

RADY 403 Case Presentation

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May 2019

Focused patient history and workup

- **1 month old boy** in neonatal ICU presented with worsening respiratory status with frequent apneic events
- **Urine culture positive** for methicillin susceptible Staph aureus
- Born prematurely by C-section due to decreased fetal movement and non-reactive Non-Stress Test (NST)
 - Completed 29 weeks gestation
- Other conditions: congenital anomaly of the brain, perinatal intraventricular hemorrhage, congenital CMV, cleft lip and palate, chronic lung disease

List of imaging studies (comprehensive)

- XR Chest Portable
- US Liver Doppler
- XR Neonate Umbilical Line Placement
- Echocardiogram Pediatric Congenital Complete
- US Neonatal Head
- XR Abodmen Portable
- Echocardiogram Pediatric Noncongenital Complete
- **US Renal Complete**
- **FL Voiding Cystogram**



Relevant to case

Clinical Course

Due to presentation of urinary tract infection in a male, **renal ultrasound** was performed after antibiotic completion

Cost Estimate:
\$112.73
*2017

**American College of Radiology
 ACR Appropriateness Criteria®
 Urinary Tract Infection–Child**

Variant 1: **Age <2 months, first febrile urinary tract infection.**

Radiologic Procedure	Rating	Comments	RRL*
US kidneys and bladder	9		0
Voiding cystourethrography	6	Consider this procedure in boys and in the presence of sonographic abnormality.	☼☼
Tc-99m pertechnetate radionuclide cystography	5	Consider this procedure in girls.	☼☼
Tc-99m DMSA renal cortical scintigraphy	3	This procedure is not a first-line test. It could be used 4 to 6 months after UTI to detect scarring.	☼☼☼
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

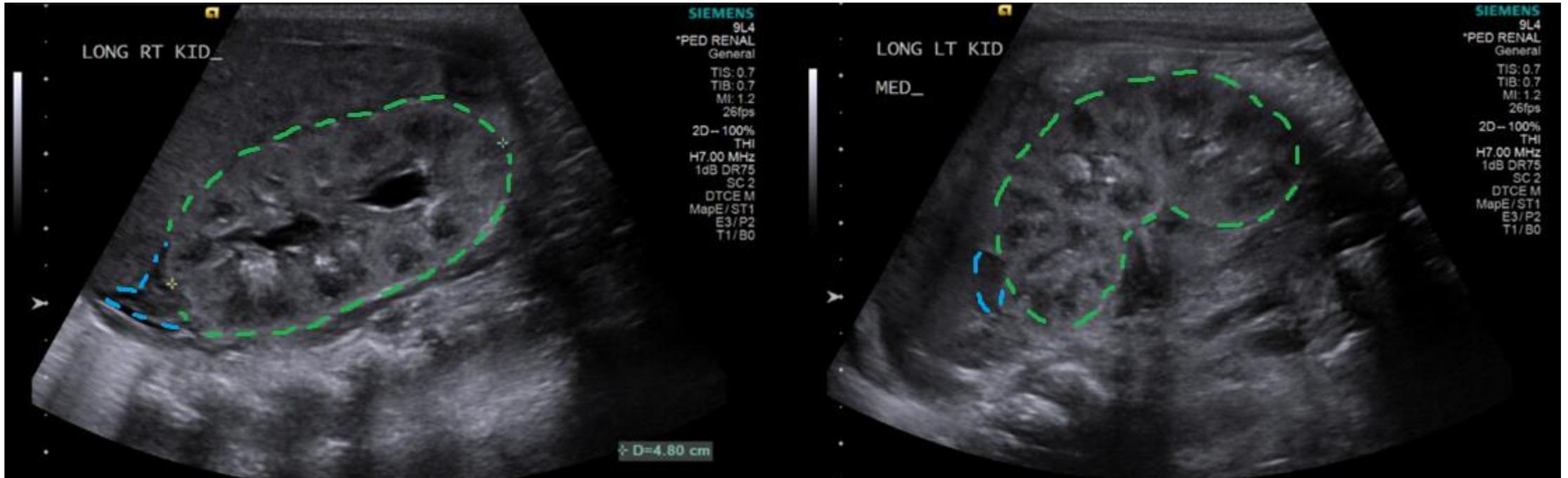
***Sensitivity** and **specificity** of renal ultrasound for prostatic utricle have not been determined due to rarity of condition, , but are 40% and 76% respectively for **vesicoureteral reflux**

Imaging studies: Renal Ultrasound



Long views of kidneys

Imaging studies: Renal Ultrasound



US revealed normal **kidneys**, **adrenal glands**

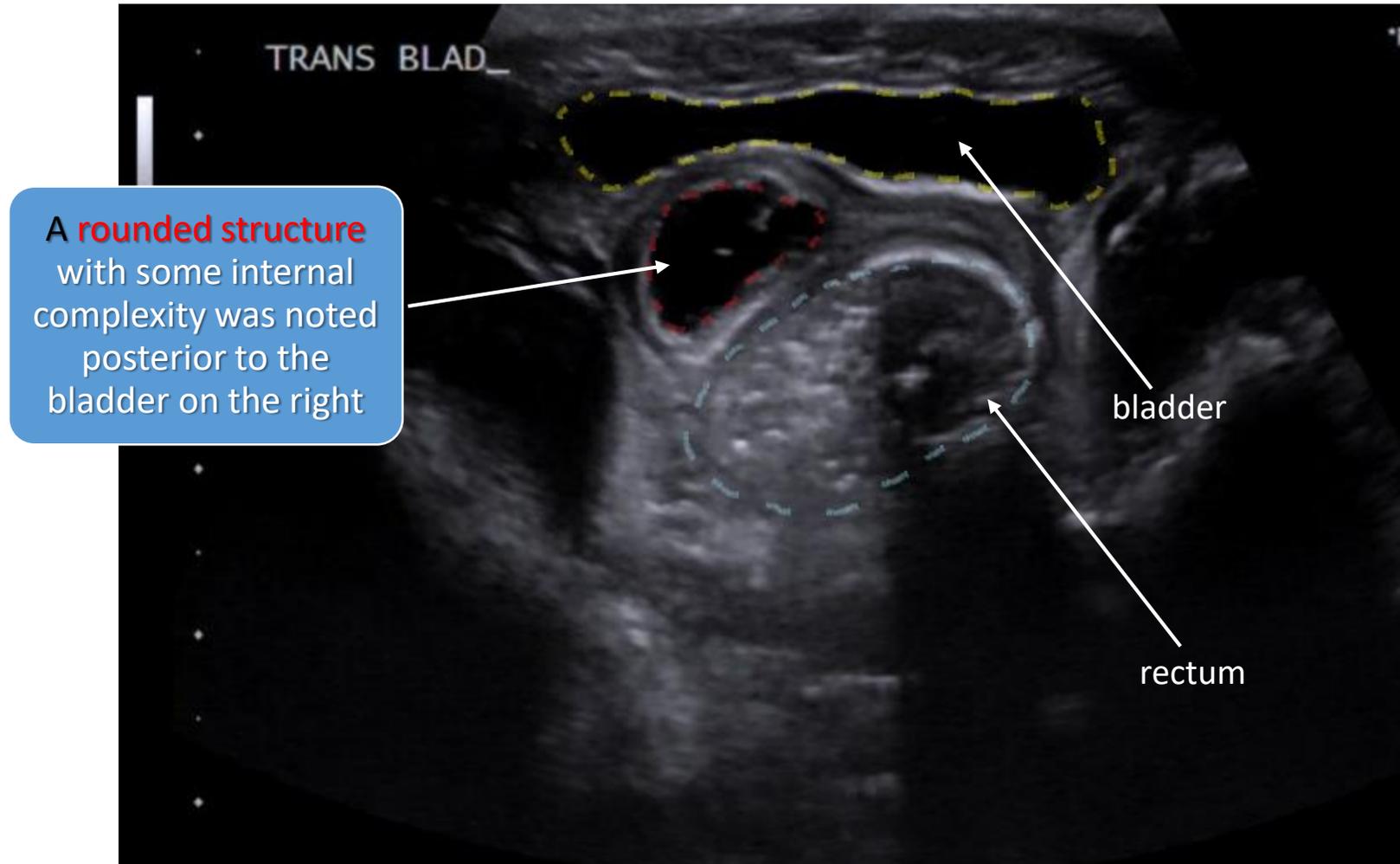
Long views of kidneys

Imaging studies: Renal Ultrasound



Transverse view bladder

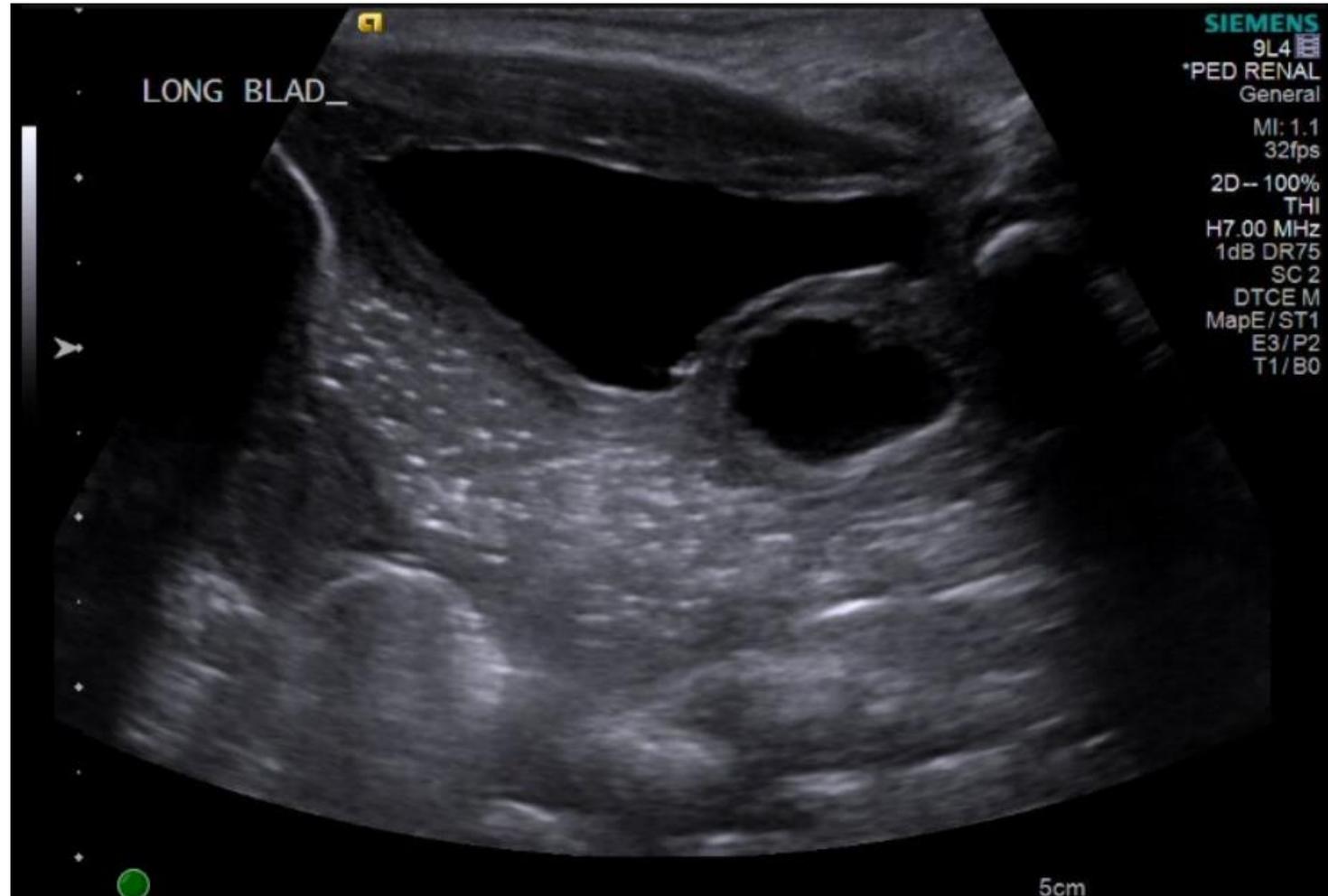
Imaging studies: Renal Ultrasound



- Suspect structure has bladder mucosa
- No intraluminal bladder calculi, polyps, or echogenic debris

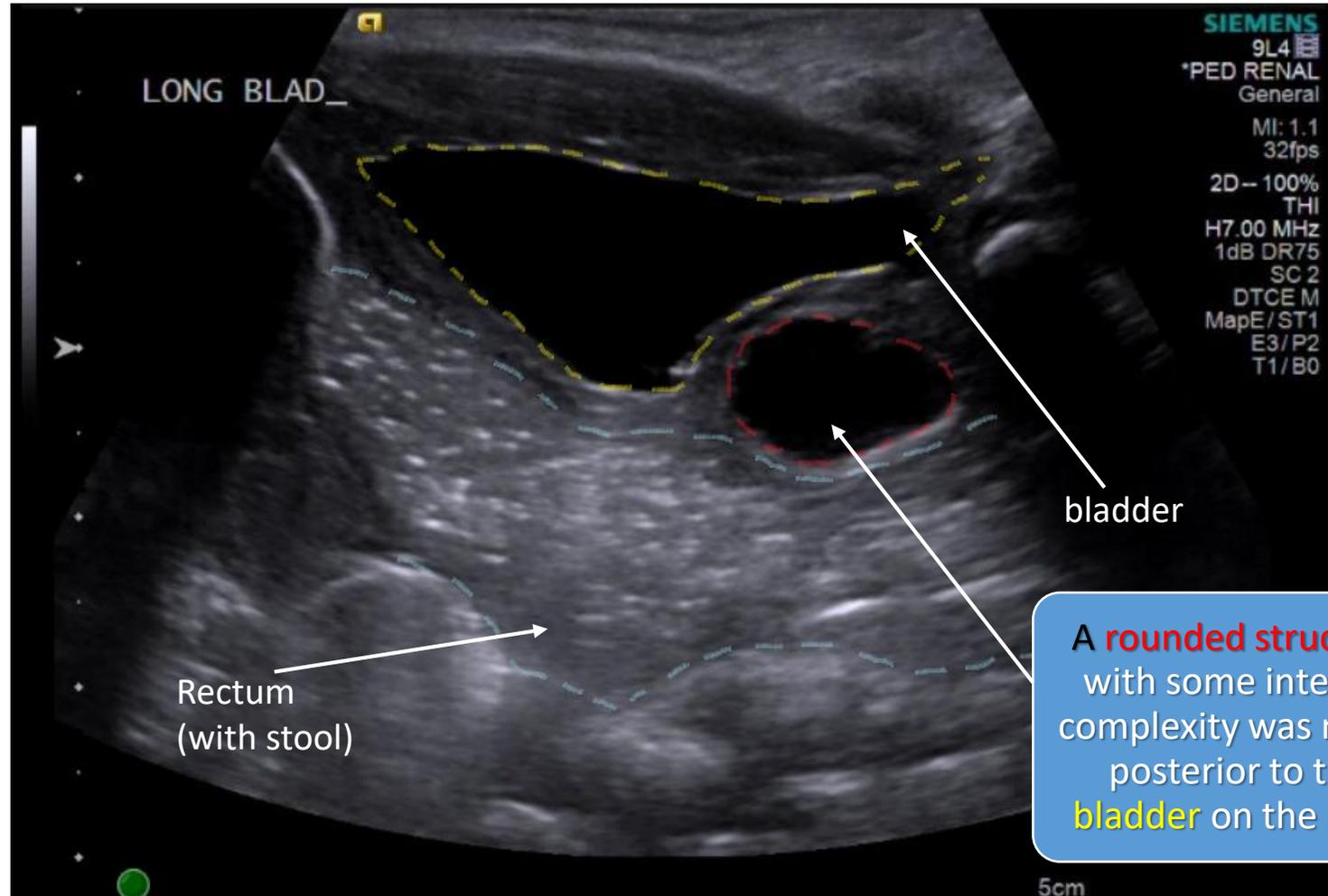
Transverse view bladder

Imaging studies: Renal Ultrasound



Longitudinal view bladder

Imaging studies: Renal Ultrasound



Longitudinal view bladder

Clinical Course

Ultrasound showed normal kidneys and adrenal glands, but also an **irregular cystic structure** behind the bladder prompting concern for ureterocele. Next step? **Voiding Cystourethrogram (VCUG)**

Cost Estimate:
\$500-1000

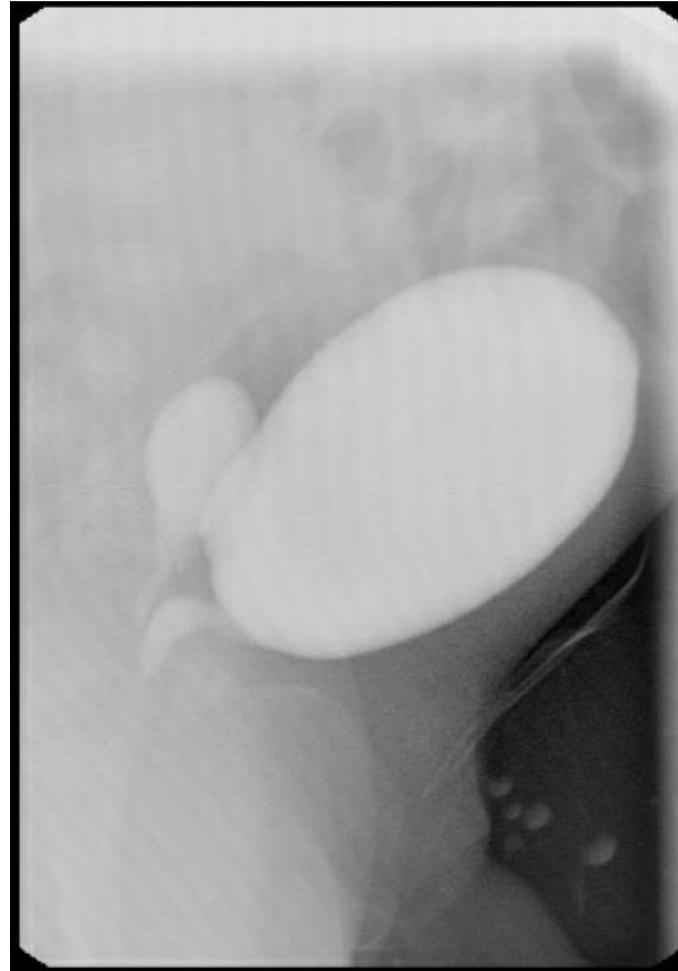
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Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

***Sensitivity** and **specificity** of VCUG for **prostatic utricle** have not been determined due to rarity of condition, but sensitivity is 88% for **vesicoureteral reflux**

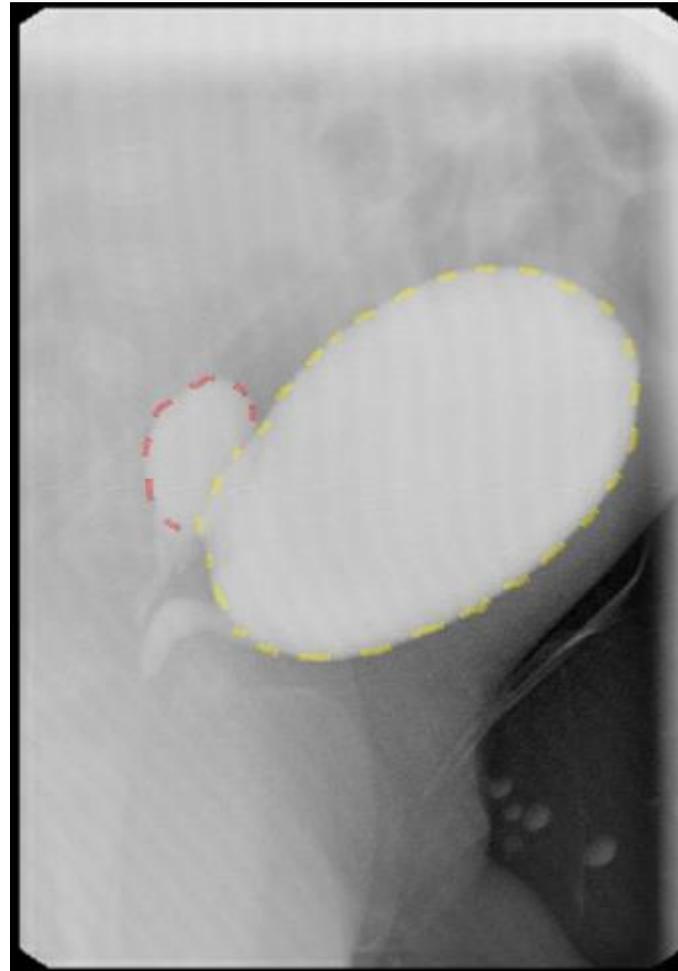
Imaging studies: Voiding Cystourethrogram (VCUG)



Lateral view

Imaging studies: Voiding Cystourethrogram (VCUG)

- Rounded **contrast filled structure** is noted posterior to the right side of the **urinary bladder**
- Structure communicates with the posterior urethra, suggesting a **prostatic utricle**
- Relatively long channel and plicated base
- Corresponds to the cystic structure seen on ultrasound
- No vesicoureteral reflux
- No ureterocele or bladder diverticulum
- Urethra was normal

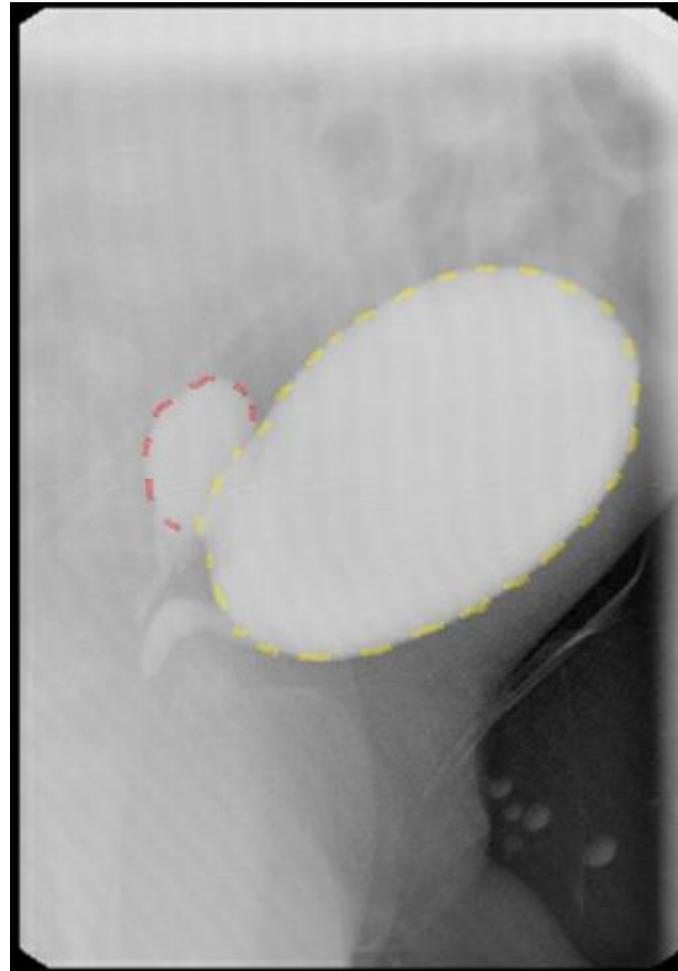


Lateral view

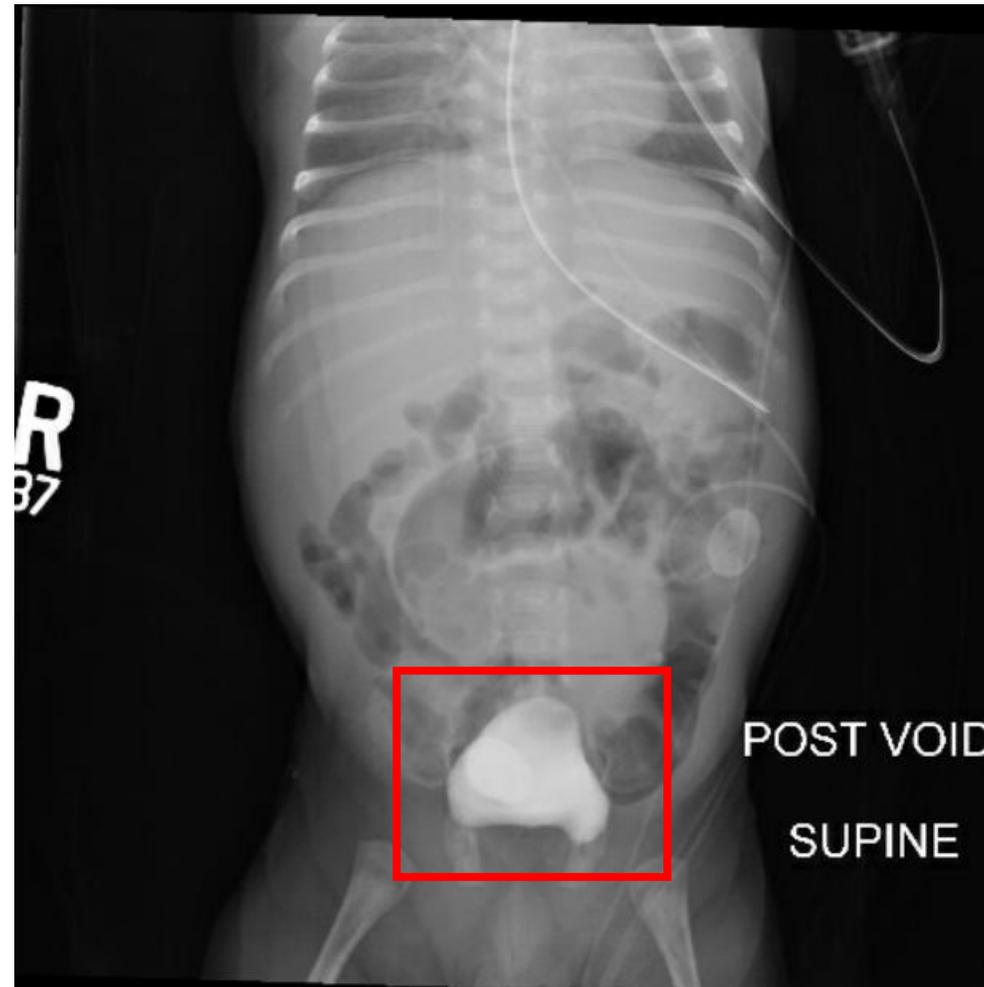
Imaging studies: Comparison

- Lateral view, VCUG
- Longitudinal view bladder, Ultrasound

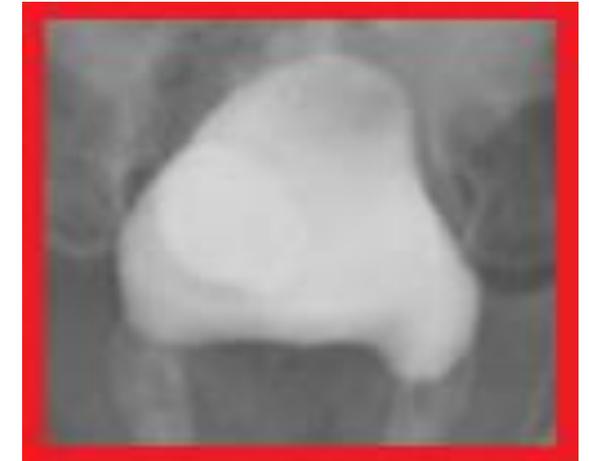
Rounded **contrast filled structure** is noted posterior to the right side of the **urinary bladder**



Imaging studies: Voiding Cystourethrogram (VCUG)

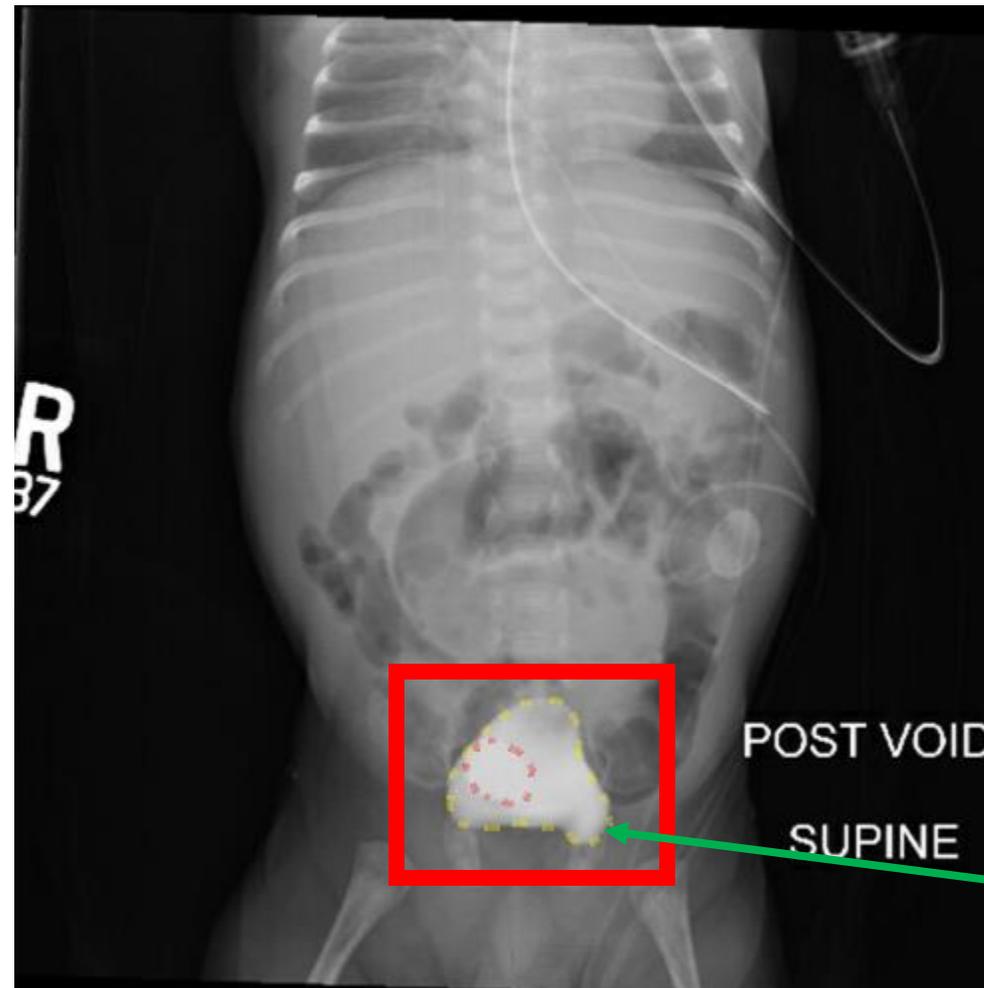


Overhead view

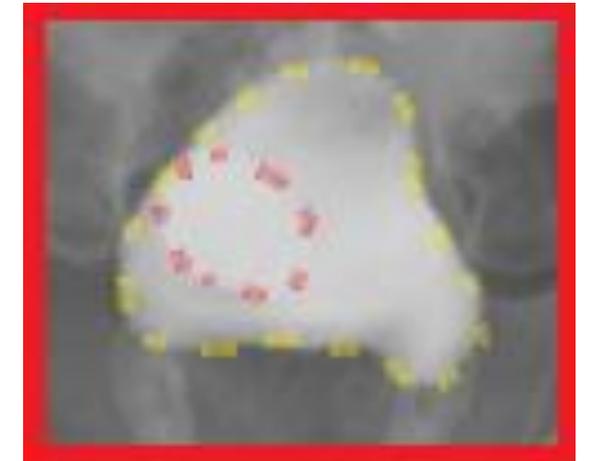


Imaging studies: Voiding Cystourethrogram (VCUG)

- No evidence of bowel obstruction
- Clear lung bases
- Bones are unremarkable
- No abnormal calcification or mass
- Moderate postvoid residual with retained contrast seen within the **prostatic utricle**



Overhead view

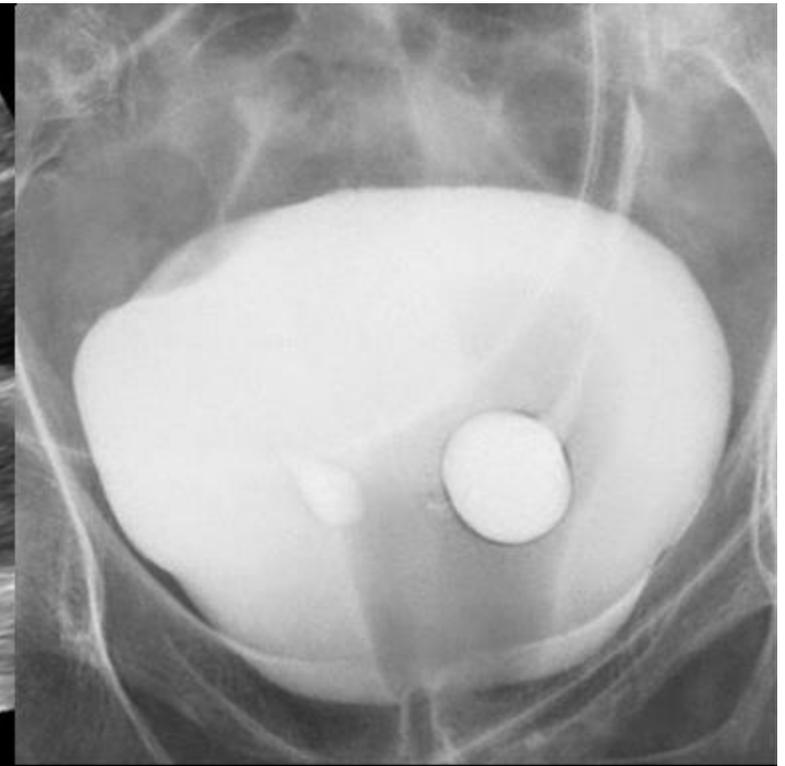


Bladder ear is also incidentally noted (bladder going into the inguinal canal) on the left side

What is a ureterocele?

- Ureterocele blocks the flow of urine
- **Swelling at ureter base** where it enters the bladder
- Can cause vesicoureteral reflux, UTI, kidney infection/damage
- Develops during prenatal period
- Can be inside or outside the bladder
- Note the “**cobra head sign**”, or “**spring onion sign**” on the VCUG on the right (shows dilated distal ureter with linear ureter behind)

Ultrasound longitudinal view bladder

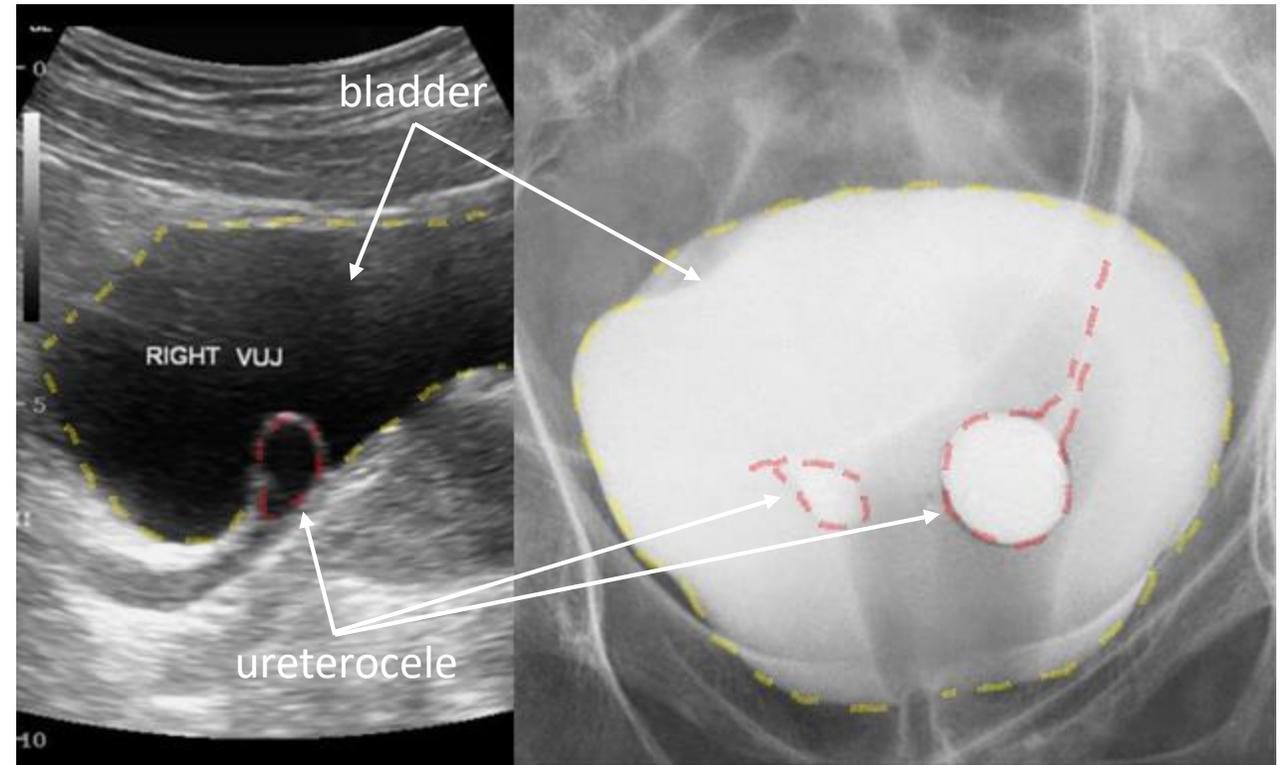


Fluoroscopy

What is a ureterocele?

- **Dilatation at ureter base** where it enters the bladder
- Can cause vesicoureteral reflux, UTI, kidney infection/damage
- Develops during prenatal period
- Can be inside (trigone or bladder base), or outside the bladder (everting)
- Note the “**cobra head sign**”, or “**spring onion sign**” on the VCUG on the right (shows dilated distal ureter with linear ureter behind, at trigone)

Ultrasound longitudinal view bladder



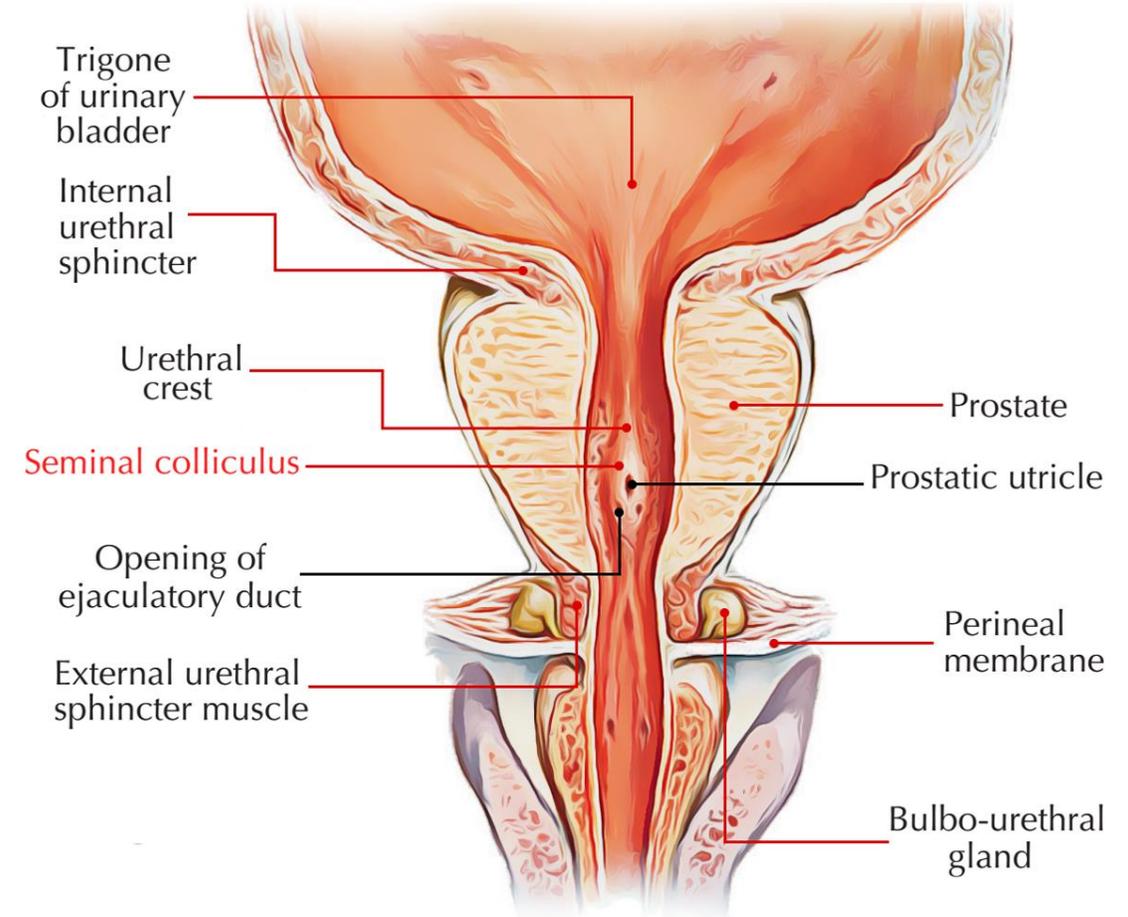
Fluoroscopy

Patient treatment or outcome

- Based on the findings of the VCUG (moderate-sized prostatic utricle), urology **did not recommend UTI antibiotic prophylaxis**
- Per urology, no additional imaging or follow up will be required in the future
- Patient remained in neonatal ICU due to numerous other medical complications

Discussion: Prostatic Utricle

- Epithelium lined blind pouch, normally 4-6mm long, positioned midline between the ejaculatory ducts
- Generally accepted to be derived from **müllerian duct remnants**, though it has been discussed that it may be of urogenital sinus origin, or partially of wolffian duct origin
- Typically **asymptomatic**



Discussion: Enlarged Prostatic Utricle

- Enlarged prostatic utricles may become symptomatic
 - Lower urinary tract irritation / repeated UTIs
 - Post micturition dribbling
 - Urethral discharge
 - Stone formation within the utricle
 - Urine retention
 - Hematospermia
 - Epididymitis
- Can cause **infertility**
- Utricles may become **malignant** (3%) secondary to repeated UTI
- >50% incidence in patients with **perineal hypospadias** (opening is behind the scrotal sac); also seen in patients with posterior urethral valves, and Eagle Barrett syndrome (prune belly)

Discussion: Enlarged Prostatic Utricle

- Treatment is generally reserved for **symptomatic patients**
- **Surgery** is the definitive treatment
 - Endoscopic and laparoscopic approaches have been described
 - Open excision is recommended in pediatric age group
- Surgery is challenging because it is close to many important structures; most severe adverse effect is **damage to pelvic nerves** causing incontinence

Take Home Point

- Prostatic utricle is a rare underlying cause of UTI in a young male
- Treatment is reserved for symptomatic patients only as surgery can be challenging

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