RETINAL DETACHMENT

CLASSIFICATION

1- Rhegmatogenous Retinal Detachment
2- Tractional Retinal Detachment
3- Exudative Retinal Detachment

Rhegmatogenous Retinal Detachment

- Associated with a retinal break (hole or tears)

Risk Factors

- Age: 40-60 yrs of age
- Sex → M:F = 3:2
- Myopia
- Aphakia and pseudophakia
- Retinal degenerations
- Trauma
- Posterior Vitreous Detachments (PVD) → associated with Retinal detachment in 10% of cases

  - Lattice Degeneration
  - Snail Tract Degeneration
  - White without pressure
  - Degenerative Retinoschisis
  - Retinal tufts

Types of Retinal Breaks

1- Atrophic Retinal holes
2- Operculated Retinal holes
3- Horse shoe shaped tears/flap tears
4- Giant Retinal Tears
5- Giant Retinal dialysis

Pathogenesis

Myopia, Aphakia, Vitreous Syneresis, Presence of PVD
↓
Retinal break → Fluid enters subretinal space and accumulates leading to RD

Symptoms

- Floaters
- Flashes (photopsias)

Stages of posterior vitreous Detachment

Stage 1 → Perifoveal vitreous detachment with residual vitreofoveal adhesion

Stage 2 → Perifoveal vitreous detachment with persisent attachment to optic disc but without vitreofoveal adhesion

Stage 3 → Near-complete PVD with only vitreopapillary adhesion remaining

Stage 4 → Complete PVD

PRODROMAL SYMPTOMS OF RD

- Dark spots :- Floaters
- Photopsia → Sensation of flashes of light (due to irritation of retina by vitreous movements)

SYMPTOMS OF RD

- Localised relative loss of field of vision
- Sudden painless loss of vision
- Sudden appearance of a dark cloud, veil/curtain in front of eye

SIGNS OF RD

- External examination → eyes look normal
- Intraocular pressure → Hypotonia (↓ IOP)
- Marcus Gunn pupil : Relative Afferent pupillary Defect
- Plane Mirron Examination / Distant Direct Ophthalmoscopy
  - Altered Red Reflex → Greyish reflex in the quadrant of detached Retina

- Shaffer Sign
  - pigment in anterior vitreous (tobacco dusting)
  - shearing force of break in RPE
  - It is pathognomonic of Retina Tear

FRESH RETINAL DETACHMENT

- Grayish Reflex instead of normal pink
- Raised anteriorly
- Thrown into folds (undulations)
- oscillates with movement of eye
- Retinal vessels appear as dark red tortuous cords oscillating with movement
- Large balloon like bullous retinal detachment

OLD Retinal Detachment

- Thinning of retina due to atrophy
- Subretinal demarcation lines (high water marks)
- Secondary intra retinal cysts formation (very old RD)

ULTRASONOGRAPHY

- confirms the diagnosis
- Hazy media in presence of cataracts or vitreous hemorrhage

Complications

- Proliferative vitreoretinopathy
- Funnel shaped Retinal detachment
- Complicated cataract
- Uveitis
- Phthisis bulbi

RETINOBLASTOMA

* Most common primary intra-ocular malignancy
  - In childhood → Retinoblastoma
  - In Adults → uveal melanoma
* Aggressive tumor → early detection

Pathophysiology

Mutational inactivation of both alleles of RB gene
↓
Uncontrolled growth of cells
↓
Retinoblastoma

HERITABLE (40%)

- Familial
- Germline
- Mutations in Reproductive cells
- Bilateral
- Multifocal
- Secondary Tumors
  - Pinealoblastoma = Trilateral RB
  - Osteosarcoma
  - Soft Tissue Sarcoma
  - Melanoma

NON HERITABLE (60%)

- Non familial
- Sporadic
- Mutations in somatic cells
- Unilateral
- Unifocal
- No secondary Tumors

3 Modes of Growth

1. Endophytic
   - vitreous seeds
2. Exophytic
   - Sub Retinal Space seeds
   - Sub Retinal Fluid
     ↳ Exudative Retinal Detachment
3. Diffuse Infiltrative
   - spread along retina
   - anterior chamber involvement
   - NO CALCIFICATION (imp point)
   - Easily missed

3 Modes of Spread

1- Direct
   - Optic Nerve → CNS
   - Subarachnoid Space → CNS

2- Lymph Nodes

3- Blood

HISTOPATHOLOGY

- Small primitive round cells
- Necrotic areas
- Focal zones of Dystrophic calcification
- Blue islands (nests of cells) + Pink sea (Necrosis) + Calcium rocks (calcium deposits)

3 Histopathologic Features

1- Flexner-Wintersteiner Rosette
   - empty lumen
   - Lumen formed by cell borders and fine cytoplasmic extensions
   - There will be NO basement membrane

2. Homer Wright Rosettes
   - Pale Neuropil (dense feltwork of interwoven cytoplasmic processes of nerve cells and neuroglial cells)

3. Fleurettes

Biopsy is Contra Indicated

CLINICAL FEATURES

- Leucocoria → most common manifestation → 40%
- Squint → 2nd MC → 20%
- Reduced vision
- Red eye
- Buphthalmos → Congenital Glaucoma
- Proptosis → Orbital Cellulitis → Tumor Necrosis
- Pseudo hypopyon → Diffuse infiltrative RB

- Leucocoria → white Reflex
  ↳ Cat's eye pupil

Mimickers of Retinoblastoma

1- Acute Red eye
2. Buphthalmos
3. Cellulitis
4. Diffuse infiltration → Hypopyon

3 STEP APPROACH

1. Screening of all newborns
2. Evaluation of suspected babies
3. Initiation of Rx

EVALUATION

- Detailed history → including family history
- Examination under Anesthesia (EUA) → Indirect Ophthalmoscope Examination
- USG B Scan → Hyperechoic stippled dots → calcified spots
- MRI Brain/orbit
- CT → Calcification
  ↳ CT is Relatively C/I bc2 CT can induce Radiation induced cancers
- Genetic Testing
- Metastatic Evaluation
  - BM Aspiration
  - Radionuclide bone scan
  - LP

Classification

1. Staging → Survival
2. Grouping → Salvage

STAGING

0 → No enucleation
1 → Enucleation + Completely Resected
2 → Enucleation + Microscopic Remnants
3 → Regional Extension
4 → Metastasis

GROUPING

* A → Very low Risk → Tx → Cryo/Laser = Focal
  - < 3 mm
  - Away from optic Disc / Fovea
  - No Seeding

B → Low Risk → Tx = Chemo Therapy
- Any size
- Any location
- No Seeding

C → Moderate Risk → Tx → Chemotherapy
- confined / focal
- Vitreous seeding

D → High Risk → Tx → Chemotherapy
- Diffuse
- vitreous seeding

E → Very High Risk → Tx → Enucleation
- Enucleable

Clinical Feature That Confer Group E Status

- Neovascular Glaucoma
- Massive intra ocular hemorrhage
- Blood stained cornea
- Orbital cellulitis
- Phthisis or pre-phthisic
- Tumor anterior to anterior vitreous face
- Anterior segment tumor
- Tumor touching the lens
- Diffuse infiltrative RB

3 Aims of Treatment

1- Save Life
2. Salvage Globe
3. Preserve Vision

Focal Therapy

1. Cryotherapy
2. Photo coagulate (Laser) → ↑ Scar around tumor
3. Thermotherapy

Local Therapy

1- External Beam Radio Therapy
2. Episcleral Plaque Brachytherapy

Indications for Chemotherapy

- Intraocular Retinoblastoma
- Prophylaxis against metastasis following enucleation in the presence of histopathologic high-risk features
- Extra ocular RB with local and/or regional spread
- Metastatic RB with or without CNS involvement
- Trilateral RB

Chemotherapy Routes

1. IV (most common) → (CEV : Carboplatin, Etoposide, Vincristine)
2. Intra arterial → Ophthalmic artery → (Melphalan, Carboplatin, Tropotecan)
3. Intra vitreal → (Tropotecan, Melphalan)
   - Tropotecan → No Retinal Toxicity
   - Melphalan → Retino Toxic

LEUCOCORIA IN CHILDREN

4R, 3C, PT

1. Retinoblastoma
2. Retinopathy of prematurity
3. Retinal Detachment
4. Retinal Dysplasia, Retinal hamartoma
5. Congenital Cataract
6. Coloboma Choroid
7. Coat's Disease
8. PHPV → Persistent Hyperplastic Primary Vitreous
9. Toxocara Endophthalmitis

COAT'S DISEASE

- Yellowish Reflex → Xanthocoria
- unilateral
- Telengiectasia
- Massive lipid exudates
- No calcification

PHPV

- unilateral
- Microphthalmos
- Retrolental mass
- Elongated ciliary processes
- Cataract

TOXOCARA

- Unilateral granulomatous pan uveitis
- peripheral granuloma + tractional bands
- H/o contact with puppies / eating dirt
- Systemic features of visceral larva migrans 'Toxocara Canis'