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.
3. Become familiar with risk factors for development of testis cancer.
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--theorectical
  - 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
- Transillumates 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