What's that? Ocular Disease Cases

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No financial disclosures

CASE 1

10 yr old Hispanic female

CC: none, routine eye exam

Medical and ocular history: unremarkable

Meds: None

Allergies: None

Family medical and ocular history: unremarkable

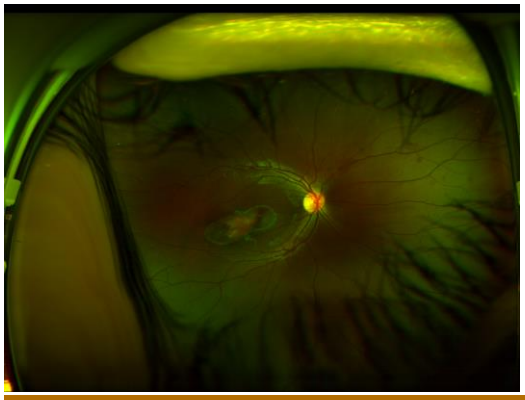
BCVA: 20/25 OD and 20/25 OS
+0.50-3.50x180 OD and OS
Meridonial amblyopia

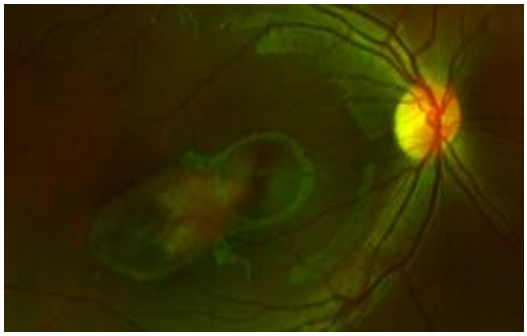
External Examination:
Pupils: equal, round, reactive, (-) APD
CVF: FTFC
Motilities: FROM OD, OS

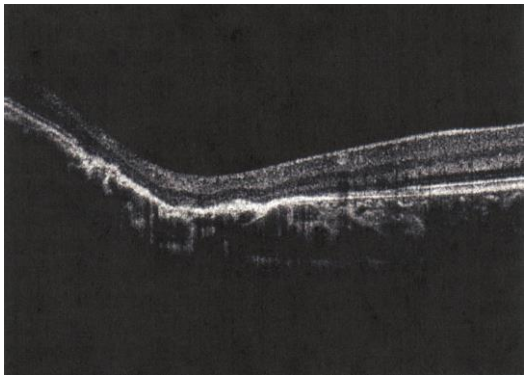
Slit Lamp Exam: unremarkable

IOPS: 13OD, 16 OS, NCT

DFE:
OD: C/D ratio .3/.3, pink, healthy, no holes, tears or detachments
OS: C/D ratio .3/.3, pink, healthy, no holes, tears or detachments







Differentials:

Congenital hypertrophy of the RPE (CHRPE)

Inactive inflammatory chorioretinal scar

Hyperplasia vs hypertrophy

Amelanotic nevus

Something else….

Torpedo Maculopathy

Torpedo maculopathy remains a rare and poorly understood condition.

Benign and non-progressive condition that spares the fovea and thus central visual acuity

The underlying etiology is unclear, but possible mechanisms include a defect in RPE development in the fetal macula

non-random location of the torpedo lesion points to a congenital etiology

OCT Findings

normal inner retina, slightly thinned outer retina overlying a cleft, and a thinned RPE

atrophic inner and outer neurosensory retina.

RPE atrophy does not appear to be universal among all cases of torpedo maculopathy; one study noted normal RPE architecture

Treatment

Monitor

CASE 2

History

•31 yr old white female

•CC: reduced peripheral vision for 6 months OU

Slowly improving, no pain, no flashes, no floaters, no trauma
Onset: when patient began gabapentin

•Medical and ocular history:

Adrenal hyperplasia, Left hip labrum repair, Left ovary removed, Mitral Valve Prolapse at birth.

Meds: Gabapentin (d/c), Nucynta, Topamax, Yasmin

- Family medical and ocular history:
  unremarkable

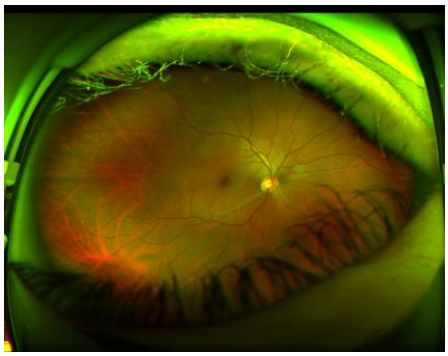
Examination

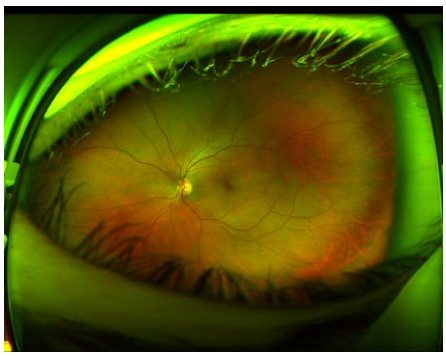
BCVA: 20/20 OD and 20/20 OS,

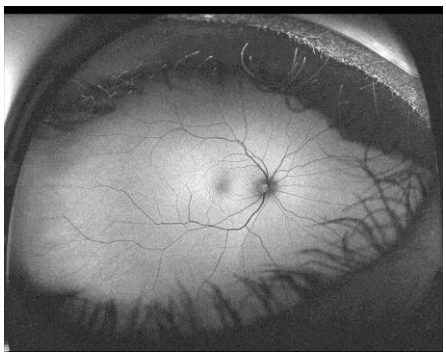
External Examination:
Pupils: equal, round, reactive, (-) APD
CVF: OD/OS: Constriction
Motilities: FROM OD, OS

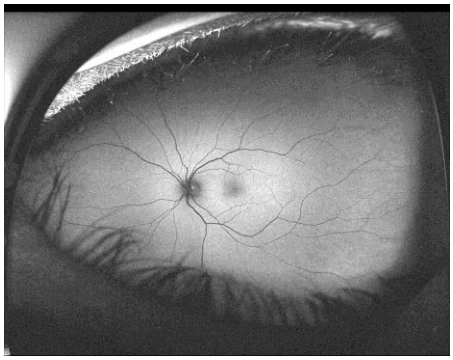
Slit Lamp Exam: unremarkable
IOPS: 11mm Hg OD and OS
DFE:
OD: C/D ratio .4/.4, pink, healthy, no holes, tears or detachments
OS: C/D ratio .4/.4, pink, healthy, no holes, tears or detachments

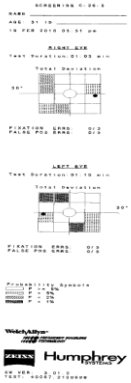
BP:105/70 RAS

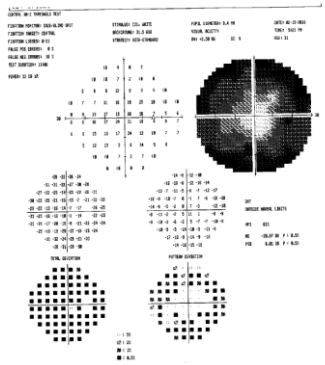


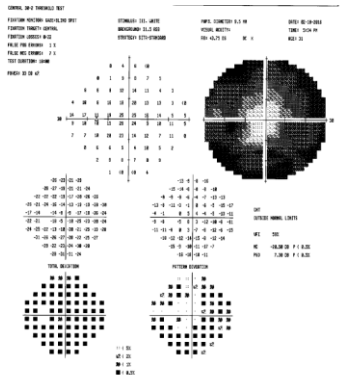












Differentials

Hereditary retinopathy

Trauma

Malingering?

Gabapentin Retinopathy

- **Gamma-Amino Butyric acid (GABA): amino acid which acts as a neurotransmitter in the central nervous system:**
  reduces neuronal excitability
- **Gabapentin: anti-epileptic agent, originally developed as GABA mimetic compound (levels of GABA increase) to treat spasticity, and has been shown to have potent anticonvulsive effects.**
  Also used to treat neuropathic pain and restless leg syndrome
  Gabapentin blocks tonic phase of nociception, exerts potent inhibitory effect in neuropathic pain models
- **Ocular side effects have been limited to blurred vision, diplopia, impairment of ocular motilities**

Pathophysiology

Unknown

Another anti-epileptic drug, Vigabatrin, is similar structurally to gabapentin.
Documented visual field loss has occurred.

Similar findings with Topiramate.

Possible mechanism:
GABA concentration is 18.5x more prominent in the retina than the brain. Toxic levels accumulate leading to Muller cells damage.

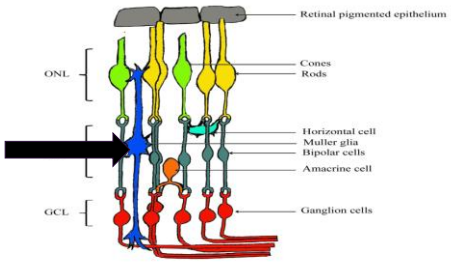
Muller cells

Maintain the stability of the retinal extracellular environment by regulation of K+ levels, uptake of neurotransmitters, removal of debris, storage of glycogen, electrical insulation of receptors and other neurons, and mechanical support of the neural retina.

Affected initially in times of retinal stress

Density is higher in the central retina than the periphery Therefore damage to Muller cells will initially result in peripheral field loss

Muller Cells



Treatment/Outcomes

D/c medication

Visual field loss by vigabatrin is not reversible

Gabapentin and topiramate is reversible

Data is limited

Our patient….

Communication with neuro……
Slight improvement
No answer…..

CASE 3

History

•55 yr old Asian male

•CC: reduced vision for 3 months OS

Slowly worsening, no pain, no flashes, no floaters, trauma OD as a child(prosthesis)

•Medical and ocular history:

Hypertension, diabetes, cholesterol
Meds: Amlodipine Aspirin, benezepril, Carvedilol, Lovastatin, Metformin
No known systemic medication allergies.
Family medical and ocular history: unremarkable

Examination

BCVA: NLP OD and 20/70 OS, NPHI

External Examination:

Pupils: round, reactive
CVF: OS: Pt unable to accurately perform
Motilities: FROM OS

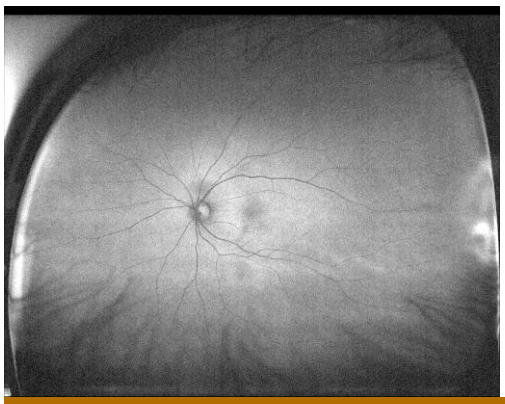
Slit Lamp Exam: Prosthetic OD, unremarkable OS

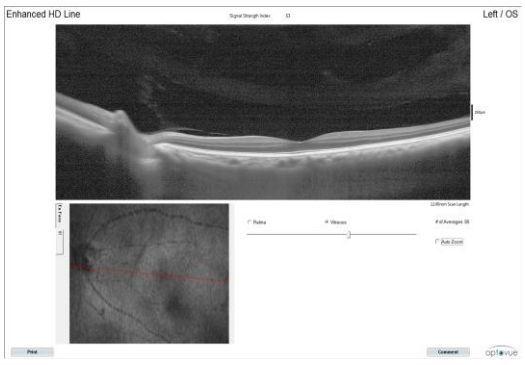
IOPS: 12mm Hg OS

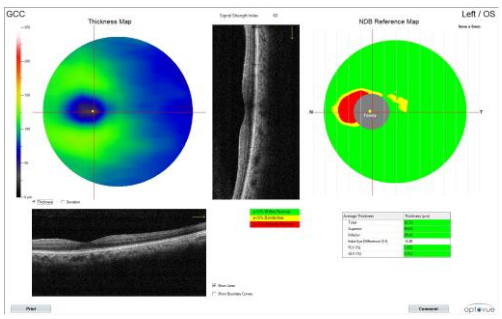
DFE:

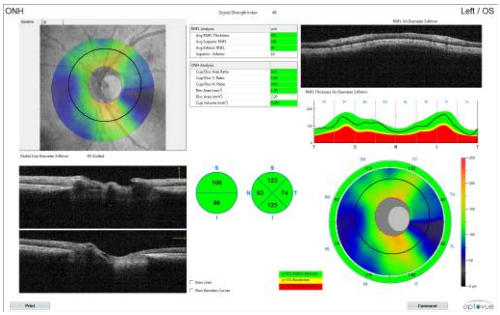
OS: C/D ratio .4/.4, pink, healthy, no holes, tears or detachments

BP:120/70 RAS

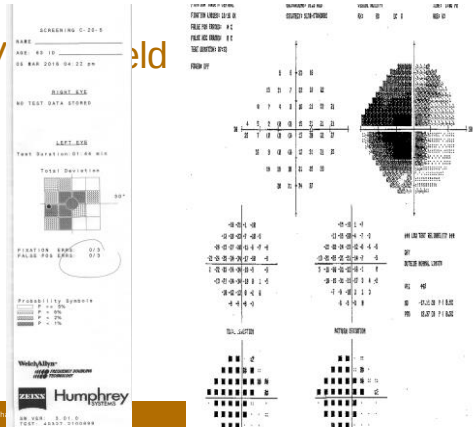




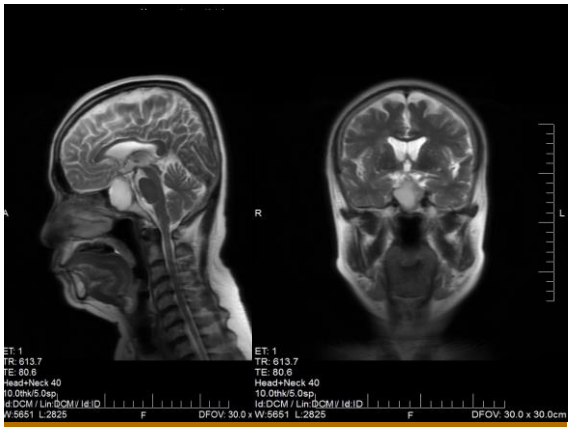


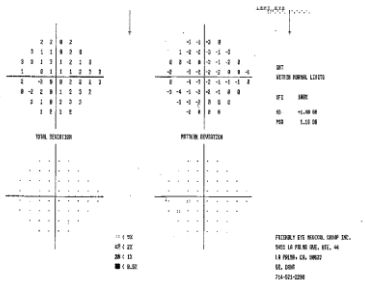


V eld



Differentials?????





Anatomy and physiology

The pituitary gland:

2-8mm in size, located within sella turcica, covered by dural fold

Macro-adenoma: >10mm

Responsible for secreting hormones:

Anterior: GH, TSH, ACTH, FSH, LH, PL

Posterior: oxytocin and vasopressin

Tumors: activation of unknown oncogene or inactivation of tumor suppressing gene can result in different types of pituitary tumors

Classification of pituitary tumors with prevalence information

Name	Percentage of tumors	Hormone secreted
Prolactinoma	40–45%	Prolactin (PL) Breast discharge and irregular menstrual periods in women. Men may experience decreased sexual desire and breast enlargement
Somatotrophic adenoma	16–20%	Growth hormone (GH) gigantism in children or acromegaly in adults
Gonadotrophic ademona	10–15%	Follicle stimulating hormone (FSH), leutinising hormone (LH)
Corticotrophic adenoma	10–12%	Adrenocorticotropic hormone (ACTH)
Thyrotropin adenoma	1–2%	Thyroid stimulating hormone (TSH)
Null / non-secreting adenoma	5–10%	None

Hereditary Gigantism-the biblical giant Goliath and his brothers

Deirdre E Donnelly[1] and Patrick J Morrison[1,2]

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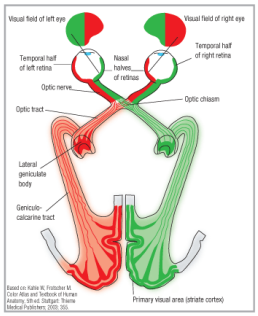
Symptoms

- **Decreased visual field**
- **Reduced visual acuity**
- **Reduced depth perception**
- **Inability to read fluently**
- **Color loss**
- **Headache**

Signs

- **Visual field defect:**
  - *Bitemporal hemianopia*
  - *Superior bi-temporal quadrantanopia*
    - 4-6mm of chiasmal elevation is needed for VF defect
- **Optic Atrophy**
  - *Optic nerve palor*

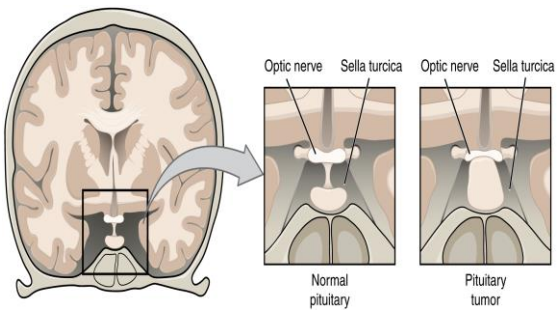


Pathophysiology

- **Tumor expands upwards, expanding dural fold**
  Headaches!

- Impinges on inferior portion of optic chiasm
  - Superior VF defect then bi-temporal
  - Asymmetric
  - Retrograde degradation results in optic atrophy

  Pituitary Apoplexy:
  - Potentially life threatening
  - Sudden headache, rapid decrease in vision, metabolic symptoms due to hormonal imbalance, ophthalmoplegia



Treatment

Prolactinomas:
Dopamine agonists (bromocriptine)

Other Adenomas:
Trans-sphenoidal resection
Medical Therapy
Radiation

CASE 4

History

•55 yr old white female

•CC: reduced night vision for 4-6 years OU, problems adjusting from light to dark, dark to light
Gradual onset, worsening.
Saw OMD in 2012, no clear diagnosis, monitored

•Medical and ocular history:
Anemia, hypothyroidism,
Gastric bypass 20 years ago
Meds: Levothyroxine

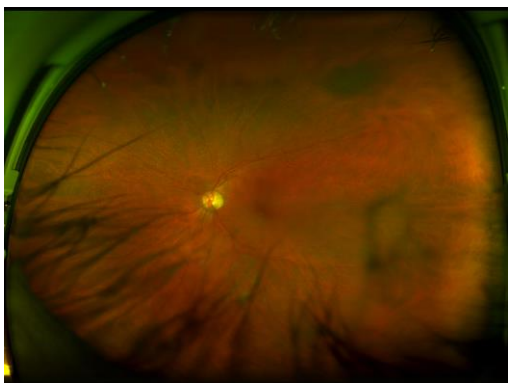
Family medical and ocular history: unremarkable

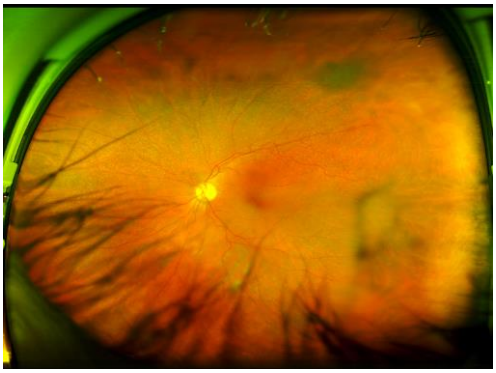
Examination

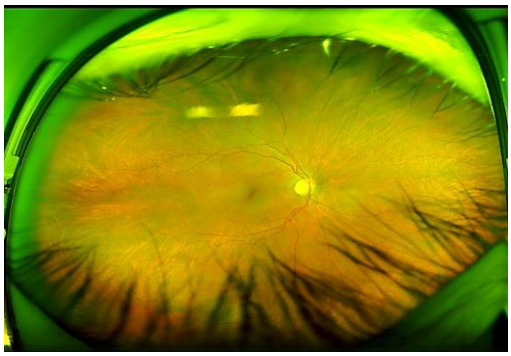
BCVA: 20/20 OD and 20/20 OS

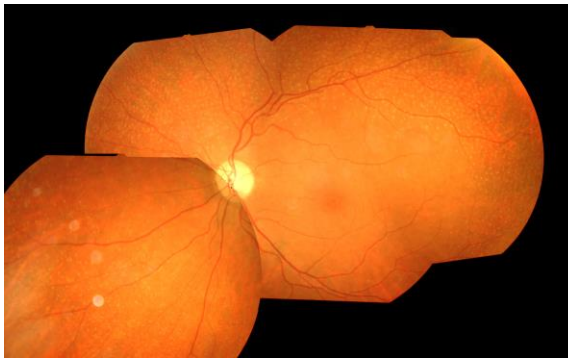
External Examination:
Pupils: equal, round, reactive, (-) APD
CVF: OD/OS: Constriction
Motilities: FROM OD, OS

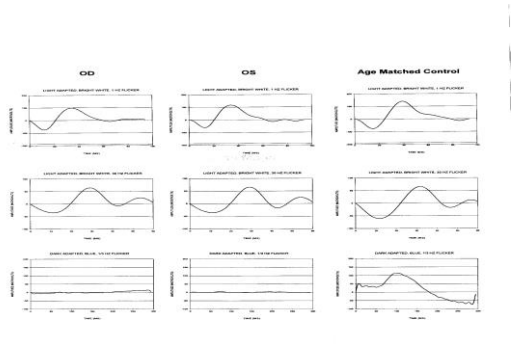
Slit Lamp Exam: unremarkable
IOPS: 17mm Hg OD and 18mm Hg OS
DFE:
OD: C/D ratio .3/.3, pink
OS: C/D ratio .3/.3, pink











Differentials:

Retinitis Pigmentosa
Fundus Albipunctatus
Retinitis Punctata Albescens
Something else…….

Vitamin A Retinopathy

Night blindness is a common complication of vitamin A deficiency

Third world countries: malnutrition

Developed: malabsorption secondary to liver disease or bariatric surgery

Vitamin A:

Essential fat soluble vitamin
Involved in ocular metabolism:
Retinal photo-transduction: Retinal contains vitamin A and combines to form rhodopsin
Lack of rhodopsin leads to symptoms of night blindness

The Dots….

Recognized feature of vitamin A retinopathy although not all patients get them

Possible accumulation of shed photoreceptor outer segments

Deposits are usually found above the RPE

Treatment

Vitamin A supplementation leads to reversal of signs and symptoms

Oral or intramuscularly:

Dosage has varied in published case reports

20,000-100,000 IU for weeks to months until levels normalize

Long term supplementation

Need to monitor levels regularly to avoid vitamin A toxicity

Acute: abdominal pain, increased intracranial pressure, and vomiting > 300,000 IU

Chronic toxicity causes changes in skin, hair, and nails; abnormal liver test results, increased intracranial pressure

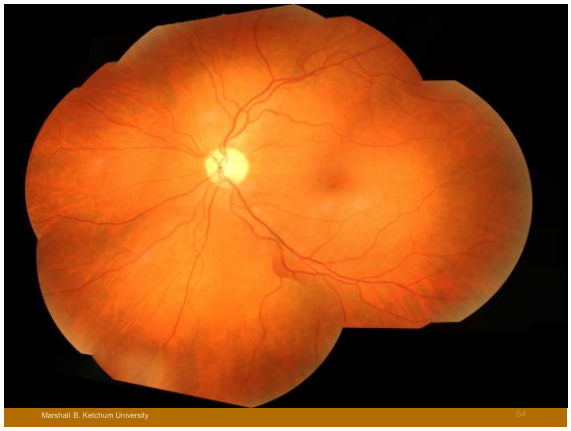
> 100,000 IU/day have been taken for months

Our patient…..

Dots

Symptoms

ERG



My family…..

Grandpa

Distant cousin

CASE 5

20 year old Hispanic male

CC: nyctalopia, problems with peripheral vision
- *Would like to drive*
- *Gradual*
  - Told he was going blind, no cure

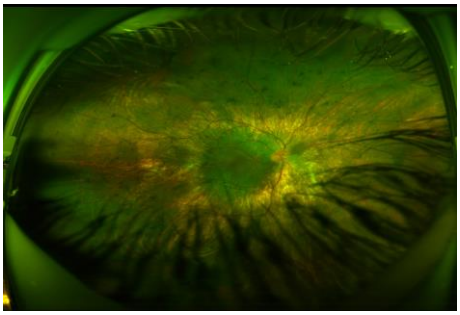
Family and ocular history:
- *Brothers have retinitis pigmentosa*

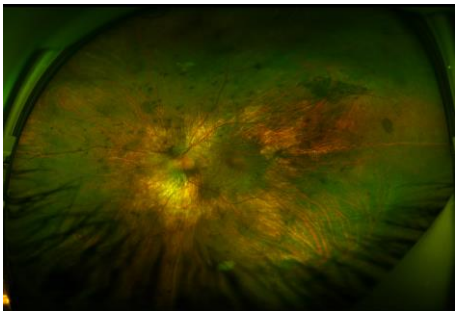
VA: 20/20 OD and OS

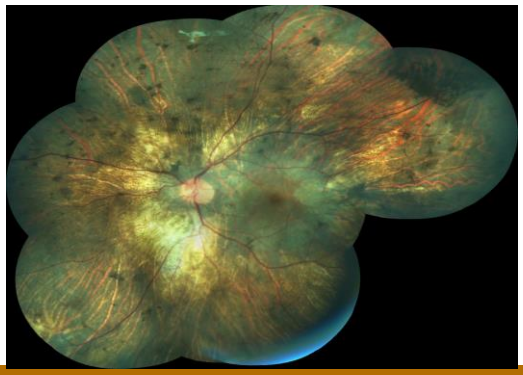
External Examination:
- *Pupils: equal, round, reactive, no APD*
- *CVF: constricted OD and OS*
- *Motilities: FROM OD, OS*

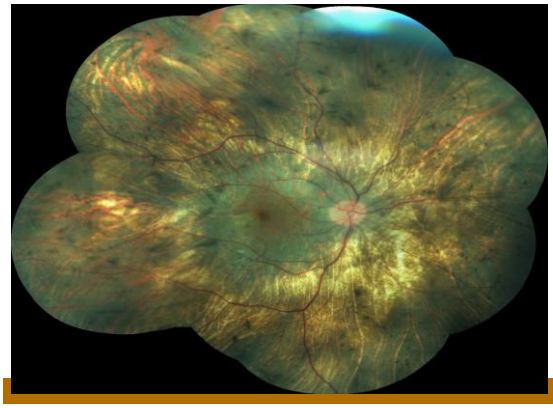
Slit Lamp Exam: unremarkable

IOPS: 11mm Hg OD and OS

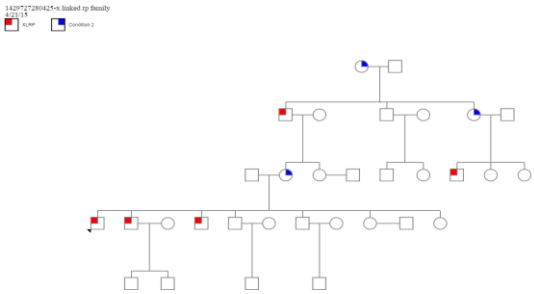








Pedigree

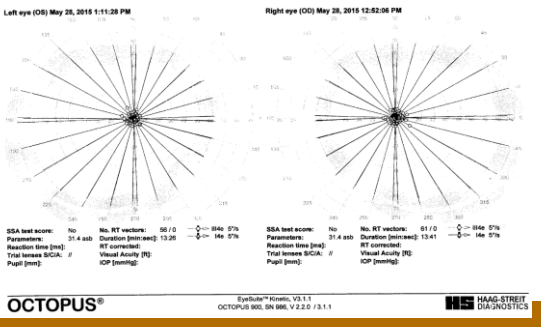


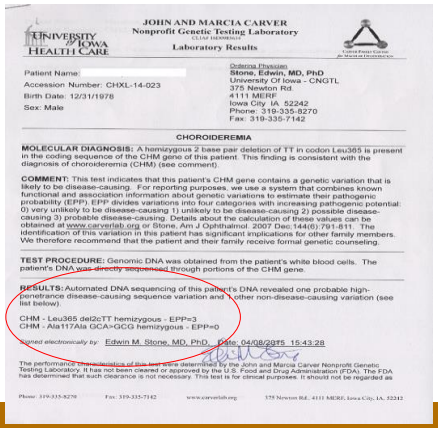
2014

Plan:

Monitor
Declined DMV form
Declined LVR

2015





JOHN AND MARCIA CARVER
Nonprofit Genetic Testing Laboratory
UNIVERSITY OF IOWA HEALTH CARE
Laboratory Results

Patient Name:
Accession Number: CHXL-14-023
Birth Date: 12/31/1978
Sex: Male

Ordering Physician
Stone, Edwin, MD, PhD
University Of Iowa - CNGTL
375 Newton Rd.
4111 MERF
Iowa City IA 52242
Phone: 319-335-8270
Fax: 319-335-7142

CHOROIDEREMIA

MOLECULAR DIAGNOSIS: A hemizygous 2 base pair deletion of TT in codon Leu365 is present in the coding sequence of the CHM gene of this patient. This finding is consistent with the diagnosis of choroideremia (CHM) (see comment).

COMMENT: This test indicates that this patient's CHM gene contains a genetic variation that is likely to be disease-causing. For reporting purposes, we use a system that combines known functional and association information about genetic variations to estimate their pathogenic probability (EPP). EPP divides variations into four categories with increasing pathogenic potential: 0) very unlikely to be disease-causing 1) unlikely to be disease-causing 2) possible disease-causing 3) probable disease-causing. Details about the calculation of these values can be obtained at www.carverlab.org or Stone, Am J Ophthalmol. 2007 Dec;144(6):791-811. The identification of this variation in this patient has significant implications for other family members. We therefore recommend that the patient and their family receive formal genetic counseling.

TEST PROCEDURE: Genomic DNA was obtained from the patient's white blood cells. The patient's DNA was directly sequenced through portions of the CHM gene.

RESULTS: Automated DNA sequencing of this patient's DNA revealed one probable high-penetrance disease-causing sequence variation and 1 other non-disease-causing variation (see list below).

CHM - Leu365 del2cTT hemizygous - EPP=3
CHM - Ala117Ala GCA>GCG hemizygous - EPP=0

Signed electronically by: Edwin M. Stone, MD, PhD Date: 04/08/2015 15:43:28

The performance characteristics of this test were determined by the John and Marcia Carver Nonprofit Genetic Testing Laboratory. It has not been cleared or approved by the U.S. Food and Drug Administration (FDA). The FDA has determined that such clearance is not necessary. This test is for clinical purposes. It should not be regarded as

Phone: 319-335-8270 Fax: 319-335-7142 www.carverlab.org 375 Newton Rd., 4111 MERF, Iowa City, IA, 52242

Choroideremia

Description:

X linked condition with progressive retinal, RPE, and choroidal damage

Females-mild fundus changes

Incidence estimated to be between 1:50,000 to 1:100,000

Pathophysiology:

Mutations in the CHM(choroideremia) gene. It provides instructions for producing the Rab escort protein 1 (REP-1).

- responsible for movement of proteins and organelles within cells (intracellular trafficking).
- Without REP-1 retinal cells do not form or die prematurely.

Choroideremia

Genetics are understood, but the pathogenesis is not completely understood.

Different theories are postulated:

- Abnormalities in RPE results in damaged photoreceptors and choroid.
- RPE and photoreceptors degenerate independently, choroid damaged secondary to RPE degeneration.
- Photoreceptors are source of degeneration
- Choroid first to degenerate with resulting RPE and photoreceptor damage

Choroideremia

Symptoms:

First to second decade patients experience nyctalopia

Visual field restrictions progressing to tunnel vision

Acuity loss, central vision preserved until 40-55 years of age

- One line acuity every five years according to one study

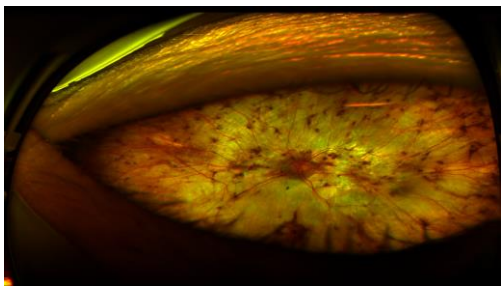
Signs:

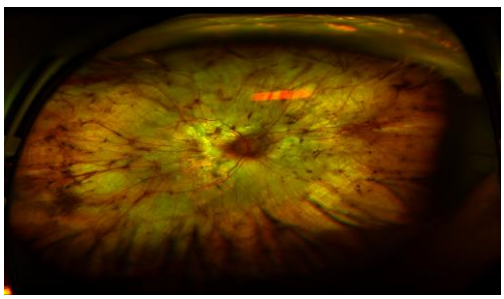
Pigmentary changes (RPE loss) in mid periphery

Choroidal atrophy then spread towards periphery and posterior pole

Bare sclera seen

- 3 types usually seen:
  - Light complexion- bare sclera seen, large choroidal vessels
  - Dark complexion- RPE pigment loss, choroidal pigment intact
  - Scattered areas of black pigmentation





Choroideremia

Additional testing:

FA, genetic testing, ERG

Management:

No known treatment
Varying stem cell research
Lancet-gene therapy
Systemic disease?
Crystals in lymphocytes and plasma fatty acid abnormalities