REFER OR RELAX: RETINA

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Lattice Degeneration

- Circumferential oval lesions often with thin white blood vessels
- Pigment can vary
- Vitreous adhesion at borders
- Syneretic vitreous overlying the lesion itself
- Can have atrophic round holes without operculum typically towards end of lesions
  - Occur up to 30% of the time

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Lattice Degeneration

- Most common in Superior and inferior retina
  - 2/3 cases from 5-7 or 11-1 o'clock
- Typical lesion size
  - ½ to 2.5 DD in width
  - 1-4 DD in length
- Average numbers of lesion per eye: 2
  - Range: 1-19
- Bilateral in >>50% of cases

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Lattice degeneration

- Most new cases discovered from 10-20 years of age
- May have hereditary component
- No apparent gender or race bias

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Risk Factors

- Myopia > 3D, especially if < 30.
- Myopia > 6 D at any age
- Fellow eye has RD
- Family history of RD
- Symptoms
- Presence of traction
- High risk behavior

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Follow up

- Lattice as only sign/symptom
  - Scleral depression
  - Pt ed.
  - RTC 1 year
- Lattice with symptoms of flashes/floaters
  - Reexamine q 6 mos
  - Repeat DFE/scleral depression
  - Pt ed

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Follow up

- Lattice with holes but no risk factors
  - Scleral depression
  - Pt ed
  - Rtc 6 mos
  - Sooner if young myope, myope > 5 D, inferior holes, or adhesion
- Lattice with risk factors for RD
  - Consider retinal consult
- Lattice with breaks at margin of lesion
  - Consider retinal consult

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Retinal Breaks

- Occur in 3 to 7% of adult population
- Usually asymptomatic
- 1-2% with breaks progress to detachment
- Risk factors include lattice degeneration, high myopia, atrophic holes, aphakia/pseudophakia, and trauma

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Horseshoe tears

- Common locations
  - Near lattice
  - Near pigment clumps
  - Near chorioretinal scars
- Worst locations
  - Superior
  - Near equator
  - Close to posterior pole

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Treatment

- Laser treatment is used to seal the break by creating adhesion between the retinal tissue and underlying RPE
- Provides barrier to continued enlargement from vitreo-retinal traction and prevents accumulation of subretinal fluid
- Adhesion present 24 hours after surgery, and strengthens over several days

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Procedure

- Topical or retrobulbar anesthesia
- Entire lesion should be enclosed by at least 3 rows in a honeycomb pattern

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Follow-up

- RTC 1-2 weeks after laser for symptomatic tears
- 3-4 weeks for asymptomatic
- If large or superior, RTC even sooner
- If enlargement or new subretinal fluid, retreat with 1 week follow-up
- RTC 6-8 weeks after initial follow-up
- Yearly thereafter

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Complications

- Few complications
  - inadequate burn intensity, causing ineffective adhesion
  - possible CNVM
  - intraretinal hemorrhage
  - vitreous hemorrhage
  - ERM formation

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Operculated holes

- Round, red hole with overlying free operculum attached to vitreous
  - Operculum often appears smaller than hole
- Minimal risk as no traction
- Treatment sometimes
  - High myopia
  - Aphakia
  - h/o RD in the fellow eye
  - Other factors

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Atrophic Retinal Holes

- Small round, red hole w/o operculum
  - May have surrounding pigment
  - Occasional edmea
- 2-3% of general population
- Most often in vitreous base
- Found in atrophic retina, perhaps 2^0 to vascular insufficiency

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Atrophic Retinal Holes

- No traction
  - Minimal risk of detachment
- Asymptomatic holes
  - Yearly
  - Pt ed
- Asymptomatic with surrounding edema
  - Follow more closely
- Symptomatic
  - Consider consult
- Other associated issues
  - As warranted
- Rarely treated

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Treatment of Asymptomatic Lesions

Lesion	Phakic	High Myopia	RD etc in other eye
Atrophic hole	No	No	Rarely
Operculated hole	No	Rarely	Rarely
Lattice with or without hole	No	Rarely	Sometimes
Flap tear	Sometimes	Sometimes	Usually

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Treatment of Symptomatic Lesions

Lesion	**Treat**
• Horseshoe tears	• Yes
• Operculated holes	• Rarely
• Atrophic holes	• No
• Lattice w/o holes	• No
• Lattice with holes	• Sometimes

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RD

- Rule-of-thumb:
  - For macula off RD, want to get it repaired in same amount of time it has been off
  - So if off for 4 days, best to try repair within 4 days!
- Macula on RD is emergency!
  - Same day referral to retinal specialist
  - **Remind pt NPO until sees specialist in case same-day surgery**

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Retinal Detachments

- Rhegmatogenous RD occur when liquefied vitreous fluid enters the sub-retinal space through a full-thickness retinal break.
- Occurs in 1/100,000 per yr
- Treatment options include scleral buckle, pars planar vitrectomy, and pneumatic retinopexy

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Retinal Detachments

- Many factors go into selecting which procedure is best for patient
  - Phakic/pseudophakic
  - Location of tear
  - Size of tear
- Experience of retinal surgeon is essential!
  - Do your homework!

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Retinoschisis

- Defined as splitting of the neurosensory retinal Layers
  - Typically in outer plexiform layer
- variability: large, small, bullous, flat, bilateral, unilateral, progressive ,non-progressive
- Two major types
  - Acquired
  - x-linked (XLRS)

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Acquired retinoschisis

- Usually benign and non-progressive
  - Myopic pts tend to be more progressive than hyperopic pts
- Asymptomatic, found on routine DFE, but may cause VF defect
- Incidence:
  - 3.9% in pts 60-80
- Most commonly affects inferotemporal retina
- Bilateral 33-82% of time

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Schisis vs RD

- Schisis:
  - More translucent with visible vasculature
  - Less flexible
  - Well demarcated borders
  - Overall smoother appearance
  - Should have absolute VF defect vs relative with RD
- B scan/OCT can be helpful
  - OCT often difficult to image due to location

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Retinoschisis

- Can have outer or inner wall breaks
  - Outer:
    - larger, often have ring of pigment
    - 11-24% of time
  - Inner:
    - smaller
    - Look like atrophic holes
  - Either associated with increased risk for detachment, so retinal consultation advised
  - Inner and outer together very dangerous
- if no holes, generally benign and can be monitored

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Retinoschisis

- Very rare to have detachment into macula area
- Prophylactic Laser treatment has not been shown effective in most studies to halt progression
- Cataract surgery and PVD do not seem to have adverse effect
- If progresses to detachment, retinal surgery indicated
  - Only about 0.05% to 2.2% of cases
  - Typically respond poorly to surgery
- Most are benign and can be monitored yearly unless holes, enlargement, or symptoms

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PVD

- Really no consensus
- Symptomatic PVD without retinal break
  - AOA:1-2 weeks
  - **AAO: depending on symptoms, risk factors and clinical finings:**
    - **1-6 weeks**
    - **Then 6 mos to 1 year**
  - Cleveland Clinic: 4-6 Weeks
  - Others: if no heme or other issues, very low risk so no need to see to back

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PVD

- Floaters are typically most common symptom
  - Cobwebs
  - Files
  - Hairs
- Flashes
  - Indicative of traction on retina, but not necessarily a tear or break

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The Vitreous Humor

- Vitreous attached most firmly at
  - Macula
    - VMT
  - Vitreous base
  - Around optic nerve head
    - Weiss' Ring
  - Also, some traction on blood vessels
    - Vit heme

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Incidence of PVD

Age	Incidence
>30	RARE
30-59	10%
60-69	27%
>70	63%
>80	75%

- 65%>65 HAVE A PVD

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Incidence of PVD

- Incidence may be accelerated by
  - Myopia
  - Trauma
  - Prior vitreoretinal disease
  - Surgery
  - Inflammation
- Symmetrical 90% of the time
- Happens to second eye with 1-2 years

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PVDs

- Good News:
  - Retinal Tears/Breaks *Relatively* uncommon
    - One study: only 7-15% of symptomatic PVDs have a retinal break
- Bad news:
  - 7-15% have a retinal break

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Risk Factors

- Hemorrhage
  - 90% have break
- Inflammatory cells
- Pigment
  - Schaeffer's Sign
    - Indicates break is possible

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CHRPE

- Unifocal lesion typically appear as flat, pigmented round lesions with distinct margins
- Color ranges from light brown to jet black, depending upon amount of melanin
- Often have areas of chorioretinal atrophy within the lesion that appear window like and allow a clear view of the underlying choroid (lacunae)

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CHRPE

- Typical size is 2-6 mm, but may be smaller or as large as 14 DD (21 mm)
- Can be located anywhere within the fundus, but about 70% in temporal half of fundus
- No apparent racial predisposition, although reported more in Caucasians
- May be present at birth, with reports in as young as 3 months old

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CHRPE

- Lesions are almost always stable in size, but color may change.
  - Very rare instances of enlargement with time
- Typically asymptomatic, and found on routine exam, but large lesions have been shown to have VF defects

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CHRPE

- Can also appear as multifocal CHRPE
  - From 3 to 30 lesions, 0.1 to 3.0 mm in size
- Benign, stationary and unilateral in 85% of the cases
- Often called bear tracks

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Gardner's Syndrome

- Multifocal CHRPE have been associated with Gardner's Syndrome
  - AKA FAP: familial adenomatous polyposis
  - Familial condition of colonic polyps that may be precursor to colon cancer
  - However, these lesions are bilateral, have more irregular borders, and are often scattered throughout the fundus

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CHRPE

- Deferential includes nevi and choroidal melanoma
  - Nevi: nevi are rarely jet black and tend to have more indistinct borders
  - Melanomas tend to be greater than 2mm in thickness, where CHRPE are flat
- B-scan, serial photos and frequent monitoring of assistance

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Nevus

- Common, benign tumor of the posterior fundus
- Typically slate –gray or brown in color, with somewhat indistinct borders
  - Often have overlying drusen, which signify chronicity of lesion
- Vary in size from 1/3 DD to as much as 7 DD
  - Flat or minimally elevated, < 2mm

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Nevus

- Very common, with prevalence ranging from 0.2% up to 32% of patients
- More common in Caucasian population
- Asymptomatic, and usually found on routine exams
- Management consists of serial photography and frequent follow-up, with ultrasound if needed for more suspicious lesions

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Nevus

- TFSOM: To Find Small Ocular Melanomas (1995)
  - T: Thickness: lesions > 2 mm
  - F: Fluid: any subretinal fluid suggestive of RD
  - S: Symptoms of photopsia or vision loss
  - O: Orange pigment overlying the lesion
  - M: Margin touching the optic nerve head
    - No factor= 3% risk of converting to melanoma in 5 yrs
    - 1 factor=8% risk
    - 2 or more factors =50% risk

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Update 2019

- Incorporates imaging and re-evaluates risk factors
- TFSOM-DIM
  - To Find Small Ocular Melanomas Doing Imaging
    - T: Thickness > 2mm (US)
    - F: Fluid, subretinal (OCT)
    - S: Symptoms of vison loss (VA)
    - O: Orange pigment (FAF)
    - M: Melanoma Hollowness (US)
    - DIM: diameter > 5 mm (photos)

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Update 2019

- Risk of converting to melanoma over 5 years
  - 0 factors: 1 % risk
  - 1 factor: 11%
  - 2 factors: 22 %
  - 3 factors: 34%
  - 4 factors: 51%
  - 5 factors: 55%
  - 6 factors: who knows?
- Bottom line: Increasing number of risk factors imparts greater risk for transformation

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Update 2019

- M: Tumor Margin replaced with ultrasound
- S: Vision loss (VA < 20/50) rather than flashes/floaters
- Most important:
  - Thickness, Fluid, orange Pigment, Hollowness
- Least important:
  - Symptoms, Diameter

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Choroidal Metastasis

- Most common site of metastasis to eye is choroid ≈ 88%
  - Iris 9%
  - Ciliary body 2%
- Most common primary sites
  - Men:
    - Lung 40%
    - GI 9%
    - Kidney 8%
  - Women
    - Breast 68%
    - Lung 12%T

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Choroidal Metastasis

- Typically yellow in color
- Often associated with subretinal fluid
- Solitary and unilateral or multiple and bilateral
- On ultrasound, have high internal reflectivity vs melanoma which has low internal reflectivity

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Choroidal Metastasis

- 90% present with visual symptoms
  - Blurred vision 70%
  - Flashes /floaters 12%
  - Pain 7%
- Asymptomatic metastasis often detected in fellow eye
- Not uncommon to be asymptomatic

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Choroidal Metastasis

Differential diagnosis

- Choroidal amelanotic melanoma
- Choroidal amelanotic nevus
- Posterior scleritis
- Choroidal Hemangioma
- Choroidal Granuloma
- Choroidal osteoma

Differential diagnosis

- Posterior Uveal Effusion syndrome
- VKH
- Central Serous Retinopathy
- Infectious lesions
- Organized subretinal hemorrhage
- Solitary idiopathic choroiditis
- Idiopathic Sclerochoroidal Calcification

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Treatment

- Collaborative effort with oncologist/retinal specialist
  - Most pts have known primary cancer
  - If no known metastatic disease, PET CT needed to look for other metastasis as well as source
- If other metastasis, chemo alone can be effective
- Plaque radiotherapy for solitary metastases
- External beam radiation for bilateral and multifocal disease
- PDT for small lesions

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