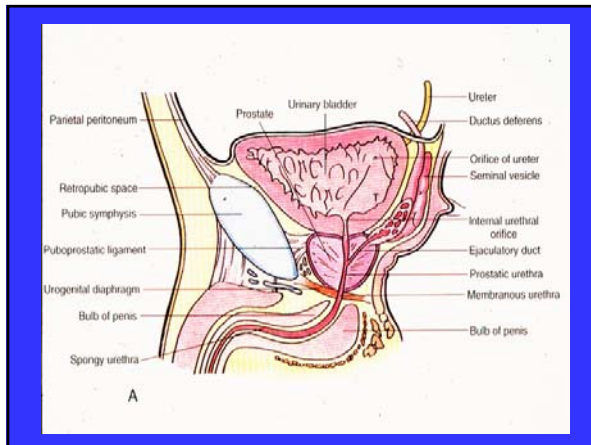
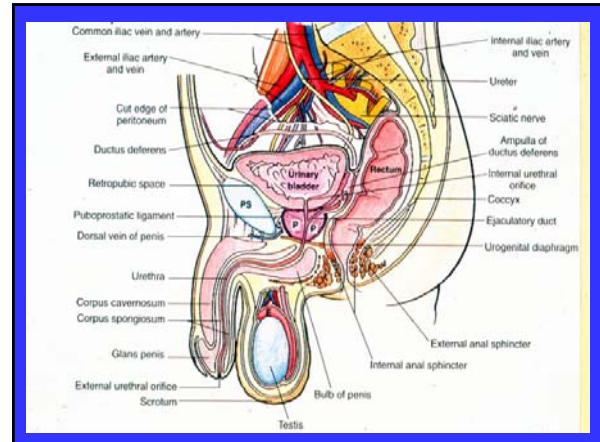


# MALE REPRODUCTIVE SYSTEM

Professor John Simpson



*How might diseases of the male genital system present?*

## Symptoms and signs

- abnormal micturition
- urinary tract obstruction, infection, calculi
- bone pain
- raised PSA or alkaline phosphatase
- genital ulceration
- urethral discharge
- scrotal swelling
- raised serum AFP (alpha fetoprotein) or HCGT (human chorionic gonadotrophin) levels
- gynaecomastia
- infertility
- etc

## Prostate

Only three significant pathologies

- benign nodular enlargement
- carcinoma\*
- inflammation

- \*PIN

## PIN (prostatic intraepithelial neoplasia)

- probable precursor of CA
- focal dysplasia/CIS of the glandular epithelium
- may occur beside CA or on its own
- low grade changes common, even in middle age
  - not an indication for concern, but ? can evolve
- if high grade PIN, say in a biopsy, surveillance for CA mandatory
- (anti-androgenic therapy can sometimes make it regress)

## Prostatitis

- acute suppurative
  - usually coliforms, gonococcus or staph.
  - usually reflux origin
  - can be “iatrogenic”
- chronic non-specific - ? important
- granulomatous – e.g. TB, post-surgery, “idiopathic” etc
- clinical effects - ?

## Seminal vesicles

- only significant pathology is involvement by CA prostate, which can make them palpable

## Penis

- congenital abnormalities
  - hypospadias, epispadias
- inflammation/infections, e.g.
  - phimosis, paraphimosis
  - herpes
  - genital warts
  - syphilis
  - lymphogranuloma venereum
  - elephantiasis
  - Fournier's gangrene
- carcinoma in situ (PIN) and CA

## Hypospadias and epispadias

- malformation of urethral groove or canal
  - abnormal openings on *ventral (hypospadias)* or *dorsal (epispadias)* penile surface
- either may be associated with failure of normal testicular descent and other UT malformations
- abnormal opening is often constricted, causing urinary tract obstruction and risk of infection
- when orifices situated near base of penis, ejaculation and insemination may be affected

## Phimosis and paraphimosis

- *phimosis* - foreskin orifice too small for retraction
  - can be congenital, but more often due to repeated infection causing scarring
  - allows accumulation of secretions/debris under foreskin, allowing secondary infection and possibly (squamous) carcinoma
- if affected foreskin forcibly retracted over glans, may not be able to be replaced - *paraphimosis*
  - extremely painful and potential cause of urethral constriction and acute urinary retention

## Genital wart - condyloma acuminatum

- benign tumour – related to common wart
- caused by HPV - types 6 and 11
- sexually transmitted
- affects any moist mucocutaneous surfaces of external genitals in both sexes
- in men, espec. glans and inner surface prepuce

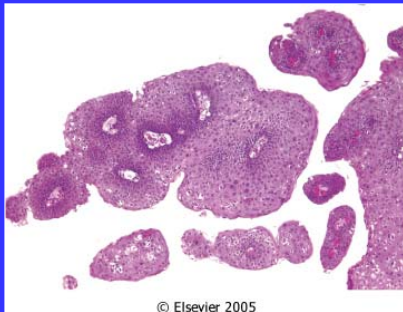
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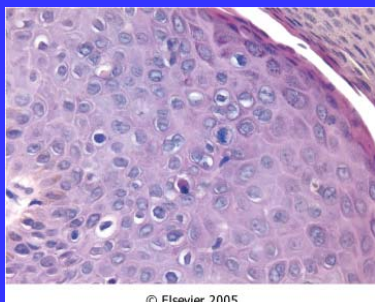
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## Carcinoma in situ (CIS) of penis

- malignancy confined to the epithelium - proliferating dysplastic epidermis with numerous mitoses
- various degrees of severity
- potentially precancerous condition
- strong association with HPV, espec. type 16
- affects external genitalia (both sexes) either as *Bowen's disease* or (rarer) *bowenoid papulosis*

## Carcinoma in situ



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## Bowen's disease

- usually > age 35 yrs
- mainly shaft of penis, sometimes scrotum
  - either solitary greyish plaques with ulceration/crusting
  - or (glans and foreskin) shiny red plaque(s) - known clinically as *Erythroplasia of Queyrat*
- HPV in 80% cases
- Bowen's evolves over years into invasive squamous cell carcinoma in ~ 10% of patients.

## Bowenoid papulosis

- compared to Bowen's disease, younger age and multiple pigmented papular lesions
- may be wart-like and mistaken for condyloma acuminatum
- often regresses spontaneously
- virtually never develops into invasive CA

## Carcinoma of the penis

- patients usually aged 40 - 70
- 10-20% male malignancies in parts of Africa, Asia and S America
- uncommon in Europe, US and Australasia
- circumcision protective
  - extremely rare among Jews and Moslems - ? easier genital hygiene decreases likelihood of HPV infection

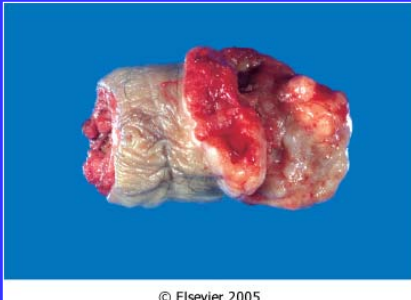
## Carcinoma of the penis

- smoking-related tumour
- HPV detectable in cancer cells in ~ 50% of patients - types 16 > 18
  - less commonly than in CIS (Bowen's disease)
  - ? HPV on its own can't cause transformation
  - probably acts in concert with other carcinogenic influences, e.g. in cigarette smoke

## Carcinoma of the penis

- usually arises on glans or inner surface of foreskin
- papillary or flat
  - papillary lesions simulate condylomata
- squamous cell carcinoma

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## Carcinoma of the penis

- slow growing, locally invasive
- often there for years before presentation
- classically painless, unless ulcerated/infected, but often bleed
- early nodal spread (inguinal/iliac), but wide dissemination uncommon
- prognosis depends on tumour stage
  - small lesion and no nodal involvement - 66% 5 yr SR survival
  - nodal involvement - 27% 5 yr SR

## Epididymal v testicular pathology

- major pathologies of testis and epididymis rather different
  - epididymis - most important and frequent diseases are inflammatory
  - testis – most important lesions are tumours
- but because organs closely adjacent, disease may spread from one to other

## Epididymis (and cord)

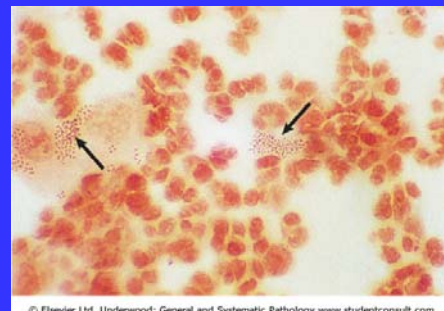
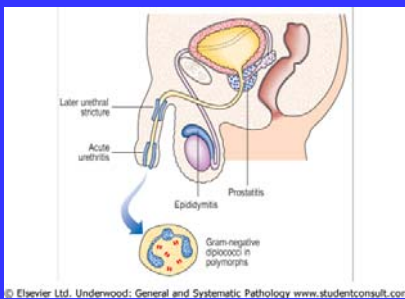
- inflammation – especially TB
- torsion (with testis)
- tumours – unimportant
- “swellings” – consider with other scrotal swellings

## Epididymitis

- epididymitis - & so possible orchitis - commonly related to UTIs (cystitis, urethritis, prostatitis)
- cause varies ~ patient age
  - uncommon in children - associated with congenital GU abnormality and infection with Gram neg bacilli
  - in sexually active, most often *Chlamydia* and *gonococcus*
  - in older men, again urinary tract pathogens, e.g. Gram negative bacilli

## Gonorrhoea

- extension of infection from urethra to prostate, seminal vesicles and epididymis common in untreated gonorrhoea
- abscesses may destroy epididymis
- infection can then spread, causing suppurative orchitis

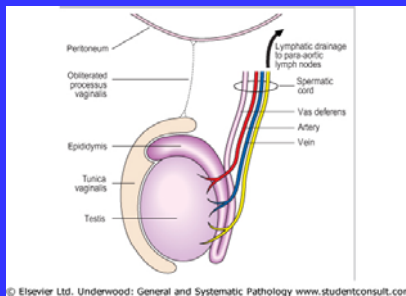




## Other swellings in scrotum

- hydrocoele
- haematocoele
- spermatocele
- varicocele

## Anatomy of scrotal contents

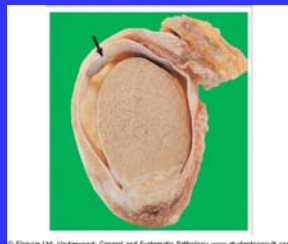


## Tunica vaginalis

- serosa-lined sac adjacent to testis and epididymis
- may be affected by anything affecting either organ
- scrotal enlargement by fluid/blood may be mistaken for testicular pathology
- transillumination usually shows sac and even testis in it

## Hydrocoele of tunica

- clear serous fluid
- associated with almost any abnormality of testis or epididymis
- can also occur spontaneously



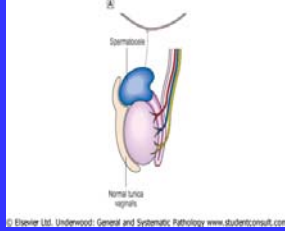
## Haematocoele of tunica

- blood in tunica
- uncommon
- usually occurs only in trauma, torsion or bleeding disease



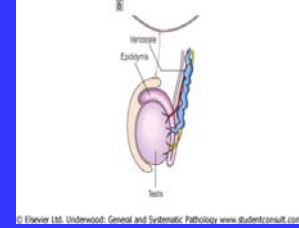
## Spermatocoele

- common
- sperm-filled cavity
- at top of testis
- due to epididymal diverticulum, trauma etc
- sperm granuloma may ensue



## Varicocoele

- dilatation of pampiniform plexus
- due to same process as varicose veins or to obstruction of venous flow higher up



## Chylocoele

- accumulation of lymph
- common in elephantiasis

## Diseases of the testis

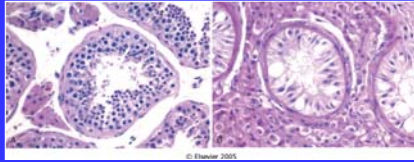
- congenital
  - undescended testis (cryptorchidism)
- atrophy
- inflammatory lesions (orchitis)
  - mumps, syphilis, TB
- vascular
- tumours
- infertility

## Cryptorchidism/undescended testis

- affects ~1+% of one year old boys
- failure of one or both intra-abdominal testes to descend into scrotum
- affected organ(s) hypoplastic – fewer germ cells
- usually isolated anomaly
  - but may also be other malformations of GU tract, e.g. inguinal hernia (10-20%), hypospadias

## Cryptorchidism

- testis exposed to trauma & torsion in inguinal canal
- even if unilateral (75%) may cause sterility
  - contralateral “normal” testis may also be deficient in germ cells
  - ? so hormonal change causes cryptorchidism
- undescended testis probably at significant risk of developing cancer (if can't be re-sited – “orchidopexy” - , ? should be removed)
  - malignancy may also occur in contralateral “normal” testis
  - ?cryptorchidism associated with intrinsic defect in testicular development and cellular differentiation unrelated to actual anatomic position



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## Testicular atrophy

- regressive changes in scrotal testis
- causes - anything which can damage testis
  - e.g. end-stage orchitis, cryptorchidism, hypopituitarism, generalized malnutrition, irradiation, prolonged administration of female sex hormones (for CA prostate), atheroma
- if bilateral, causes sterility
  - (but sterility can occur without any obvious predisposing factor for atrophy)
- also occasionally occurs as a primary failure of genetic origin = *Klinefelter's syndrome*, a sex chromosomal disorder – again, causes infertility

## Orchitis due to mumps

- uncommon in children, but maybe ? 20-30% post-pubertal cases
- usually, acute interstitial orchitis ~1 week after parotid swelling
- rarely, orchitis precedes parotitis or occurs without it

## Orchitis due to syphilis

- testis (and epididymis) affected in both acquired and congenital syphilis
- testis involved first and may be no epididymitis
- two different pathologies -
  - gummas or
  - diffuse interstitial inflammation with lymphoplasmacytic infiltrate and characteristic obliterative endarteritis with perivascular cuffing

## Orchitis due to tuberculosis

- genital TB usually widespread disease
- involving prostate, seminal vesicles, epididymis and testis
- ? “ascending” infection

## Testicular tumours

- 5 x commoner in whites than blacks
- low incidence in blacks not affected by migration, e.g. still low in African-Americans
- commonest solid tumour of all in young whites and increasing in incidence
- 95% germ cell tumours – malignant, but curable
- 5% non-germ cell (aka sex cord stromal) tumours – usually benign, sometimes presenting hormonally

## Germ cell tumours of the testis

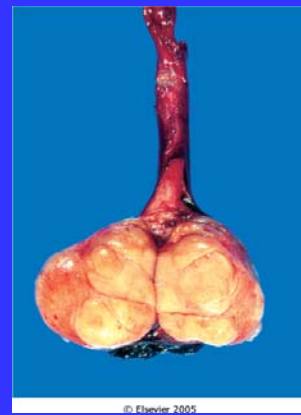
- mainly 15-40 yrs
- more common in undescended testes & in testicular dysgenesis (Klinefelter's syndrome)
- usually presents as painless mass
- almost always malignant
- seminoma and "non-seminoma" are two main types
- precursor lesion = ITGCN

## Intratubular germ cell neoplasia

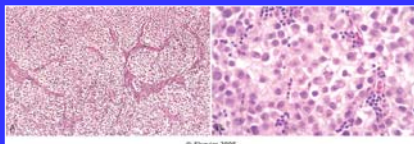
- like CIS in other organs
- seen adjacent to most tumours
- also often seen where germ cell tumours may arise, e.g. cryptorchidism, Klinefelter's syndrome
- progresses to invasive tumour in ~ 50% cases over ~ 5 years
- may be bilateral
- important to follow up/treat (e.g. radiotherapy)

## Germ cell tumours - seminoma

- most common type
- (seminoma = ovarian dysgerminoma)
- (rarely arise elsewhere - mediastinum, pineal, retroperitoneum)
- can metastasise- especially nodes and bone
- radiosensitive - 95% cure in early stages
- pathology
  - pale homogenous tumour
  - big cells, lymphocytes, few mitoses
  - contain PLAP (placental alkaline phosphatase)

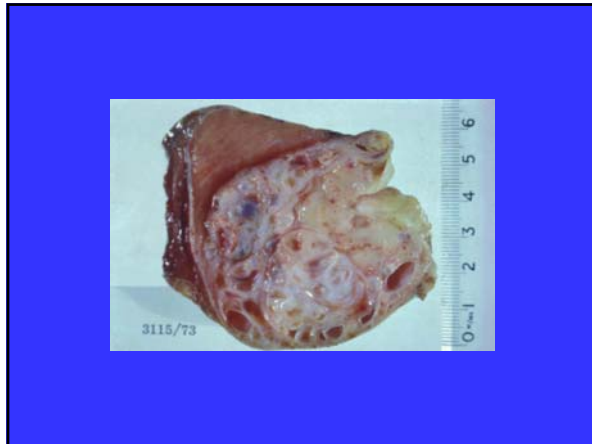


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## "Germ cell tumours other than seminoma"

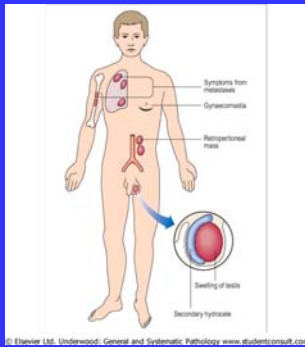
- most are malignant, some worse than others
- in UK literature, all lumped together as "teratomas", but of different subtypes (types of differentiation) and so prognosis
- in US literature, divided into
  - embryonal CA (undifferentiated)
  - teratoma
  - yolk sac
  - chorioCA
  - but in ~60% mixtures of these types
- usually variegated appearance grossly and microscopically
- may contain/secrete  $\alpha$ FP and  $\beta$ HCG



## Germ cell tumours

- classically painless
- treat any testicular mass as potentially malignant
- lymphatic spread commonest, but also by blood
- presentation
  - seminomas – mainly stage I
  - non-seminomas – mainly stage II or III, but aggressive chemotherapy can cure most

## Presentation of testicular tumours



## Sex cord stromal tumours

- much less common
- usually benign
- various types, e.g. tumours of Sertoli cells, Leydig cells etc
- presentation may be due to hormone secretion

## Testicular lymphoma

- uncommon other than in AIDS

## Torsion of the testis

- twisted cord may stop venous drainage and arterial supply to testis
- thick-walled arteries usually remain patent, so usually intense vascular engorgement and venous infarction
- two types:
  - neonatal (in utero or shortly after birth) - no clear causes
  - adult (typically in adolescence) - sudden onset testicular pain - bilateral anatomic defect in which testes overly mobile – onset often without obvious injury – rapid surgery required, incl value of orchidopexy

