





 Children's Hospital Boston
Update on Pediatric Urology
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 (I have no industry ties or disclosures)

Prenatal Imaging of the Urinary tract



- Ultrasound
- MRI
- Timing
- Follow-up
- Counseling
- Intervention
- Post-natal evaluation
- Goals



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Prenatal Evaluation: Goals

- Identify anomalies that may require pre or post-natal treatment
- Monitor fetal development
- Evaluate amniotic fluid
- Provide prenatal counseling to parents
- Determine if post-natal follow-up is needed
- But...No standardized protocols, wide variability in findings and **LACK OF COMMUNICATION BETWEEN SUBSPECIALTIES**

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Prenatal Evaluation of the GU Tract

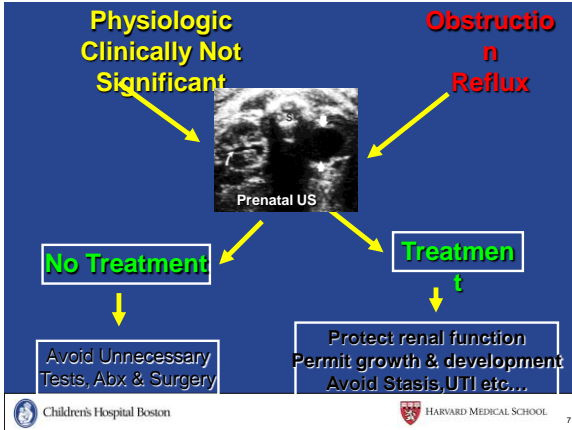
- Fetal kidneys visualized by 12 weeks of gestation
- Fetal bladder seen by 10 weeks
- Amniotic fluid index important clue to renal function
- Improving technology= Increasing detection and higher prevalence
- Specific criteria to evaluate the GU tract
- The big questions: “accuracy in diagnosis” and “postnatal significance of the findings”

Prenatal Hydronephrosis

- Dilatation of the upper urinary tract (renal collecting system and/or ureter)
- Great variability over time
- Is present in up to 10% of all fetuses undergoing prenatal U/S
- May be associated with:
 - No pathology
 - Vesico-Ureteral Reflux
 - An obstructive process

Definition of Prenatal Hydronephrosis

- Based on measurement of the Antero-Posterior diameter of the renal collecting system
- False positive rate 9 to 50%
- 2d. trimester: mild 4-7mm, moderate 8-10mm, severe >than 10mm
- 3d. Trimester: mild 7-10mm, moderate 10-15mm, severe >15mm
- Must also look at bilaterality, ureteral dilatation, appearance of the renal parenchyma, aspect of the bladder and urethra.



PNH: When to be Concerned

- Oligohydramnios (AFI low)
- Moderate or severe bilateral hydronephrosis
- Associated anomalies (spine, heart, etc...)
- Abnormal kidneys (hyper echoic, cystic)
- Very dilated bladder
- Markedly enlarged renal collecting system encroaching on GI tract or lungs
- Intrauterine growth retardation
- Prenatal consultation with Pediatric Urologist is mandatory

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Differential Diagnosis of Prenatal Hydronephrosis

• Transient / Physiologic	50-70%
• UPJ obstruction	10-30%
• VUR	10-40%
• Megaureter	5-15%
• MCDK	2-5%
• PUV	1-5%
• Ureterocele, ectopic ureter, duplex system, urethral atresia, Prune belly, PCKD, renal cysts	

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Prenatal Intervention

- Goals: - preservation of renal function
- allow for lung development
- Rarely needed and should be considered experimental and must be done at specialized center
- Open fetal surgery
- Needle aspiration and amnio-infusion
- Vesico-amniotic shunt
- Termination
- There is no evidence to suggest improved outcomes

Post-Natal Evaluation of PNH

- No published guidelines accepted by Ob-Gyn, radiologists, pediatricians and pediatric urologists
- Mild PNH: no follow-up unless family hx of VUR
- Moderate PNH: consider U/S at one month with +/- bladder imaging
- Severe unilat. PNH: U/S and VCUG at 1 month with MAG3 renal scan
- Severe bilat. PNH: immediate evaluation bt U/S and VCUG
- Role of antibiotic prophylaxis and circumcision in males

Neonatal Circumcision in the USA

- Obstetrician performs the circumcision
- Pediatrician manages the wound
- Urologists takes care of any complications



Circumcision, altar panel by Master St. Severin, circa 1490

CIRCUMCISION

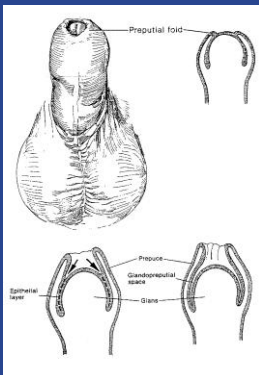
- > Most common operation carried out in the world
- > 25% of men world wide are circumcised
- > 1.2 million a year in USA
- > 65% of US males circumcised
- > Origins may date back 15,000 years
- > Oldest planned operation
- > Most controversial surgical procedure in history



Worldwide Recommendations (non-therapeutic, non religious circumcision)

- > Australia/New Zealand - no medical indication for routine male circumcision
- > British Assoc of Ped Surgeons - practice should be discouraged by education
- > Canadian Ped Soc - evidence insufficient to warrant routine practice
- > ACOG, AAP - data not sufficient to recommend routine neonatal circ.
- > PPS - unnecessary & without medical indications
- > Europe: circumcision not recommended.
- > Japan: emphasis on hygiene, circumcision not recommended

Anatomy



Smegma --> glanular secretion and sloughed debris



Contraindications to Circumcision

- **Absolute:**
 - Penile abnormalities (hypospadias, epispadias, megalourethra, micropenis)
- **Relative:**
 - Bleeding diathesis (family history)
 - Prematurity
 - Severe medical problems
 - Large hydrocele or severe concealed penis
 - Lack of adequate skill or equipment

Indications for Circumcision

- **Medical**
 - Phimosis
 - Balanoposthitis
 - Paraphimosis
 - Localized condyloma acuminata
 - Localized carcinoma
- **Inability to provide hygiene**
- **Prevention**
 - UTIs
 - STDs
 - HIV
 - Penile Cancer
- **Religious & cultural**
- **Parental preference**

Post-circumcision Bleeding

- 0.1 – 35% cases
- Typically from the frenular artery
 - Pressure, pressure, pressure – 5-10 mins
 - Single hemostatic stitch – *fine* absorbable suture material, e.g., 6-0 chromic
 - Must avoid underlying urethra
- Diffuse bleeding
 - Gelfoam around incision for 5-10 mins
 - If does not stop consider coagulopathy
 - May have to bring to OR for further therapy

Questionable Cosmesis: the "Botched Circumcision"

- Not enough skin removed. Push down on prepubic fat pad to ensure that skin is not being pushed up over the glans.
- Asymetric residual foreskin.
- Recurrent preputial adhesions.
- Penile skin bridges.
- Too much skin removed.
- Penile entrapment.

Alternative to Circumcision

- Topical application of steroid cream for treatment of phimosis (40 to 70% success rate, may be related to retraction)
- "Swedish procedure": dorsal slit on outer aspect of penis at level of the phimotic ring
- Complete dorsal slit.
- Tincture of time (most phimoses resolve by puberty)

Penile Adhesions

- Physiologic adhesions present in all uncircumcised infants
- Resolve as a underlying skin exfoliates
- Can often be seen as a whitish lump (smegma)
- Natural process not infectious. Occ. redness when separate.
- Physiologic adhesions may persist after NB circ and will resolve without Rx



Penile Skin Bridge

- Form as a result of newborn circumcision
- Scar tissue forms between the circ incision line and the glans
- Will not resolve without surgical excision
- Normally do not recur after Rx



Meatal Stenosis

- Acquired problem of circumcision
- Pathogenesis: recurrent meatitis from prolonged exposure to moist environment
- Other causes: prior hypospadias repair, prolonged urethral cath., trauma and BXO
- Pinpoint meatus (nl < 1 yo --> 5 fr.; 1-6 --> 8fr.)
- Application of post-circumcision lubrication!
 - Reduces risk of meatal stenosis (7% v. 0%); Bazmamoun et al., Urol J, 2008

Meatal Stenosis

- Dx: dorsal deflection of urinary stream, fine caliber and forceful stream, dysuria, blood spotting, frequency, urgency.
- May be associated with significant voiding dysfunction in boys.
- Rx: Meatotomy; NO DILATATION !!!!





Care of the Non-Circumcised Penis

- Newborns and toddlers: Wash penis gently with soap and water
- Start gently retracting foreskin at 6 months to a year
- Have child start washing his penis at age 2 to 3
- Should be taught to retract foreskin early
- Never retract foreskin forcefully
- Foreskin should retract fully by age 4 to 5

Scrotum and Testicles

- Hydrocele
- Hernias
- Maldescended testes
- Absent testis
- Scrotal pain/ acute scrotum
- Varicoceles

Testicular Maldescent

- Common condition 1% of boys
- Bilateral in 5 to 10% of cases
- 20% are impalpable: 80% intra-abdominal, 20% vanishing testis syndrome
- Do NOT use Ultrasound to find testicle, no change in management and lack of reliability
- Laparoscopy for evaluation
- Rule out retractile testis> Definition
- Surgery for truly maldescended testis between 6 months a 1 year of age so referral at 4 to 6 months of age.



The Acute Scrotum

- Differential diagnosis: torsion of spermatic cord, torsion of appendix torsion (blue dot sign), epididymitis
- Presentation: acute onset of pain versus slow, degree of pain
- Physical examination
- Role of ultrasound
- Timing of surgical intervention (4 to 6 hour window of time to salvage testicle)
- Torsion of the spermatic cord is a true emergency!

Hernia/Hydrocele

- Hydrocele= fluid around the testicle, very common in newborns, will resolve within 1 year in most cases
- Association with hernia, groin swelling
- Incarcerated hernia, also an emergency!
- Hydroceles should not be treated until 1 year of age, so refer later unless very large and tense
- Adolescent hydrocele usually secondary to trauma. Should have scrotal U/S evaluation

UTIs and Pyelonephritis
