Nephrology clinic case scenarios

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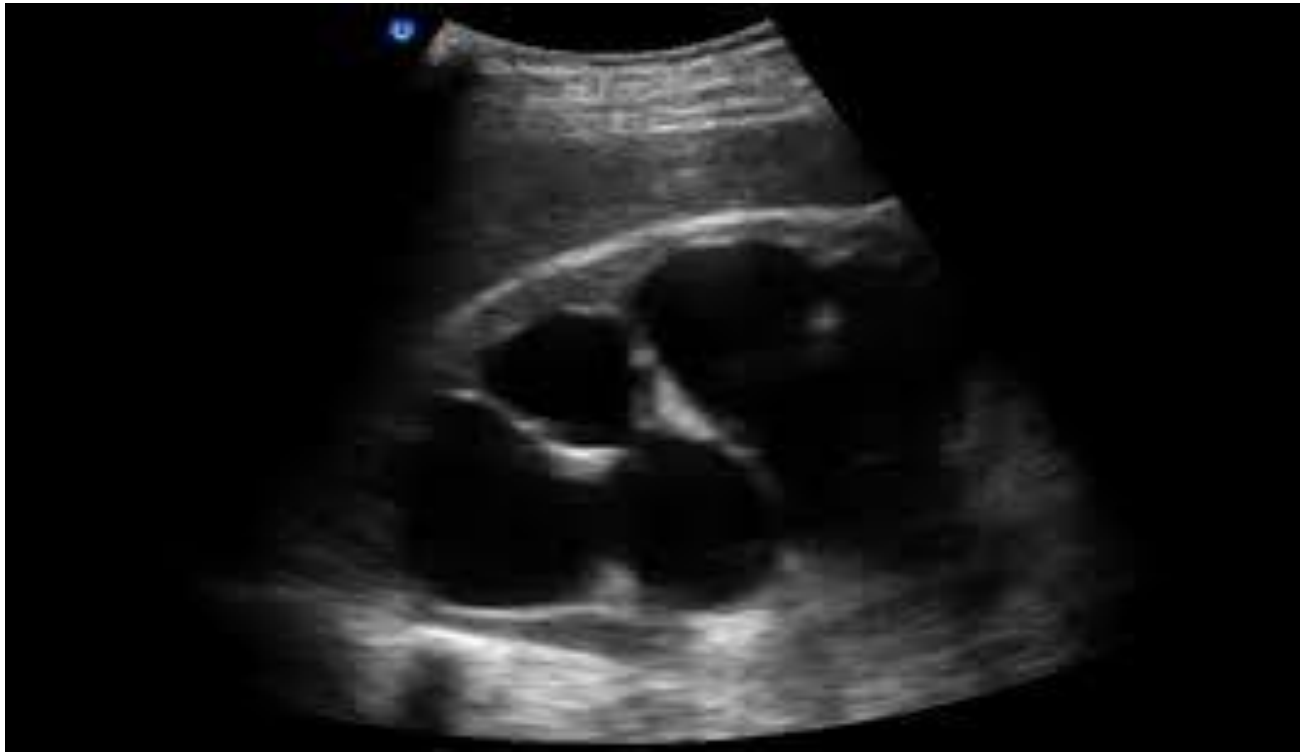
Case 1

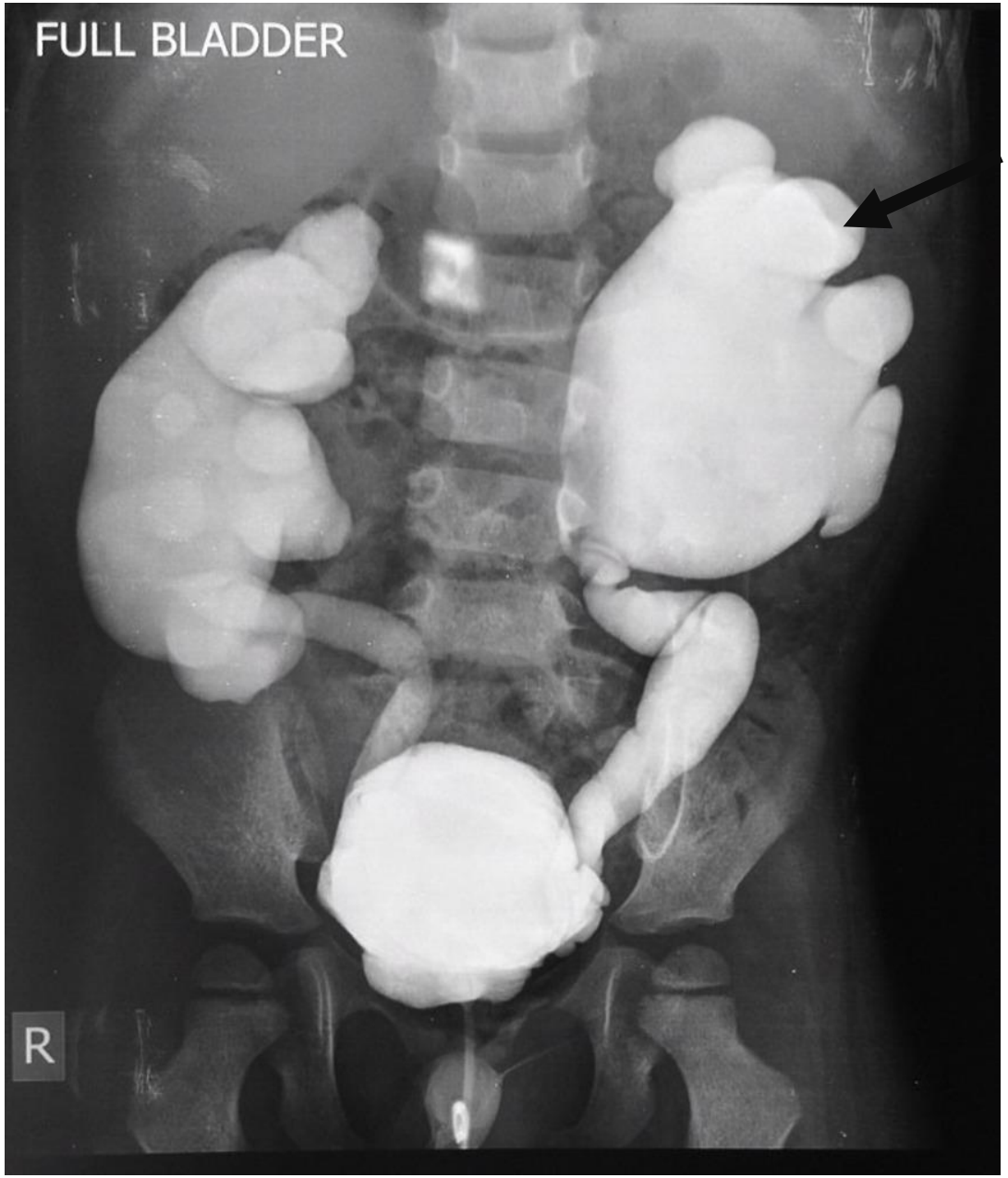
- A two weeks old male baby came to the clinic with a history of antenatal hydronephrosis but with good liqour around the baby
- Family history :his older sister has recurrent uti and is not investigated
- What is your next step ?
- Renal ultrasound
- It showed bilateral severe hydronephrosis with dilated ureter and cortical thinning

Renal US showing hydronephrosis



What are you next investigation and why ?

- 1. MCUG
- What will be your differential diagnosis ?
- 1.bilateral VUR
- 2 .posterior urethral valve


FULL BLADDER
R

What is your diagnosis ?

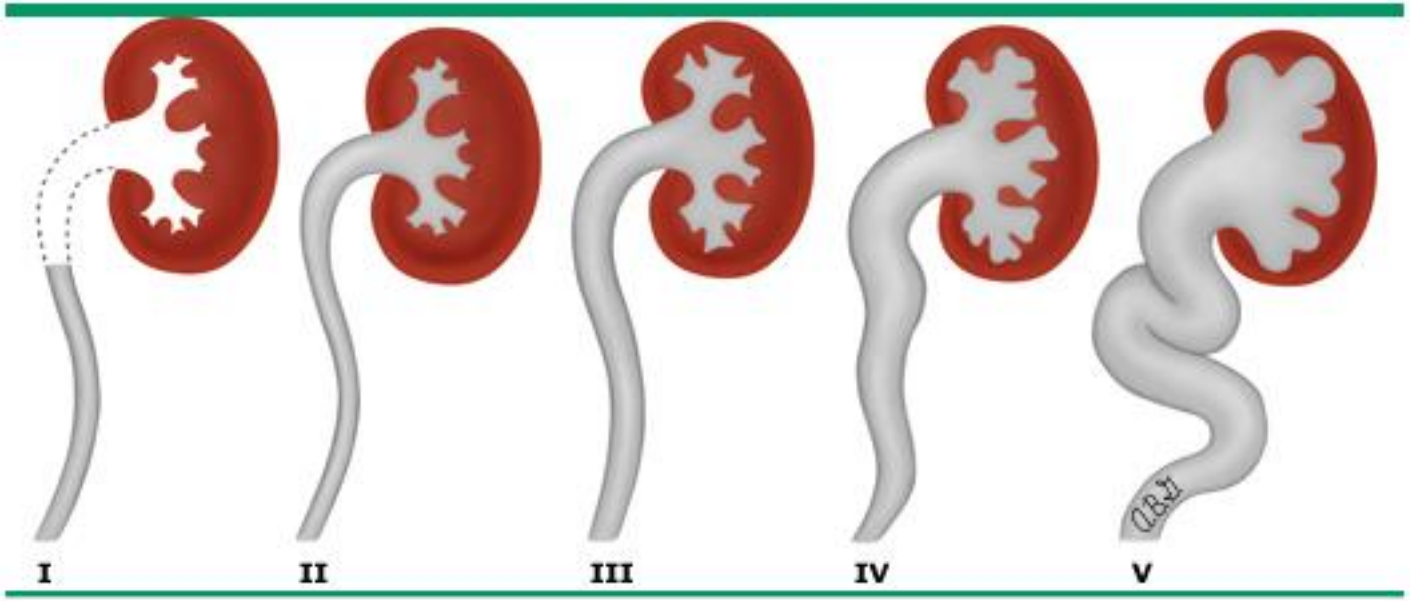
- Bilateral grade 5 VUR because there are dilated tortous ureters with calyceal blunting as in the arrow

Other needed investigations ?

- 2. baseline DMSA scan to assess function for children with reflux can have dysplastic kidneys
- DMSA showed small scarred left kidney with a function of 10% and right 90%
- Scarring on DMSA can be the result of dysplastic kidneys or recurrent uti

- 3.he needs kidney function test

International classification of vesicoureteral reflux (VUR)



Modified from: International Reflux Committee. Medical versus surgical treatment of primary vesicoureteral reflux. Pediatrics 1981; 67:392.

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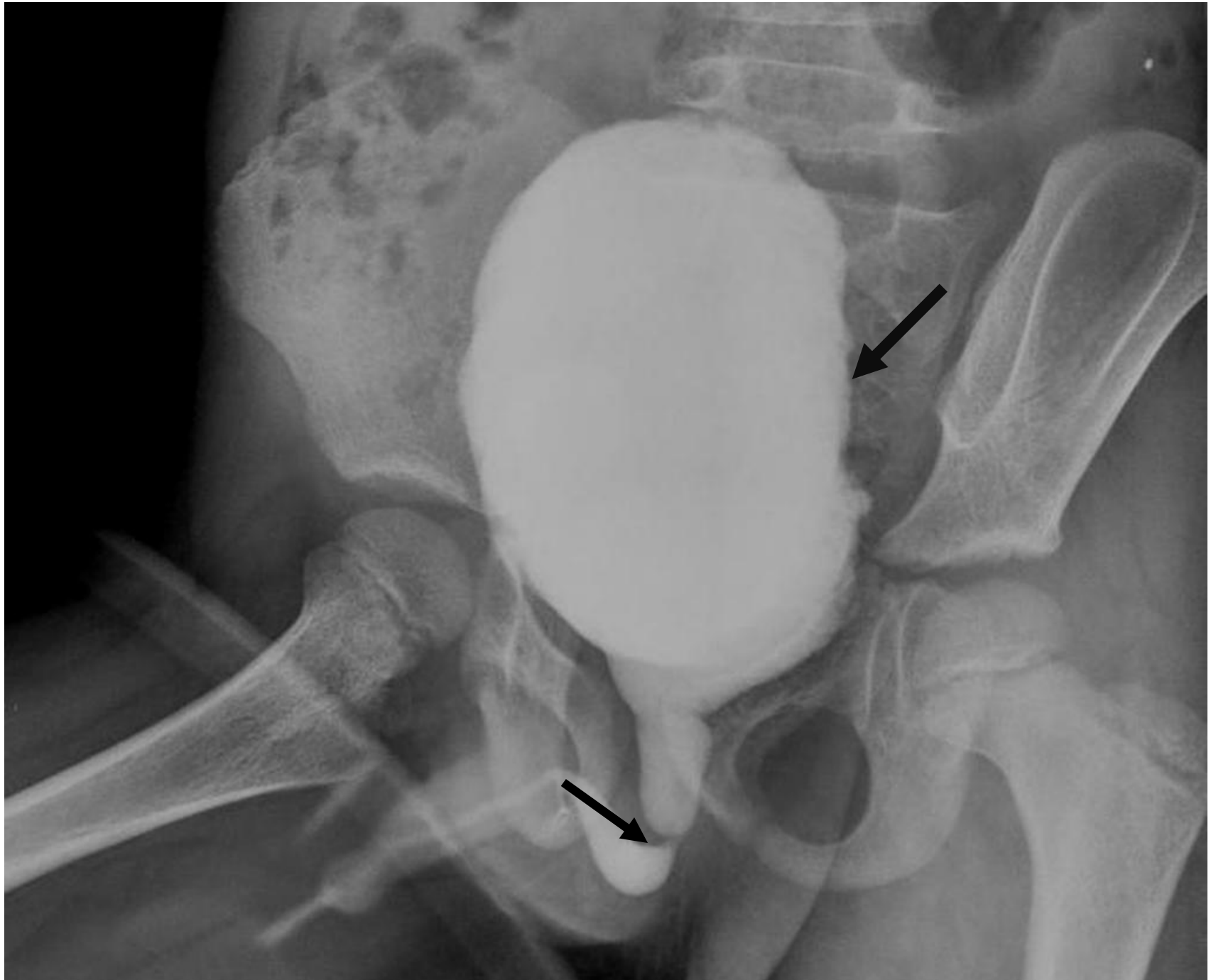
Long term management of children with VUR

- 1. prophylactic antibiotic to prevent recurrent UTI and further damage and scarring
- 2.follow up creatinine
- 3.long term management include surveillance for uti and surgical correction of high grade reflux for there is a low chance of spontaneous resolution unlike lower grades of VUR
- Treat associated bowel and bladder dysfunction

Case 2

- A one week old male baby came to the clinic with a history of antenatal hydronephrosis with oligohydraminos .Mum reports dribbling and poor stream of urine and she reports that the diaper aren't heavily soaked with urine as his previous sibling
- What is your next step ?
- 1 .Renal US
- It showed bilateral severe hyronephrosis with dilated ureter and cortical thinning and thickened and trabeculated bladder
- 2.MCUG was done



What did you see?

- The bladder is elongated and has trabeculated outline
- Normally the bladder should be rounded with a smooth contour
- There is narrowing in the urethrea and proximal to this narrowing there is dilatation
- Creatinine was done and it was 2 mg/dl..this is high for a one week old baby.The Cr at birth reflects maternal Cr and will be high but then it will decrease.

What is the diagnosis?

- 1.posterior urethral valve

- What is the management?

- The child has post renal acute kidney..he needs relief of obstruction either through valve ablation by cystoscopy and if not possible he will need vesicostomy to relief obstruction and ensure good urine drainage

Case 4

- A 10 year old boy presents to the clinic with a history of never been dry at night.We call this primary enuresis.
- What important questions you need to ask?
- 1.presense of day time symptoms as wetting,urgency and frequency for they might underly bladder dysfunction
- 2.constipation : there is a strong relation between enuresis and constipation for it will affect bladder capacity and with treatment of constipation the enuresis resolves
- 3.presense of dysuria to rule out UTI
- 4.Fluid intake at night
- 5.family history of enuresis

- Secondary enuresis means that the child became wet after being dry for at least six months and is usually is secondary to psychological stress as divorce or birth of a new sibling

What important areas in your exam you have to focus on ?

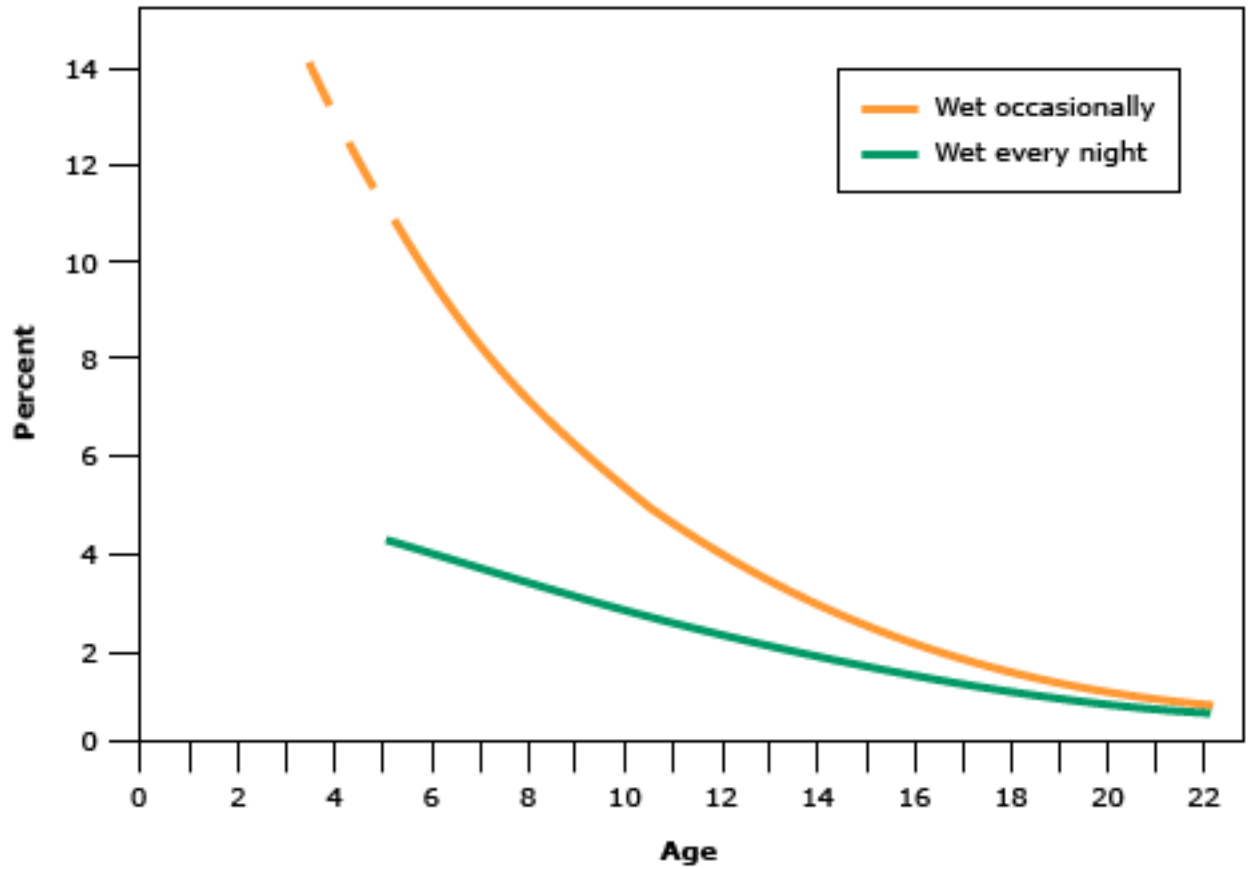
- 1. back :looking for sacral dimple as it might indicate a neurological bladder
- 2:abdomen: looking for tenderness and fecal masses
- 3.general exam

What is your diagnosis and management ?

- The mum reported that his sibling wetted the bed till the age of 9 year. The child doesn’t have constipation or urinary symptoms
- He drinks a lot of fluid at night

- A: monosymptomatic enuresis due to absence of day time symptoms
- and it can resolve by itself spontaneously but 1% can wet bed as adults
- If there are daytime symptoms we call it non-monosymptomatic enuresis and it indicates bladder dysfunction with various types

Epidemiology and prognosis of monosymptomatic enuresis



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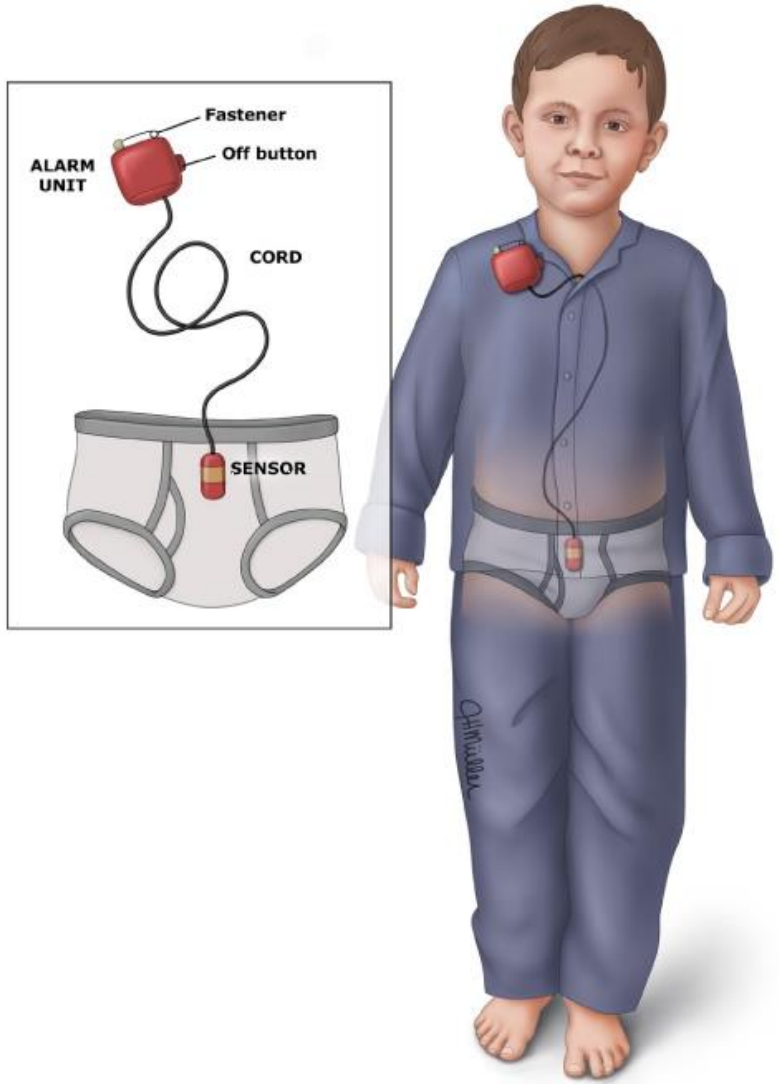
lines of management

- 1.urotherapy: decrease fluid at night,avoid caffeinated drinks and excess solute as sweets and salty food to decrease nocturnal urine

- 2.star chart: using a chart with stars at days of being dry can motivate the child and help him to be dry

- 3.If previous measures fail: use desmopressin which is an ADH analogue that will lead to decreased urine production or bed wetting alarm that works throught conditioning,for the the alarm will ring each time the child wets

Enuresis alarm



Enuresis alarms are activated when a sensor, placed in the undergarments or on a bed pad, detects moisture. The arousal device is usually an auditory alarm and/or a vibrating belt or pager.

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Case 4

- A 3 year old child come to your clinic with a hx of small kidneys at birth.Her labs showed that her creatinine was 2 mg/dl.SO THE CHILD HAS CHRONIC KIDNEY DISEASE.
- How do you stage her CKD?
- We used modified schwartz formula which is .41 * height/serum creatinine
- Her height was 100 cm
- GFR is 20.5   which is stage 4 CKD

Stages of chronic kidney disease for children based on the KDIGO 2012 clinical practice guideline

GFR category	GFR (mL/min/1.73 m^2)	Terms
G1	≥90	Normal or high
G2	60 to 89	Mildly decreased*
G3a	45 to 59	Mildly to moderately decreased
G3b	30 to 44	Moderately to severely decreased
G4	15 to 29	Severely decreased
G5	<15	Kidney failure

In the absence of evidence of kidney damage, neither GFR category G1 nor G2 fulfill the criteria for CKD.

KDIGO: Kidney Disease: Improving Global Outcomes; GFR: glomerular filtration rate; CKD: chronic kidney disease.
* Relative to young adult level.

What main important signs we need to look for?

- 1.growth parameter: child with CKD have impaired growth so we should follow her growth centiles

- 2.measure her blood pressure ,for children with CKD can develop hypertension

- 3. look for pallor ,earthy color of Ckd, skin itching,heart murmurs from anemia….

What other important labs we have to follow and why?

- 1. electrolytes : mainly potassium and sodium
- Children with CKD due to dysplastic kidneys can develop hyponatremia and may need salt supplements

- They can develop hyperkalemia and we need to refer them to dietician to give then advice on K rich food
- They may need to be placed on potassium binding resins to decrease absorption of K as sodium polystyrene sulphonate

- We need to follow their hemoglobin for they will develop anemia either due to iron deficiency or due to erythropoiten deficiency.They need to placed on iron supplements and erythropoetic agents

- We need to follow their Ca,Po4,PTH
- They will develop high phosphate which will be managed by dietary restrictions and phosphate binders as calcium carbonate
- Low calcium
- Hyperparathyroidism due to high PO4,low Ca,vit D deficiency due to one alpha hydroxylase deficiency.They need one alpha vitamin D and regular vit D

- We need to look for metabolic acidosis and treat it with sodium bicarbonate

- Thank you
- Stay safe