POTPOURRI OF PEDIATRIC UROLOGY

DMG PED UROLOGY

CRAIG SMITH M.D., F.A.A.P., F.A.C.S.

AUTUMN ROLAND PA-C

Overview

- Recurrent UTIs
- Ureteral reflux
- Dysfunctional Voiding
- Hydroceles and Hernias
- Glandular and Labial Adhesions
- Undescended Testes
- Acute Scrotum

MANAGEMENT OF RECURRENT UTIs AND VUR

Overview

- Concealed Penis
- Hypospadias
- Varicocele
- Obstructive Uropathies
  - UPJ Obstruction
  - Megaureters
  - Ectopic Ureters and Ureteroceles

Guidelines

AAP Guidelines
AUA Guidelines
Riley Children’s Hospital Guidelines

Riley Practical Guidelines

- Obtain UA when suspect UTI. If positive, culture should be obtained from catheterized specimen
- Positive cultures should be treated with 7-10 days of antibiotics - based on sensitivities
- All patients with febrile UTI should undergo RBUS

Riley Practical Guidelines

Obtain UA when suspect UTI. If positive, culture should be obtained from catheterized specimen
Positive cultures should be treated with 7-10 days of antibiotics - based on sensitivities
All patients with febrile UTI should undergo RBUS
Riley Guidelines (continued)

- All patients with febrile UTI should undergo VCUG
- Patients with VUR and abnormal US may benefit from DMSA renal scan
- Children <1 year of age with febrile UTI should be started on continuous antibiotic prophylaxis (CAP)

Why UTI’s?

- 40% anatomical
  - 95% reflux
- 60% functional

4 UTI Questions

- Is there dysfunctional voiding?
- How to prevent?
- Use of prophylactic antibiotics?
- Is reflux present?
  - When to correct?

Dysfunctional Voiding

- Characterized by incomplete relaxation or overactivity of the pelvic floor muscles during micturition.
- It can manifest in different patterns depending on the degree of functional outflow obstruction as well as the status of detrusor activity
- The underlying bladder-sphincter dysfunction may evolve progressively and change with time through a transitional phase of a complex sequence of events of bladder functional developments.

Dysfunctional Voiding (Dysfunctional Elimination Syndrome)

- It has been long recognized that children with voiding dysfunction and recurrent UTI’s often have associated bowel dysfunction, including constipation, fecal impaction and encopresis.

Dysfunctional Voiding (Demonstration)

- “Buford the Bladder” has issues w/ “Sammy the Sphincter” on urinary control
Dysfunctional Voiding
Common Sx
- Postponing micturition (Vincent’s curtsy)
- Frequency
- Urgency
- Urge incontinence
- Constipation

Treatment
- Behavior Modification
timed voiding
- bowel program
- Biofeedback
  - 80% successful

BIOFEEDBACK
- For treatment of dysfunctional voiding and inadequate pelvic floor relaxation during voiding.
- Child learns visually what pelvic floor relaxation and contraction are
- Animated game for children 5 y/o or older
  - “help the dolphin swim”
- Non-invasive using sensors (stickers)
- Each session lasts 30-60 minutes
- 3 sessions, each two weeks apart

The Impact of Biofeedback on Dysfunctional Voiding and VUR**
- Resolution of VUR on VCUG 6 mo. after biofeedback
  - Resolution 63%
  - Grade improvement 29%
  - No change in grade 8%
- Subjective improvement in children treated with biofeedback
  - Nocturnal Enuresis 82%
  - Daytime wetting 79%
  - Constipation 78%
  - Frequency 76% Urgency 71%
  - UTI 80%


Prevention of Recurrent UTIs in Children
- Cranberries and Blueberries
- Timed Voiding
  - Q 2 hours
  - “Potty” watch
- Bowel Program
  - Fruits, Fiber, Fluids, low sat Fat
  - Miralax
- Biofeedback

Antibiotic Prophylaxis Recommendations
- 0-3 months
  - Keflex
  - Amoxicillin 20 mg/kg/day
- 3 mo and older
  - Primsol or Septra
  - Nitrofurantoin
Vesicoureteral Reflux

Antibiotic prophylaxis: Advantages
- Conservative approach may be preferred by patients
- Low risk of serious adverse events
- Lack of need for surgery
  - no waiting time
  - no anesthesia
  - no operating room costs

Antibiotic prophylaxis: disadvantages
- Conservative approach may need to be continued for many years
- Breakthrough UTI
  - 5-year infection rates above 40% have been reported
- Antibiotics not indicated for long-term prophylaxis
- Risk of antibiotic resistance
- VUR is not cured

Antibiotic prophylaxis: disadvantages
- Poor long-term compliance
- Possible difficulties with administration
  - Need to crush tablets for infants
  - Unpleasant taste, may discourage children from taking their medication
- Risk of adverse events
- Continued need for monitoring
  - regular VCUG assessments

Overall spontaneous resolution rates: 16–49% after 4–5 years (dependent on reflux grade)
- Resolution more likely with lower grades of reflux
- Rate of resolution decreases over time
- For children with grade III–IV reflux, 48% will require treatment for >10 years
- New renal scars have been reported in up to 22% of patients

VCUG or PIC Cystogram (When VUR needs to be confirmed)
- VCUG in Infants
- VCUG with sedation in children 9 mo and older
- Option of PIC Cystogram when child is ~2 yrs or older

What is a PIC Cystogram?
- Positional Installation of Contrast Cystogram
- Performed under general anesthesia
- Was initially performed when reflux was not detected on a VCUG (15% chance of false negative)
PIC Cystogram

- Greater than 2y
- No dysfunctional voiding
- Recurrent febrile UTI's
- Possible candidate for deflux
  - Performed at same time

Evolution of Reflux Surgery

Surgery is not extinct - but it's on the endangered species list

First Parental Concern:
Degree of Invasiveness / Risk

Many options!

AUA Reflux Guidelines 2010
Goals

- Prevent recurring febrile UTIs
- Prevent renal injury
- Minimize the morbidity of treatment & follow-up

Injection Technique: Double HIT

Maximizes coaptation and decreases migration

Port sites

Open or Robotic Surgery
Overkill?

Endoscopic Injection
Optimal! Overused?

More likely to substitute for both open surgery & Ax

AUA GUIDELINES
A Department within the Health Policy Division

Lackgren and Kirsch, BJU Intl 2010

Maximizes coaptation and decreases migration

Artwork, Nicola Capozza, with permission

Peters, C et al, J Urol, 2010

Open or Robotic Surgery

Endoscopic Injection

Overkill?

Optimal! Overused?

More likely to substitute for both open surgery & Ax
Endpoint of Injection = H0

Assumes proper technique and adequate volume of injection

Deflux

Advantages

- Outpatient, 20-minutes
- Performed bilaterally without risk of AUR
- No scar
- No pain medication
- Same (or better) clinical results as open surgery

HERNIAS and HYDROCELES

- Definition: patent processus vaginalis
- Simple Hydrocele
- Communicating Hydrocele
- Inguinal Hernia

When should a hydrocele/hernia be repaired?

- Spontaneous resolution up to 1y
- If incarcerated, should repair within a few days
- When present in premature infants
  - Strangulation risk

Right Inguinal Hernia

Glandular and Labial Adhesions

- When to address
- How to correct
- When uncircumcised
- Recurrence
Undescended Testes

- 3% of newborn males
- ~75% of newborn testes will descend by 3 m.
- ~80% of UDT’s are palpable
- ~50% of non-palpable testes will be absent (confirmed as a vanishing testes @ time of laparoscopy)

Palpation of UDT

- Examination of the groin for an undescended testicle is often enhanced with the use of lubrication. (A) The examining hand is swept along the inguinal canal, starting at the superolateral extent of the inguinal canal. If the testicle is present, it will either “pop” under the examiner’s fingers (B,C), or be manipulated into the scrotum, where it will be palpated by the opposite hand (D).

TRUE or FALSE

- Monorchidism does not appear to diminish the paternity rate.
  - True

Acute Scrotum

- Testicular torsion
  - Adolescent
  - Infant
- Testicular Appendage
  - Childhood
Testicular Torsion
Fix it before it’s too late

Testicular Appendage Torsion
Observe or remove

Concealed Penis
- Why it is, what it is.
- Penoplasty repair when to wait when to go

Concealed Penis
- Give it time
  - Typically 18mo
- Genital awareness increases after 2y

Hypospadias
- Increase prevalence from 1/500 to 1/250 from 1970 to 1993.
- Familial tendencies w/ ~7% of fathers and 14% of male siblings.
- Anterior/distal defects constitute 50-70% of hypospadias

Hypospadias Variants
Question

- What percent of pt.’s w/ hypospadias and a unilateral palpable undescended gonad have an intersex condition? What if the gonad is non-palpable? What is the most common condition?
  - 15%
  - 50%
  - Mixed Gonadal Dysgenesis

Hypospadias

- Goal: as good if not better than a typical circumcised boy appearance.
- One staged repairs
- Two staged repairs
  1) correction of chordee w/ grafts
  2) urethroplasty covered by TV graft

Varicocele

- 7-12% of adolescents
- G-3 require consideration for repair
- Most common cause for male factor infertility
- Asthenozoospermia
- Typically asymptomatic

Varicocele repair

- Laparoscopic
- Incisional
  - with sclerosings
UPJ Obstruction

- Most common cause of significant dilatation of the collecting system in the fetal kidney (~48% of all dilated systems)
- > 20mm A-P pre-natal renal pelvis diameter may need post-natal surgical repair
- Other urologic abnormalities may be found in ~50% of affected infants

UPJ Obstruction Evaluation

- Serial in office RBU/S
- MAG-3 Renal Scan w/ lasix
- VCGU if dilated ureter or UTI
- Sx assessment

UPJ Obstruction Repair

- Incisional
- Endoscopic
- Laparoscopic
- Robotic

UPJO Repair

Megaureters

- Obstructed
- Refluxing
- Refluxing and Obstructed
- Non-refluxing Non-obstructed

Megaureters

- Work up same as for UPJ Obstruction
- Define condition
- Monitor with serial in office RBU/S
- Treat each case individually and appropriately
Megaureters Repair
- Tapered Reimplant
- TUU
- Treat contributing conditions

Ectopic Ureters
- 80% are associated with a duplicated collecting system
- In females > 80% are duplicated and internal genitalia may be disordered
- In males most ectopic ureters drain single systems with the posterior urethra as the most common site of termination

Ectopic left ureter repair (TUU)

Question
- How common are duplicated collecting systems?
  - 0.8% (+ family Hx increases incidence to 12.5%)
- What % of duplicated systems are incomplete?
  - 70%

Ectopic Ureters
- Work up same as for UPJ Obstruction
- Define condition
- Monitor with serial radiographic exams
- Treat each case individually and appropriately

Ureteroceles
- Intravesical vs Ectopic
- Single or Duplex
- Stenotic vs Sphincteric vs Sphincterostenotic vs Cecoureterocele w/ or w/o prolapse
- “Or just Supra-caIa-fragalistic Espe-ali-gosis”
Ureteroceles
- Work up is same as for UPJ Obstruction
- Define condition
- Monitor with serial radiographic exams
- Treat each case individually and appropriately

Ureterocele repair
- TUPU
- Double barrel reimplant
- TUU
- Partial Nx

DaVinci Robot

Pediatric Urologic Oncology
- Neuroblastoma
  - Most common extracranial solid tumor in childhood
  - 95% present at < 10 y/o (50% at < 2 y/o)
  - Neural crest origin sympathetic chain
  - 75% retroperitoneal (50% adrenal)
  - Most common malignant tumor in infancy
  - Metastatic at presentation in 70%, N-myc amplification
  - Children < 1 y/o better survival
  - Possible regression, become benign or extremely malignant

Rhabdomyosarcoma (RMS)
- Most common soft tissue sarcoma in infant and children
- 15% of all pediatric solid tumors
- 20% arise from the GU system
- Prostate—bladder—paratesticular—vaginal—uterus
- Peak incidence bimodal: ~2 y/o and early adolescence
- Embryonal, alveolar, pleomorphic
- Embryonal most common subtype in GU RMS
- 60-80% of paratesticular RMS are stage 1, older pt > 10y at higher risk of retroperitoneal disease
- Organ sparing therapies for bladder, vaginal + uterus poor Px

Wilms' Tumor
- Most common primary malignant renal tumor of childhood
- Congenital mesoblastic nephroma (CMN) most common < 3m
- Congenital anomalies: aniridia 7.6%, hemihypertrophy 8.4%, Beckwith-Wiedemann 33.4%
- Genitourinary anomalies: hypospadias 13.4%, UDT's 37.3%, hypospadias and UDT 12%
- Genetic mapping: deletions of WT1, 11p, 11p15, 1p, 18p
- Local recurrence if no LND or tumor spillage with decrease survival to 43%
- Favorable and Anaplastic pathology
Rare renal and testicular tumors

- Renal
  - Clear cell sarcoma
  - Rhabdoid tumor
  - Multilocular cystic
  - Renal cell carcinoma
  - Angiomyolipoma
- Testicular
  - Teratoma, yolk sac, epidermoid cyst
  - Intersex and gonadoblastoma

Bless You for taking care of Children

THANK YOU

- For the joy of the opportunity to participate in the urologic care of your patients
- For your expertise, commitment, love and hard work that you continuously give to the children the Lord has entrusted
- GOD BLESS,
  
  Craig and Autumn