Pediatric Urology



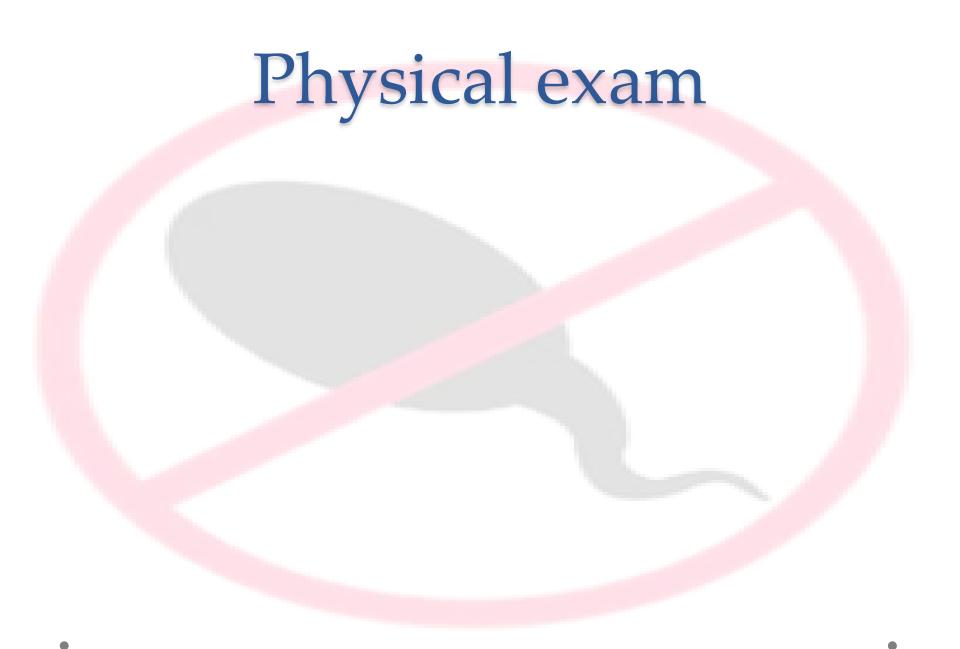
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ASSOCIATE PROFESSOR.



Emergencies

Urological Emergency •
 Any condition of the genitourinary tract that jeopardizes the gonads, kidneys or the life o the child if there is a delay in diagnosis or treatment

- Congenital Malformations Account for 10% 15 % of all deaths occurring within the first year of life with most deaths during the first 30 days of life
- The urgency of diagnosis and treatment of infants with congenital abnormalities depends on the risk associated with that anomaly



- Abdominal Mass
- Most common sign/symptom leading to urologic surgery in the neonate
- 50% renal origin :
- Hydronephrosis
- MCDK
- Requires immediate evaluation

- Potential etiologies of abdominal masses:
- Cystic versus Solid
- Hydronephrosis
- RVT
- MCDK
- Neuroblastom
- Adrenal Hemorrhage
- Teratoma
- Hydrocolpos CMN
- Ovarian Cyst
- Wilms' Tumor
- Mesenteric, choledocal cyst
- Pancreatic cysts ARPKD

Imaging studies:

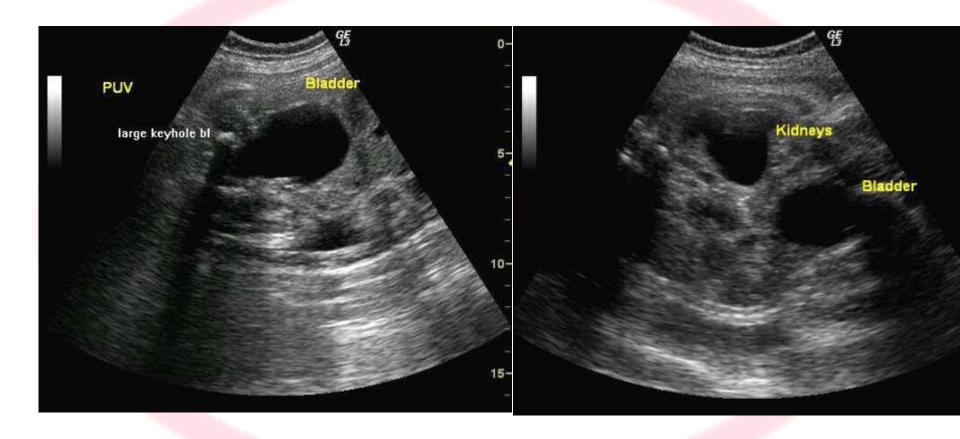
- Ultrasound: Most important initial study
- Renal scan:
- DMSA
- Mag 3
- MR urography

- Hdronephrosis
- Important characteristics
- Unilateral vs. bilateral
- Degree of pelvicaliectasis
- Presence of hydroureter
- Cortical appearance
- Perirenal urinoma
- Bladder appearance
- Amniotic fluid level (AFI)
- Sex



- Congenital urinary tract obstruction
- Conceptually different than post-natal obstruction
- Timing and severity critical to outcome
- Examples that need emergent operative
- Intervention:
- cloacal anomaly with obstructive common channel
- and distended Mullerian and Wolffian structures and
- respiratory distress
- Newborn with prune belly syndrome and urethral
- atresia

- Potential emergent urinary tract obstruction
- Clinical status
- Oliguria
- Anuria
- Slow urinary stream
- Laboratory
- Urinary tract infection
- Acute kidney injury



Posterior urethral valve



)

- Intervention
- Depends on location of obstruction
- UVJ

 nephrostomy tube, end-cutaneous ureterostomy
- UPJ

 nephrostomy tube, ureteral stent, pyelostom pyeloplasty

Gross heamaturia

- Hematuria evaluation
- Full evaluation is essential
- Gross hematuria in neonates is rare
- renal vein thrombosis
- In childhood the 3 most common causes of
- hematuria are
- post strep GN
- UTI
- trauma

CAUSES OF NEONATAL HEMATURIA

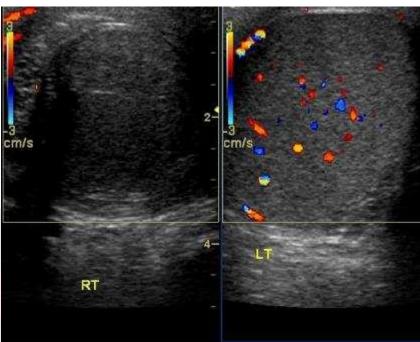
Renal	Nonrenal
Renal vein thrombosis Obstructive uropathy Polycystic kidney disease Renal artery thrombosis Nephrolithiasis Medullary sponge kidney Wilms' tumor Glomerulonephritis Renal cortical necrosis	Adrenal hemorrhage Endocarditis Air embolus Hemorrhagic disease of the newborn Drugs

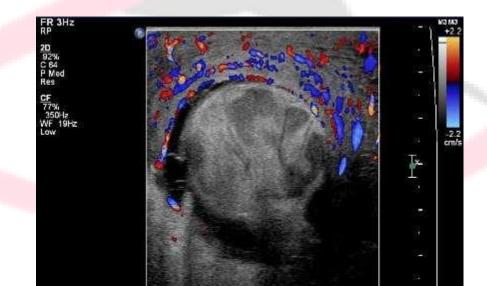
- Renal vein thrombosis
- Triad of hematuria, proteinuria and
- thrombocytopenia
- 20% of all cases of gross hematuria in the
- neonate
- 65% of cases occur in the first 2 weeks of life
- 20% of cases are bilateral
- Treatment
- Hydration/electrolyte balance
- Heparin
- Streptokinase controversial
- Early nephrectomy only if uncontrolled hemorrhage
- /infection

Acute scrotom

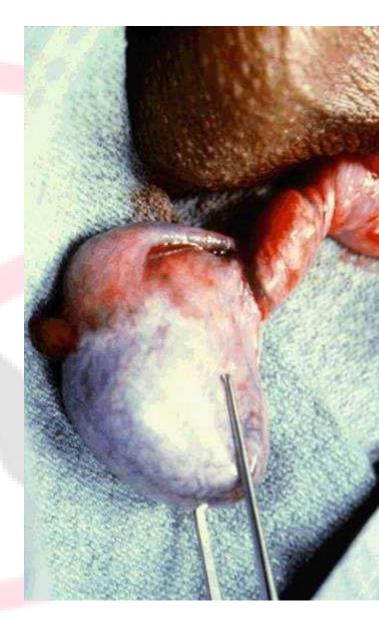
- Acute Scrotum: Differential Diagnosis
- Spermatic cord torsion
- Testicular appendage torsion
- Acute hydrocele
- Incarcerated hernia
- Epididymitis
- Trauma
- Testis tumor
- Idiopathic scrotal edema
- Scrotal abscess





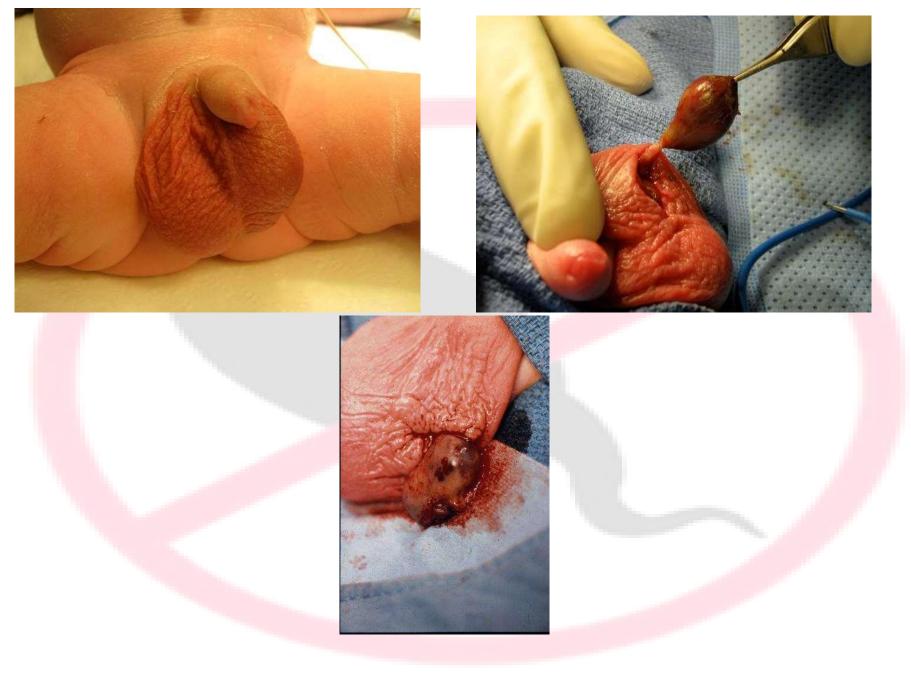






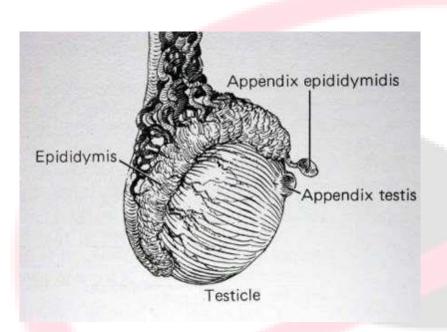


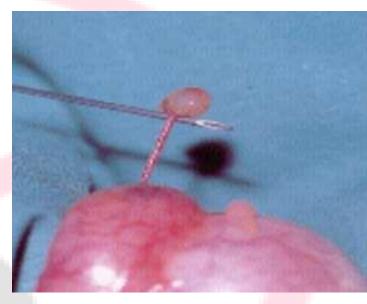
- Extravaginal (neonatal) testicular torsion
- Firm enlarged testis
- +/- skin fixation
- Ecchymosis of scrotal skin
- Frequently in utero event
- Poor salvage rate
- Immediate surgery if suspected mostly to
- prevent asynchronous torsion (controversial)

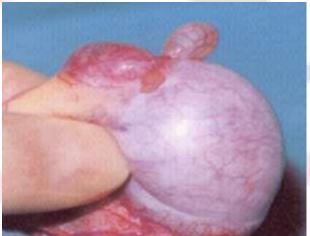


- Testicular appendix torsion
- Clinical presentation
- May mimic testicular torsion
- Usually less severe pain and swelling
- Upper pole "blue dot"
- Management
- Reassurance
- Relative rest
- Analgesic (acetaminophen, codeine)
- It takes 1-2 weeks to improve
- Return to ER if any change in symptoms/findings

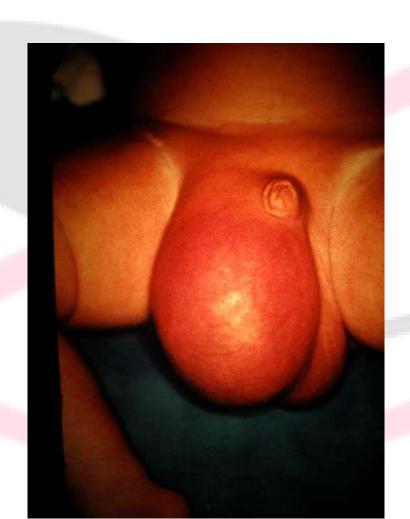
Testicular appendix torsion



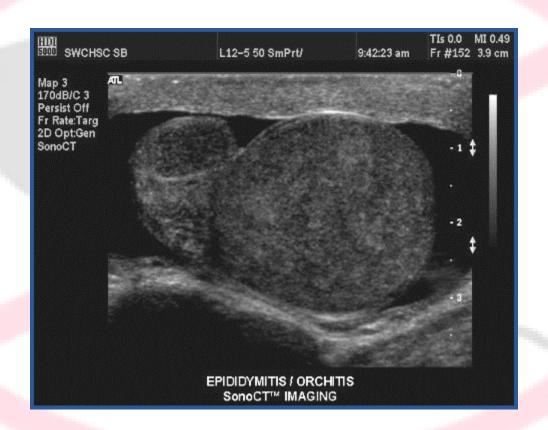




Incarcerated Inguinal Hernia

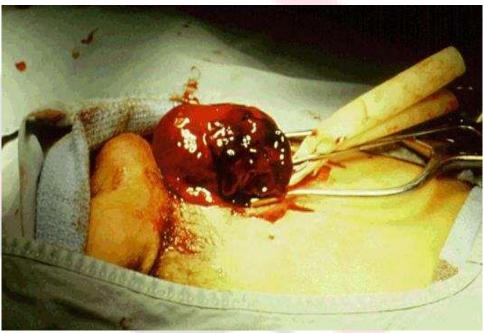


Epididymitis



Trauma





Testis tumor

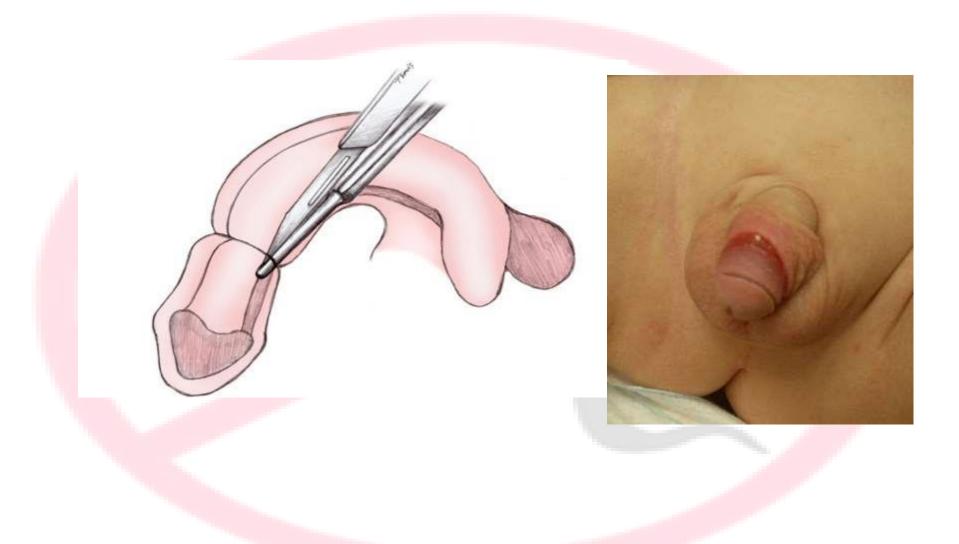




- Circumcision Complications Emergent Issues
- Bleeding
- Typically needs compression dressing rarely suture
- Lidocaine/epinephrine/tetracain (LET) gel
- Can be performed in the emergency room
- Glans Injury
- Buried Penis

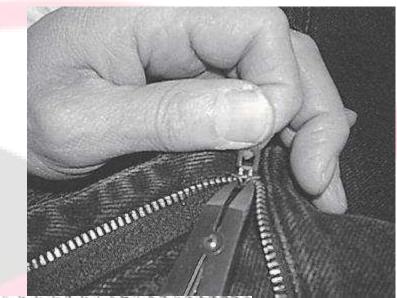
Hair Tourniquet

- Surgical emergency
- Penile edema
- Ischemic injury to glans may result if hair not divided or removed
- If penile swelling present, always check for hair
- tourniquet





Source: Knoop KJ, Stack LB, Storrow AB, Thurman RJ: The Atlas of Emergency Medicine, 3rd Edition: http://www.accessmedicine.com. Copyright © The McGraw-Hill Companies, Inc. All rights reserved.



ENTRAPPED PREPUCE WIRE CUTTER

Paraphimosis Possible consequences of gangrene necrosis Urgent intervention needed Can be done in the ER or office Penile block typically not needed EMLA cream, pain killers and sedation can be used to achieve patient comfy



Manual reduction and compression bandeges









Cryptorchidism

- Cryptorchidism is common, occurring in 1-4% of fullterm boys
- Reasons for treatment: improved fertility potential and
- reduced risk of testicular malignancy, torsion and/or
- associated inguinal hernia

Guidelines:

 Providers should obtain gestational history at initial evaluation of boys with suspect cryptorchidism.

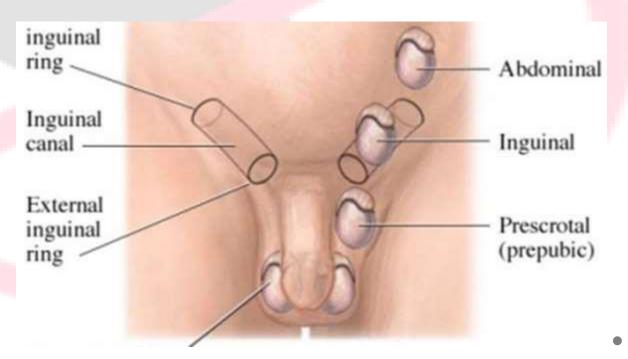
History

- Testis ever palpable/ seen in bathtub
- Prior inguinal surgery
- Family hx of cryptorchidism, hypospadias
- DSD, infertility
- Associated anomalies/syndromes
- ART, meds, prematurity

Primary care providers should palpate testes:
 quality and position of the testis.

- Physical Exam
- Warm, relaxed child
- Frog leg position
- Catcher's position
- Look before you touch
- Milk down from iliac crest toward scrotum
- Lubricant on fingers may help
- Check ectopic sites

- Classification
- Should be practical
- Nonpalpable
- Undescended describe location
- Ectopic
- Retractile



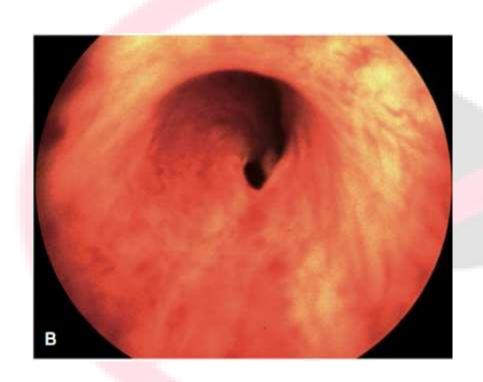
Classification ☐ Testis position on PE nonpalpable-33% above pubic tubercle12% above pubic tubercle-□ pubic tubercle- 35% □ upper scrotum- 15% ectopic-5% □ Testis position at surgery ☐ intra-abdominal-9% "peeping" at IR-20% pubic tubercle- 42% upper scrotum- 8% ☐ SIP or other ectopic-1 □ absent/atrophic-9%

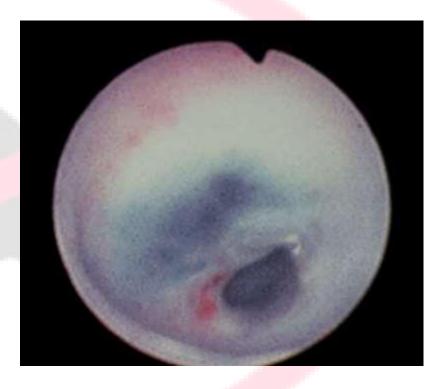
- Hormonal Influences
- 60-90 days of life- 60-90 days of life- high LH and FSH = LH and FSH = high T
- LH, FSH, and T low to prepubertal levels by
- 6-9 mos of age
- Does highT from 2-6 mos of age allow
- High vascularity and improved orchiopexy
- results?
- Therefore if the testis did not come down at the age of 6 months then we have to do surgery.

PUV

- Classification
- Type I 95% of PUV Membranous ridges (leaflets)
 arising from verumontan that extend anteriorly and
 fuse just proximal to the external sphincter
- Type II Arise from verumontanum and extend posteriorly – Nonobstructive, no longer classified as PUV
- Type III Annular ring with a small central perforation – Distal to verumontanum

Type 1 and 3

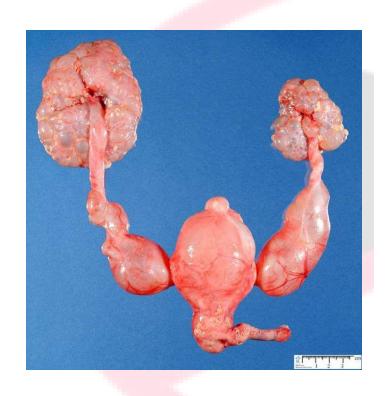




- Secondary effects of PUv
- Lungs
- Pulmonary hypoplasia (may be fatal in newborn period)
- Kidney
- Glomerular injury
- Obstructive uropathy: can be reversible
- Dysplasia: irreversible injury due to obstruction during development vs. abnormal
- ureteral bud development
- Tubular injury
- Compromised body sodium and water maintenance
- Bladder
- Hypercontractility/ low compliance / myogenic failure
- Dilated and elongated prostatic urethra
- Dilated ejaculatory ducts from refluxing urine
- Ureter
- Significant ureteral dilation

 wall thickening

 decreased peristalsis









VUR

- VUR associated with damaged/dysplastic kidneys
- Transmission of high bladder pressures to the upper tract "Pop-off" pressure systems
- Bladder diverticulum,
 urinomas, urinary ascites



- Vesicoureteral reflux and dysplasia (VURD)
- Unilateral reflux is a pressure release valve for the
- bladder
- Renal dysplasia on side of VUR
- (Preserves) contralateral function
- Theory proved false
 long term functional study
- showed no benefit of VURD

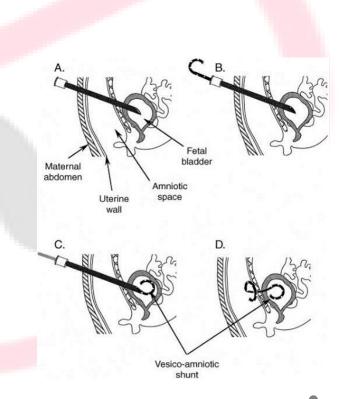
- Clinical Presentation
- Ranges from prenatal to older children
- Age at presentation correlates with disease
- severity and degree of obstruction
- Low birth weight and prematurity
- Older Children
- Present with UTI, voiding dysfunction, hematuria
- Renal insufficiency less common (?)

- Clinical Presentation:
- Prenatal US
- Antenatal USG
- Sensitive for hydronephrosis
- DDx: PUV, PBS, UPJO, VUR, UVJO, urethral atresia
- May be missed if US < 24 weeks gestation
- Classic Findings:
- Bilateral HUN
- Thickened bladder wall
- Dilated prostatic urethra
- Oligohydramnios
- Increased renal echogenicity
- Urinary ascites



Prenatal treatment

- Vesicoamniotic shunt
- Restoration of amniotic fluid volume
- 20-32 weeks
- When fetal electrolytes are abnormal
- POOR:
- Na >100meq/dL
- -C1 > 90 meq/dL
- Osm > 210
- Goals
- Preserve pulmonary function
- No improvement in renal function
- Risks:
- Premature labor
- Shunt obstruction/migration
- Shunt and cystoscopy with ablation?



- Evaluation: VCUG
- Urethral catheterization can be difficult
- Defines anatomy of bladder, BN, and urethra
- Urethra images diagnostic
- Findings:
- Thick-walled, trabeculated bladder
- Bladder diverticula
- -> 50% VUR at the time of diagnosis
- Proximal urethral dilation and elongation
- Prominent bladder neck





- Initial management
- Valve ablation
- Cystoscopy and valve incision
- Standard of care to relieve obstruction
- Cold knife, bugbee electrode, resectoscope, laser ablation
- Incise at 12, or 5 and 7, or both—surgeon preference
- Can be done via both retrograde and antegrade (vesicosto
- approaches
- Circumcision
- 50-60% overall risk for UTI
- Reduces risk by 83-92%
- Videourodynamics (VUDS)?







UTI

- Classification
- Investigation
- Management

VUR

- Etiology
- Investigation
- Grading
- Management