Retinal Findings with Systemic Disease

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Disclosure

- I have been on advisory boards/a consultant
to/received honoraria from/or been on speakers
bureau list of the following:
  - Allergan, Alcon, Arctic Dx, Bausch & Lomb, Carl Zeiss
    Meditec, Freedom Meditech, Optos, Optovue, VSP,
    ZeaVision

These affiliations will have no
affect on the content of this lecture

Course Objectives

- Discuss Ophthalmic tests for evaluating retina
- Discuss systemic conditions that affect retina, and how we factor into patient care
- Discuss findings associated with systemic diseases, both common and uncommon
- Know when to refer, and to whom
Antioxidants

- Do you drink coffee?
  - Over 50% of Americans drink coffee
- Is this important?
  - Coffee is leading source (by far) for antioxidant intake in the US diet!!
- Neither coffee nor caffeine intake were associated with early AMD per BDES
- Beware:
  - COFFEE and DOUGHNUT Maculopathy

1. As reported by American Chemical Society 8/05


- 2 Cohorts
  - 41,736 men Hx Professionals FUp Study – 18 years
  - 86,214 women Nurse’s Hx Study - 24 years
- Results
  - After adjustment for age, smoking, other CVD and CA risk factors

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Men</th>
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<tr>
<td>&lt;1 cup / month</td>
<td>1.07</td>
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<tr>
<td>1 c/m – 4 cups/w</td>
<td>1.02</td>
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<tr>
<td>5-7 cups / week</td>
<td>0.97</td>
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<tr>
<td>2-3 cups / day</td>
<td>0.93</td>
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<tr>
<td>4-5 cups / day</td>
<td>0.80</td>
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<tr>
<td>&gt; 6 cups / day</td>
<td>0.74</td>
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P<0.001 for trend and independent of caffeine intake

Medical optometry: A different kind of “liability”
More Than Meets the Eye

- Macula off retinal detachment OD
- LP vision
- Systemic health: good?
- Meds: Valium, Oxycodone, Methadone, Elavil
- Tx: Vitrectomy and Scleral Buckle
- Post op: Corneal Abrasion and HM
- How did the abrasion happen???
- Bottle Top

What does this mean to you?

Clinical exam

- **BIO best for clinical exam of peripheral retina
- Condensing lens at slit lamp ideal for magnified posterior pole views
- Dynamic clinical exam
- Require examiner to document
- Some things best seen clinically, and unable to be seen with imaging devices
Why bother to discuss??
- As more practices go to digital (both OD and MD), printouts will be more accessible
- We will all be getting printouts of pt tests
- Importance of recognizing pathology
  - Active part in patient education

Optical Coherence Tomography
- OCT provides a non-invasive, non-contact, quick, high resolution imaging of posterior segment
- Likened to an “Optical Biopsy”
- Objective, quantifiable, repeatable
- Based on technology similar to ultrasound, but uses light
- Resolution of 10microns with time domain and 5microns with spectral domain

A different side of OCT
- All of the instruments capture a tremendous amount of data
- Data usage is software dependent
- Sometimes Doctor has to “outsmart” the software to perform diagnostic tests…
En-Face or “C-scan” technology

Cystic spaces in CME

Advanced visualization

ERM causing macular thickening

Surface tension folds evident on en-face / c-scan

20/60 “Cataracts worse x 6 mos”

Virtual Fluorescein Angiography
Healthy patient??...

- 32 yo male
- 2-3 month history of cough, dyspnea, chills, malaise
- Recently returned from International travel
- Lives in Midwest
- Health care professional
- No improvement with antibiotics and PO prednisone
- Abnormal chest x-ray
- Good vision
- Referred to Pulmonologist

Chest X-ray

- Calcified Granulomas
- Differentials?
  - TB
  - Sarcoid
  - Histoplasmosis
  - Lymphoma
Case continued

- CT ordered with contrast
- Labs ordered
  - CBC Normal
  - Normal Liver function
  - ESR 46 mm/hr
  - Negative TB skin test
  - ACE 44 U/L (7-46)
  - Histo Mycelial Ab Normal
  - Histo Anti H Ab 1:32

Histoplasmosis

- Treatment:
  - Sporanox (Itraconazole) 200mg BID x 1 mo
  - 100mg BID x 2 mo

Aside:

- Value of prescription drug coverage!
- Importance of good doctor patient relationship!!!

- In case you were wondering, Histo has remained quiet, with no radiologic changes as of 4/06

Systemic Histoplasmosis

- Caused by Histoplasma capsulatum, a dimorphic fungus, that turns into a yeast at body temperature
- Endemic to Ohio, Mississippi, and Missouri River valleys
- Aerosolized fragments result in alveolar deposition
- Most infected people are asymptomatic
- Can involve CNS, liver, spleen, eyes, rheumatologic system, and hematologic system
Histoplasmosis cont.

- Symptoms can occur 3-14 days after exposure
- Approximately 250,000 infected annually
- Clinical manifestations in less than 5%
- About 90% with acute pulmonary histo are asymptomatic
- Enlarged hilar and mediastinal lymph nodes in 5-10% of patients
- Affects males 4:1
- Progressive disseminated histo mostly occurs in immunocompromised patients ex: AIDS

Good summary article: Trevino & Salvat: Preventing Reactivation of OHS, Optometry 1/06

Testing

- CBC generally normal
- Sputum cultures yield positive results in only 10-15% of acute pulmonary histo
- Complement fixing antibodies
  - Greater than 1:32 suggests active
  - Positive 5-15% of within 3 wks of exposure
  - Positive 75-95% of fails
- Immunoprecipitating antibodies
  - Anti-M detected in 50-80%, and remains elevated for years
  - Anti-H detected in 10-20%, and becomes undetectable after 6mos. This antibody is most specific for active histo
- Imaging studies
  - Chest X-ray
  - CT scan
  - HLA-B7, HLA-DR2 and may be elevated more in people with CNVM

Treatment

- No treatment needed if asymptomatic
- Treatment if symptomatic, or progressive
- Treatments
  - Amphotericin B: drug of choice for overwhelming active histo, administered by IV
  - Itraconazole: Fungistatic, very active against Histo, minimal side affects
    - Liver functions must be monitored
    - Approximately 86% success when treating > 2mos
  - Ketoconazole: Fungistatic, well tolerated, does not cross blood/brain barrier
(P)OHS

- (Presumed) ocular histoplasmosis syndrome
- Not previously found post-enucleation in patients with typical POHS
- Has been found in eye of patients with known Histo
- Approx 1-10% pts. In endemic areas have ocular involvement, usually asymptomatic
- 10% will be bilateral

- Histo Spots
  - Atrophic yellowish white marks from previous multifocal or disseminated choroiditis
  - Can form streaks

- Peripapillary Atrophy
  - May represent atrophied granulomas that formed during active infective stage
  - Neovascular membrane can form here, and involve macula

- Macular Involvement
  - CNVM tend to form in area of pre-existing histo spot
  - May be immune reaction against H. capsulatum
  - May be due to weakened Bruch's membrane
  - 10% become bilateral at 5 yrs, and 20% at 10 yrs
  - 81% with disciform macular scarring have pulmonary calcifications
Treating CNVM from Histo

- MPS
  - Argon laser to entire lesion effective if extrafoveal with 8% recurrence
  - Krypton laser if juxtafoveal with 23% recurrence
- Submacular Surgery (SST)
  - Benefit seen in surgical group if entering acuity worse than 20/100 (76% vs 50% same or better)
  - More recently shown beneficial with PPCNVMM: different histopath
  - Pt experience no better with surg in any group
- PDT
  - >50% remain equal or show improvement
  - No cases of severe vision loss as has been reported as has been with AMD patients
- Anti-VEGF Therapy

Central “Spot”

- 50yo female referred in with a “spot” in the center of her vision
- Present for 1-2 wks
- Referring OD noticed abnormality
- VA 20/20 OU
- Denies High stress or type “A” personality

Central Serous Choroidopathy

- Characterized by breakdown of the outer retinal barrier, with leakage of fluid through a defect in the RPE into the subretinal space, resulting in a neurosensory detachment
- Often times associated with high stress +/-
  - ED (Emotional Distress) may be related
- FA or OCT must be done to rule out CNVM
- Other systemic associations
  - Use of corticosteroids* (Well documented in literature), pregnancy, increased adrenaline level, hemodialysis, collagen vascular disease, and hypertension
- Treatment?
- Letter of diagnosis to PCP to make aware

ICSC

Newer treatments proposed:
- PDT
  - Success in multiple studies
- IVTA
  - May prevent leakage
  - Not study proven and counterintuitive
- Anti-VEGF

Is it too easy to be successful with new treatments??


Central Serous and Steroids

How would you know about steroid use?
What kinds of steroids
  - I have had cases of cream/ointment, oral

Could hormones have same affect?
  - Patient on Androgel for "Low T"

Case Study

44 yo native-american male
Recent awareness of central blind spot
20/25 OU
Diagnosis?
  - Solar Maculopathy
  - Systemic assoc???
Solar Maculopathy

- Bilateral yellowish spot in fovea with surrounding hyperpigmentation and OCT shows loss of cells at RPE layer
- Retinal phototoxicity vs photocoagulation
- Often happens in patients who use drugs or are on psychotropic meds
  - Sun gazing while “on drugs” or brief exposure with pharm.
  - Dilated pupils
  - No other systemic associations

Case Study cont.

- Take a closer look at the ONH
- What is this?
- No PEPS
- Idiopathic
- Warned of possibility of future CNVM

32yo female
Good health
20/20 OU
“Retinal changes”
Angiod Streaks

- Diagnosis: Angioid Streaks
- Treatment: yearly exams, and home monitor with Amsler grid
- Note: proximity of Angioid streak to fovea
- Over 50% of Angioid streak patients have associated systemic disorders

Angioid Streaks

- Represent breaks in an abnormal Bruch’s Membrane that may present spontaneously or as result of trauma
- Eventual RPE and choriocapillaris degeneration
- Generally radiate out from ONH, bilateral
- Color depends on fundus color and degree of RPE atrophy
  - Red: Lightly colored fundi, reflect underlying choroid
  - Brown: Darker pigmented fundi
  - Orange: Specific type of RPE mottling

Angioid Streaks: associated systemic conditions

- Pseudoxanthoma Elasticum
  - 80-90% have angioid streaks
  - Degeneration of collagen
  - Most common systemic
- Paget’s Disease
  - 8-15% have angioid streaks
  - Metabolic bone disease
- Sickle Cell Disease
  - <6% have angioid streaks
- Ehlers-Danlos Syndrome
  - Skin fragility, joint hyperextensibility
- Diabetes
- Others: maybe coincidental
- PEPSI
Angioid Streaks
- Not problematic unless get CNVM
- If CNVM, standard is thermal laser, but >75% recur
- Monitor with Amsler grid

Case of Missing Labs
- RM is a 46 year old Caucasian male
- Referred for retinal changes, questionable macular edema
- Last physical 2-3 years prior
- "No systemic health problems", no medications
- Paramedic
- Note: Not a very healthy looking patient

“Healthy” Paramedic cont.
- Visual acuity: OD: 20/100 OS: 20/30
- Pupils, CVF, Amsler all normal
- Anterior segment: Normal, no iris changes
- Fundus exam:
  - Widespread microaneurysms, several cotton wool spots, vascular engorgement and crossings, dot and flame hemorrhages in post-pole and equatorially
  - Macular edema present OD, possibly OS
- Fluorescein Angiogram ordered
  - Above changes noted, significant leakage in OD macula. Limited change to macula OS
- TX: Focal laser recommended
- TX Cont: Letter sent to PCP telling of findings, recommend blood workup for DM and other vascular problems
Unhealthy Paramedic

- Vision after focal: OD: 20/70
- Retinal changes: worse
- Pt notes that has been to doctor, and now on meds for DM
- BP checked at visit and was 184/102

Paramedic

- 2 mos later he notes vision may be a little worse: OD: 20/200 OS: 20/40
- BS poorly controlled
- BP: 156/94
- We called PCP for lab results.......

Case of Missing Labs

- MD office had no records of any lab work done!
- Pt self tested while on job, and treatment based on that
- Fairly non-compliant patient
- ? Compliant PCP
- Needs Endocrinologist consult...
- **This patient not only has diabetes, but also hypertension!
Diabetes

- 2 types
  - Type 1 (previously insulin dependent)
    - Beta cell destruction leading to absolute insulin deficiency
    - Glucose stays in blood since can not enter insulin dependent tissues
  - Type 2 (previously non-insulin dependent)
    - Peripheral insulin resistance, maybe relative insulin deficiency or secretory defect
    - Treatment to decrease hepatic glucose production &/or decrease peripheral insulin resistance
    - May become insulin dependent

- NPDR may predate diagnosis of Type 2 DM by 6 years and detected in >20% at diagnosis
- BMI and weight are major risk factors: for every increase in wt by 1kg, increase risk by 4.5%
- Obesity by BMI is well over 20%

Testing
- Should be more frequent if obese, family history, birth to large baby, hypertensive or dyslipidemia

Diagnosis
- Fasting BG >125mg/dl
- Symptoms of DM plus casual BG >200mg/dl
- 2 hour BG >200mg/dl during OGTT
- Repeat test to confirm
- ***A1c over 6.5
**Diabetes**

- Most common retinal vascular disease
- Typical findings
  - MA, intraretinal hemorrhages, hard exudates, CWS, macular edema, IRMA, neovascularization, vascular changes...
- Non-proliferative diabetic retinopathy vs Proliferative retinopathy
- Macular edema

**NPDR**

- Mild
  - At least 1 mac
- Moderate
  - Hemorrhages &/or ma's (2A), CWS, or VH(< 6B) or IRMA (<8A)
- Severe
  - 4/2/1
  - 15% to PDR in 1yr¹
- Very Severe
  - 2 or severe findings without nea.
  - 45% to PDR in 1 yr¹

¹ As reported by ETDRS

**Proliferative Diabetic Retinopathy**

- NVD or NVE
- High risk
  - NVD >1/2 disk area
  - NVD and VH/PRH
  - NVE >1/2 disk area + VH/PRH
- Untreated, can lead to VH or tractional RD
- Without tx, 50% blind in 5 years
- Current treatment: PRP when High Risk, may need vitrectomy
Macular Edema

- 3 criteria
  - Thickening <1/3DD from center of macula
  - Heme/exudate with thickening of adjacent retina <1/3DD from center of macula
  - Thickening >1DD size within 1DD center
- Current treatment: Grid/Focal laser
- Investigational treatment: IVTA

Diabetic Retinopathy Study

- Randomized, prospective to evaluate PRP
- Primary outcome was severe vision loss defined as 5/200
- Demonstrated 50% decrease in SVL in PRP group
- Recommendation: PRP
- Complication: 11% lost 1 or more lines of acuity, and 5% had visual field loss

Early Treatment for Diabetic Retinopathy Study

- Evaluated PRP and aspirin in pts with less than HR PDR OU, laser for DME
- Outcome was Moderate VL (doubling of visual angle)
- Results:
  - >50% less MVL with laser for CSME
  - PRP for PDR, not needed earlier, but may be beneficial for Type 2
  - ASA 650mg did not alter retinopathy, VA or VH, or rates of vitrectomy
Diabetic Retinopathy Vitrectomy Study

- Is early vitrectomy beneficial?
  - 20/40 was more common in early-vitrectomy group (1-6 mos.)
  - Benefit seen in eyes with most severe disease
  - In regards to VH, clear benefit to type 1, but not to type 2
- Today: 25g vitrectomy

Intravitreal Steroid for DME...The Next “Best Thing”

- NOT........
- Published paper shows that traditional focal laser better for CSME than 2 different doses of steroid injection\(^1\)
- At 2 yrs, focal more effective and less side affects than injection: in general
  - Just as convincing at 3yrs\(^2\) IVT stable vs laser gain!
- Subgroup:
  - Thicker OCT better with Laser
  - Worse VA than 20/200, better with 4mg steroid

Lucentis

- DRCR.net investigated Lucentis vs laser and/or steroid \(n=691\) people (~850 eyes).
- Grps (success is 20/20 or <250microns @ 1yr)
  - 1: sham injection + prompt laser treatment
  - 2: Lucentis + prompt laser (8/13)
  - 3: Lucentis + deferred laser treatment (≥24 weeks (9/13)
  - 4: IVK + prompt laser (3/4)
- Success: 32%, 64%, 52%, 56%
- Lucentis gained 9 letters vs 3 in laser v 4 w steroid
- Steroid better than laser for OCT, but not VA
- Approx 30% Lucentis + 3 lines vs 15% w laser

Elman et al. Lucentis in DME. Ophthal 4/10
Diabetes Control and Complications Trial & UK Prospective Diabetes Study

- Pts randomized to conventional or intense control
- Showed slower progression for intense control group
- For those with no NPDR at start, if intense, then 76% less devel. of retinopathy
- If A1c down by 2%, PDR would decrease by 50%
- Decrease in A1C by 1%:
  - 14% decrease in MI
  - 12% decrease in stroke
  - 37% decrease in microvascular dz
  - 21% decrease in any DM endpoint
- DCCT reported relationship of A1C and avg. Glucose

<table>
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<tr>
<th>%HbA1C</th>
<th>Avg. Glucose (mg/dL)</th>
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<tr>
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<tr>
<td>10.0</td>
<td>240</td>
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<tr>
<td>11.0</td>
<td>270</td>
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</tbody>
</table>

Control group in DCCT: 9-10%
Strict control group: 7%

Sources: NEJM 329:977-986 1993

What We Need to Know

- The Diabetes Prevention Program (DPP) showed that lifestyle modification lowers the risk of developing T2DM in high-risk patients by 58%
- Walking
- Metformin reduced the risk by 30%
- Exercise was twice as effective as drug

The DPP Ten Years Out

- 38% reduced risk with lifestyle modification
- 17% reduced risk with metformin

Hemoglobin A1c

- Importance of A1c monitoring
- Critical to disease control and prevention of problems
- Does a patient know their last reading?
  - Good, bad, or worse response
- In-office testing
  - www.a1cnow.com
The Challenge for OD’s in Diabetes Care....

Those Who Aren’t What We Call Them

Don’t Substitute a Part Of Any Person

For the Whole Person

You never know...

- Diagnosed with T2DM 2 wks ago
- Vision not good, Endo said due to BS fluctuation
- 20/50
And today....

“Paramedic’s Friend”

- 65yo male
- Occupation: retired, but used to be field medic in military
- “My optometrist referred me because of my right eye, I am not sure what is wrong”
- “Good general health, my blood pressure runs low”
- My exam...

Hypertension??

- Vision: 20/400 OD
- Anterior Segment: normal
- Blood Pressure: 196/120
- What next....
- Sent to PCP directly from office
- Started on HTN meds
- Returned for laser 2 wks later
Hypertension

- 50-60 million Americans have systemic HTN (by today’s standards)
- Usually asymptomatic, but can lead to MI, PVD, CVA, renal disease, retinopathy
- Significant CVD risk at 140/90, and risk doubles with every increase of 20/10mmHg
- Risk factors include smoking, dyslipidemia, DM, age, family history, race, sedentary, obese, sodium…

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<th>Category*</th>
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<th>Diastolic</th>
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<td>&lt;120</td>
<td>&lt;80</td>
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<tr>
<td>Pre-HTN</td>
<td>120-139</td>
<td>80-89</td>
</tr>
<tr>
<td>HTN</td>
<td>140-159</td>
<td>90-99</td>
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<td>Stage 1</td>
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<td>Malignant</td>
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*The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, NIH

Refer to PCP in timely manner
- Goal of BP reduction to as low as tolerated
- Most patients will require 2 medications
- Lifestyle modification
  - 30 minutes of physical activity 5 days/wk can lower SBP by up to 9mmHg
  - Weight loss of 10kg can lower SBP by 5-20mmHg

Current Treatment of Branch Retinal Vein Occlusion

- Branch Vein Occlusion Study (BVOS)
  - 65% of eyes treated with grid laser photocoagulation gain 2 or more lines of visual acuity (3 yrs)
  - 37% of untreated eyes gain 2 or more lines of visual acuity (3 yrs)
  - Laser decreased NV by 50% but only 60% of treated eyes would have developed
  - Therefore, grid laser photocoagulation is recommended for BRVO with macular edema
Current Treatment of Central Retinal Vein Occlusion

- Central Vein Occlusion Study (CVOS)
  - Grid laser photocoagulation reduces angiographic evidence of macular edema
  - Final median visual acuity in treated eyes was 20/200 (3 yrs)
  - Final median visual acuity in untreated eyes was 20/160 (3 yrs)
  - With or without treatment, approx. 33% Lose 3 lines of VA at 3 years
  - PRP did not prevent iris NV

Therefore, grid laser photocoagulation is NOT recommended for CRVO, unless NV develops

So, what do we do now???

- CRUISE: Lunecrisis for CRVO
- BRAVO: Lucentis for BRVO
- SCORE for BRVO
- SCORE for CRVO
- Dex

Why studies are needed

"When you have a hammer, everything looks like a nail"
Jost Jonas, M.D.
Hemorrhage everywhere!
- 68 yo female
- Dramatic decrease in vision 1 wk prior due to Vitreous Heme
- Exam as seen after VH resolution
- Diagnosis and Treatment?

Macroaneurysm
- 1 mo and 5 mo s/p focal laser
- VA returned to 20/20
- Blood Pressure at initial visit:
  - 186/98
- Hypertension is prime concern if macro-a seen, secondary concern of diabetes

RAM
- Most commonly in 6th or 7th decade of life
- Usually women, and only 10% bilateral
- Hypertension is prime systemic assoc. (2/3)
- Must also rule out cardiovascular disease, including increased cholesterol/lipid levels, and diabetes
- Communication to PCP
**Dangers of Addiction**

- 38 yo male
- Healthy
- No meds, but…
  - Viagra PRN
  - Frequent Alcohol
- 20/20 OD, 20/30 OS
- Ant Seg healthy
- Retina OS as seen
- Diagnosis?

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**Valsalva**

- Not generally associated with systemic disease, but…
  - More common in people with DM, HTN, and sickle cell
- Typical ocular findings:
  - Pre-retinal heme, subhyaloid heme
- Caused by sudden raise in intrathoracic pressure, which leads to increased intraocular venous pressure
  - Causes break in macular capillary

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**“Drunken Pumpkin” Valsalva Maculopathy**

- Common causes:
  - Vomit, cough, sneeze, constipation, exertion
  - Often seen with alcoholism, bulimia and GI problems
- Tend to resolve on own
- No long lasting damage
- What caused condition in this patient?
What do you think when you see this clinical image?

OD Macula  OS Macula

How about this Visual Field??

Pt. AM exam findings

- Pt AM is a 47yo female that has been on Plaquenil 200mg BID x 1 yr, weights approx 120lbs
- Being seen by request of her rheumatologist for screening for Plaquenil toxicity
- Vision corrects to 20/20 in both eyes
- Pupils and screening Matrix VF are normal
- Contrast is normal at 1.25% OU and color is normal
- MPOD is .31 OD and .38 OS
- IOP 18/17mmHg
- Schirmer is 0mm in both eyes w/ dry eye sx
Further findings: Cross Hair OCT: Worried yet??

OD
OS
No apparent PIL degredation

Inner Retinal Thickness: Still all normal

GCC and RNFL

GCC Comparison
RNFL Comparison
Full Retina
Significance
OD and OS

- Note: significantly ring thinning around OD macula

Revised Recommendations on Screening for Chloroquine and Hydroxychloroquine Retinopathy

- Risk increases sharply to 1% at 5-7yrs or cumulative dose of 1000g (usual dose 400mg/d HCQ or 250mg/d CQ)
- New screening guidelines include baseline exam and then annually at 5yrs
- Objective tests: mfERG or FAF or SDOCT
- Subjective test: 10-2
- Fundus exam still important, but findings are generally late stage

Recommendations screening for CQ and HCQ
Retinop. Marmor et al. Ophthalmology 2/11

This is the question
- When looking at the scans for this patient, can we tell if this is Plaquenil toxicity vs other macular abnormality?
- Is it likely to see such asymmetric changes due to Plaquenil?
- Cumulative dose is low, at only approximately 150,000mg (well below hypothesized “tipping point” of 1,000,000mg)
A horizontal section through the fovea of the left eye reveals similar findings as displayed previously in the right eye. A small, but intact, PIL is present under the fovea and a perifoveal absence of the PIL is documented. With loss of the PIL, the intact external limiting membrane (ELM) appears to drape over the missing tissue.

**Drug Induced Maculopathies**

- Tamoxifen
- 1-6% incidence
- Related to total dose (10g) or daily dose
- Can happen very acutely
- Often improve after discontinue drug

**Tamoxifen vs Evista**

- STAR Trial: shows that Evista (approved for prevention and treatment of osteoporosis) may be as effective in Breast CA prevention as Tamoxifen in high risk post-menopausal women
- Evista was equally preventative with less side effects (Decrease CA by 50% in both groups)
- Evista had 38% less uterine ca and 29% fewer blood clots
- 20% reduced rate of cataracts and no retinal findings

*National Cancer Institute April 2006*
Nevus

- Usually flat lesions of choroid, may have minimal elevation
- May develop drusen
- Estimated to be in 6-10% by Blue Mountain Eye Study
- Recent pub. stating 2.1%¹
- May be pigmented or amelanotic
- Observation for growth critical
- Ophthalmology Oct 2005 Singh et al
  - Estimate 8.64 million in US with nevus
  - Estimate conversion to melanoma to be 1/8845

Metastatic Disease

- Cancer is 2nd leading cause of death in US
- Choroidal met is most common ocular malignancy
- As high as 34% with choroidal met, have no previous dx of cancer
- Most common primary site is lung, followed by breast
- Despite rise in dermal melanoma, no rise in choroidal melanoma seen
- PET/CT scans most effective for detecting systemic met. BJO Sept. 2005
**Metastatic Disease**

- Most common sites of Choroidal Metastasis
  - Breast 39.7 – 65%
  - Lung 14-29.5%
  - GI 2.6-6.3%
  - Skin 2.0-4.5%
  - Prostate 1.3-3.6%
  - Kidney .9-4.0%
  - Unknown 4-18.3%
- Thorough systemic work-up needed in cases of ocular malignancies

**Ocular Melanoma**

- Early recognition of signs of small lesions likely to prove to be melanomas: symptoms, tumor margin touching disc, thickness > 2.0 mm, subretinal fluid, orange pigment
Choroidal Melanoma

- 53yo caucasian female
- HTN and hypecholest.
- Referred by OD
- 20/20 OD 20/25 OS
- Suspicious lesion OD
- Sent for systemic w/u

Post treatment

- Systemic workup negative for metastasis or other ca
- Brachyplaque therapy
- Vision to 20/50 post tx
- CE and vision to 20/40
- Spread/mortality
  - Tumor configuration
  - Histology
    - Spindle
    - Mixed
    - Epithelioid

Life Expectancy

- High likelyhood of metastatic disease
  - 25% at 5 yr and 34% at 10yr
  - If metastasize, poor prognosis
    - Death rate of:
      - 89% at 1 yr
      - 92% at 2 yrs
      - Approx. 1% survive 5 yrs
- Difficult to predict survival
  - Not related to tumor size or treatment modality

COMS group, Dovel. Of Metastatic Dz in COMS. Arch Ophth 12/05
Familial Adenomatous Polyposis (FAP)

- Rare: 2.3-3.2/100,000
- Avg onset at 16yo
- Without Colectomy, colon cancer inevitable
- Autosomal dominant
  - 75-80% have affected parent
  - 78-88% have 4 or more fundus lesions

Retinal Consult

- 37 year old female
- Vision 20/40 OS
- No pain or pain with movements
- No APD
- Normal Anterior segment exam
- Recent ER visit for LOV
- Then went to Ophthal.
  - Either MS, Diabetes or nothing...wait and see

Further History:
- Previous episodes of vision "Graying"
- Unable to take hot showers
- Electric-like impulses through arms/back
- Numbness in fingers
- Clumsy walking
- Decreased contrast/color OS
Optic Neuritis

- What is the normal visual outcome?
- Will this recur?
- What is risk of MS?
- What is eye treatment?
- What is Systemic Treatment?
- What tests are needed?

ONTT, CHAMPS and ETOMS

- All 3 agree, and confirm likelyhood of progression to further demyelinization
- Recurrence of Optic Neuritis:
  - 28% at 5 yrs
  - 35% at 10 yrs
- Recurrence more frequent in those that eventually developed MS
- Single occurrence not associated with poor vision
- Multiple occurrence associated with worse vision, approx. 25% were 20/400 at 5 years

Optic Neuritis and MS

- 15-20% of MS present with ON
- 38-50% of MS will develop ON
- Most predictive factor in who will develop MS is presence of white matter abnormalities (demyelinating lesions) on brain MRI
- *Overall 10-year risk of MS 38%*
  - no baseline MRI lesions 22%
  - > 1 baseline MRI lesions 56%*
Treatment?

- Oral steroids alone not effective
- At 3 years, MS risk for IV vs PO vs Placebo 17% vs 21% vs 25%
- IV methylprednisolone x 3 days followed by 11 days of oral pred.
- Treatment with IMA?
  - 12,000/yr with weekly/daily injections and side effects
  - Interferon Retinopathy
*NEW ORAL TX!!!*

Retinopathy of MS on interferon. Saito et al. MS. April 07

OCT: Predictive value

- RNFL thickness may be able to be predictive as to MS or level of vision loss
- RNFL thickness signif. reduced in MS eyes
- Disease free thickness > MS = fellow of ON > MS w ON
- Lower visual function with less RNFL
- Avg. RNFL thickness declined with increased neuro. impair. and disability

Fisher et al. RNFL in MS. Ophthal 2/06

Lattice Degeneration...

- 30 year old male referred for evaluation of lattice degeneration and atrophic holes
- Very healthy athlete, no medications
- Exam findings:
  - VA: 20/20 OU
  - Anterior segment healthy
  - Peripheral retina: Lattice with holes
  - Posterior pole..
Plaques
- Several Hollenhorst Plaques
- Further questioning: No cardiovascular or carotid disease
- Treatment: Laser to lattice and holes
- Referral: To PCP for cardio and carotid work-up
- Pt lost to follow up

Hollenhorst Plaques
- Landmark article in AJO January 1973
  - Carotid disease and heart disease about same incidence at time of plaque seen
  - Patients 4x more likely to die of MI than CVA
  - If embolus, mortality 54% over 7 years (2x that of age matched norms)
- Referral to PCP or internist

Artery Occlusion
- Historically felt than 5% develop NV
  - Duker et al 1991: 18.2% NVI, 15.2% NVG
  - Hayreh: mean to NVI 5.5 weeks
  - Can develop NVI without carotid disease
  - Inner retinal cell death, but outer layers spared, and have high O₂ demand
- Treatment
  - PRP when NVI
  - Acute treatment
    - AC paracentesis, massage, carbogen...
    - Acupuncture: marked visual improvement in 25%
    - TPA (EAGLE study in Europe)
  - Referral to PCP or internist for treatment of underlying systemic disease
- Article in Sept 06 AJO by S.S. Hayreh

Just last month
• 42yo healthy Caucasian female
• Work in appt for “flashes in vision” 1 mo ago exam, completely normal exam

What is it??

Is AMD strictly an ocular disease with no systemic associations?
• NO
• Several different theories and factors that point to AMD being systemically related
• “Systemic” treatments may be beneficial
• Nutrition modification is an easy way to treat systemically
Remember Pablo….Vision is important

- Can we allow our patients to see like this…regardless of ocular pathology?

So now you are ready to “treat” systemic disease, but…..

- What is the most important thing we can do for our patients (in their “eyes”)
- CORRECT VISION!
  - That is why they come to us
    - Majority of vision impairment in diabetes is from lack of refraction!1,2
  - Practice the “Optometric Model”
  - Combining medical and optical “treatment”


Thank You
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Online Resources
- www.theretinaexchange.com
- www.retinalphysician.com
- www.pubmed.com
- www.optometricretinasociety.org
- www.optos.com