Urology: A Practical Primer and Recent Updates

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About Me

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Disclosures
None

Objectives
- Discuss practical, day-to-day care regarding common issues
- Review recent published AUA guidelines
- Know when to refer to specialized care and what to tell parents ahead of referral
- Q & A

Undescended Testicles: Diagnosis and Management

AUA Guidelines
https://www.auanet.org/guidelines/cryptorchidism-(2018)
AUA Guidelines

- Providers should obtain gestational history at the initial evaluation of boys with suspected cryptorchidism.
- Primary care providers should palpate testes for quality and position at each recommended well-child visit.
- Providers should refer infants with cryptorchidism detected at birth by six months corrected gestational age.
- Providers should refer infants boys with newly diagnosed (acquired) cryptorchidism after six months corrected gestational age to a surgical specialist.

AUA Guidelines

- Providers must immediately consult a specialist for all phenotypic male newborns with bilateral, non-palpable testes.
- Providers should NOT perform ultrasound or other imaging modalities in the evaluation of boys with cryptorchidism.
- Providers should assess for a possible disorder of sexual differentiation (DSD) when hypospadias and cryptorchidism co-exist.
- In boys with bilateral, nonpalpable testes who do not have congenital adrenal hyperplasia (CAH), providers should measure Müllerian Inhibiting Substance (MIS) or Anti-Müllerian Hormone (AMH) and consider additional hormone testing to evaluate for anorchia.
- In boys with retractile testes, providers should assess the position of the testes at least annually.

AUA Guidelines

- Providers should not use hormonal therapy to induce testicular descent.
- In the absence of spontaneous testicular descent by six months (corrected for gestational age), specialists should perform surgery within the next year.
- A scrotal or inguinal orchiopexy should be performed in prepubertal boys with palpable cryptorchid testes.
- In boys with a non-palpable testicle, the surgical specialist should perform an exam under anesthesia to reassess palpability/location.
- At the time of exploration for non-palpable testes the surgeon should identify the testicular vessels.
- In boys with a normal contralateral testis, the surgical specialist may remove the undescended testicle.
- Providers should counsel boys with a history of cryptorchidism regarding potential long-term risks.
**AUA Guidelines**

- Providers should obtain gestational history at the initial evaluation of boys with suspected cryptorchidism

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**Embryology**

- When do the testis normally descend?
  - 3rd trimester
  - 60% by 30 weeks
  - 93% by 32 weeks
  - More common:
    - premature births
    - small for gestational age babies

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**Incidence**

- Term male infants?
  - 3%
- Preterm and/or birth weight < 2.5kg?
  - 33% - 45%
- 1 year of age?
  - 1% for full term
  - 10% for premature births
- 90% of spontaneous decent by 6 months
Incidence

- Proximal hypospadias - 30%
- Other syndromes/conditions associated with UDT
  - Prune belly
  - Exstrophy
  - Prader-Willi

AUA Guidelines

- Primary care providers should palpate testes for quality and position at each recommended well child visit

Classification

- Palpable vs. non-palpable
- Scrotal, inguinal, abdominal
- Retractile
- Ascending
- Ectopic
Classification

- Palpable vs. non-palpable
- Scrotal, inguinal, abdominal
- Retractile
- Ascending
- Ectopic

Diagnosis

- Physical exam
  - Warm room
  - Supine and frog leg
  - Soap or lube may help
  - Retractile testes should remain in the scrotum when manipulated down
Diagnosis

- **Non-palpable**
  - Feel for cord structures across the pubic bone
  - Look for compensatory hypertrophy
  - 18% of non-palpable are palpable under anesthesia

- **Bilateral non-palpable**
  - New born: consider DSD (CAH until proven otherwise)
  - Older child: chromosome and hormonal work up
    - Baseline LH, FSH
    - NGS vsm test
    - AMH
    - Bilateral intra-abdominal testes 20x more likely than bilateral anorchia
  - Surgical exploration typically still recommended

Imaging?
AUA Guidelines

- Providers should NOT perform ultrasound or other imaging modalities in the evaluation of boys with cryptorchidism

Imaging—Why not?

- Imaging accuracy
  - US 45% sensitive and 78% specific in non-palpable testes
- Cost
- Availability
- Need for anesthesia (MRI)
- Diagnostic laparoscopy/surgical exploration are the gold standards
- Parental anxiety

AUA Guidelines

- In boys with retractile testes, providers should assess the position of the testes at least annually
Retractile Testicles

- Initially extrascrotal on examination or easily moves out of the scrotum
- Manually replaced in scrotum
- Remains temporarily
- No tension

Ascent

- Typically identified ages 6-10
- More likely with retractile testicles (20%)
- Inguinal hernia in 50%

When to refer?

- Providers should refer infants with cryptorchidism detected at birth by six months corrected gestational age
- Providers should refer infants boys with newly diagnosed (acquired?) cryptorchidism after six months corrected gestational age to a surgical specialist
Fertility

- Histologic changes demonstrated in UDT and to a lesser extent in the contralateral testis
- Delaying orchiopexy increases abnormal histologic changes
  - Push for orchiopexy by 1 year
- Unilateral UDT still have normal fertility rates (90%)
- Bilateral UDT fertility rates 50-65%

Malignancy

- Increased risk of malignancy
- UDT ?
  - 2-8 x
  - Increased with orchiopexy after age 10 compared to prior
- Contralateral ?
  - 1.7 x
- Facilitate self exams

Ascending testicles

- May be more like primary undescended testicles
Management

- 1 month old referred for unilateral UDT
- PE: normal phallus, normally descended R testis, L testis palpable in the inguinal region
- What do you do?
- Re-examine after 6 months of age, refer to urology if still undescended

Management

- 6 month old referred for unilateral UDT
- PE: normal phallus, normally descended R testis, L testis non-palpable
- What do you do?
- Refer to urology
- NO IMAGING

Management

- 1 day old with bilateral non-palpable testicles and hypospadias
- What do you do?
- Full DSD work up
  - Chromosome
  - T, MIF, 17 OH-P, LH, FSH, Cortisol
  - Abdominal and pelvic US: looking for uterus
AUA Guidelines

- Providers must immediately consult a specialist for all phenotypic male newborns with bilateral, non-palpable testes

Management

- 12 year old referred for UDT
- Bilateral non-palpable testes on PE, otherwise healthy
- US (outside) shows bilateral inguinal testes 3.5cm each

Management

- Chromosome and hormones
  - LH, FSH, T, AMH, hCG stim
- In this case LH and FSH elevated and T undetectable
- Surgical exploration
  - Blind ending vessels on the left and vessels crossing ring on the right
  - Atrophied testicle removed from right scrotum
In the absence of congenital adrenal hyperplasia (CAH), providers should consider hormone evaluation to assess for anorchia.

Testicular Microlithiasis (TML)

- Prevalence: 2.4-5.6%, increases with age
- Association with testicular tumors rare in pediatrics (3.1%)
- No association with CIS in children
- Utility of US has not been proven in children
- Most recommend self exams and/or annual physicals only in children

European Society of Urogenital Radiology Guidelines (2015)/EUA guidelines
- Isolated TML: serial self exams only
- TML+risk factors (UOD, personal/1st degree relative GCT, atrophy): annual US and monthly self exams
- Peutz-Jeghers Syndrome → 10% risk of calcified Sertoli cell tumors
Summary UDT

- Refer at 6 months adjusted gestational age
- NO IMAGING
- Testicles may ascend later in life
- Bilateral non-palpable UDT in new born → think CAH
- TML associated with testis tumors but typically routine self exams and annual physicals are only recommendation

VUR

- The prostate cancer of pediatric urology
  - High incidence/detection
  - Much is relatively benign
  - We overtreat to avoid undertreating
  - Still high morbidity in select patients

Vesicoureteral Reflux (VUR)

- Standard: A guideline statement is a standard if (1) the health outcomes of the alternative interventions are sufficiently well-known to permit meaningful decisions and (2) there is virtual unanimity among panel members about which intervention is preferred.
- Recommendation: A guideline statement is a recommendation if (1) the health outcomes of the alternative interventions are sufficiently well-known to permit meaningful decisions and (2) an appreciable, but not unanimous majority of the panel members agrees on which intervention is preferred.
- Option: A guideline statement is an option if (1) the health outcomes of the interventions are not sufficiently well-known to permit meaningful decisions or (2) preferences are unknown or equivocal.
Treatment: < 1 year old

- Recommendation: Prophylaxis if < 1 year old with VUR and previous febrile UTI
- Recommendation: Prophylaxis even without febrile UTI (detected through screening) if < 1 year old with grades III-V VUR

- Most (not all) scarring occurs in 1st year of life
- Higher grade VUR = greater risk of renal scarring


Treatment: > 1 year old

- Recommendation: If bowel bladder dysfunction (BBD) present, treat it, ideally before any surgery
- 1st recommendation in this section
Treatment: > 1 year old

<table>
<thead>
<tr>
<th>CAP</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No BBD, recurrent febrile UTI, renal cortical abnormalities</td>
<td>option</td>
</tr>
<tr>
<td>BBD, recurrent febrile UTI, OR renal cortical abnormalities</td>
<td>recommended/not recommended</td>
</tr>
</tbody>
</table>

Option: surgical intervention
- Open
- Lap/robot
- Endoscopic

Follow up
- Annual US, BP, height, weight, urinalysis
  - Also for WCC
- VCUG
**Breakthrough UTI**

- Symptomatic or febrile
- Strongly consider change in management
  - Surgery
  - Start or change CAP
  - Revisit BBD

**Sibling/Family Screening**

- Prevalence in siblings ~27%
- VCUG if abnormal US or history of UTI
- Option to get screening US
- Certainly higher suspicion/lower threshold

**VUR screening with prenatal hydronephrosis**

- Recommendation: VCUG if
  - High grade hydronephrosis
  - Abnormal ureter/bladder
- Option: observation or VCUG for lower hydronephrosis
VUR screening with prenatal hydronephrosis

- Not in the guidelines
  - VCUG for any male with bilateral hydronephrosis to rule out PUV

Our Standard Practice

- Febrile UTI = renal US
- Febrile UTI + abnormal renal US = VCUG

Our Standard Practice

- Consider VCUG after 1st febrile UTI
  - Sibling/family history of VUR
  - Abnormal pathogen
  - Rare for us
Our Standard Practice

- VUR prior to age 1
  - CAP till 1 year old
    - Risk of scarring much lower after 1 year
    - Consider observation, especially in males
  - Shared decision making

- Breakthrough UTI on CAP
  - Consider surgery
  - Rotate CAP

- UTI while off CAP after 1 year old
  - Focus on BBD
  - Consider CAP till toilet trained and BBD improved
Our Standard Practice

- Surgery typically last resort
  - Older patients when resolution less likely
  - Existing renal damage (labs or imaging)
  - Breakthrough UTIs

VUR Summary

- The prostate cancer of pediatric urology
  - High incidence/detection
    - recent decrease
  - Much is relatively benign
    - MUCH less treated now

VUR

- We overtreat to avoid undertreating
  - Still many on CAP who probably don’t it to protect those that do
- Still high morbidity in select patients
  - Hopefully very low risk of permanent sequela from VUR today
VUR

- **Additional tools**
  - VURx (VUR index)
    - Validated resolution prediction tool

- **Resolution rates**
  - 1: 89%
  - 2: 69%
  - 3: 53%
  - 4: 16%
  - 5-6: 11%

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Additional Resources

- [https://www.auanet.org/guidelines-and-quality/guidelines/vesicoureteral-reflux-guideline](https://www.auanet.org/guidelines-and-quality/guidelines/vesicoureteral-reflux-guideline) VURx (VUR index)

- Managing vesicoureteral reflux in children: making sense of all the data
Thank You

- Questions?