BENIGN & MALIGNANT TESTIS DISEASES

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OBJECTIVES

1. Become familiar with the scrotal contents and their anatomical relationship with each other.
2. Become familiar with presenting symptoms of testis cancer, testicular torsion, and epididymitis.
4. Know what the PE characteristics are for testicular torsion and epididymitis.
5. Develop a diagnostic and treatment algorithm for a patient who presents with scrotal pain.
6. Understand the etiology of the formation of hydrocele, spermatocele, and varicocele.

TESTIS CANCER
Epidemiology
1-2% of all neoplasms in men
Incidence 2.3-6.3/100,000 per year.
Highest incidence in caucasian population (several x incidence)
2nd most common malignancy ages 20-35 (behind leukemia)
97% are germ cell tumors
   Seminomas--average age 31-42 years of age at presentation
   Embryonal carcinomas--average age 26-33 years

Risk Factors
Age--Highest risk age 20-40
Cryptorchidism--risk continues after the testis is brought down into the scrotum,
but orchidopexy allows easy surveillance for tumor. Also, the contralateral testis
is at risk for development of tumor. In fact, approximately 20% of testis tumors
related to cryptorchidism occur in the non-cryptorchid testis
Mixed gonadal dysgenesis (gonadoblastoma)
Previous testis tumor--2-3% risk to the contralateral testis
Presentation

Diagnosis is commonly delayed
Painless Mass
Pain (acute hemorrhage or necrosis)
Trauma ("Was perfectly normal until I was kicked")

Differential diagnosis
- Torsion
- Epididymitis
- Orchitis
- Hydrocele
- Hernia
- Spermatocele

Evaluation

Physical examination--best diagnostic tool--hard mass in the testicular parenchyma on examination IS A TESTIS TUMOR UNTIL PROVEN OTHERWISE

Ultrasound may be used to confirm physical examination or to clarify an ambiguous examination--solid mass in parenchyma requires exploration

Tumor markers pre-op and post-op:
- Alpha feto-protein
- Beta HCG

Pathology--to be covered in next lecture.

Initial Treatment:

Radical inguinal orchiectomy
- Limit spread to retroperitoneal nodes--theoretical
- Pathological analysis of tissue

Staging Studies: CT, CXR, lymphangiogram (+/-), tumor markers done after diagnosis of tumor confirmed pathologically

Staging:
- A: Confined to the testis
- B1: Retroperitoneal spread, microscopic only
- B2: Retroperitoneal spread, >6 nodes, microscopic or gross metastatic lesions, 2-6 cm.
- B3: Retroperitoneal spread, >6 cm size
- C: Above the diaphragm or solid organ involvement

Subsequent Therapy--Stage A Seminoma

Approximately 15-25% of clinical stage A seminomas will have micrometastases in the retroperitoneum, therefore 15% will relapse

Reliable spread allow radiation therapy to be given to all men in this situation, increasing the cure rate for Stage A seminoma to very near 100%

Decreased fertility couple months - resolves

Follow-up with x-ray studies and additional therapy if relapse
Subsequent Therapy--Stage A Nonseminomatous Germ Cell Tumor

Not radiosensitive, radiation therapy of no benefit
Still 20-25% have mets, despite clinical Stage A
2 options:

1. Retroperitoneal lymph node dissection (RPLND)
   - Accurate diagnosis
   - Cure if B1 or B2
   - Relapse in chest - easier to treat with chemotherapy
   - Disadvantages - Big operation
     Problems with ejaculation
     nerve-sparing surgery

2. Observation
   - Frequent follow-up  CXR q 1m, CT q 3m, marker q 1 m
   - Non-surgical
   - Disadvantages If relapses = chemo tx
     Unreliable patient may die due to massive disease at relapse, if hasn't been followed closely

Cure rates for above therapeutic plans remain >95%

Treatment of Metastatic Disease - Seminoma or Non-Seminoma

- Initial chemotherapy
- RPLND - for residual masses - cancer, teratoma, scar (?)
- Cure rates remain approximately 70% in men with metastatic disease,
  and approximately 40-50% with extensive disease

TESTICULAR TORSION

Most common ages 12-18 (2/3 of cases), but CAN OCCUR AT ANY AGE!
*Don't miss this diagnosis!

Mechanism -
- Bell Clapper deformity--tunica extends high on spermatic cord
- Anomalies of the Wolffian system leading to abnormal lie
- ? trauma--maybe coincidental in many cases
- Probably requires 720° of torsion to cause ischemia
- Venous congestion occurs first, with obstruction of arterial flow following
- Ischemia time of only one hour may cause damage, but most investigations suggest 4-6 hours may be the safe treatment "window"
Presentation
Acute pain
Colicky (?)?
May be acute resolution, if spontaneous detorsion occurs

Exam
Scrotal swelling/diffuse
Must attempt to palpate the epididymis to r/o epididymitis
Cord defects/tenderness
Decreased cremaster reflex

Tests
Standard U/S negative
Duplex U/S - no flow to testis parenchyma--see next lecture
Nuclear medicine testicular flow Scan
Urinalysis--if +, supports a diagnosis of epididymitis

Diff Dx: epididymitis
Tumor
Trauma
Torsion appendix of testis or epididymis
Ureteral stone (may present with pain radiating into the ipsilateral scrotum)

Treatment
May attempt manual detorsion--anterior testis is manipulated in the lateral direction--like opening a book
Emergent operation to detorse and fix testis to scrotal wall to prevent future occurrences
Orchiectomy if testis is non-viable
Consider contralateral orchidopexy to prevent torsion on that side

EPIDIDYMITIS/ORCHITIS

Path
Urinary Pathogens - Age 40 & < puberty
STD's - < age 40
Viruses - orchitis mumps

Risk Factors
Voiding dysfunction/BPH >50
Neurogenic bladder
Chronic Foley
STD's <40
Cong Anomalies of Wolffian structures or bladder neck/urethra--pediatric age group
Recurrent UTI's/prostatitis
Presentation
  Can be toxic, high temperature
  Scrotal pain/swelling, usually subacute
  Voiding symptoms - irritative/obstruction

Evaluation
  Scrotal swelling, redness
  Tender epididymis - occ testis
  U/A positive - adults
  Nuclear medicine scan - increased flow epid
  Duplex ultrasound--increased flow to the epididymis

Treatment
  Antibiotics - urinary (?) STD's
  Elevation of scrotum on towels while lying
  Bedrest
  Non-steroidal anti-inflammatory agents
  Admit if not responding or very toxic at presentation
  Urinary tract evaluation, esp peds
  Consider operation for torsion if epididymitis diagnosis is equivocal

TRAUMA

(-) Transillumination
Hematocele - >8 cm - operate to drain
U/S - may see disruption. If disruption, operate to repair testis

PAINLESS SCROTAL MASS

Hydrocele
  Fluid-filled mass in the potential space of the tunica vaginalis
  Non-communicating hydroceles (adults) may be due to infection, lymphatic obstruction (eg, post-hernia surgery), trauma or testicular tumor.
  Communicating hydroceles are hernias, through which peritoneal fluid accumulates in the scrotum. These are seen in infants (congenital) and require repair.
  Symptoms usually related to size or underlying cause--eg epididymitis with resultant hydrocele.
  If etiology a new onset hydrocele is not clear by the history, or if the testicular parenchyma cannot be palpated, an ultrasound examination should be performed to exclude testicular tumor as the cause.
  Treated only if symptomatic. The treatment is surgical and consists of partial excision & closure.
  Possible complications of repair:
    Recurrence
    Vascular injury to testicle
    Obstruction of epididymis from scarification.
**Varicocele**

"Bag of worms"

Appears when upright, Valsalva, decreased supine
Occ uncomfortable
Mostly fertility issue - will see case later
Abnormal drainage int spermatic
Interrupt internal spermatic vein
   laparoscopic
   open surgery
   embolization
If persists when supine or solitary (R) varicocele is seen-- evaluate retroperitoneum for mass lesions
Indications for treatment:
   Infertility and abnormal sperm count
   Pain--uncommon
Testis size smaller than other side--controversial
Pediatric varicocele--controversial

**Spermatocele**

Rupture epididymal/efferent ducts of the testis
Filled with sperm/aspiration will give diagnosis
Transilluminates in a dark room
Treatment only if symptomatic
Surgical excision of sac and ligation of neck to prevent recurrence

**Epididymal Masses**

Tumors epididymis are exceedingly rare
Almost always cysts or previous infection/scar
Ultrasound may help
No treatment necessary unless painful
Treatment generally means surgical excision of epididymis