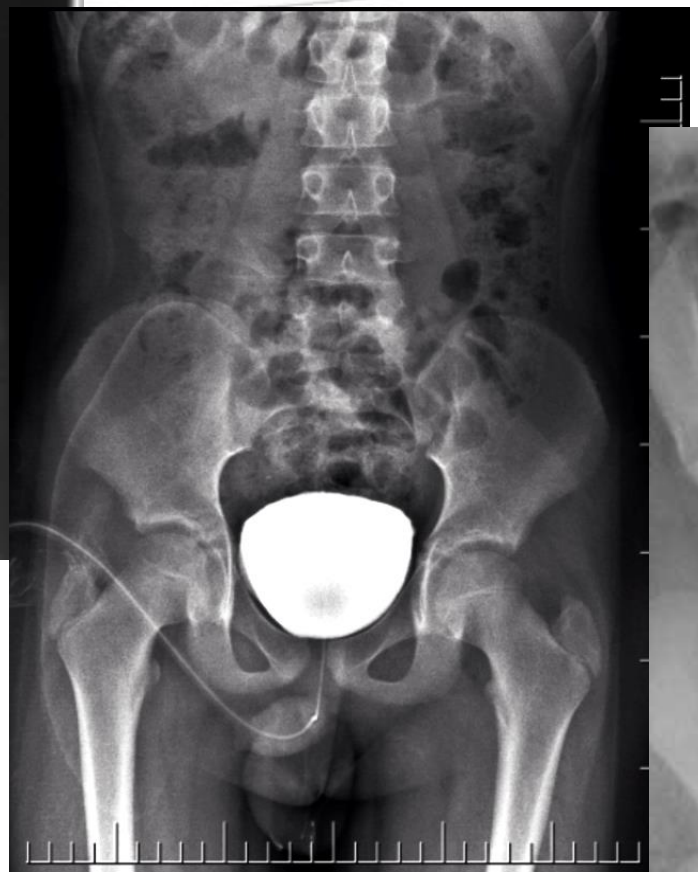


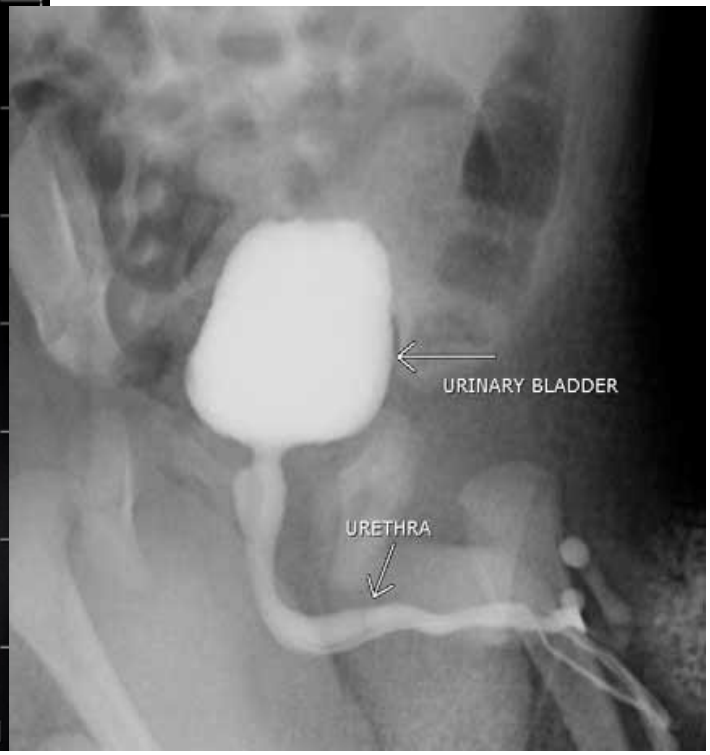




Voiding cystourethrogram (VCUG)

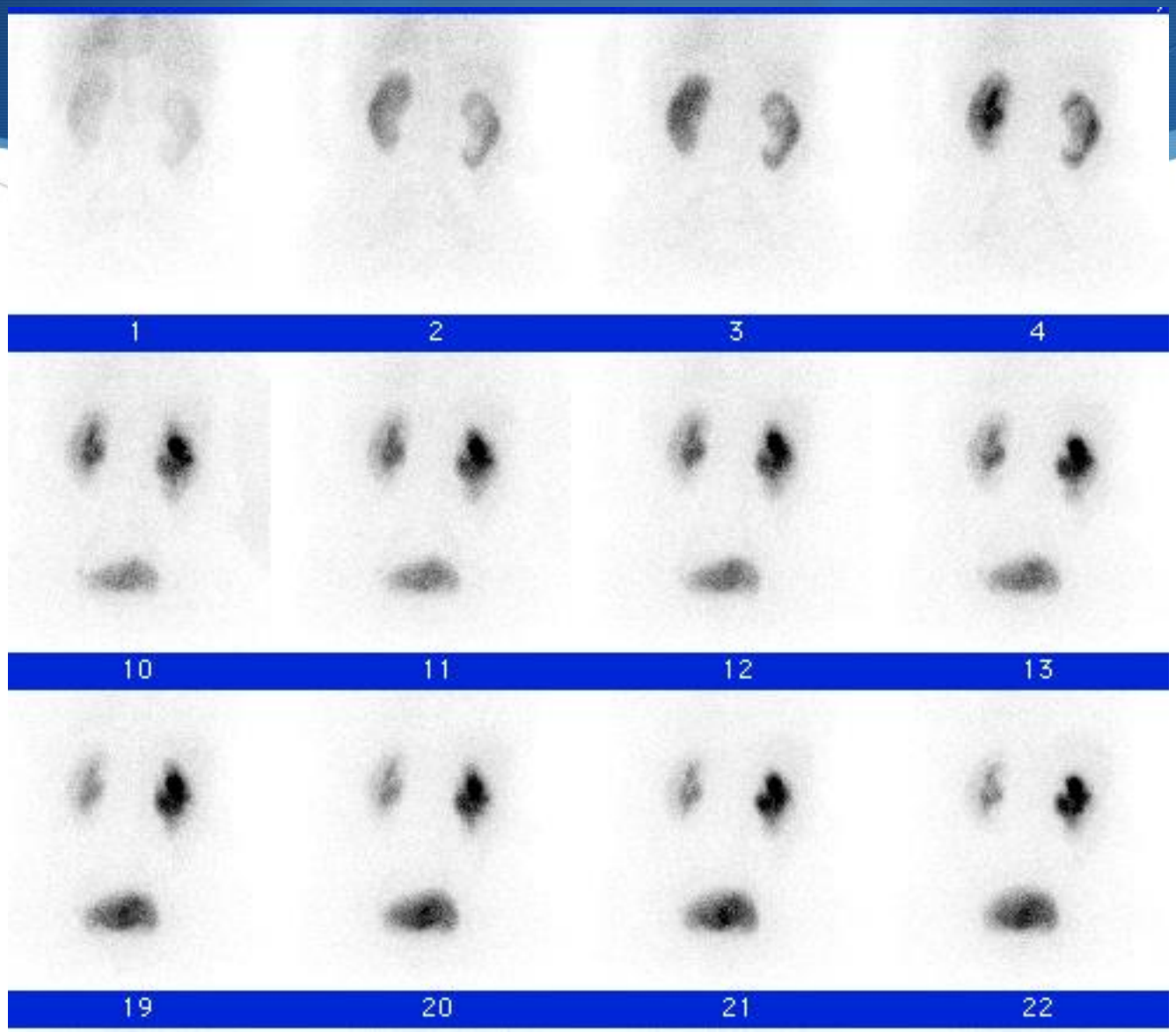




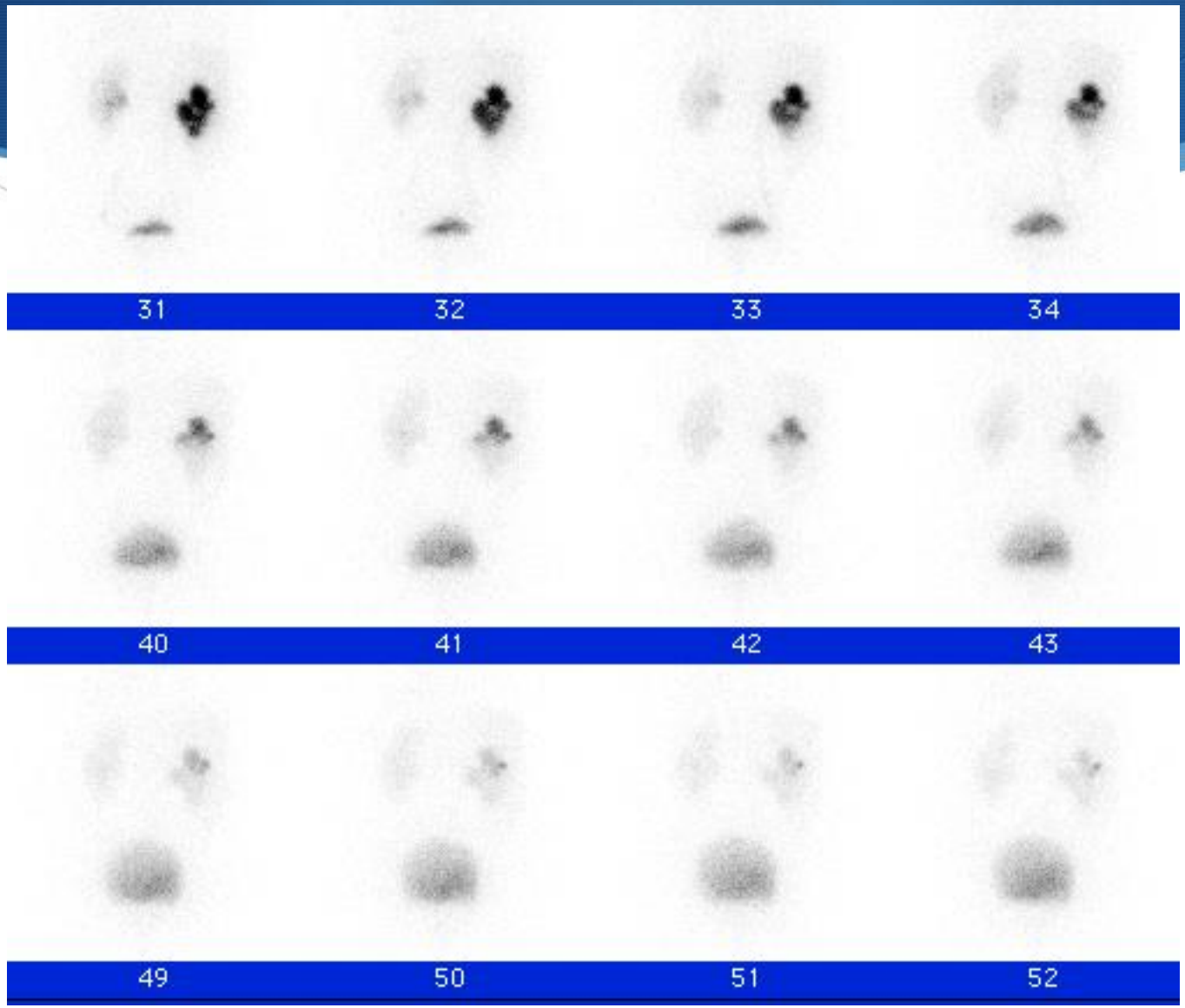


Diuretic renal scan

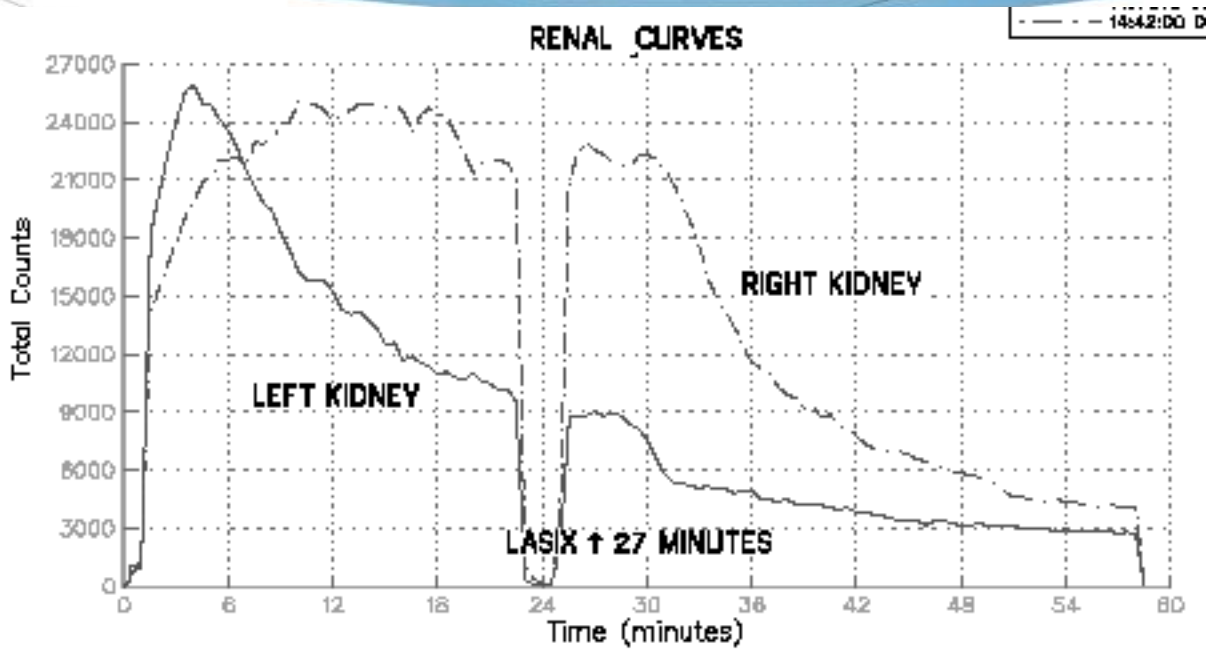
pre-Lasix



post-Lasix



No UPJ obstruction



T1/2
R = 6'
L = 2'

Post natal workup

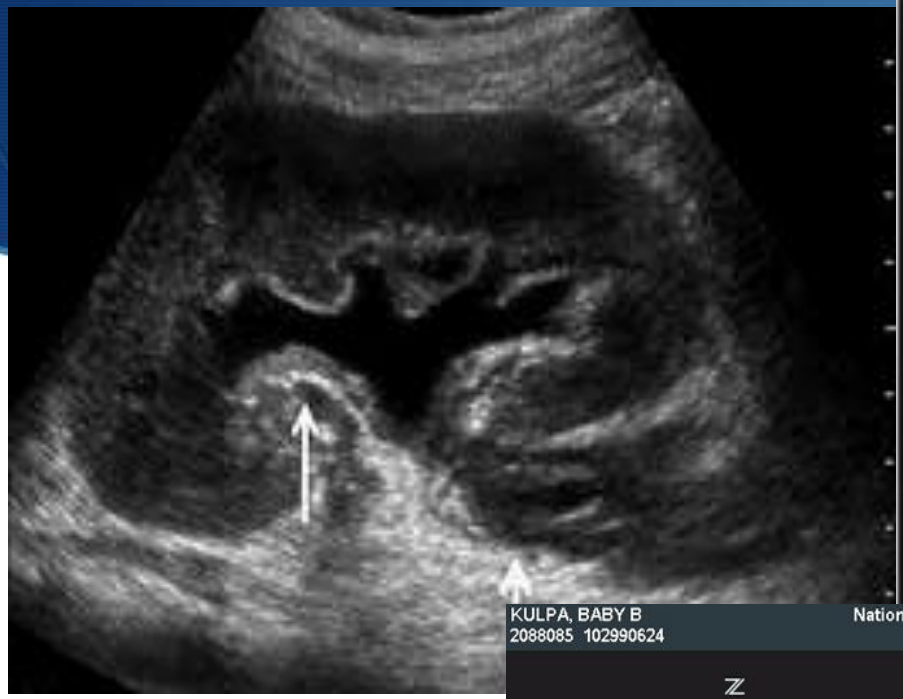
Post-natal

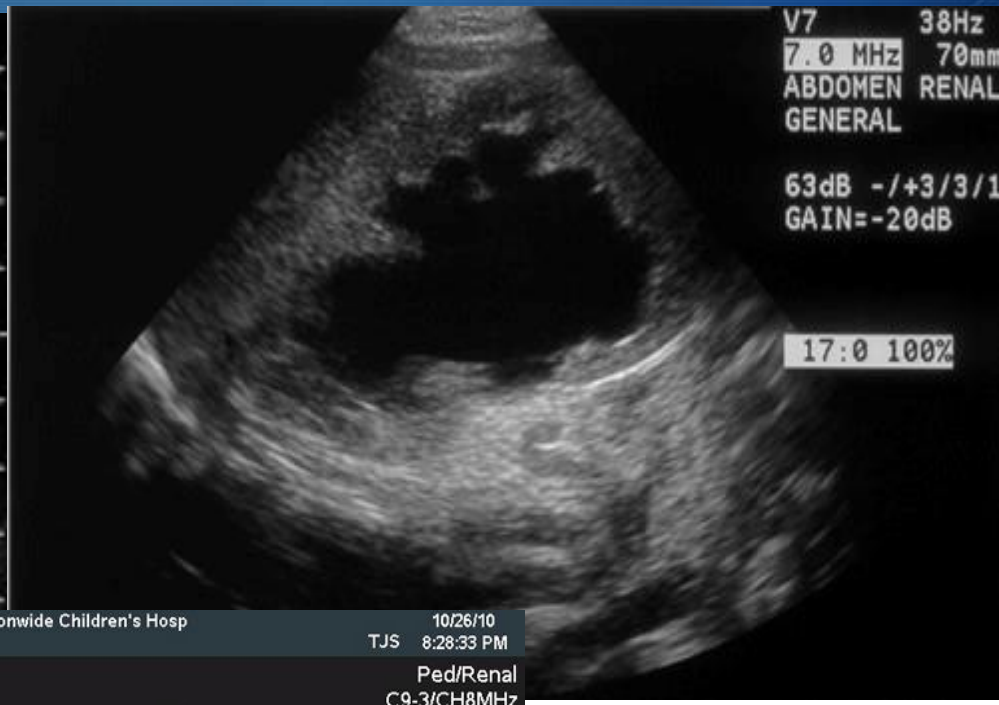
- Observe child voiding.
- Serum Cr. (When and why?)
- Prophylactic antibiotic.
- Repeat US +/- VCUG or nuclear scan .

- Divide your self in 3 teams , each team will be responsible for a case scenario.

Case 1

- 2 days old term boy (SVD), found to have bilateral hydronephrosis on antenatal US?
- What are the possible causes ?
- How would you manage this case?

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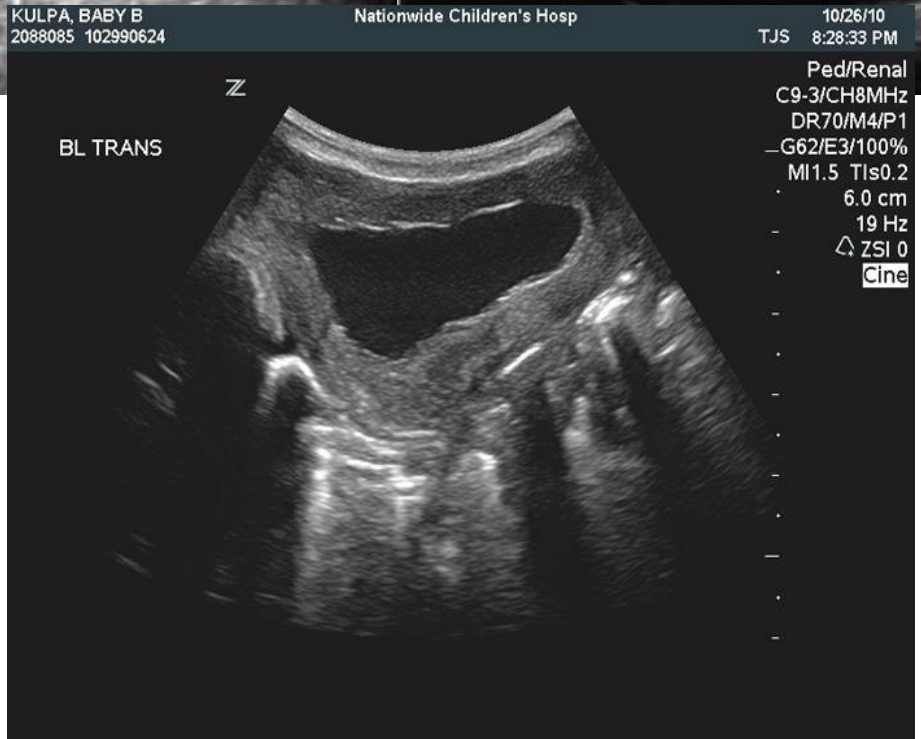
GAIN=-20dB
17:0 100%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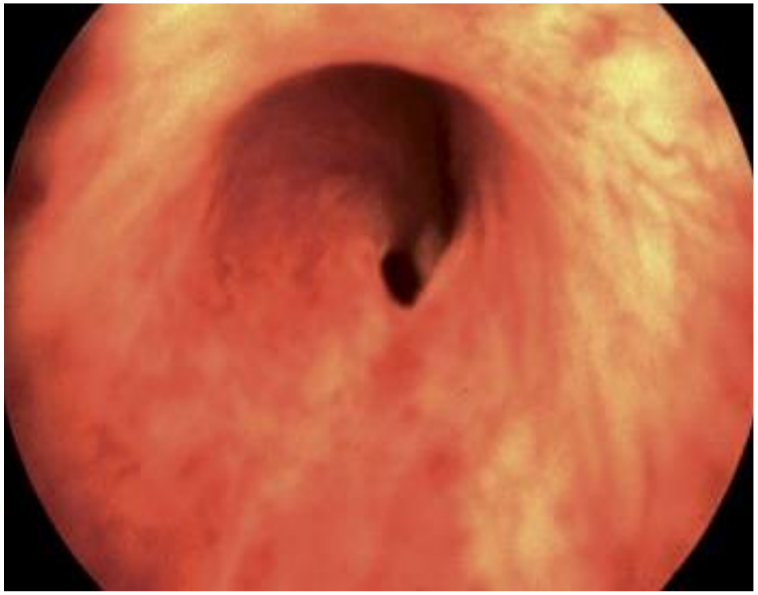
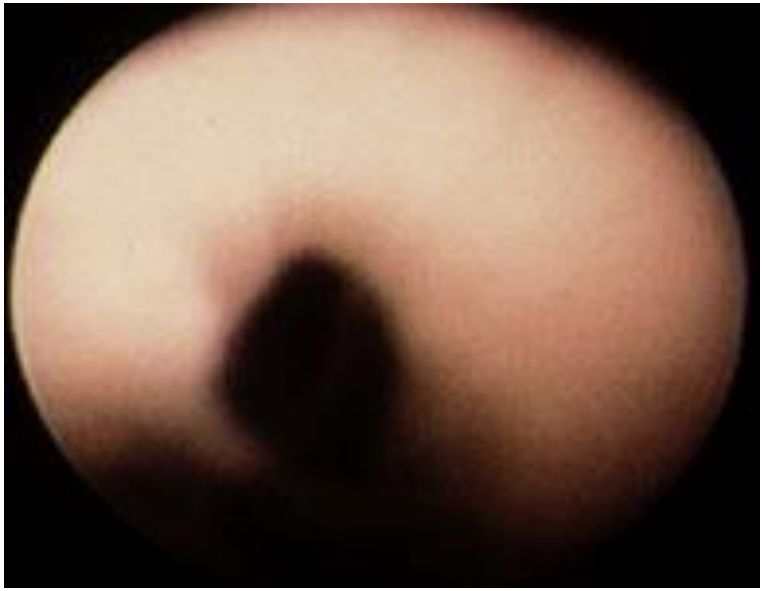
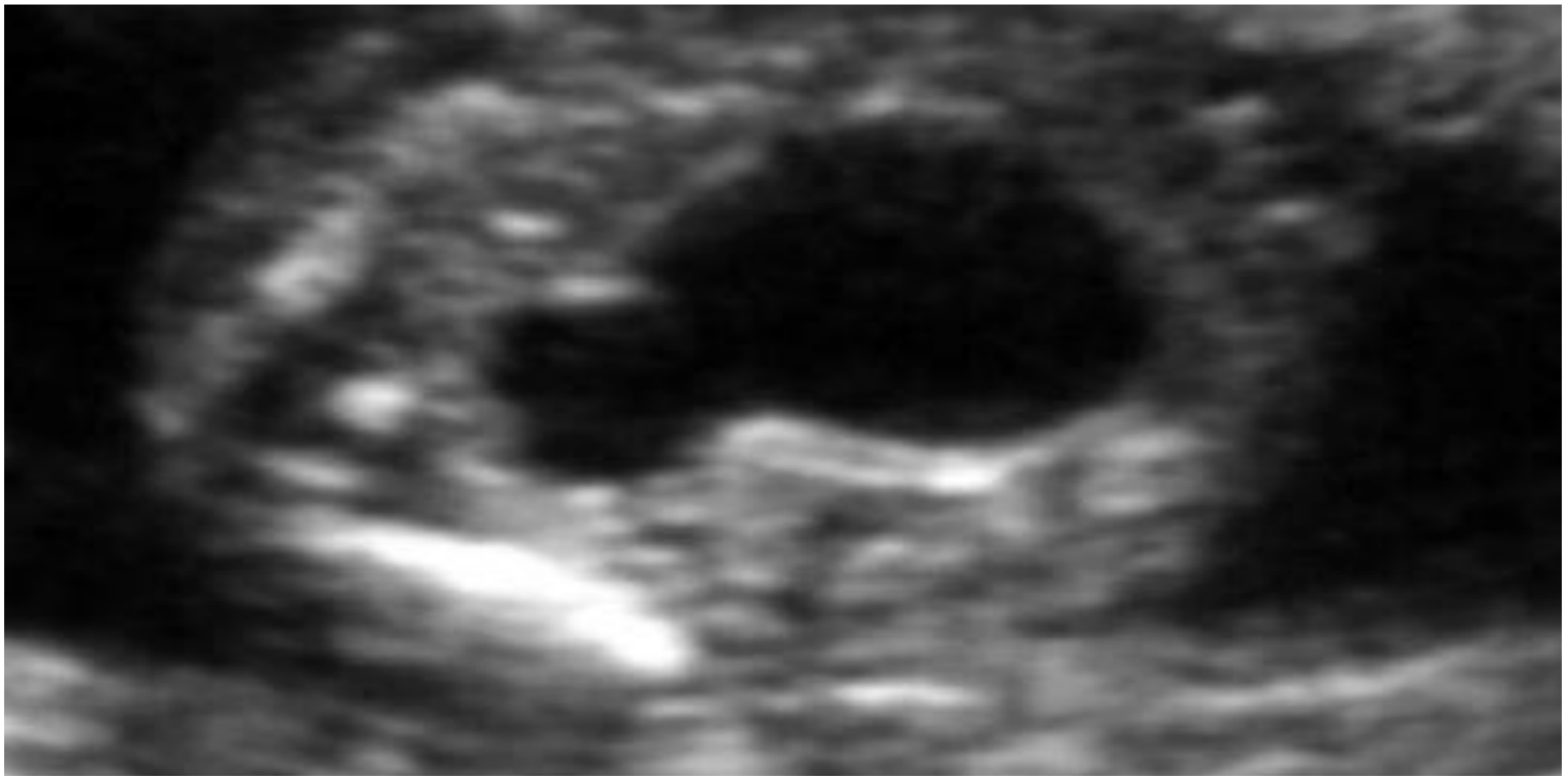
Ped/Renal
C9-3/CH8MHz
DR70/M4/P1
G62/E3/100%
MI1.5 TIs0.2
6.0 cm
19 Hz
ZSI 0
Cine

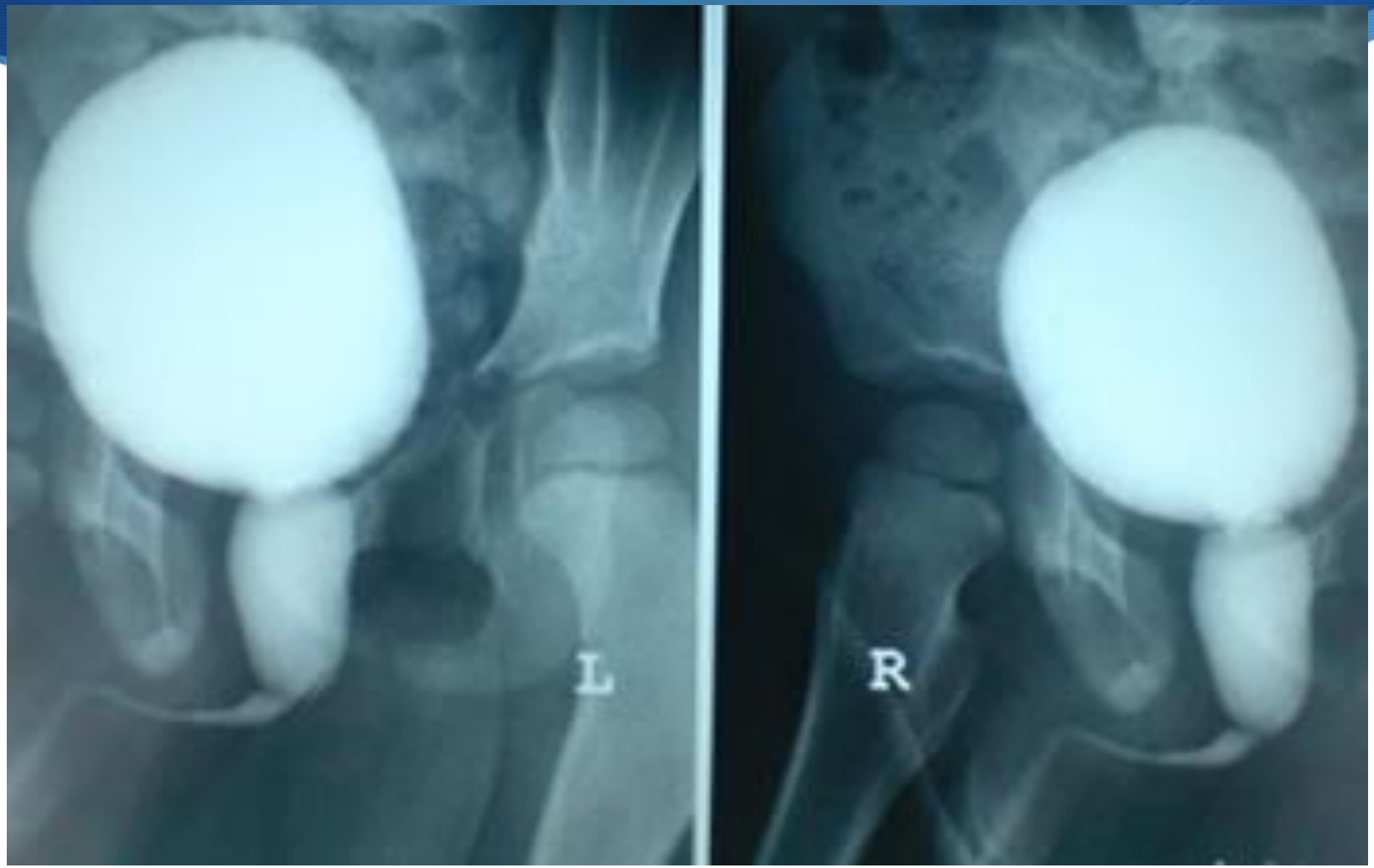
Posterior urethral valve (PUV)

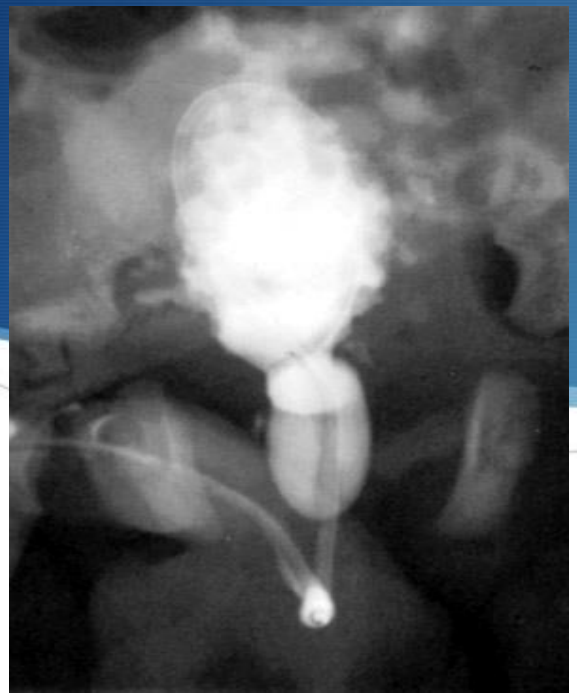
- **congenital obstructive membrane** in posterior urethra that impedes antegrade flow of urine.
- occurs in 1 in 8,000-25,000 live male births.

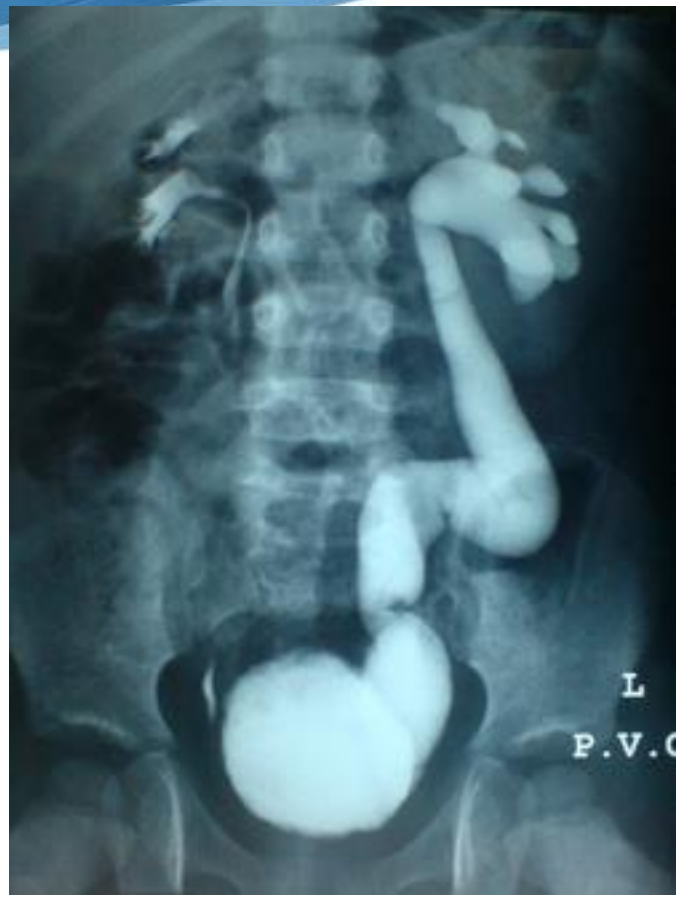







L
R




L
P.V.C

Initial Management of PUV

1) **1ST step of management :** Bladder drainage (permits medical stabilization)

2) Effective NICU support for issues with pulmonary hypoplasia & renal insufficiency

3) Lab investigations

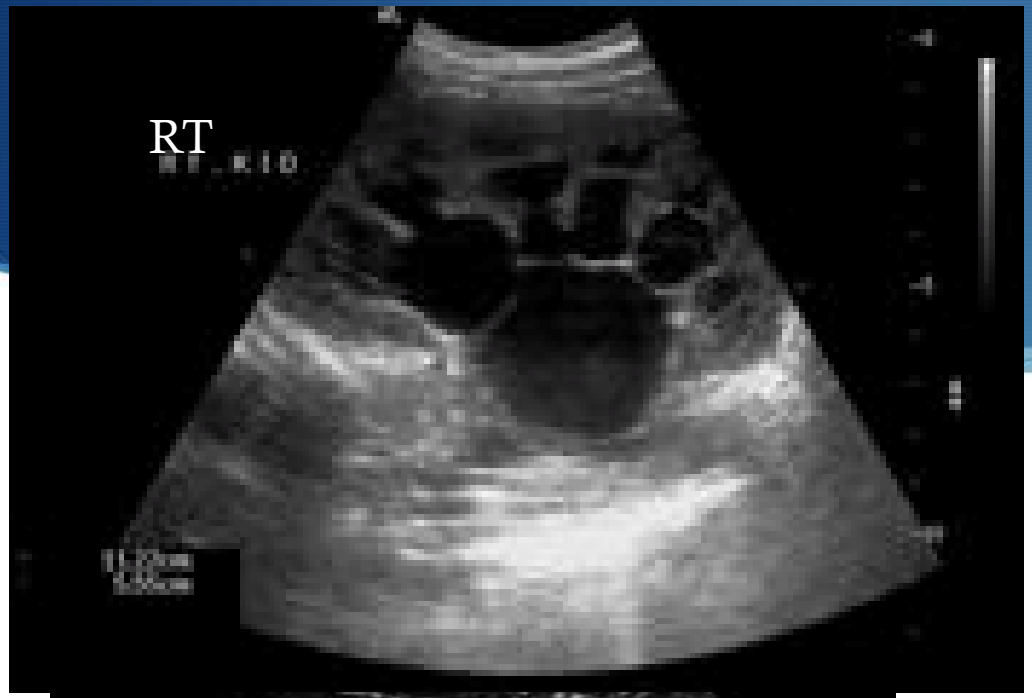
   - Electrolyte, creatinine , BUN: may take 48hrs to be accurate.

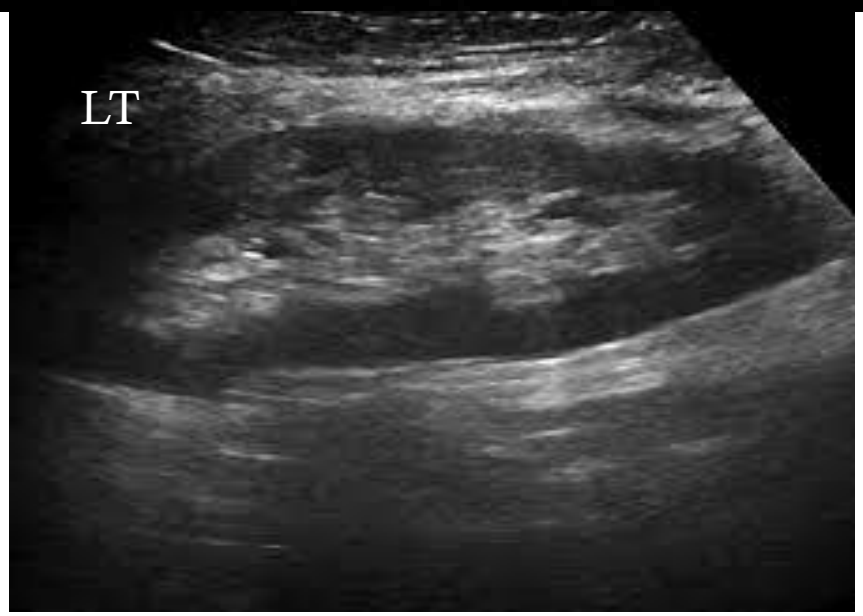
4) Prophlactic Abx.

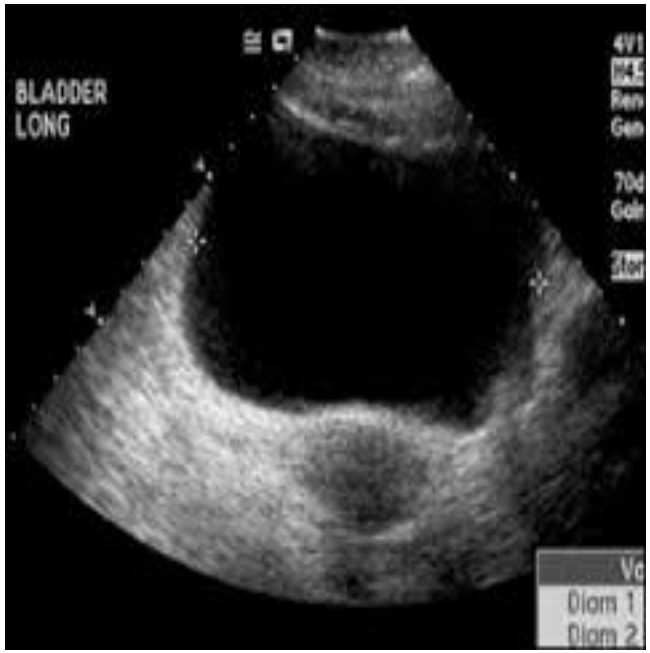
5) **Cystoscopy and Valve ablation**. (Definitive treatment)

Case 2

- 5 days old boy with unilateral hydronephrosis diagnosed on antenatal US.
- What is the possible causes ?
- How would you approach this case?

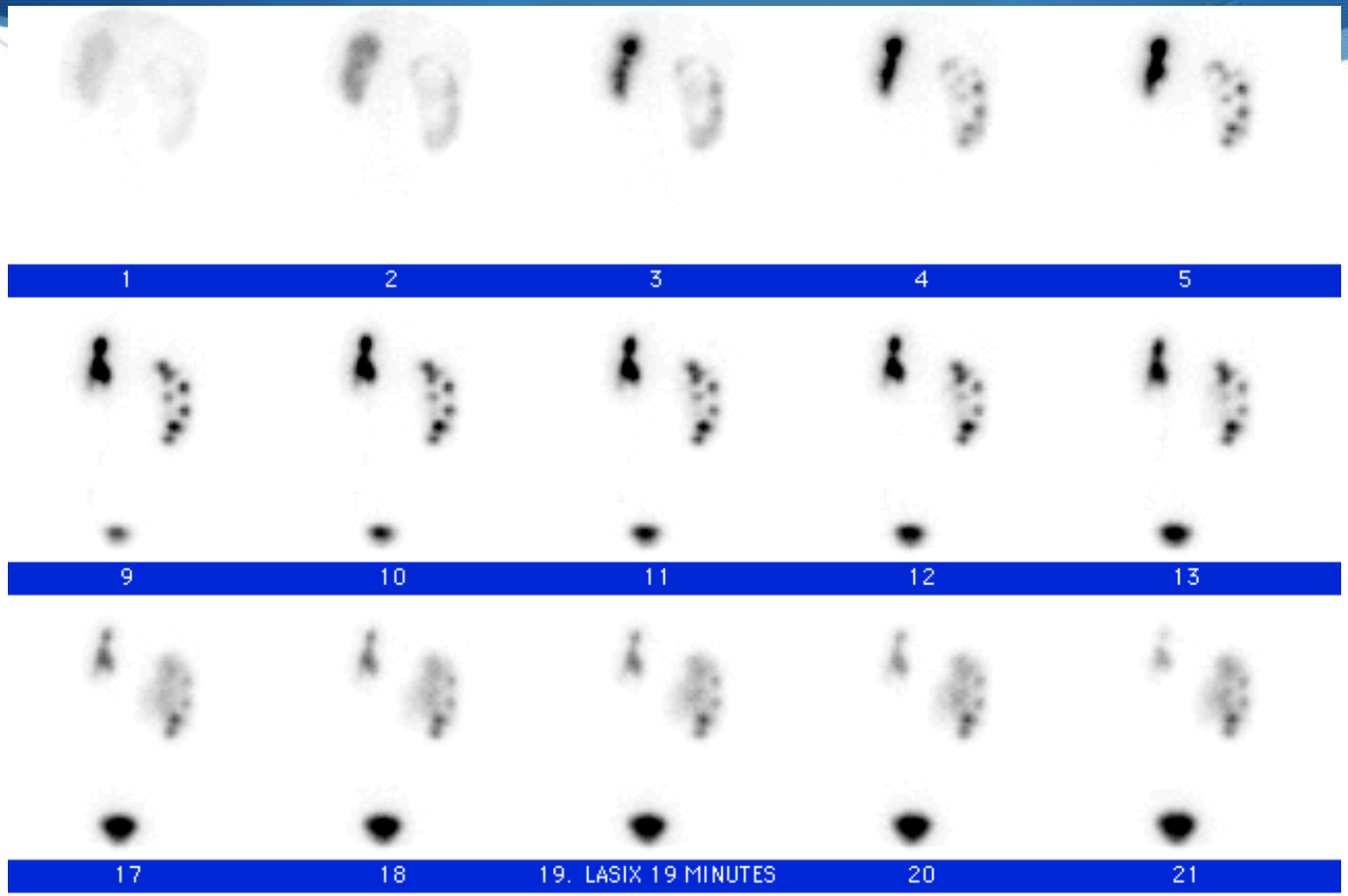

RT


LT

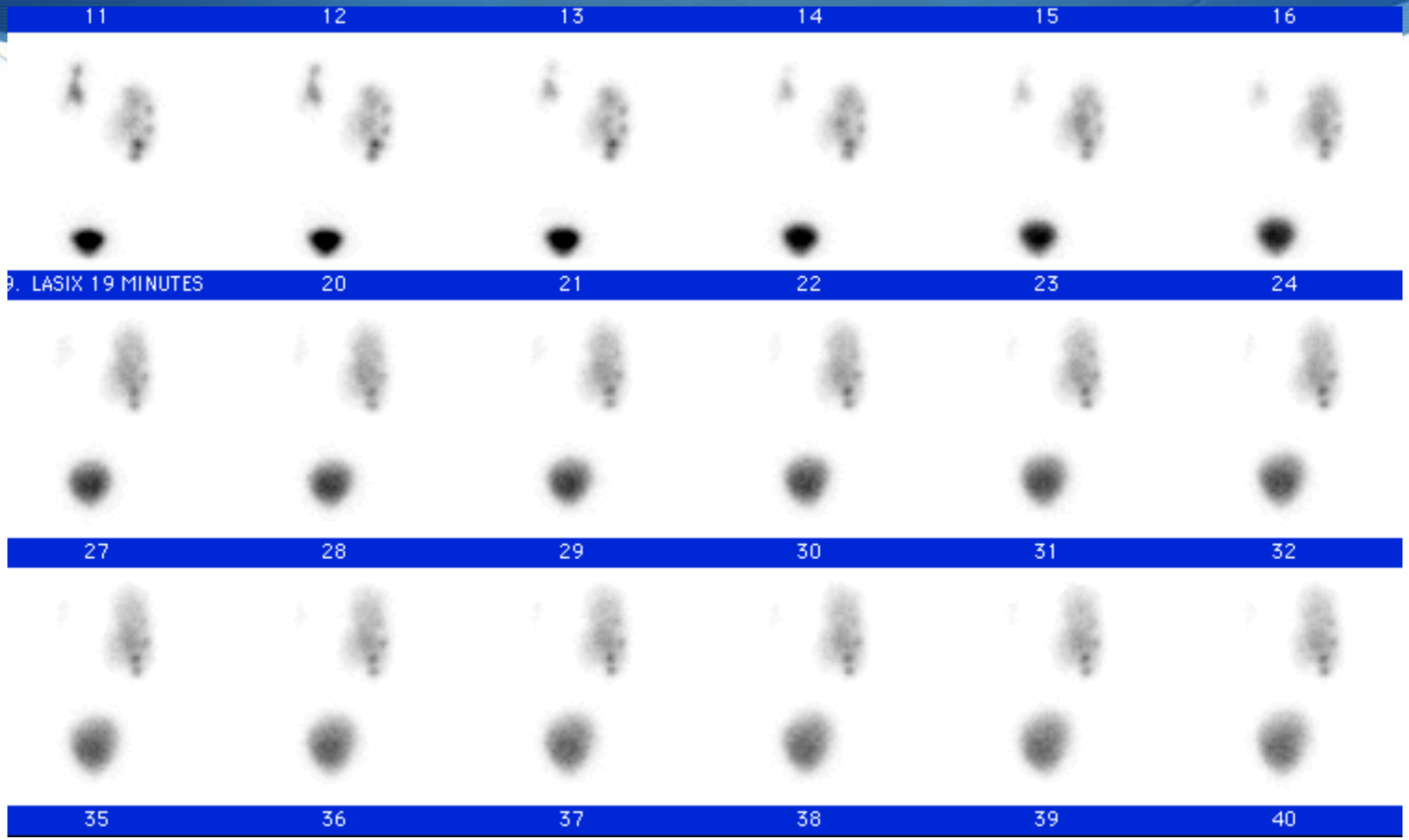

BLADDER
LONG
Diam 1
Diam 2

WHAT IS NEXT?

Pre-Lasix



Post-Lasix


11
12
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LASIX 19 MINUTES
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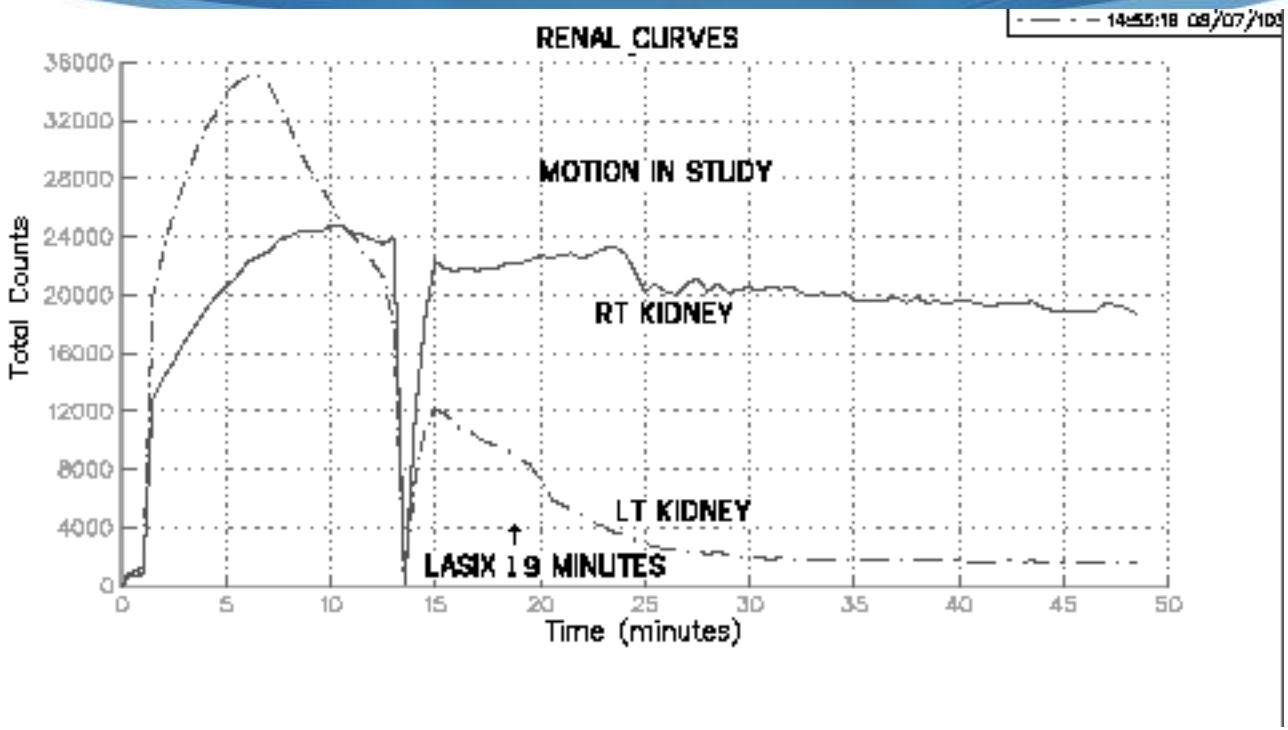
40

Rt UPJ obstruction

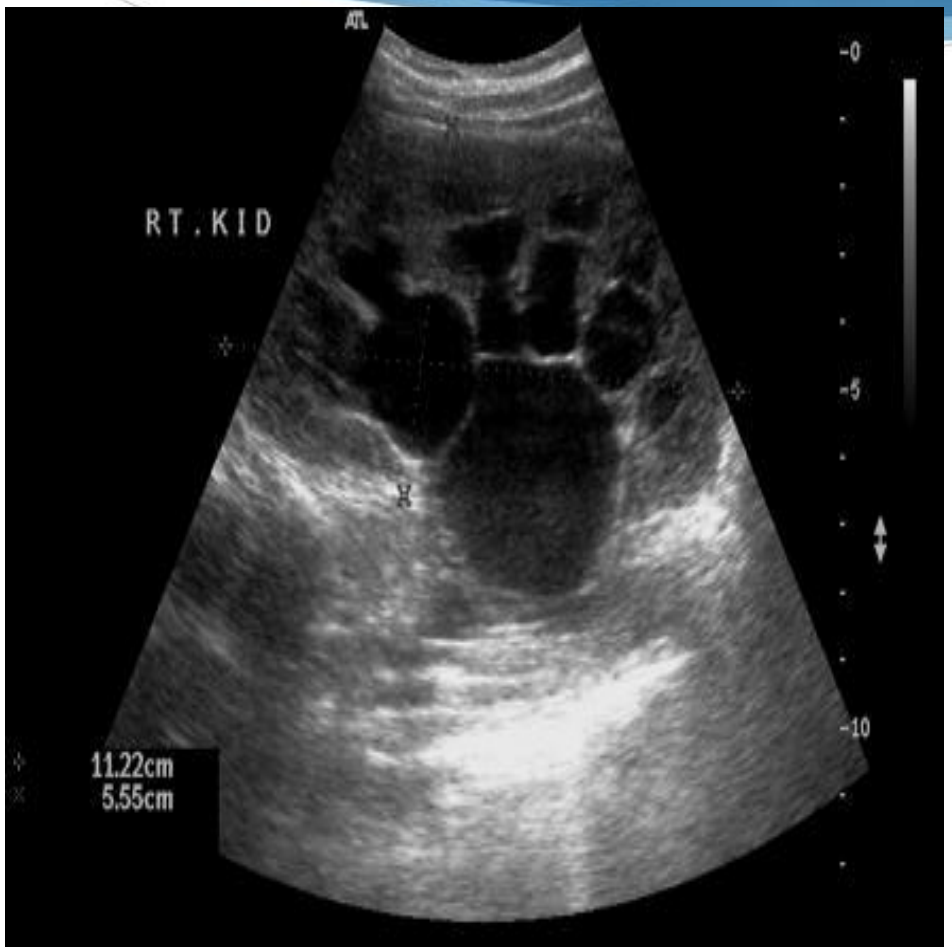


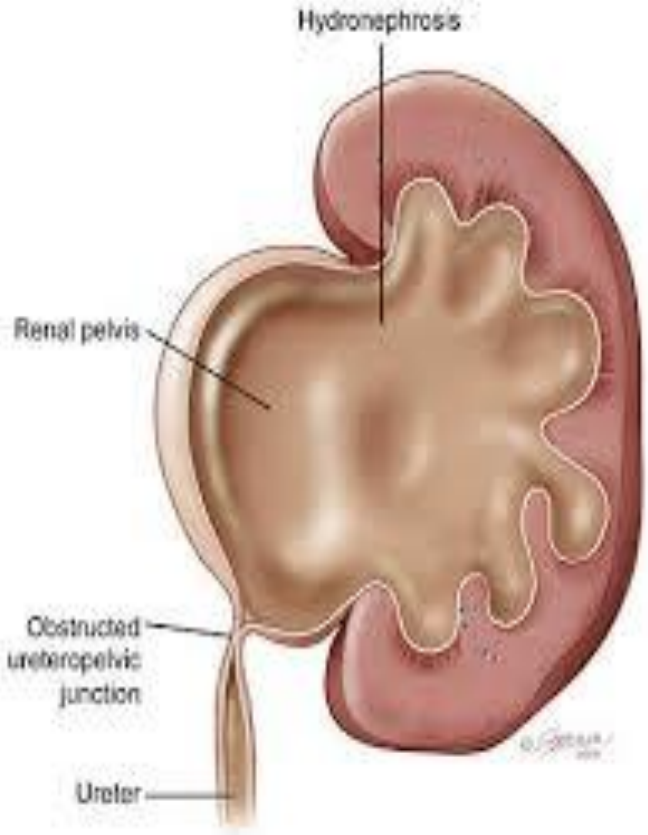
T1/2
R = N/A

Ureteropelvic Junction Obstruction

- **Most common cause of UNILATERAL hydro in fetal kidney (~50%)**

- More common in Males, **Lt> Rt.**

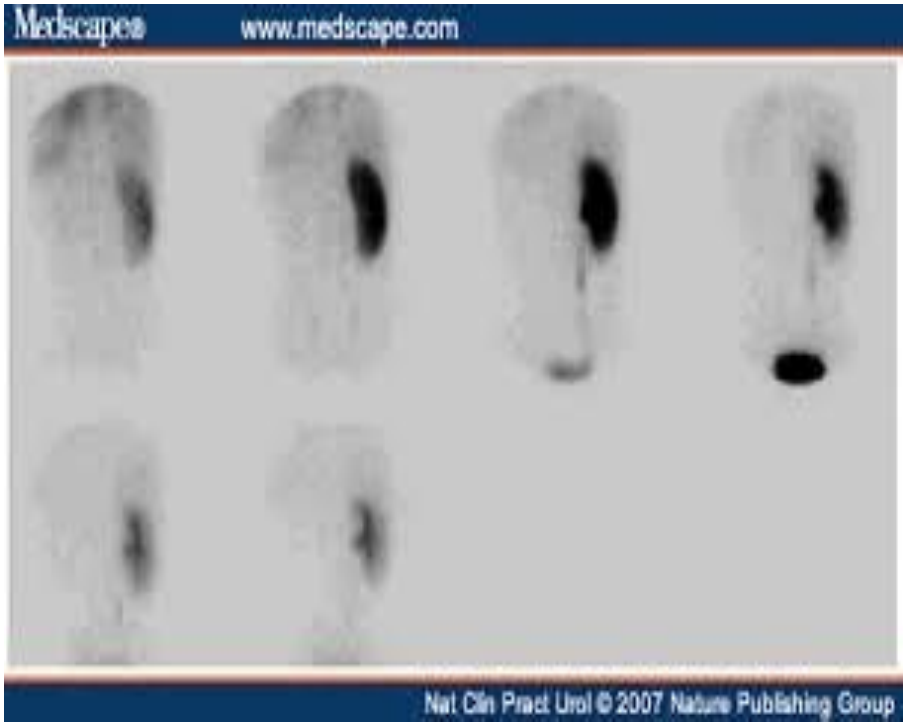

RT.KID
11.22cm
5.55cm


Hydronephrosis
Renal pelvis
Obstructed ureteropelvic junction
Ureter

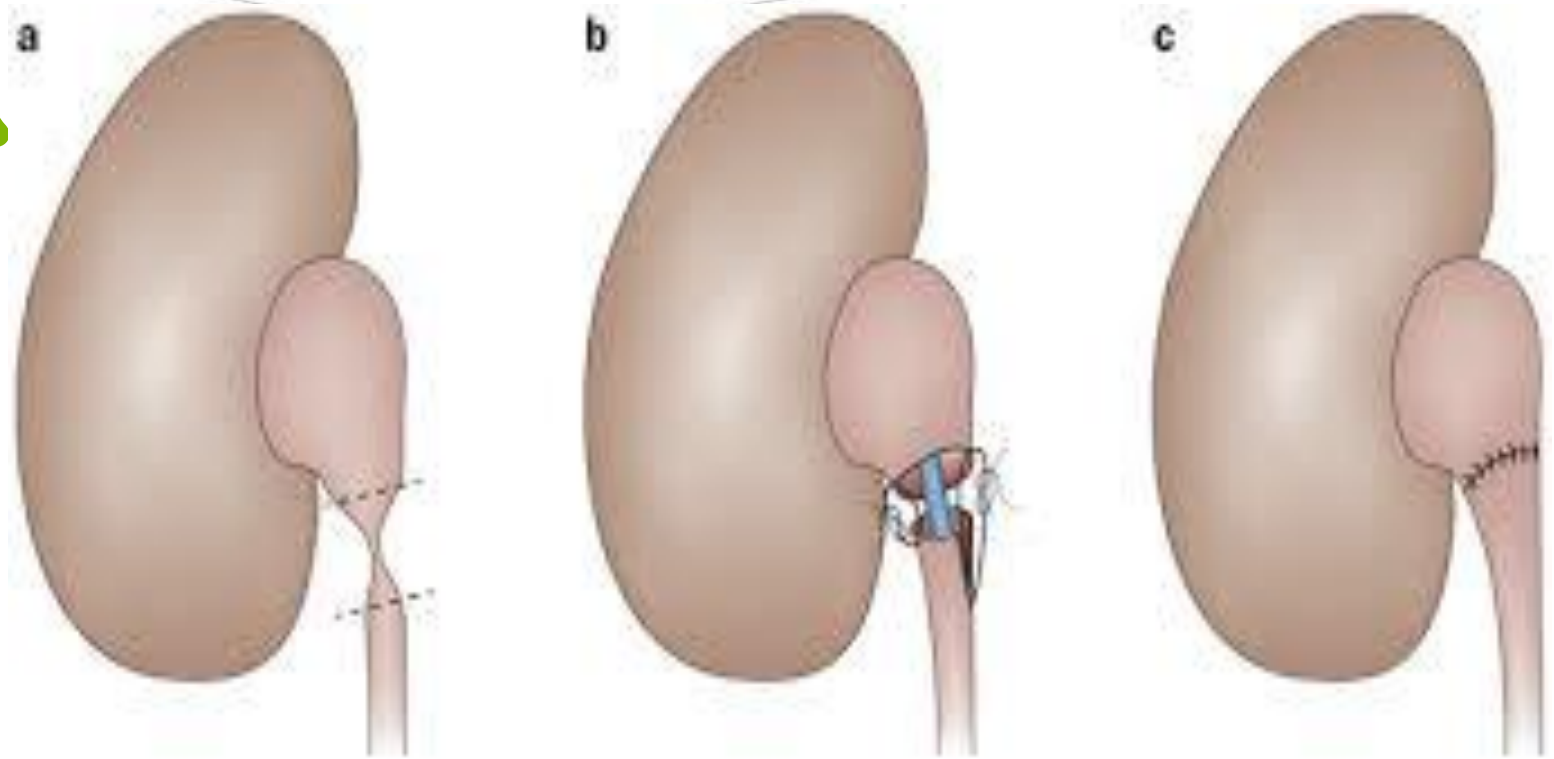
Work-up

- No need for urgent intervention unless baby develops pyelonephritis (nephrostomy tube or stent).
- Repeat US.
- Diuretic renal scan

  (MAG3 or DTPA)

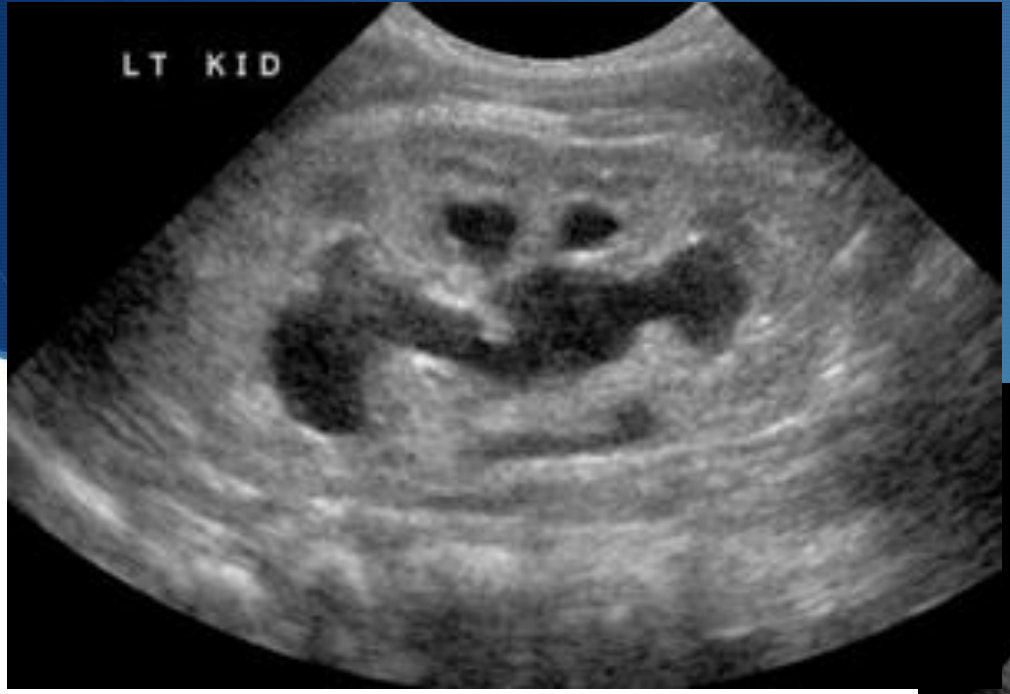


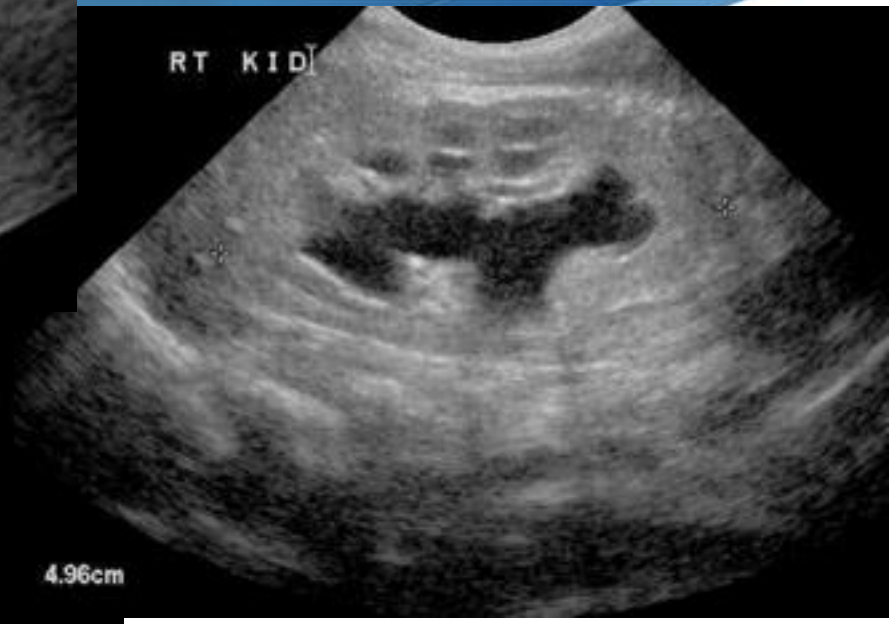
Pyeloplasty

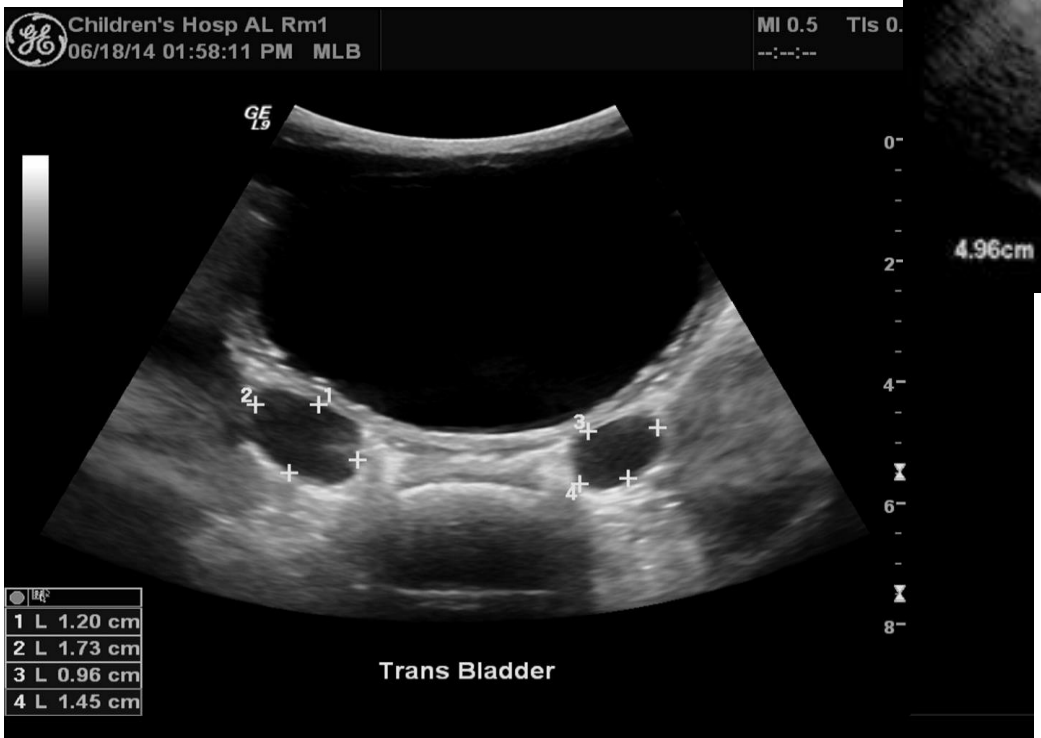


Case 3

- 5 days old girl fond to have bilateral hydronepohrosis on antenatal US?
- What are the possible causes?
- How would you approach this case?


LT KID


RT KID
4.96cm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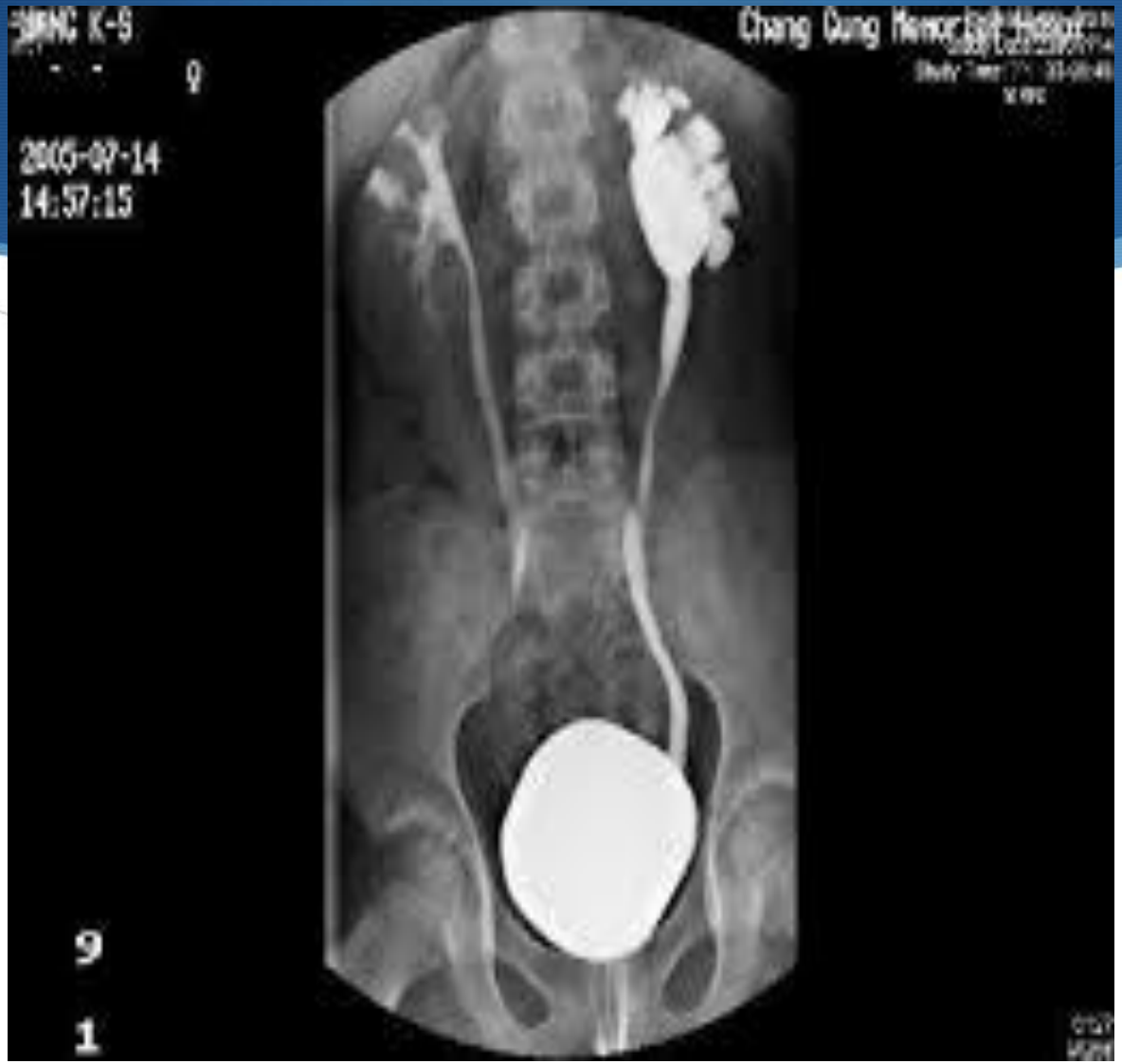
2 L 1.73 cm
3 L 0.96 cm
4 L 1.45 cm
Trans Bladder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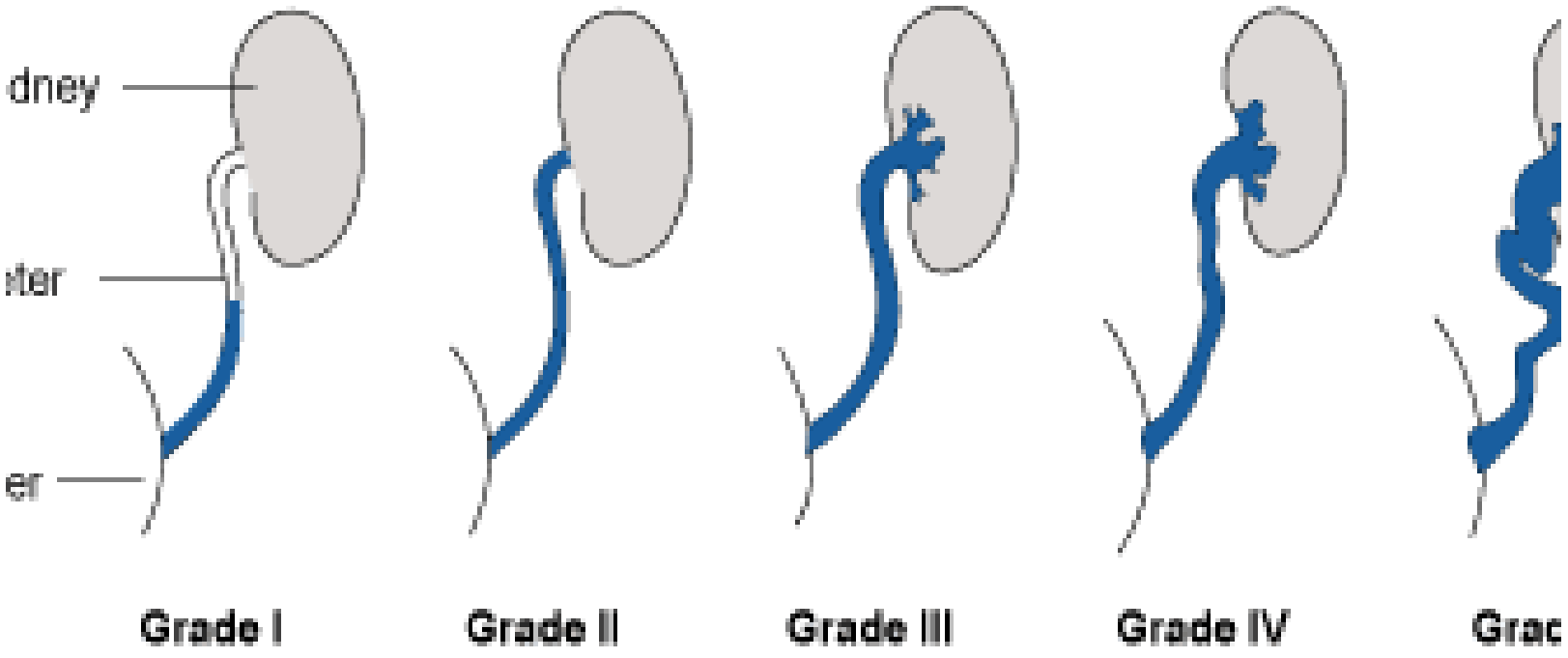
Vesicoureteral Reflux (VUR)

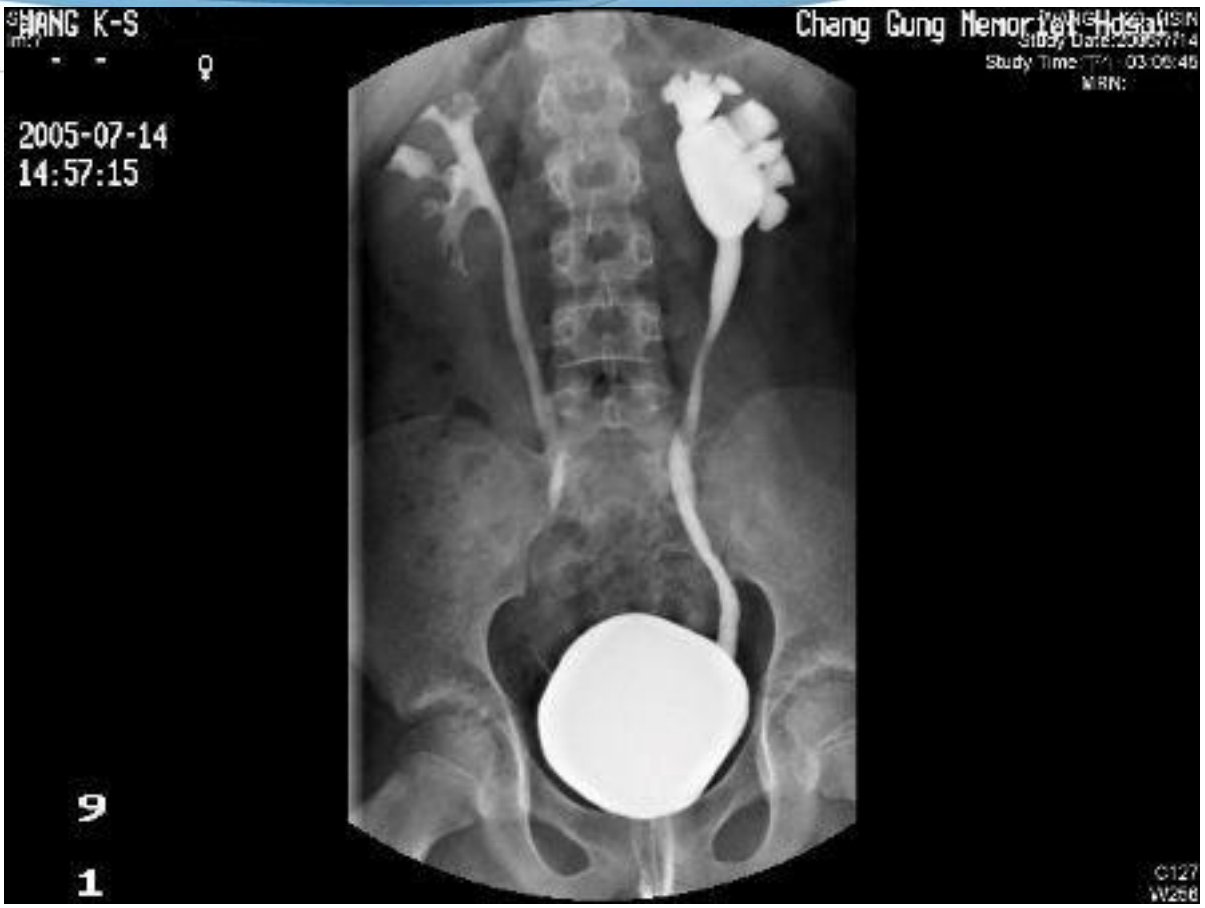


Vesicoureteral Reflux (VUR)

- 30-40% of ANH is due to VUR.
- Presentation : ANH or UTIs.
- Family Hx (30%) .

Work-up for VUR

- US
- VCUG.



Treatment options

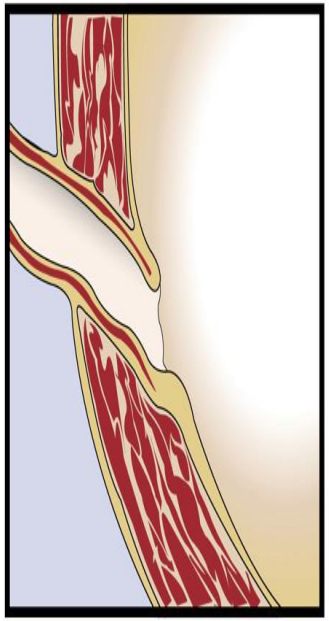
- Observation
- Prophylactic antibiotics.
- Surgical:

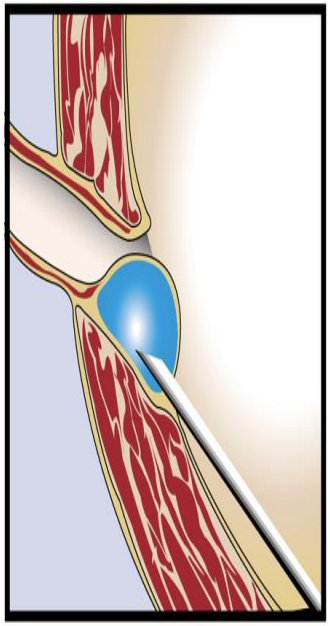
  - Deflux injection

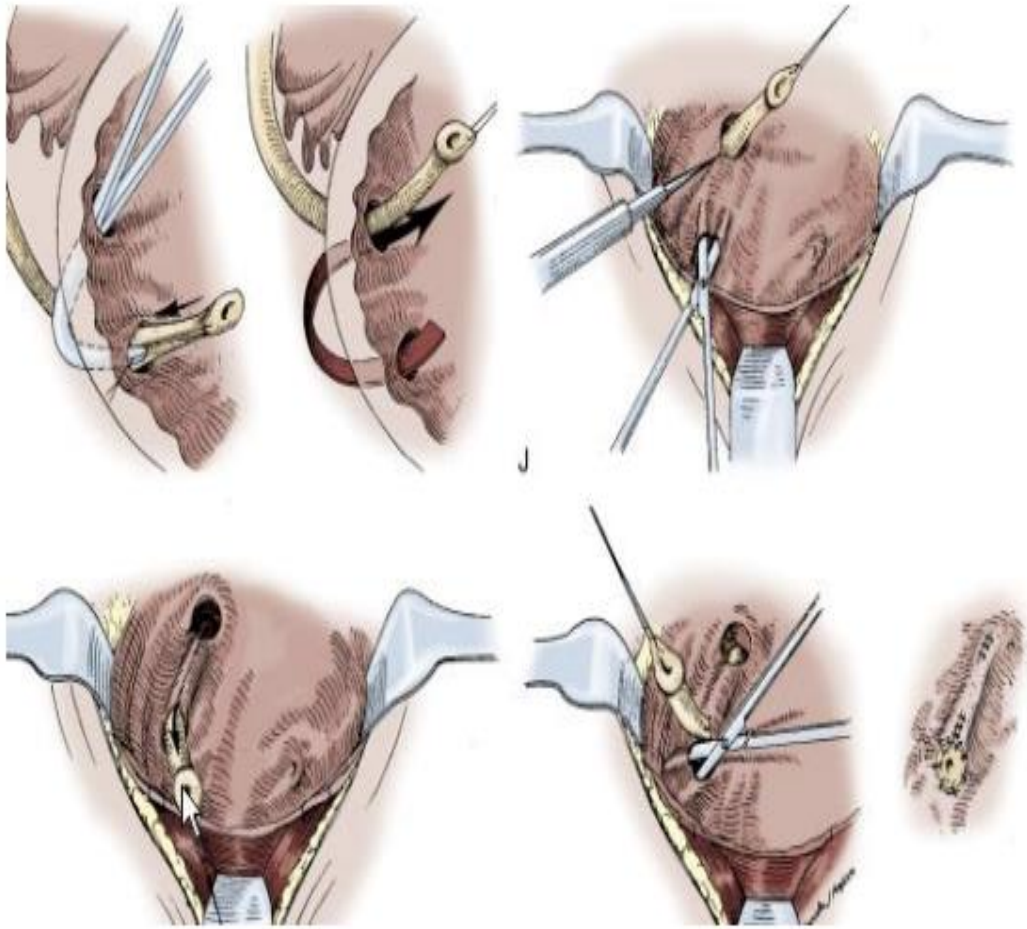
  - Ureteric reimplantation

Principles of Management of VUR

1. Spontaneous resolution is very common
2. High-grade VUR is less likely to resolve spontaneously
3. Extended use of prophylactic ABx is benign
4. Success rate with surgical correction is very high







Hypospadias

What is hypospadias?

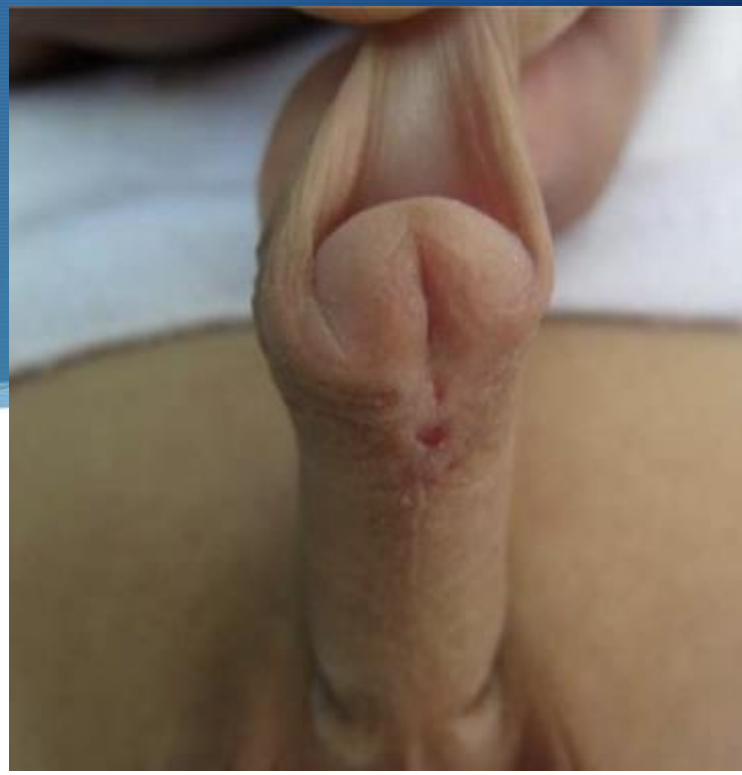
Association of 3 anomalies of the penis

1) Abnormal ventral opening of urethral meatus (glans to perineum)

2) Abnormal ventral curvture.

3) Abnormal distribution of foreskin with a dorsal “hood” and deficient ventral foreskin

Hypospadias



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Association of 3 anomalies of the penis

1) Abnormal ventral opening of urethral meatus (glans to perineum)

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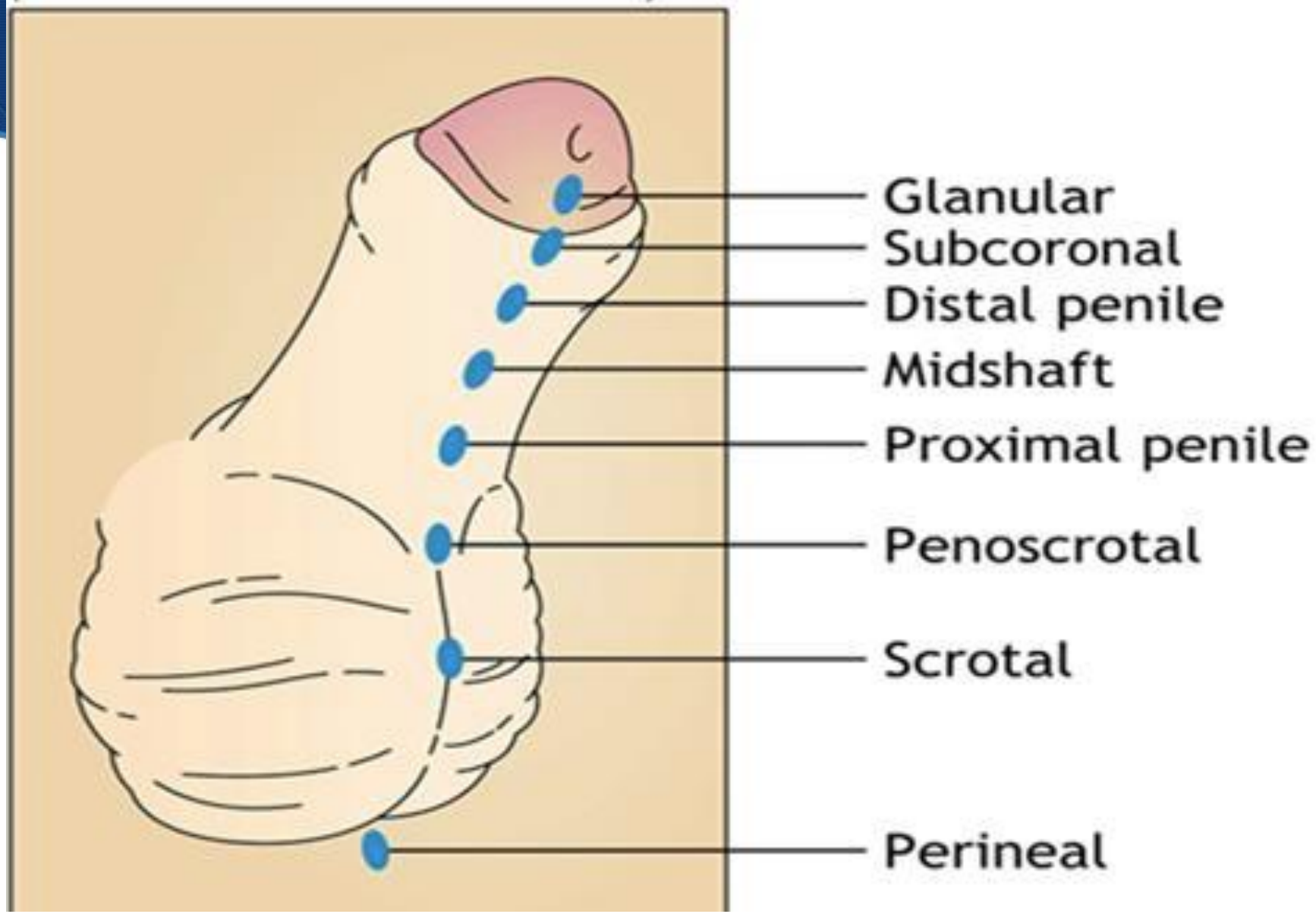
Types of hypospadias

(shows where the urine comes out)



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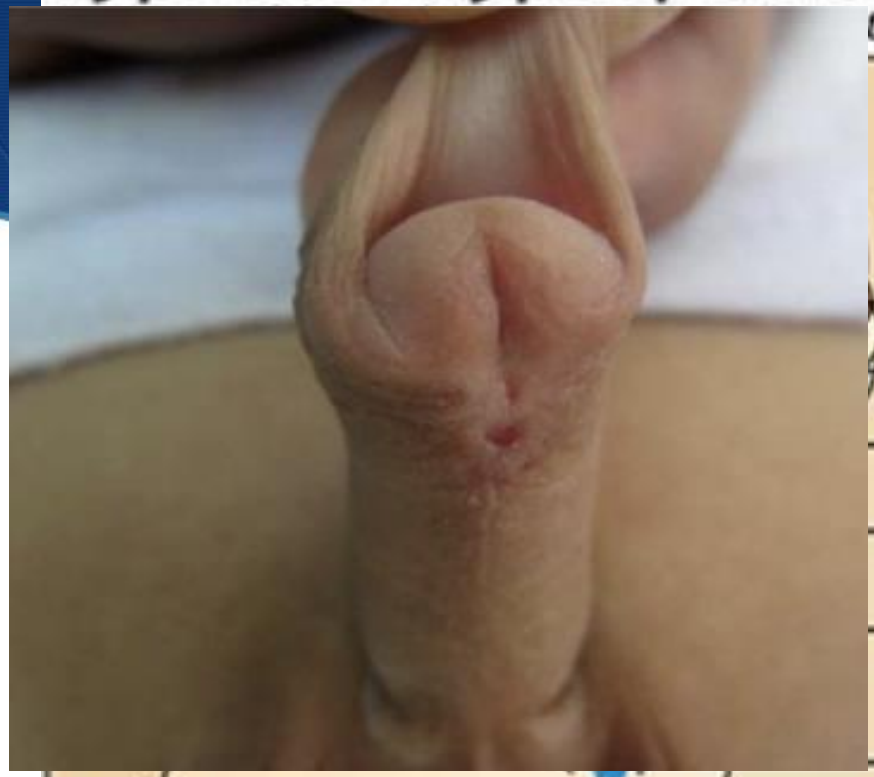


Epidemiology

- Approximately **1 in 250 live male birth**
- The majority are distal hypospadias.
- It can be familial.
- More in twins.

Diagnosis

- Most found at newborn P/E.
- Some cases are diagnosed at later age or after circumscion.
- Look for associated anomalies like UDT or intersex

- **No routine imaging for isolated hypospadias.**

Physical exam

- Abdominal exam: masses, SP/flank tenderness, full bladder.

- External genitalia:

micropenis, meatal location, deficiency of spongiosum, hernia, hydrocele, **and UDT**

- ✓ **In cases of non palpable UDT and hypospadias what you should think about?**


CIRCUMCISION

Reasons of Hypospadias Repair

1) To allow micturition in standing position.
2) To allow sexual intercourse.
3) To allow effective insemination.
4) Cosmesis.

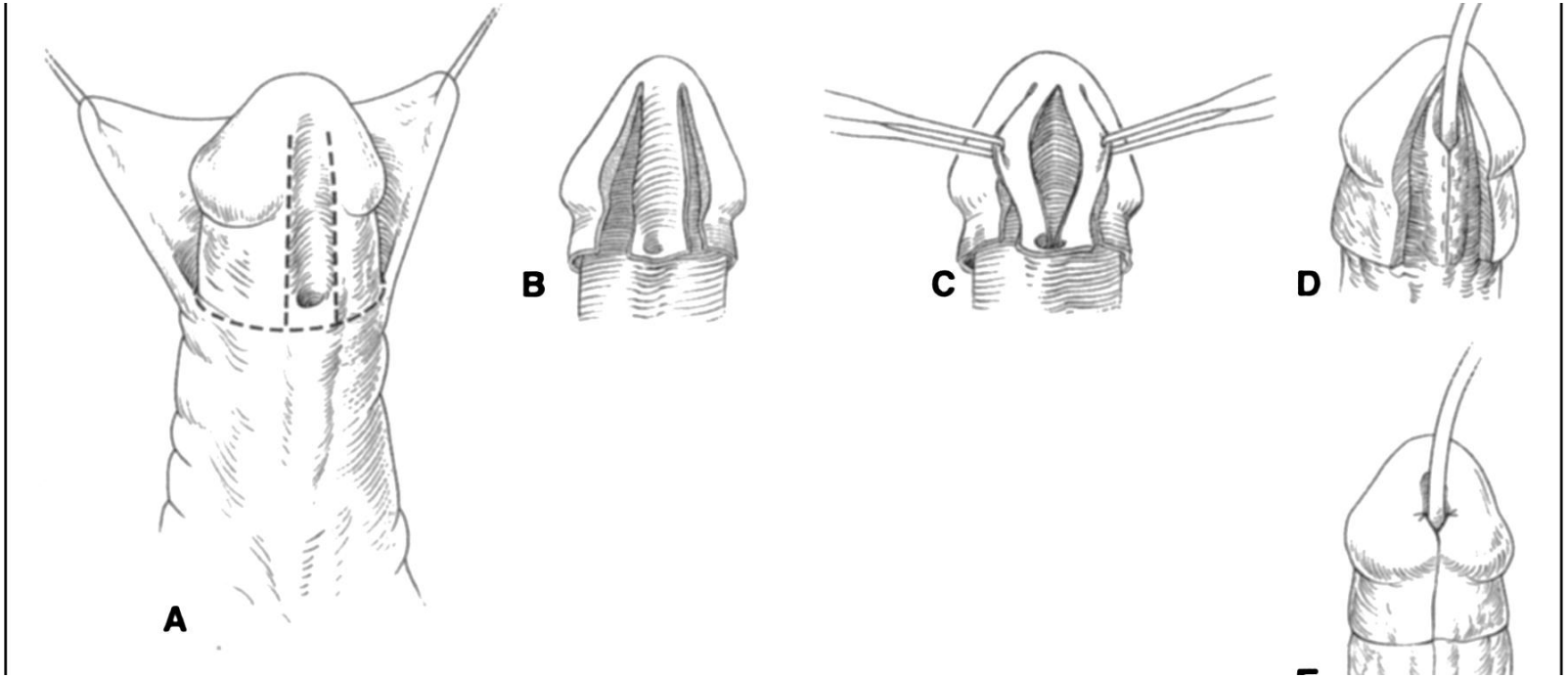
→ most males with distal hypospadias have no medical indications for repair other than cosmesis

Surgical Repair

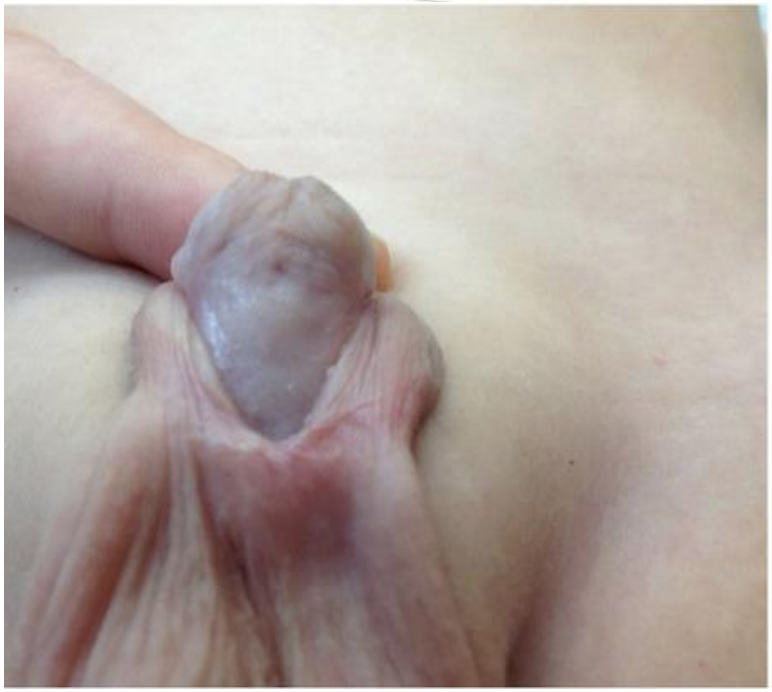
- Idealy it should be done after the age of 6 months (6-12months)

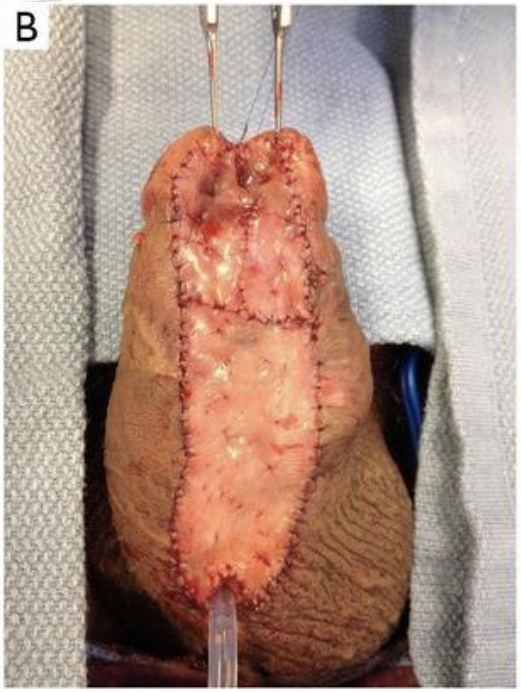
- It can be done in 1 or 2 stages.

One Stage Repair



Staged repair



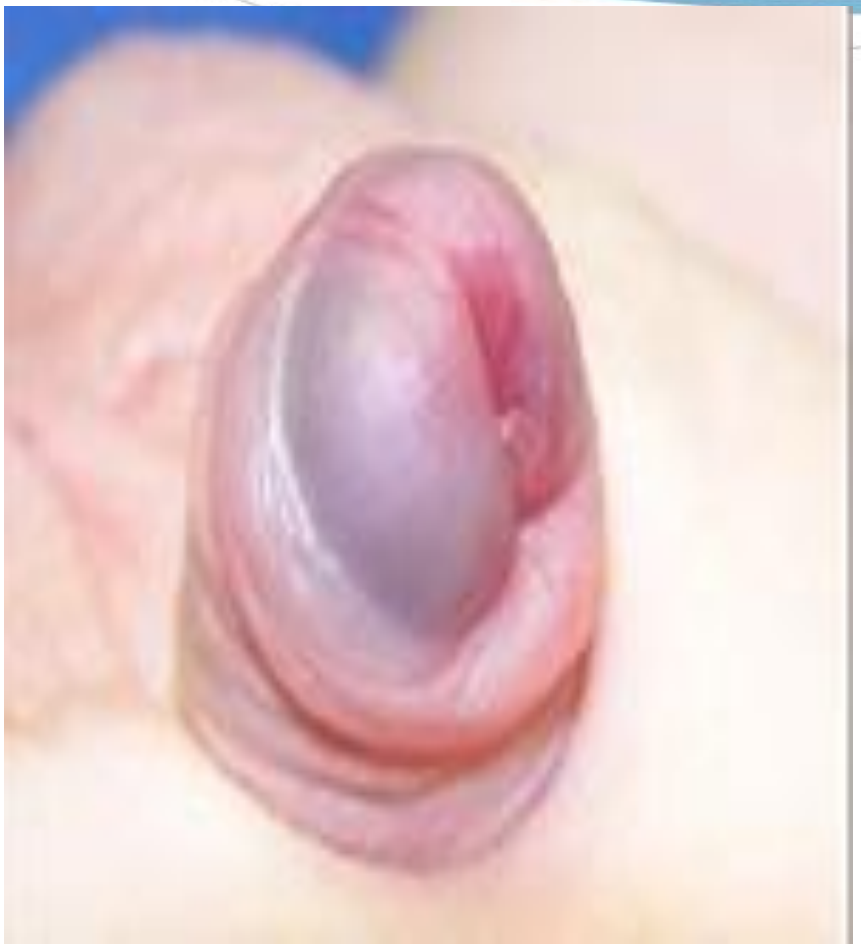


EXSTROPHY-EPISPADIAS COMPLEX

- **3 main variants**

1) Epispadias
2) bladder exstrophy } accounts for >50% of kids born with this complex
3) cloacal exstrophy } much more GI involvement

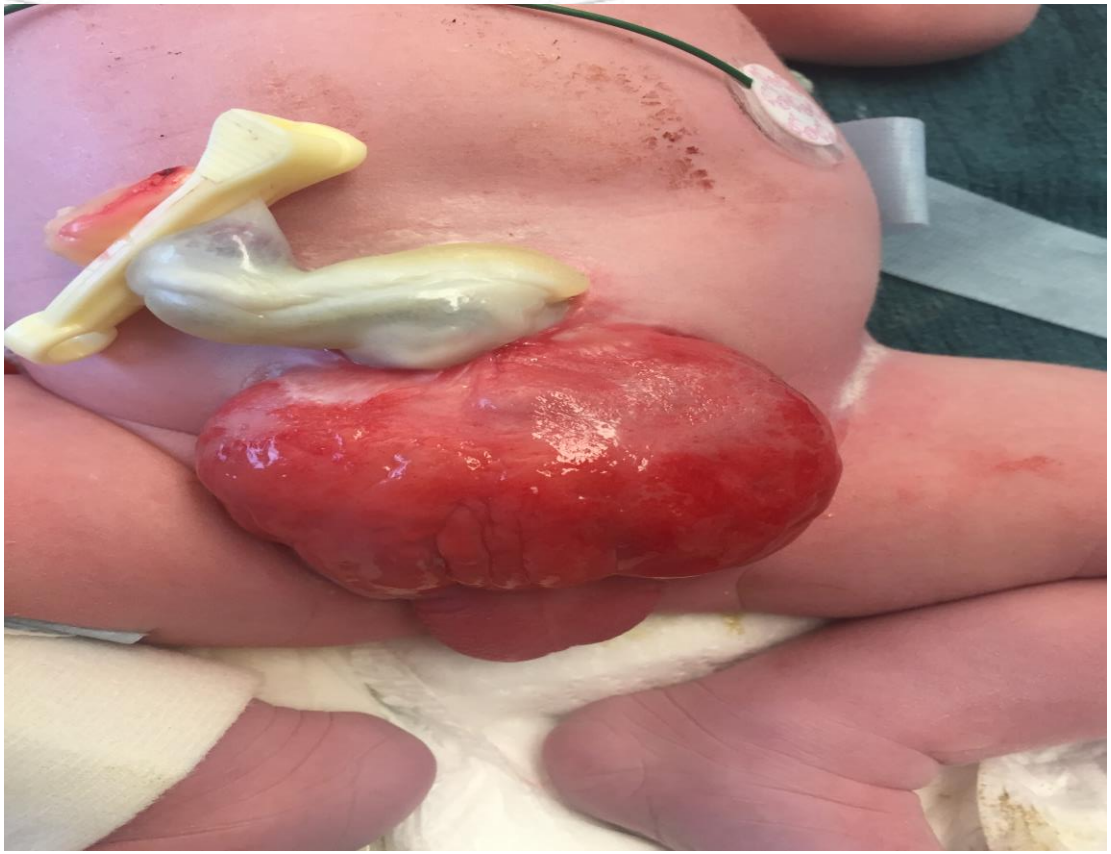
Epispadias



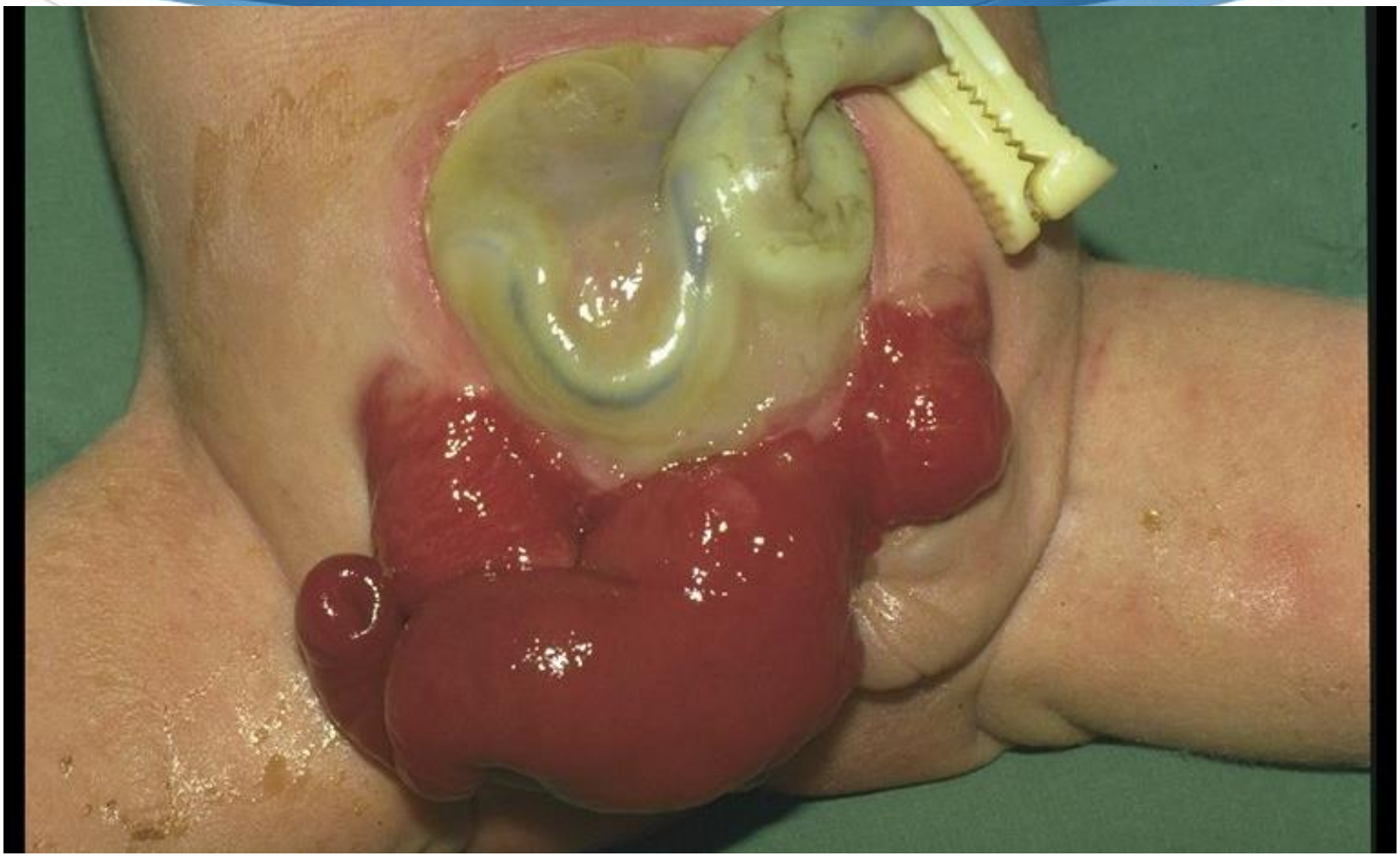
Epispadias

- Males >Females X 3-5 times.
- Males : 1 in 150,000
- It require surgical repair after the age of 1 year.
- Some patients will have issues with incontinence

CLASSIC BLADDER EXSTROPHY



CLOACAL EXSTROPHY



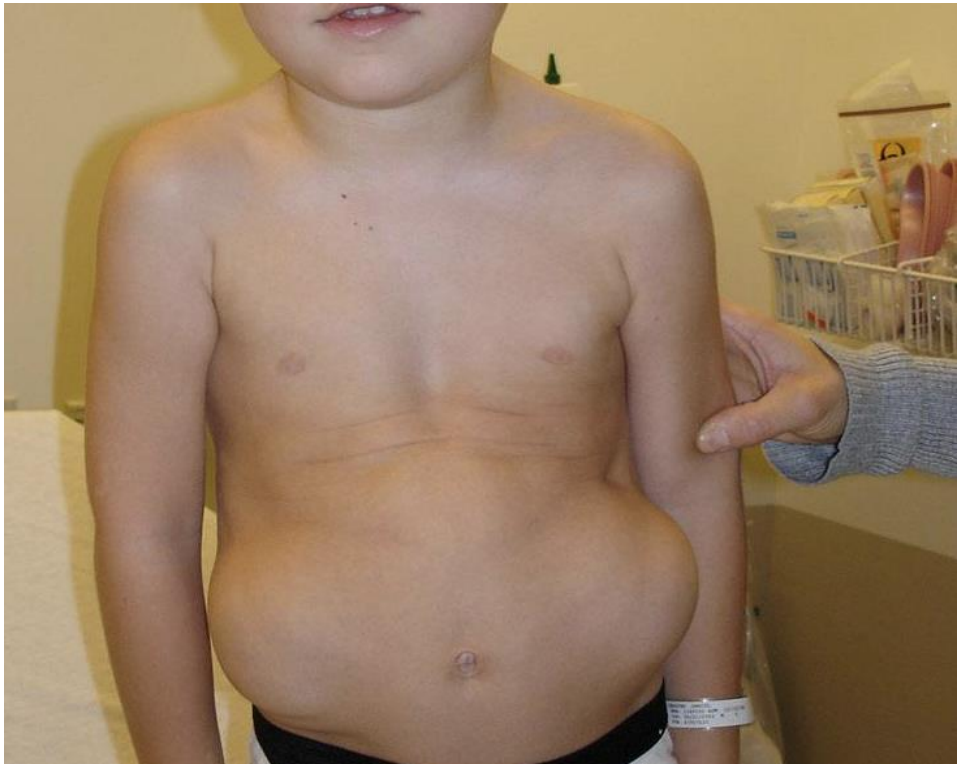
Prune Belly Syndrome

- It affects 1 per 30,000-40,000 live births. (Boys>Girls)
- Usually patients will have the triad

1. Weak/absent abdominal muscles.
2. Bil UDT.
3. Weak and dilated GU organs (Bladder, ureters, urethra).\

+/- Cardiac anomalies : tetralogy of Fallot (TF) and ventriculoseptal defects (VSD)

- The mortality rate can reach up to 20% in this syndrome.



Questions