A Journey to the Peripheral Retina: Diagnosis and Management of Peripheral Retinal Disease
A Clinically Relevant Review

Disclosures

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  - Charles Retina Institute
  - Alcon/Novartis
  - Genentech
  - Heidelberg Engineering
  - Notal Vision
  - Optos
  - Regeneron
  - RegenXbio

Purpose of physical examination, Diagnostic testing and imaging

• Screening and inspection for specific or common (endemic or epidemiological) or even rare conditions
  - Myopia, Amblyopia, Glaucoma,
  - Discovering cause or etiology in a symptomatic patient
    - Example: Loss of sight, Flashes, Floaters
  - Examining for complications of certain systemic disease or Medication/Treatment
    - Example: Diabetes
  - Evaluating coincidental findings
    - Example: Asymptomatic with OHS, Lattice, various lesions and scars

Peripheral Retinal Abnormalities
(Primary or Secondary Conditions)

• Peripheral Lesions
  - Meridional Folds, Pars Plana Cysts, Ora Serrata Pearls
• Degenerative Disorders
  - Paving Stone, Lattice, Acquired Retinoschisis
• Vitreous and Vitreoretinal Interface Caused
  - Degenerative virenochacies, Tufts, Holes, Tears,
• Retinal Vascular
  - Cysts, PEHCR, Sickle and Diabetic, Vascular Tumors
• Inflammatory, Infectious Disease
  - Pars Planitis, AN, CMV
• Pigmented Lesions
  - CHORE, Choroidal Nevus and Melanoma, pigmented CRs
• Trauma

Dilation

• For proper evaluation of the crystalline lens and beyond
• Maybe able to get by in young patient
  • Slit lamp lenses (90D)
  • 28 D lens
  • Or imaging
• Medical-Legal and Standard of Care Concerns
• Limiting Factors
  • Technique and Skill in Detection (What am I looking at?)
  • Recognition of the findings and proper assess (What is this what do I do with it?)
• Patient flow, and patient complaints of inconvenience (How do I convince the PT they need it?)

Dilation Risks and Benefits

• At risk population
  • Age
  • Systemic conditions such as Diabetes
  • Family history
  • Trauma
  • Symptoms
• Clinical/Examination Findings (High Myopia)
Degenerative Myopia with and without PRD

Instruments

Peripheral Retinal Examination

Morphological Differences in Clinical Course
• The Involved Landmark
  • Vitreo-retinal
  • Neurosensory Retina
  • RPE
  • Choroid
• OCT’s Role in Clinical Understanding
Peripheral Retina

Normal Variations

Peripheral Lesions-Pars Plana Cysts

Peripheral Retinal Degeneration
Consequential vs. Inconsequential

Pigment Distribution

LPCN
Artist’s Renditions of Peripheral Retinal Degeneration (PRD)

Peripheral Retinal Degeneration Association With RRD
- Association of these conditions with inner or outer retina
- The architectural association of vitreous and retinal surface
- The integrity of “normal” retinal thickness
- Peripheral Retinal Degeneration
  - Of Outer Retina
  - Of Inner Retina
- Coexisting Conditions may or may not be interrelated or may have common root (e.g., myopia, genetics)
- Similarities with central retinal conditions

White and Dark without Pressure
Misdiagnosed for RRD and Retinoschisis
Look and Listen for Clues

White Without Pressure (Classic Teaching Disputed)
An Outer Seg Degeneration

Spectral Domain Optical Coherence Tomography
Characteristics of White-Without-Pressure
Retina Sep 2013

OCT-White without Pressure

Dark Without Pressure
Opposite to WSP
Peripheral Drusen (another outer retinal deg)

Peripheral Drusen

Peripheral Drusen + Macular Drusen, Familial (mid-peripheral) Drusen

Association with AMD

Normal vs AMD

Peripheral Reticular Degeneration
Peripheral Reticular + Peripheral Drusen

Same genotype (CFH) as Peripheral Drusen (and AMD)
Both have choroidal vascular deficiency

Myopic Pt with MD findings also has multiple Peripheral DZ

Other co-existing conditions may go undetected or overlooked

AMD Complications

Peripheral CNV

Paving Stone (CR) Deg
This is not a retinal hole!
Compare the choroidal thickness

Absence of choroidal features

Peripheral Microcystoid Degeneration (An intra-retinal degeneration)

Peripheral Microcystoid Precursor for Retinoschisis

Retinoschisis Variations and Causes

X-linked JRS
Acquired Retinoschisis

RRD vs. Retinoschisis
RPE

Outer Retina

Inner Retina

OR

Break

IR Break

Retinoschisis

Outer Layer Break

Schisis?

RD?

Role of Vitreous

- Architectural/Anatomic Implications
- Effect of Aging
- Congenial Anomalies
- Degenerative Vitreopathies

OCT-Scanning Around

Vitreoretinal Interface Macular Region

Scan Orientation

1/18/2011 1/13/2011 8/21/2012
Vitreomacular Disorders Taxonomy

- Anomalous PVC or Posterior Vitreous Separation
  - ILM Defect
  - Glial Repair
  - Circumferential Tearing of ILM
  - Epiretinal Membrane (ERM)
  - Macular Hole
  - Vitreomacular Traction

- Pre-Foveal Cortex
- Adherence to Fovea
- Hypocellular Contraction

Possible Outcomes:

- VMT Released with formed Schisis
- Recent Onset Floaters and Vision Loss
- Young Diabetic with Vitreous Hemorrhage
- Dense vitritis
- Peripheral Vit attachment
- Retinoschisis
- OCT - Outside of Macula

Prominent Vitreous Base
Vitreous Adherence and Base

Vitreous Skirt

PVD+VH

Vitreous Opacities Tags, Tufts

Vitreous Adherence (Vitreo-retinal Tufts)

Recent Onset “Flashes” OS

Suspicious Retinal Hole
Tuft (small cysts) No Retinal Breaks No TX (Monitor)

Referred for RT

Vitreoretinal Tufts
cystic vs. non-cystic

Tuft during PVD

VR Tuft Post PVD
Tuft-Partial Thickness Hole

Operculated Retinal Hole

Tuft-Partial Thickness Hole

Operculated Retinal Hole

Tufts-to Operculated Hole

Tuft Post PVD

RRD 2ndry to FTMH
Subclinical RRD 2ndry to Peripheral RH

Peripheral Break Leading to RD

Partial Thickness Operculated Holes

Prophylactic Laser

Cystic Tuft (Traction, Fluid, Break) TX

No Treatment!
Maybe the old myth
Operculated holes don’t need TX!
Lattice a Retino-vitreal Degeneration

Peripheral Vitreo-retina Interface and Lattice

Pocket of liquefied vitreous
Abnormal attachment of formed vit

Variations and Morphology of Lattice

Lattice-Myopia

Lattice (Snail Track) Degeneration

Lattice

Retinal Permeability Drives TX Plan
Vit Deg, Lattice

Lattice Lacunae

Schisis w ORB RT w SRF??

Partial- vs Full-thickness Holes (within or outside/adjacent to lattice)
13 Y/O high myopia Bilateral Radial Lattice

Lattice with PVD-related break

PVD • Complications
• VH — RT
Lattice-RD Post Laser then PVD and RRD

Lattice RRD with PVD

RD not Schisis

Degenerative Vitreopathies-Stickler Syndrome

Lattice associated with Stickler

Degenerative Vitreopathies FEVR (Mutation of FZD4 Gene)
Retinal Breaks (Holes, Tears)
- With and Without Symptoms
- With and Without PVD
- With and Without RRD

Peripheral RH

Peripheral Retina

RRD Management

Chronic Atrophic Hole Subsequent RRD
RT - After PPV

Iatrogenic RT

Posterior RT (Tractional)

Chronic RRD

Asymptomatic

41 Y/O M Post Lasik 20/20-2

20/20
RRD (multiple RT)-PPV FGX

Giant Break (>3 clock hours)

Retinal Dialysis

Surgery Outcome
PVR

PVR-Subretinal Band

Serous RD (No RT)

RRD-Buckle

RRD-RT
Subtle Hints of Advancing Disease

Sickle Cell Retinopathy

PDR-TRD

SCR
Peripheral Retinal Hemorrhages

Peripheral Hemorrhage

Ocular Ischemic Syndrome

S/p Endarterectomy

Peripheral Exudative Hemorrhagic Chorioretinopathy

OIS
Telangiectasia

Coat’s Disease

Vascular Tumors

Peripheral Retina in Inflammatory and Infectious Disease
Toxoplasmosis

Histoplasmosis and DDX

Chorioretinal or Retinochoroidal Scars

DDX of Causes

OHS, MCP, Toxoplasmosis, West Nile
Peripheral Pigmented Lesions

Iatrogenic

Associated with genetic conditions

ROP

CHRPE (RPE)
CHRPE with Lacunae

Heavily CHRPE

Non-pigmented CHRPE

Suspicious CHRPE with secondary melanocytic proliferation

Other RPE Hypertrophic Lesions

Choroidal Nevi
Elevated Nevus

Choroidal Melanoma

Nevus VS CMM

Peripheral Retina In an Injured Eye

Commotio Retinae
Conclusion

- Importance of examination of peripheral retina for variety of conditions

- Thank you