Testicular Disease
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Vitals

Vessels of male genital organs (schematic drawing).
A = lateral aspect; B = cross section of penis.
Overview

- Testicular cancer
  - Case Study
  - Epidemiology
  - Risk factors
  - Types
  - Presenting symptoms
  - Examination findings
  - Investigations
  - Management
  - Follow-up and prognosis

- Acute red swollen testes
  - Differential diagnosis
  - Quick summary

Aim

- By the end of this talk you should be able to:
  - Recognise the diagnosis of testicular cancer from differentials
  - Organise the appropriate investigation and follow-up management
  - Recognise the diagnosis of testicular torsion and organise immediate management for it
Case Study

- 19 year old man presents with a 6 week history of swelling in the right side of his scrotum. He had noticed a dull ache in the groin and his local doctor had made a diagnosis of epididymo-orchitis and prescribed a course of antibiotics. There has been no change in the discomfort associated with the lump or its size following the course of antibiotics.
Differential diagnosis

- Testicular cancer
- Inguinal scrotal hernia
- Hydrocoele
- Varicocoele
- Epididymal cyst
- Epididymo-orchitis

History

- Pain – acute or chronic
- Cryptorchidism, past history of testicular cancer or CIS, family history of testicular cancer
- Constitutional symptoms + backache + other metastasis symptoms
- Sexual history
- Dependency – bag of worms on standing, hernia
- Bowels obstruction – from hernia
Case Study

- He has no significant past medical history apart from a groin operation 2 years ago for undescended testis

Examination

- Testicular exam
  - Inguino-scrotal hernia (unable to get above the swelling)
  - Epididymal cyst (distinct entity above the testis)
  - Hydrocele (light bulb + can’t feel testis as a distinct entity)

- General exam
  - Weight loss
  - Lymphadenopathy
  - Abdominal masses or hepatomegaly
  - Pleural effusions
Case Study

- Right testis is 3cm larger than its counter part
  - Distinct entity, uniformly enlarged
  - Firm and not tender
  - No hydrocoele

Investigations

- FBE, UEC (renal impairment from ureteric obstruction)
- LFTs (mets)
- Tumour markers
  - Alpha fetoprotein
  - Human chorionic gonadotrophin
- Ultrasound of scrotum and contents
- Chest X-ray
- CT CAP – if confirmed diagnosis of cancer (for staging)
Case Study

- Alpha fetoprotein – 470 (normal is <11)
- Beta HCG – 91 (normally not detectable)
- Ultrasound

Case Study

- CXR – normal
- CT CAP – normal

What do you do now?
Case Study

- Surgical exploration and biopsy
Epidemiology

- Relatively rare: 1-2% of men
- Most common malignancy in age 20-40
- Second most common malignancy in age 15-19
- Three peak model - infancy, 30-34 years, >60 years

Risk factors

- Cryptorchidism (x5 risk) - undescended testis
  - Note: orchidopexy reduces risk to 2-3x if done before puberty and allows patients to monitor for cancer
- Past history of testicular cancer
- Family history of testicular cancer
- Intra-tubular germ cell neoplasia
  - Carcinoma in situ of testicular cancer
Classification

- 95% arise from the germ cells and are classified into:
  - **Seminomas** 40%
  - **Non-seminoma germ cell tumours** 40%
    - Embryonal carcinoma
    - Yolk sac tumour
    - Choriocarcinoma
    - Teratoma
  - Mixed tumour (seminoma and NSGCT) 15%
  - Other tumours (e.g. stromal tumours, lymphoma, leukaemia) 5%

History and Examination

- Painless testicular mass
- Acute testicular pain
- Metastasis (10-20%)
  - Spread by lymphatics (except choriocarcinoma $\xrightarrow{\text{haematogenous}}$)
  - Common sites
    - Para-aortic nodes (Left) $\xrightarrow{\text{back pain, flank pain}}$
    - Interaortocaval LNs (Right)
    - Lungs $\xrightarrow{\text{respiratory symptoms}}$
    - SC node $\xrightarrow{\text{neck mass}}$
- Note: concurrent benign pathology can be present and mask cancer - e.g. hydrocoele, acute epididymo-orchitis
- **Golden rules**
  - ALL solid scrotal lumps are malignant until proven otherwise
  - MUST always examine contralateral testis (2% incidence of bilateral GCTs $\xrightarrow{\text{do not want to miss it}}$)
Tumour Markers

- Accurate serum tumour markers - WHY measure?
  - Alpha fetoprotein
    - EC and yolk sac tumours - 50-80%
    - Choriocarcinoma and seminomas - NO
    - Half life - 5-7 days
  - Beta HCG > 5000
    - EC and choriocarcinoma - 20-60%
    - Seminomas - 15%
    - Half life - 24-36 hours
  - LDH
    - 20-60% of GCTs

Management

- USS for diagnosis
- Bloods, CXR, CT CAP for staging
- Tumour markers for monitoring
- Radical inguinal orchidectomy
Staging

- **T stage**
  - **Tis** = carcinoma in situ (IGCN)
  - **T1** = Within testis and epididymis (no lymph/vascular invasion)
  - **T2** = With lymph/vascular invasion or invade to tunica vaginalis
  - **T3** = Invades spermatic cord
  - **T4** = Invades scrotum

- **N Stage**
  - **N0** = none
  - **N1** = LNs all within 2cm
  - **N2** = LNs all 2-5cm
  - **N3** = LNs all >5cm

- **M Stage**
  - **M0** = none
  - **M1** = mets
Management

- Complex algorithms

- Stage 1 Tumours
  - Seminomas → respond to a course of radiotherapy to para-aortic nodes
  - Teratomas → no further treatment

- Stage 2, 3, 4 Tumours
  - Respond to chemotherapy with cisplatin or carboplatin with the possible addition of etoposide
  - Small volume disease may be treated with radiotherapy alone and radiotherapy will often be given following chemotherapy in other patients
  - Teratomas will respond to chemotherapy

- Consider sperm banking prior to chemotherapy

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### Seminoma VS NSGCT

**Table: Comparison of the common testicular cancers**

<table>
<thead>
<tr>
<th></th>
<th>Seminoma</th>
<th>Non-seminoma (NSGCT)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typical age</strong></td>
<td>20-40yo</td>
<td>&lt;35yo</td>
</tr>
<tr>
<td><strong>Incidence</strong></td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Growth rate</strong></td>
<td>Slow</td>
<td>Rapid</td>
</tr>
<tr>
<td><strong>Nature</strong></td>
<td>Solid</td>
<td>Mixed – solid + cystic</td>
</tr>
<tr>
<td><strong>Stage at presentation</strong></td>
<td>90% stage 1</td>
<td>60% stage 1</td>
</tr>
<tr>
<td><strong>Tumour markers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* α-fetoprotein</td>
<td>Never</td>
<td>Common</td>
</tr>
<tr>
<td>* β-hCG</td>
<td>Occasional</td>
<td>Common</td>
</tr>
</tbody>
</table>
| **Treatment**        | Inguinal orchiectomy + radiotherapy | Stage 1: orchiectomy
| **Sensitivity to chemotherapy** | +++ | +++
| **Sensitivity to radiotherapy** | +++ | - (does not respond to radiotherapy usually) |
| **Prognosis**        | Stage 1: 98% 5 year survival Overall: >85% | Stage 1: 75% cure by surgery
|                      |          | Otherwise varies      |
Acute Testis

Differential Diagnosis

- Testicular Torsion
- Epididymo-orchitis
- Hydatid of Morgagni
- Idiopathic Scrotal Oedema
Quick Summaries

- History and exam – rule out epididymo-orchitis (sexual history and urine dipstick)
- Examination – bell clapper testis, loss of cremasteric reflex
- Investigation – often waste of time, TIME is TESTIS
- Call Urology Registrar → exploratory surgery if history is highly suggestive, but if history sounds very unlikely then → USS
- Always fix both testis
- Difficult to distinguish Hydatid of Morgagni from Testicular Torsion until theatre → you can look for the blue black dot at the upper pole of testis but they’re not always there

Summary

- Testicular cancer although rare, is the most common malignancy in men aged 20-40
- ALL solid scrotal lumps are malignant until proven otherwise
- NEVER needle biopsy a suspected testicular cancer
- Excisional biopsy is the management +/- chemo/radiotherapy based on risk stratification and stage
- Testicular torsion is a urological emergency. Aim to minimize time to theatre where the testis is untorted and fixed.
Thank you for listening

Any questions?