

Approach to Pediatric Kidney Disorders

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Objectives

- To appreciate kidney disorders in children
- To know how to approach a child with a renal problem
- Children are not young adults
- How to be a safe doctor

Assessment of kidney function

- Serum creatinine
- Creatinine clearance by timed urine collection
- Estimated Glomerular Filtration rate(eGFR) by updated Schwartz Formula: $[\text{Ht cm/ser creat mg\%}] \times 0.413 = \text{ml/min/1.73 m}^2$

CKD Stages

Prognosis of CKD by GFR
and albuminuria categories:
KDIGO 2012

				Persistent albuminuria categories, description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30–300 mg/g 3–30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (ml/min/1.73 m ²), description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60–89			
	G3a	Mildly to moderately decreased	45–59			
	G3b	Moderately to severely decreased	30–44			
	G4	Severely decreased	15–29			
	G5	Kidney failure	<15			

green, low risk (if no other markers of kidney disease, no CKD); yellow, moderately increased risk; orange, high risk; red, very high risk.

Hematuria and Glomerulonephritis

- Definition of Hematuria
- Glomerular Hematuria vs Non glomerular
- Definition of Acute Nephritis vs Nephrotic

Proteinuria & Nephrotic Syndrome

- Definition of proteinuria:
- 24 hour urine collection
- Spots : Prot/ creat ratio
- Alb/creat ratio

Proteinuria

- Nephrotic range Proteinuria:
 - $> 50 \text{ mg/kg/day}$
- OR
- $> 40 \text{ mg/m}^2/\text{hour}$

Albumin/Creatinine ratio

Normal or mildly increased

- AER < 30 mg/24 hour
= A/Cr < 3 mg/mmol = <30 mg/g

Moderately increased

AER 30-300mg/24 hr
= A/Cr 3-30mg/mmol = 30-300 mg/g

Severely increased

AER >300 mg/24 hrs
= A/Cr > 30 mg/mmol = >300 mg/g

Childhood Hypertension

- References
- Task Force for Pediatric hypertension 2004
- New Guidelines: 2017

Urinary Tract Infection

- Upper vs Lower
- Complicated vs Noncomplicated

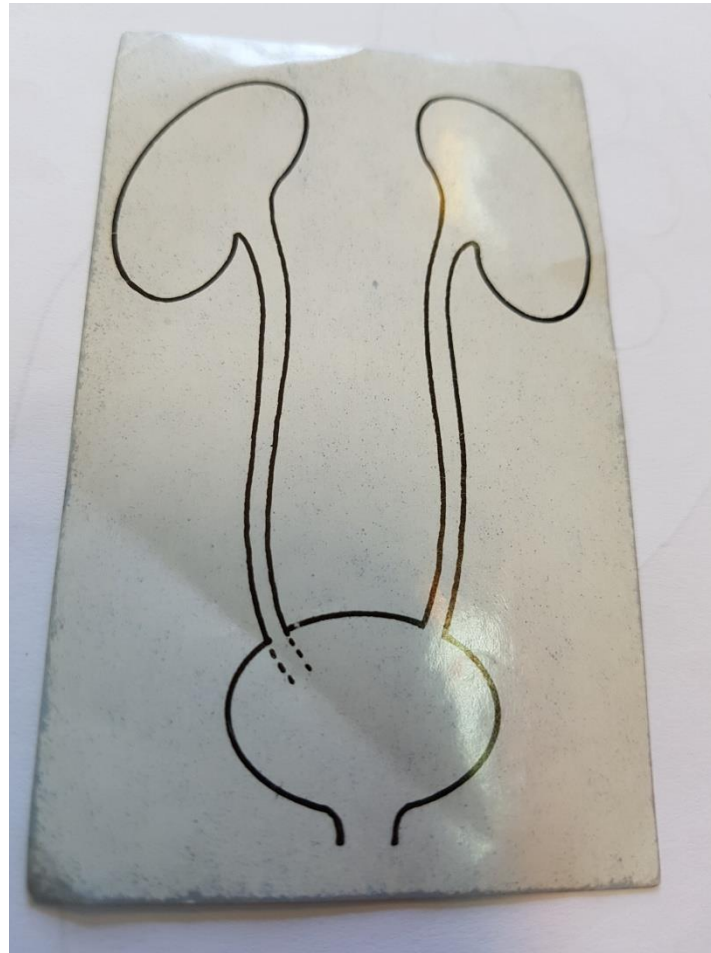
Diagnosis of UTI

- New guidelines
- Urinalysis
- Urine Culture

Vesicoureteral Reflux

- Grades:
- By MCUG : 5
- By Isotope Cystography: 3

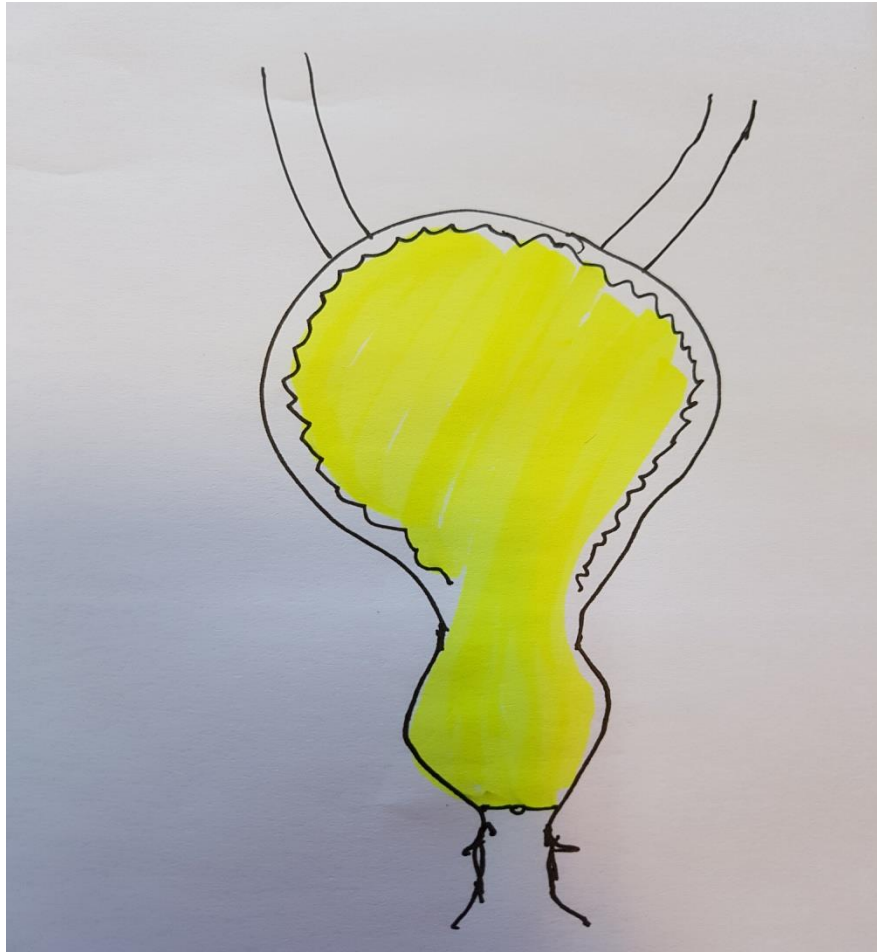
Normal Anatomy



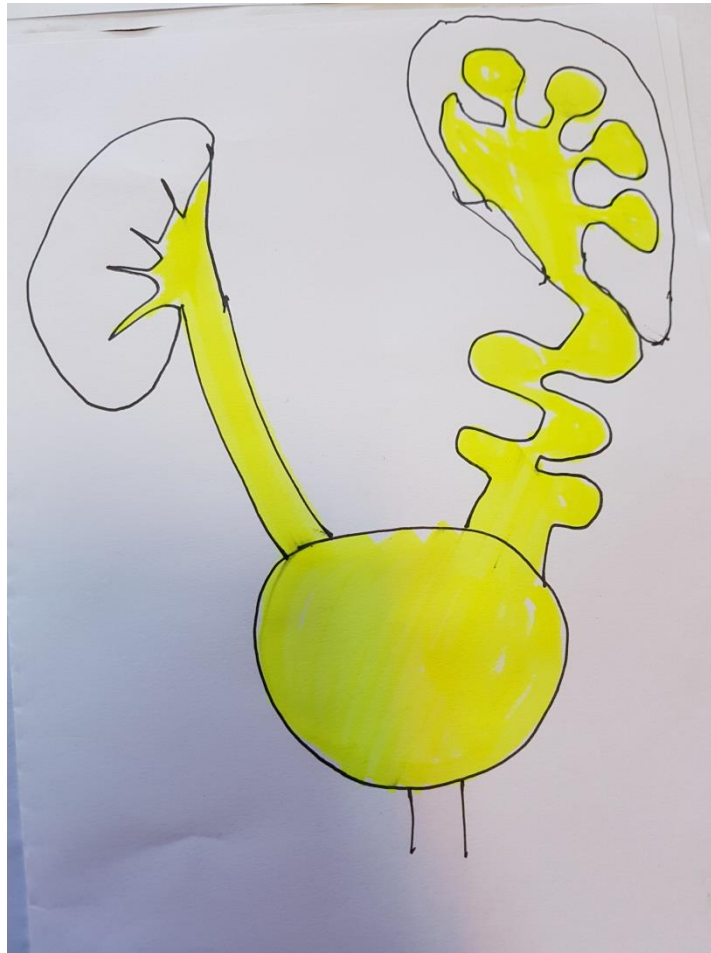
Other congenital anomalies discovered on imaging for UTI

- Pelviureteric Junction Obstruction(PUJO)
- Posterior Urethral Valve(PUV)
- Ureterovesical Junction Obstruction
- Neurogenic Bladder
- Renal Dysplasia
- Renal Hypoplasia
- Single Kidney
- Horseshoe Kidney

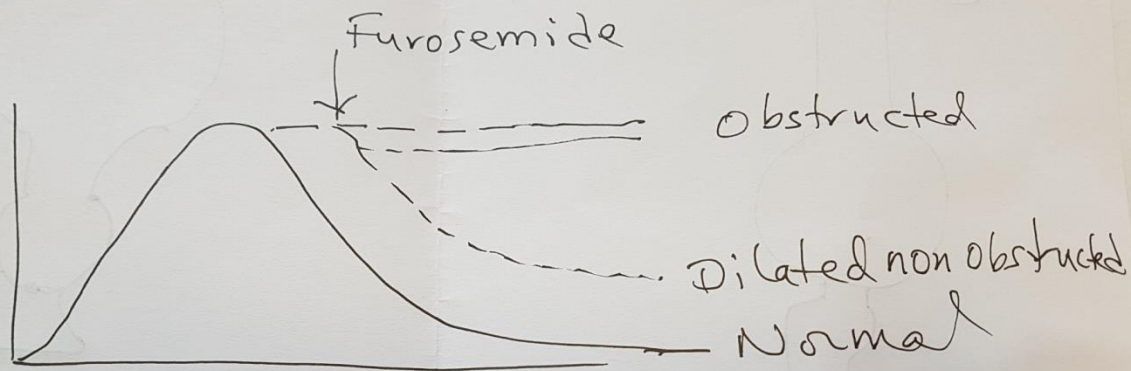
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Checking for PUJO



MAG-3 Renogram
or
DTPA Renogram

Spot Diagnosis



PRUNE BELLY SYNDROME



Approach to metabolic acidosis

- Hx; PE
- Calculate serum Anion Gap → Normal →
Urine Anion Gap: positive vs negative

Renal Tubular Acidosis(RTA)

- dRTA
- pRTA
- Hyperkalemic RTA

Conclusions

- Treat the patient, not the lab.
- Thank you