Aspects in the Management of Cryptorchidism in Children

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PAEDIATRIC SURGEON
Undescended testis is the result of a congenital defect in the regulatory or anatomic process of testicular descent.

Classification:
- Palpable 80%
- Non-palpable 20%
Incidence

- 3% of all term male infants
- Birth weight < 2.5 kg: 33 – 45%
  - Majority descend in first 3 months after birth
  - Descend after one year unlikely
- Unilateral cryptorchidism twice as common as bilateral
- Right side affected more than left: 70% versus 30%
- 14% family history
Why operate?

- Fertility
- Malignancy
- Inguinal hernia
- Risk of torsion
- Psychological factors
When to operate

- 6 – 12 months
Fertility

- Beyond 12 months light and electron microscopy - histological changes in germ cell population.
- Failure of gonocyte transformation to A.D. spermatogonia at 6 months. This stage is important to establish a pool of stem cells for spermatogenesis.
Neonatal Gonocyte

3-12 months

?? Hormonal Regulation

"Mini Puberty"

3-4 years

Hormonal treatment at 1-10 years will trigger precocious germ cell maturation to spermatids

Stem Cell for sperm

11-15 years Puberty

Spermatid

Sperm
Malignancy

- 2 to 8 times increased risk in malignancy. Still only 1 in 2 000 men with cryptorchidism history.
- In abdominal testis - seminomas; in orchiopexy - germ cell tumours.
- 15 - 20% of testicular tumours in the normal contralateral testis.
- Orchiopexy facilitate subsequent testicular examination
- Carcinoma in situ: similar enzymatic markers as neonatal gonocytes (neonatal gonocytes fail to transform into spermatogonia and increase in temperature also prevents apoptosis)
- Reason for surgery at 6 months.
Anomalies associated with Undescended Testis

- Prune belly syndrome
- Gastroschisis
- Bladder extrophy
- Myelomeningocele
- Posterior urethral valves
Retractile Testis

- **Diagnosis:**
  - Testis can be brought into the scrotum
  - Remains there for a period
  - Normal size
- 25% ascend and become undescended testis:
  - Failure of the spermatic cord elongation
  - Persistent fibrous remnant of processus vaginalis
  - Tethering of ectopic gubernaculum
- Annual follow-up until post puberty: if undescended - orchiopexy at diagnosis
Hormonal Treatment - Human Chorionic Gonadotrophin (hCG) and Luteinizing Hormone-Releasing Hormone (LHRH)

- Effective in only 10 – 20% of patients
- Hormonal treatment triggers precocious germ cell maturation (↓infertility).
- Twenty % of successfully treated testes reascend again. (Follow-up important).
- Contra indicated in newborns, ectopic testis and prune belly syndrome.
- Possible complications include frequent erections, scrotal pigmentation, weight gain, aggressive behaviour and premature closure of epiphyseal plate.
Bilateral Undescended Testis

- Exclude disorders of sexual differentiation (30% of patients).
- Hormonal evaluation to establish if testicular tissue is present or not.
- Anorchia:
  - Serum testosterone ↓
  - FSH and LH ↑
  - AMH (anti mullerian hormone) ↓
  - Negative hCG stimulation test
Special Investigations

- Radiological imaging is seldom helpful
- Bilateral undescended testis: MRI with gadolinium might be useful.
Surgical Management
Cryptorchid testis

Palpable

Inguinal Exploration

- Insufficient length
  - Prentiss Manoeuvre
  - Preperitoneal
  - Laparoscopic

- Sufficient length
  - Pexy
Palpable Testis

- Inguinal orchiopexy
  - Transvers inguinal incision
  - Dissection to external ring
  - Canal open lateral
  - Gubernaculum transected
  - Cord structures mobilised off sack
  - Hemia sack tied off
  - Upward traction on the sack
  - Cord structures can be mobilised into retroperitoneum
  - Transverse skin incision in scrotum
  - Dissection of subdartos pouch
  - Testis delivered into pouch
  - Pexy: closure of neck of pouch versus pexy of tunica vaginalis to dartos
Inguinal orchiopexy insufficient length
  - Prentiss manoeuvre
  - Preperitoneal approach
  - Laparoscopy
Surgical Planning

Cryptorchid testis

- Palpable
- Non Palpable
  - Cord Structures exiting internal ring
  - Abdominal Testis
    - Laparoscopic Pexy
    - Fowler Stephens
    - Microvascular Autotransplantation

- Blind Ending Cord Structures

Inguinal Exploration

- Present
- Nubbin
- Absent

- Pexy
- Contralateral Absent
- Contralateral Normal
- Remove
- Pexy other side
- Hormonal workup
  - Leave in situ until after puberty

- Pexy other side

- Pexy
Non Palpable Testis

- Diagnostic laparoscopy:
  - Blood vessels end blindly
  - Blood vessels enter inguinal canal
  - Visible intra abdominal testis is identified
Laparoscopy

- Blind ending vessels - no further exploration. ? Pexy opposite side.
- Vessels transversing through open or closed internal ring - inguinal exploration.
- Normal testis <2cm from internal ring - primary laparoscopic orchiopexy without division of blood vessels.
- Testis >2cm from internal ring - division of spermatic vessels as a single stage or two stage Fowler - Stephens orchiopexy.
- Very high testis - microvascular autotransplantation.
- Abnormal testis (nubbin) - remove.
When is Orchidectomy an Option?

- Prepubertal high intra abdominal testis that cannot be brought down, with a normal contralateral testis.
## Results

<table>
<thead>
<tr>
<th>Type of surgery</th>
<th>Success rate</th>
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<tbody>
<tr>
<td>Inguinal orchiopexy</td>
<td>88%</td>
</tr>
<tr>
<td>Laparoscopic abdominal testis</td>
<td>81%</td>
</tr>
<tr>
<td>Two stage Fowler-Stephens</td>
<td>78%</td>
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<tr>
<td>Microvascular anastomosis</td>
<td>80%</td>
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