# TESTICULAR DESCENT

Origin: mesodermal germinal ridge (SRY at wk 6 stimulates differentiation of gonad into testis)
Caudal migration:3mths at iliac fossa, 7mths at external ring, 9mths into scrotum; continues for 3mths post-natal
Spontaneous descent doesn't occur after 9mths
Processus vaginalis: Double-fold of peritoneum attached to scrotum by gubernaculum; testis slides behind
Obliterates by 9mths leaving testis invested in tunica vaginalis
Persistence if increase abdominal pressure (ascites, dialysis etc), FHx, low BWT, premature

## MALDESCENT

### ECTOPIC TESTIS

*Normal testis strays from normal line of descent*
Superficial inguinal pouch, root of penis, femoral canal, perineum
Clinical features (i)History
(ii)absent testis, underdeveloped hemiscrotum

### UNDESCENDED TESTIS (UDT)

*Small testis arrests along normal line of descent *concomitant indirect hernia sac as PPV still patent**
Anywhere from abdominal cavity → inguinal canal → top of scrotum
80% unilateral
If not descended by 9mths, unlikely to descend. In you go for a rummage.

ET vs UDT: hemiscrotal development in UDT, not in ET/ET palpable in groin with tense abdo muscles, UDT is not

### COMPLICATIONS OF MALDESCENT

Defective spermatogenesis from age 2; 33% of unilaterals have impaired fertility → 95% paternity rates; bilateral 65% pat rate
Malignancy: seminoma 5x risk if untreated, germinoma if treated
Torsion
Trauma
Inguinal hernia: patent PPV

## CRYPTORCHIDISM

Failed descent of both tests by 3months
Risk factors: FHx, maternal E2 exposure, prematures, low BWT
Associations: hernia, hydrocele, hypospadias, CP, Down's, Prader-Willi, prune belly etc
Investigations:

# IMPALPABLE TESTIS

(i)truly absent (ii)UDT (intraabdominal) (iii)ectopic (iv)impalpably small
20% of UDTs

History:
Age of child
Descent: (i)unilateral or bilateral? (ii)has testes ever descended?

Examination:
Inspection: (i)scrotal development +syndromic phnotypes (Prader-Willi, Kallman, Laurence-Moon-Beidl
(ii)testis location(scrotum, ectopic sites
(iii)penile abnormalities(hypospadias/ambiguity)
(iv)hernia
Palpation: (i)tense abdo to diff ET vs UDT/milk testis and hold to fatigue cremaster and release: UDT retracts/non-inguinal sites
(ii)examine testis: normal size?
(iii)hernia

Diff dx: retractile testis (overactive cremasteric reflex, normal in 2-8yo but can be acquired if UDT)

NICE GUIDELINES FOR UDT
Bilateral (i)paeds referral within 24hrs for endocrine/genetic Ix
(ii)re-examine 3mths and if undescended → paeds surgeon by 6mths

Unilateral (i)re-examine 6-8wks → discharge if descended
(ii) re-examine at 3mths if undescended → discharge if descended → annual follow-up if retractile
(iii)refer to paeds surgeon by 6mths if undescended

Investigations:
**Laparoscopy**(most reliable for locate/assess viability/proceed to fixation)US has poor S&S, CT is radiation, MRI hampered by movement artefact

Management:
(a)Orchidopexy at 3-6mths ideally/6-12mths acceptably *(BAUS)*
Tekkers: (i)mobilise via inguinal incision (ii)subdartos pouch via scrote incision (iii)contralat orchidopexy (iv)IH repair
Earlier operation gives more germ cell catchup, less malignancy, torsion and tumour risk and opportunity to fix hernia19851985
Single stage (i)pulldown (ii)Fowler-Stephensligate testicular vessels)
Two-stage (Fowler-Stephens and wait for collaterals before later pulldown)

(b)Nubbin excision/orchidectomy

## HYDROCOELE

**Excessive serous fluid collection in processus vaginalis**

Aetiology (i)Primary$_{idiopathic}$ (ii)Secondary$_{orchitis,\ tumour}$

Anatomical types: vaginal/infantile hydrocoeles encompass testis, separate from peritoneal cavity)
congenital aka communicating
cord hydrocele (PPV closed prox and distally with encysted fluid; female is canal of Nuck)

History:

Onset

Primary vs secondary: testis feel normal?/orchitis symptoms/trauma

Hernia symptoms

Examination:

Inspection: (i)swelling +transillumination (ii)scrotum

Palpation: (i)swelling: tense if primary, lax if secondary; ability to get above cf hernia
(ii)testis *also scrotum; groin nodes, deep ring*
(iii)hernia: silk glove sign of PPV in kids

Diff dx: hernia, haematocoele, hydrocele, epididymal cyst

Investigations

USS testes: primary vs secondary by assessing testis/hernia sac

Cytology

Tumour markers

Management

Infants: conservative as resolve spontaneously by 12mths

Adults: Lord's/Jaboulay's operations

## VARICOCOELE

**Varicosities of the pampiniform plexus of veins**

Aetiology: primary (valve defect) or secondary (obstruction of testicular vein on right by retroperit tumour, left by renal tumour)

Left testicular vein inserts perpendicularly to left renal vein, long, no valve; right testicular vein inserts obliquely to IVC

History: dragging sensation in scrotum; subfertility; features of retroperit/left renal tumours

Examination: bag of worms on standing, less on reclining (G1= palpable on Valsalva G2=palpable at rest G3=always palpable)

Investigations: US testes + CTAP for obstructing lesions

Management: reassurance usually; embolization; ligation (inguinal, retroperitoneal, subinguinal – doesn't improve fertility)

## EPIDYDMAL CYST

Cystic degeneration of epididymis/paraepididymal structures

Palpable separately from testis and fluctuant cf hydrocoele; transilluminate

Management: excision (recur after aspiration)

## ORCHITIS

Acute: blood borne or ascending from UTI → painful testis, secondary hydrocele, UTI symptoms with discharge, fever
Diff dx: torsion
Investigations: Bloods, urine, US testes, STI test
Management: as for UTI

Chronic: syphilitic gumma, TB

## TORSION

**Twisting of testis around testicular pedicle → venous then arterial compromise → ischaemia → infarct**

Anatomical predisposition: clapper-bell testis (high TV on SpC so testis hangs feely and twists easily
other= UDT/CO, horizontal lie, epididymal anomalies

History: pain (sudden onset in testis and lower abdo)

Examination: swollen testis, tender, high-riding ?absent cremasteric reflex unreliable

Diff dx: orchitis, strangulated hernia, epididymitis, torsion of epididymal appendage/hydated cyst of Morgagni

Treatment: scrotal exploration $_{(median\ raphe/transverse)}$ + orchidopexy$_{prolene}$/orchidectomy + contralateral orchidopexy$_{congenital\ anomaly\ likely\ to\ be\ bilateral}$

TESTICULAR TUMOURS

Epidemiology: commonest solid organ malignancy in young adult males; bimodal (first 2yrs + adulthood)

Risk factors: maldescent, infertility, previous malignancy

Pathology: (i)Seminoma 60%: arise from seminioferous tubules
(ii)Non-seminomatous Germ Cell Tumours NSGCT 40%: teratoma is main type
(iii)Stromal: Sertoli and Leydig cells
(iv)Lymphoma
(v)Leukaemia
(vi)Yolk sac
(vii)Choriocarcinoma

Spread: (i)local= (ii)lymphatic= para-aortic nodes (iii)blood= liver/lungs *can get into inguinal nodes via scrotal skin*

History: heavy sensation; PMHx: UDT, HIV, previous cancer, contralateral testis pathology, fertility, 45XO
FHx: testicular cancer SHx: have children/completed family?

Examination: hard testis, secondary hydrocele; mets (dyspneoa, hepatomegaly)
other findings: gynaecosmastia if BhCG (Sertoli/choriocarcinoma); precocious puberty (Leydig)

Investigations: (i)diagnostic - USS testes$_{\text{(for tumour/hydrocele)}}$ (ii)staging= CT CAP
Tumour markers - aFP (70% NSGCT, not pure seminoma) and BhCG (all chorios, 50$ teratoma, 30% seminoma)
Other= testosterone in Leydigs

Management: Orchidectomy (inguinal) +/- laparoscopic para-aortic lymphadenectomy (depending on staging)
Chemotherapy after staging (if distant mets, NA-C)

Kids
Don't get seminomas
Teratomas are benign
Commonest are teratomas
Others= yolk sac, stromal (Sertoli → gynaecomastia/Leydig→ precocious puberty), juvenile granulosa-cell tumours
Treatment: chemotherapy; less nodal spread so lymphadenectomy not routine

VASECTOMY

PENIS THINGS

Foreskin construction completes by 16 weeks
Normal adhesions to glans → non-retractile at birth
First 3-4yrs smegma accumulates and breaks adhesions → 90% retractile at 3yrs/1% non-retractile at 17yrs

PHIMOSIS
Features: flower-petal appearance (cf BXO constriction at the tip)

PARAPHIMOSIS

BALANITIS XEROTICA OBLITERANS
Features: phimosis (constriction is at the tip cf physiological phimosis flower-petal)
Treatment: (i)Medical: topical steroids (ii)Surgical: preputioplaty or circumcision if causing phimosis

CIRCUMCISION (BAPU)
Indications (i)BXO → phimosis (1.5% of boys)
(ii)Severe recurrent balano-posthitis >3 times/yr
(iii)Trauma to foreskin not salvageable
(iv)Recurrent febrile UTIs with abnormal urogenital tract

*not indicated in non-retractile foreskin, preputial adhesions, preputial pearl of smegma, paraphimosis
*religious circumcision not finding by NHS in England/Wales

Tekkers:
Supine/abx if infective/penile block
Retract prepuce and clean
Break down preputial adhesions/dorsal slit
Several methods: incise foreskin to 5mm below corona plus circumferential penile incision at same level then suture them
Histology if BXO/cancer suspected

Complications: infection, bleeding, glans ischaemia, urethral fistula, meatal stenosis, inadequate excision