Management of Undescended Testis

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Tenets of treatment

• Proper identification of anatomy, position, and viability of the undescended testis

• Identify coexisting syndromic abnormalities

• Timely placement of testis within scrotum
  – Prevent fertility/endocrinologic impairment

• Attain permanent fixation within normal position

• No further testicular damage from treatment
When to treat?

- **Definitive treatment**: between 6-12 months

- **Spontaneous descent**: occurs in most by 3 months & uncommon thereafter

- **Approach & timing**: depends on anatomic position and whether both testis are undescended

- **Effort to preserve testicular tissue early**: poor paternity in bilateral cryptorchidism & risk of neoplasm
Management

• **Hormonal**
  – Exogenous hCG
  – Exogenous GnRH or LHRH

• **Surgical**
  – Open surgery
  – Laparoscopy
  – Microvascular Autotransplantation
Exogenous hCG

• Structurally analogous to LH
• Stimulates Leydig cells → Testosterone
• Min total dose of 10,000 IU
• IM 1,500 IU/m2 twice a week x 4/52
• Decreases lymphocytes – immunosuppressed
• Success rate 14%-59%*
• Side effects
  – Increased rugation & pigmentation, pubic hair, increase penis size

Exogenous GnRH

- Stimulates pituitary – LH release
- Nasal spray 1.2mg/day x 4/52
- Approved only in Europe
- Success rate 32% - 73%*
- Side effects – similar but less than hCG

*Illig et al, 1977; Hadziselimovic et al, 1982; Witjes et al, 1990*
Hormonal treatment

• Overall efficacy < 20%

• Significantly depends on pretreatment testicular location
  – i.e lower the pretreatment position, better the success rate

• Analysis of RCT: LHRH vs hCG (21% vs 19%)
Surgical treatment

• Based on principles by Bevan in 1899
  – Adequate mobilization of testes & spermatic vessels
  – Ligation of associated hernial sac
  – Adequate fixation in the dependent portion of scrotum

• Depends on:
  – Palpable
  – Non-palpable
  – Unilateral
  – Bilateral
Palpable testis

- EUA to reaffirm position
- Standard Orchidopexy
  - Inguinal approach
  - Success rate up to 92%*
  - Open processus vaginalis – dissected and closed
  - Testis placed in subdartos pouch
  - Lymphatic drainage change
    - Iliac to iliac and inguinal drainage (important in an event of later malignancy)

*Docimo SG; J Urol, 1995
• Staged Orchidopexy
  – Persky & Albert in 1971
  – Preservation of spermatic vessels
  – Max mobilisation, testis anchored to ext. ring or pubic tubercle
  – Cord and testis wrapped in silastic sheath (reduce adhesions)
  – 2\textsuperscript{nd} stage – 6 to 12 months later
Non-palpable testis

• EUA – testis may be palpable
  – Relaxation of abdominal muscle

• 1/5 of children with UDT

• Inguinal surgical exploration with possibility of laparoscopy should be attempted*
  – Significant chance of finding the testis via an inguinal incision
  – No vessels or vas in the groin → search abdomen

*EAU Guidelines 2007
Laparoscopy

• Attained greatest degree of acceptance (diagnostically & therapeutically) – management of UDT

• Advantage over ‘open’:
  – Accurate anatomic assessment of position and viability of testis

• 95% accuracy of localisation*

• Helps determine intra-abdominal testicular anatomy & feasibility of single or two-staged orchidopexy or orchidectomy if testis is abnormal

*Moore et al, 1994; Tennenbaum et al, 1994
Laparoscopy

• 3 distinct possible findings:
  – Blind-ending vessels above the internal ring (vanishing testis)
  – Cord structures entering the internal ring
  – Intra-abdominal testis

• Exploration along the course of descent necessary - to determine course of action

• 36% - 64%* with non-palpable testis are monorchid

• Laparoscopic view of normal vas deferens and testicular vessels entering a closed internal inguinal ring
- Laparoscopic view of atretic testicular vessels approaching the internal inguinal ring, leading to a diagnosis of vanishing testis syndrome (ie, testicular agenesis)
• Laparoscopic first-stage endoligation of the testicular artery as part of a planned 2-stage Fowler-Stephens orchidopexy for an abdominal testis
• Laparoscopic view of testicular vessels entering an open inguinal hernia sac
• Blind-ending vas deferens
Fowler-Stephens Orchiopexy (1959)

- High inguinal or intra-abdominal testis

- Based on principle:
  - Testicular artery & vein often limits the distal mobility
  - Preservation of testicular blood supply via collaterals

- 3 sources:
  - Testicular artery (primary)
  - Differential artery - branch of inferior vesicle artery
  - Cremasteric artery - branch of inferior epigastric artery

- Spermatic vessels are divided – allow collateral formation (6 months)
Fowler-Stephens Orchiopexy (1959)

• One-stage or 2-stage procedure

• Can be performed both open and laparoscopically

• Presence of a long, looping vas – most important requirement for success

• Testicular survival rate *:
  – One stage – 50%-60%
  – Two stage – up to 90%

*Radmayr et al, J Urol 2003
Microvascular Autotransplantation

- Indications similar to F-S orchiopexy

- MA vs F-S orchiopexy?
  - Variability of collateral blood supply in high undescended testis which may potentially compromise the F-S procedure
  - More the variable → better for MA

- Silber & Kelly in 1976

- Success rate: *in excess of 80%

- Procedure of choice – solitary, high intra-abdominal testis

- Laparoscopic assisted MA (Wacksman et al, 1996) was successful in 5 children – median time 5hrs

*Wacksman et al, 1982; Bianchi, 1984; Harrison et al, 1990; Bukowski et al, 1995*
EAU Guidelines

• Intra-abdominal testis in a 10 yrs boy or more, with normal contralateral testis:
  – Should be REMOVED

• Bilateral intra-abdominal testis or < 10 yrs
  – One-stage or two-stage Fowler-Stephens Orchidopexy