Non-palpable testis: Is management consistent and objective?

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Introduction

• Undescended testis (UDT)
  ▫ 30% non-palpable

• Sonography
  ▫ Unreliable
Introduction

• Contralateral hypertrophy
  ▫ 90% predictive of absent testis

• Blind-ending vessels
  ▫ 100% nubbin or no remnant
  • No germ cells
Introduction

• Guidelines – AUA & EAU/ESPU

• NPT
  ▪ No sonography
  ▪ Diagnostic laparoscopy or open inguinal

  • If vessels are “blind-ending”, then no inguinal exploration is necessary
Hypothesis and Aims

• Hypothesis 1: Surgeons are not following guidelines and evidenced-based literature

• Aim 1: Assess patient and clinician variables that effect NPT management decisions.
Materials & Methods

• Aim 1: Practice patterns
  ▫ Surveys electronically sent
    • Surgeon region
      • Europe vs USA
  • Years in practice
  • Type of practice
Aim 1

How often do you perform laparoscopy?

- Never

Frequently/Sometimes

- Contralateral normal testicle
- Contralateral hypertrophic testicle

Would you obtain an ultrasound?

- Yes
  - No testis seen
    - 1. Reassure without further imaging or surgery
    - 2. Start with diagnostic laparoscopy
    - 3. Start with inguinal or scrotal exploration
- No
Aim 1

- Diagnostic laparoscopy
  - Normal vessels
  - Atretic vessels
  - Blind-ending

1. Proceed with inguinal or scrotal exploration
2. Complete case without further exploration
3. Complete case then proceed with outpatient imaging
4. Other management plan (specify)
Aim 1 - Results

- Participants – 339
- Ultrasound
  - Laparoscopy – first step 81-97%
  
- NPT
  - Not associated with years in practice or type of practice
Aim 1 - Results

- Hypertrophic contralateral testis
  - 2% switched and chose sonography
  - 10% switched from diagnostic laparoscopy to open exploration
Vessel status

Diagnostic laparoscopy

- Normal vessels: 88%
- Atretic vessels: 68%
- Blind-ending: 17%

Inguinal exploration
Vessel status

• Most important variable

• Is this variable objective?

• Time for another survey!
Hypothesis and Aims

• Hypothesis 2
  Interpretation of gonadal vessels is not reliable

• Aim 2
  Determine inter- and intra-reader interpretations
Methods

• Digital image survey
  ▫ 32 consecutive cases with an absent intra-abdominal testis
Methods

• Digital image survey – 32 cases

L side – index

R side always normal

L side choose:
Normal
Atretic
Blind-ending
Digital image survey

L side – index
R side always normal

L side choose:
Normal
Atretic
Blind-ending
Digital image survey

L side – index

R side always normal

L side choose:
Normal
Atretic
Blind-ending
Digital survey

• 32 consecutive cases
  ▫ Inter-reader interpretations

• 18 cases repeated
  ▫ Intra-reader interpretations (reliability)

• Agreement - Fleiss’ kappa coefficient
  ▫ perfect agreement, kappa = 1
  ▫ no agreement, kappa ≤ 0.
Inter-reader agreement

• Participants – 116

• normal vessels – moderate agreement (K = 0.59)
• blind-ending vessels – (K = 0.42)
• atretic vessels – poor agreement (K = 0.27).

• More experienced urologists disagreed with each other’s interpretations more often (P <0.001)
Intra-reader reliability

- normal vessels – moderate agreement ($K = 0.50$)
- atretic vessels – ($K = 0.41$)
- blind-ending vessels – poor agreement ($K = 0.34$)

- When the first interpretation was blind-ending, the same surgeon changed interpretation of the same image 39% of the time.

- There was no statistical difference by years of practice.
Limitations

• Many
Conclusions

• Europeans utilize sonography

• Absence of testis on sonography
  ▫ no statistically significant impact on management decision

• Hypertrophy of the contralateral testis
  ▫ no to minimal impact on management decisions
Conclusions

• Interpretation of testicular vessels has the most impact upon management decisions

• Assessment of vessels is subjective and poor
  ▫ Validity
  ▫ Reliability
• Thank you
Discussion

- Use of sonography
  - U.S. pediatric urologists utilized sonography for NPT at a lower rate (12%) than European pediatric urologists (49%)
- Both guidelines support either diagnostic laparoscopy or inguinal exploration in the setting of NPT
  - <20% of participants chose inguinal/scrotal approach as the first choice for NPT
- The size of the contralateral testicle in the setting of a unilateral NPT has been utilized to predict monorchism (absent IAT).
  - <17% of participants chose to start with an inguinal/scrotal exploration when there was a contralateral hypertrophic testicle.
- Both guidelines recommend no further exploration in the setting of “blind-ending” vessels
  - Risk of leaving viable testicle tissue (malignant potential)
- AUA guidelines state that the identification of the testicular vessels should be the objective of any exploration for an NPT
• Sturm et al. reviewed 595 patients with NPT and 318 (53%) had an abdominal testis. Of 86 boys deemed to have atretic vessels entering a closed ring, two (2%) were found to have a normal testis. Of the 102 deemed to have normal vessels entering a closed ring, 17 (17%) were found to have a normal testis. This study was retrospective. Vessel status was recorded by the surgeon after surgery was completed hence vessel designation could have been influenced by inguinal findings. Of the 207 excised testicular remnants, only two (1%) had germ cells and no