Not So Fast, Some Cases May Fool You

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Disclosure Slide for Dr Eric Schmidt

- Dr Schmidt is an advisor or consultant for the following:
  - Allergan
  - Tarsus
  - Eyenovia
  - Carl Zeiss
  - Thea Pharmaceuticals
  - Topcon
  - B&L
  - Sight Science
  - Peripherex
  - Harrow Pharmaceuticals
  - Sydnexis

The Case Specifics

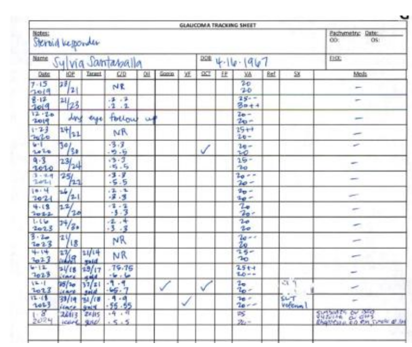
- 56 y/ o College Professor
- Chronic Severe Dry Eye (>2 yrs)
  - Has been treated w/ Restasis, Omega 3s, IPL,autologous serum. Biggest relief found with Steroid usage
  - However – steroids raised IOP into high 30s, but returned to 23 or lower after cessation of steroids
  - Eyes were comfortable with no NaFl stain in March, without steroid drops
- IOP OD- 21mm Hg, OS 23mm Hg
  - C/D OD .2/.2, OS .4/.4
- Another Dry Eye Success Story , Right?

3 Months Later

- The Professor saw her Primary Care OD for a refit of CLs
- Doc noted her IOP was higher (23OD, 19OS) but her C/D ratios were "significantly larger"
- Started her on Timolol ½ OU BID
- No VF or OCT performed…

3 more months later

- Patient complaining of "weird vision", esp superiorly
- IOP- 38OD, 25 OS
- C/D now "cupped out" OD, .7/.7 OS
- Time to panic, right?



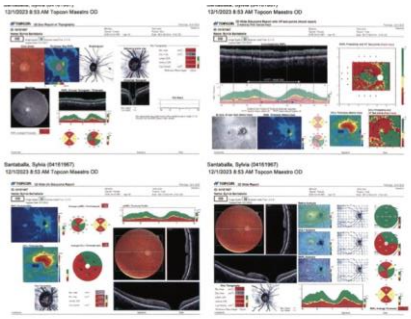
GLAUCOMA TRACKING SHEET

Notes: Steroid responder

Pachymetry: Date: OD: OS:

Name Sylvia Santaballa DOB 4·16·1967 FHX:

Date	IOP	Target	C/D	Oil	Gonio	VF	OCT	FP	VA	Ref	SX	Meds
7·15 2019	28/21		NR						20 20			–
8·12 2019	21/23		.2 .2 .2 .2						25-- 30++			–
12·20 2019	dry eye follow up								20- 20-			–
1·23 2020	24/22		NR						25++ 20-			–
6·1 2020	30/30		.3 .3 .5 .5				✓		20- 20			–
9·3 2020	23/24		.3 .3 .5 .5						25- 20			–
3·29 2021	25/22		.3 .3 .5 .5						20-- 20-			–
10·4 2021	26/21		.2 .2 .3 .3						20- 20-			–
4·18 2022	22/20		.2 .2 .3 .3						20 20-			–
1·16 2023	24/20		.2 .4 .3 .3						20 20			–
3·20 2023	21/18		NR						20-- 20			–
4·14 2023	27/19	21/14 goal	NR						25- 20			–
6·12 2023	21/18 icare	29/17 goal	.75 .75 .6 .6						25++ 20--			–
12·1 2023	35/20 icare	37/21 goal	.9 .9 .65 .7		✓		✓		20 20-		[illegible]	–
12·18 2023	38/19 icare	31/18 goal	.9 .9 .55 .55			✓			20- 20--		SLT referral	–
1·8 2024	28/13 icare	20/15 goal	.9 .9 .5 .5						25 20-			[illegible]



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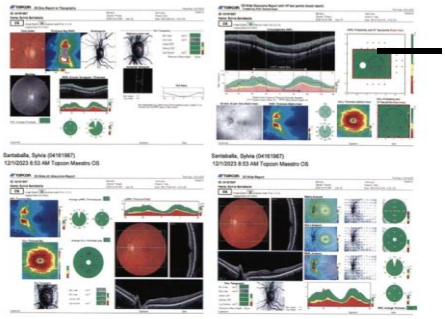

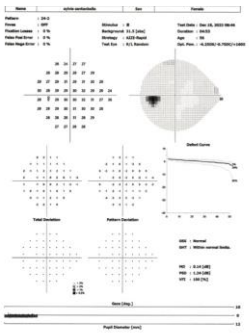

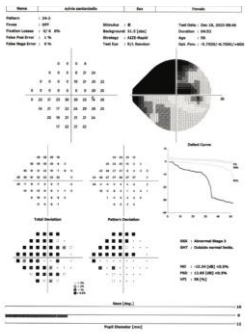

Rapidly Progressing Glaucoma- What Do You Do?

– You Rapidly Treat

– You Look For Other Causes
- Angle Issues
- Pseudoexfoliation
- Neovascular Glaucoma
- Vascular Issues

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So doctors… What Do We Do?

– What have we done to date?

– What is left to do?

– How Much Time Do We Have?

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ANOTHER SUPER EXCITING CASE!

- 48 y/o WF
- Seeing Neurologist for "constant Headache" x 6 wks
- HA focused behind eyes and in sinus area
- Bouts of vertigo
- VA blurs – but only when she experiences the vertigo
- Meds:-Prozac, BCP, SIngulair

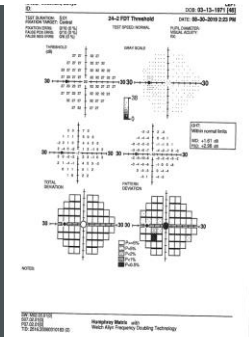
CLINICAL PRESENTATION

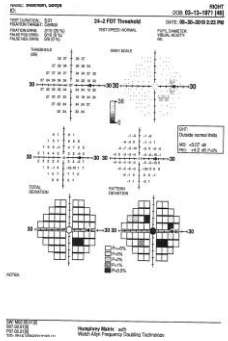
VA 20/20 OD, 20/20 OS
Emmetropic Presbyopia
SLE – normal
IOP – 18mm Hg OD, OS
Fundus and ONH – as shown
? SVP?

SO WHAT NOW? WHAT IS YOUR NEXT STEP?

Differential Diagnosis?

What Is It Most Likely To Be?





IDIOPATHIC INTRACRANIAL HYPERTENSION – (BIIH, PTC)

- Papilledema plus-
  - HA, diplopia, and/or TVO
  - Increased CSF (otherwise normal)
  - Normal CT scan
  - Neurologically intact
  - "Classic" patient

IIH- CAUSES

- Obesity
- Dysmennorrhea
- Mediastinal mass
- Toxemia
- Idiopathic
- Viral meningitis
- Medications
- Sarcoid/SLE
- Syphilis
- Get blood work!!

PSEUDOTUMOR CEREBRI: NOT-SO-BENIGN-INTRACRANIAL HYPERTENSION

- Treatment
  - Acetazolamide 500mg BID
  - Prednisone 10-40mg QD
  - Repeat LP
  - Shunt surgery
  - Topamax
- Treatment
  - Weight loss
  - WEIGHT LOSS
  - **WEIGHT LOSS**
  - **WEIGHT LOSS!!!**
  - Lose weight

LISTEN UP!!

- Bilateral disc edema should be considered papilledema until proven otherwise
  - Get CT scan, if normal LP

THE TELLING OF THE TALE…

- 45 y/o AAF
- CC : Woke up 2 days prior with sore OD. Temporal side worse than nasal
  Sectoral redness temporally, no d/c
- Meds: Metformin, Synthroid,Onglyza, Lantus, Lisinopril, Lipitor
- Exam- VA 20/20 OU, 3+ temporal conj injection OD, AC- d &q ,(-) RI, no DR, IOP 18OU
- Diagnosis: Episcleritis
- Tx: TD OD Q4H

1 WEEK LATER

- No Improvement, in fact pain is worse
- Seeing double upon waking for a few minutes
- RUL becoming swollen

- Little change in clinical appearance, IOP 24 OD, 18 OS
- Diagnosis changed to Scleritis
- D/C TD, Rx Durezol OD QID

1 MORE WEEK, THE SORDID TALE CONTINUES…

- Symptoms are no better, in fact…
  - Head now hurts
  - Eyes hurt worse, especially upon movement
  - Diplopia worse on superior gaze
- VA 20/20 OD, OS
- Injection improving
- 2mm ptosis RUL
- IOP 32OD, 22OS

SO, IS THIS…

- A Case hurtling out of control ?
- A simple side effect of the drops?
- Just a matter of letting the drops work longer?
- A misdiagnosis?
- A case where we are missing something?

- Time to consult with someone else?

SO WHAT ARE YOU GOING TO DO NOW??

1. Oral steroids
2. Blood work (Thyroid panel, ESR, CBC)
3. VF, OCT
4. Orbital Imaging (X-Ray)
5. MRI of head

TEST RESULTS

- VF – Normal OU
- T3, T4, TSH – Good
- OCT – Thick RNFL OU,
- Exophthalmometry – 25OD, 24OS
- IOP 22OD, 22OS
- Patient feeling somewhat better

TELL ME OH GREAT ONE, HOW DOES THIS END?

- What have we missed?
- What should we look for?
- Hint: It begins with an M and ends with an I

THE CASE OF THE NARROW ANGLE

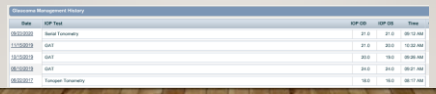
- 63 year old female
- In for PI evaluation
- Patient presents for PI eval. Last seen in November 2019 . Was previously scheduled for LPI but had to reschedule due to Coronavirus.
- Patient is not on blood thinners. Patient has not had cataract surgery before and complains of decreased vision and blur (worse OD>OS).
- Patient states she gets floaters, longstanding. Denies flashes of light or curtains.

THE CASE

- VA:
  - OD – 20/70+ PH 20/30-
  - OS – 20/30 PH 20/20
- Last refraction (Nov 2019)
  - OD +1.00 -1.75 x 095 20/25 -2
  - OS +1.75 -1.75 x 100 20/20 -2
- Slit lamp:

NARROW ANGLE (CONT)

- Slit Lamp:
  - Lens
    - OD grade 2 NS, trace-grade 1 PSC
    - OS grade 1-2 NS, trace PSC
  - IOP



POSTERIOR SEGMENT EXAMINATION

AUDIENCE QUESTION

- What is your diagnosis?
  - Ocular Hypertension
  - Primary angle closure suspect
  - Primary angle closure
  - Primary angle closure glaucoma
  - Secondary angle closure
  - Anatomical Narrow Angle (ANA)

SO LET'S TALK ABOUT THIS…

- Diagnosis:
  - Primary angle closure suspect (PACS)
    - Anterior segment OCT and gonioscopy performed at today's visit. Narrow angles OU (OD > OS) with (-) PAS, (-) NVI and (-) iris processes. PI is a primary angle suspect (PACS) at this point in time.
- Plan:
  - Monitor?
  - Laser PI?
  - Cataract surgery?

A Simplified Classification Scheme (Friedman)

1. Anatomically narrow (PACS)
   - Indentation gonioscopy opens angle
   - Normal IOP
   - Heightened suspicion

Can it progress over time ?

Progression rate is 10-25% over 10 years

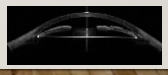
A Simplified Classification Scheme

1. Anatomically narrow (PACS)
   - Indentation gonioscopy opens angle
   - Normal IOP
   - Heightened suspicion
2. Anterior synechiae and/or elevated IOP (PAC)
   - Minimal natural history data
3. Closed angles and glaucomatous damage (PACG)

(Fourth category: Acute symptomatic angle closure)

HOW NARROW IS TOO NARROW?

When should you treat??



PI OR NOT TO PI……ZAP STUDY

- **Laser peripheral iridotomy for the prevention of angle closure: a single-center, randomized controlled trial. (ZAP Study)**
- He, et al Lancet 2019
- 889 patients with prophylactic PI followed for six years for incidence of angle closure

- Screening 11,991 patients
- 1087 were classified as Primary Angle Closure Suspects (PACS)
  - 9.1%
- 889 entered the study
  - PI in one eye
  - Observation in the other

PI OR NOT TO PI……ZAP STUDY

- ZAP study:
  - Primary outcome was:
    - Development of Primary Angle Closure (PAC) over 6 years
      - Peripheral anterior synechiae (PAS) of 1 clock hour or greater
      - Elevated IOP
      - Acute angle closure
  - 889 eyes received a PI — 889 eyes received observation
    - 19 developed PAC — 36 developed PAC
    - 2.14% — 4.05%
    - 47% reduction in the risk of developing PAC in the eyes that underwent PI
    - Statistically significant
    - But……

PI OR NOT TO PI……ZAP STUDY

- ZAP study:
  - Final Conclusions:
    - "Laser peripheral iridotomy had a modest, albeit significant, prophylactic effect"
    - "The number needed to treat was 44 to prevent one case of new primary angle closure disease over 6 years, the vast majority of which were not acute attacks."
      - Treat 44 PACS patients with laser PI to prevent 1 from going to PAC
    - "Assuming that these primary angle closure cases have a 35% risk of developing sight loss from glaucoma over a further 5 years, and assuming that prevention of sight loss would be the ultimate goal of prophylactic laser iridotomy, then the total number needed to treat (over approximately a decade) would be around 126 people."
      - Treat 126 PACS patients with laser PI to prevent 1 from losing vision from PAC or PACG
    - "Widespread prophylactic laser peripheral iridotomy for primary angle-closure suspects is not recommended"

RISK OF PACS DEVELOPING ACUTE PRIMARY ANGLE CLOSURE

- ZAP Study
  - 889 followed for up to 6 years
  - 19 in LPI group
  - 36 in control group
- Guangzhou China
  - 485 followed for 4.8 years (1-6 yrs)
  - 6 (1.2%)
- Chicago Study
  - 129 followed for 2.7 years (1-6 yrs)
  - 8 (6.2%)
- Vellore India
  - 48 followed for 5 years
  - none

SINGAPORE ANA-LIS TRIAL

- Approximately 10% of PACS patients progressed to PAC over 5 years
- If they received an LPI, the rate of progression to PAC was approximately 5%
- LPI cut the risk in half
  - Just like the ZAP study

SINGAPORE ANA-LIS TRIAL

- Which PACS should be considered for Laser PI?
  - Pts with symptoms such as HA or pain
  - Pts with diabetes
  - Pts that need to be dilated on a regular basis
  - Pts with poor access care or unlikely to follow up
  - Pts with a family history of angle-closure glaucoma

RISK FACTORS FOR PRIMARY ANGLE CLOSURE - RACE

- 0.1-0.6% - Whites/Hispanic/Black
- 0.6% in Chinese but as high as 7% is some sub-groups
- Some estimates = 50% of Vietnamese have "occludable angles"

RISK FACTORS

- **Age** – rare under the age of 40 but prevalence increases with each decade over 40
  - Due to the increase in lens thickness with age
- **Gender** – occurs 2 to 4 times more common in females than it does in males
  - Females tend to have shorter anterior segments than do males

Hyperopia

- **Family history** – increased in first degree relatives
  - 3 to 6 times greater risk

WHEN TO RECOMMEND PROPHYLACTIC LPI

- Narrow angle and presence of any:
  - Peripheral anterior synechiae and/or elevated IOP (PAC)***
  - Optic nerve damage (PACG)***
  - Retinal disease
  - Family history
  - Unreliable patient that does not seek routine care
  - Symptomatic patient
- Narrow angle without any of these: discuss risks, involve patient in decision

SO FOR OUR PATIENT

- What do we recommend?
- What did we do?

DO WE HAVE TIME FOR ANOTHER?

47 Y/O CL WEARER

Presents for Annual Exam

- Overall he is doing well, but has had to wear readers over CL for past 6 months-"I hate that!"
- VA 20/20 OD, OS
- Normal exam. No pathology identified
- RX for Vuity OU QD
- 2 weeks later- "This Vuity is the Best!"

3 WEEKS AFTER THAT…

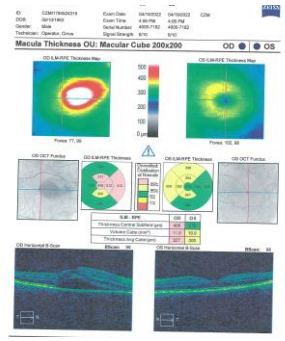
- CC: OD has been bothering him for the past 5 days
- No pain
- Seems like there is a smudge over his CL
- This occurred acutely and has not really changed
- Only affecting OD, stays present and consistent all day long
- "This Vuity is the Worst!"

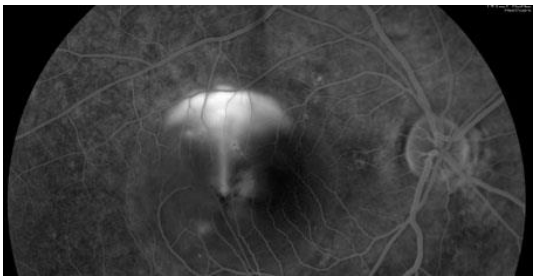
EXAM FINDINGS

No Medications
No changes in health status

- VA - OD 20/25-2 OS – 20/20
- EOM – no restriction, No tropia
- Pupils -, PERRL, (-) APD
- SLE – normal. Good CL fit, no staining. No cell/flare
- IOP – 19OD, 16 OS

- DFE… (But before that)
- Differential Diagnosis??





CENTRAL SEROUS CHOROIDOPATHY

Clinical Characteristics

CSR

- Leaking of serous fluid from underlying choroid
- Idiopathic
- 20-50 y/o Males
- VA- 2020- >20/80
- It is essentially a Pigment Epithelial Detachment (PED)

CSR OUTCOMES

- Generally self resolving (?)
- Atrophic changes can occur
- How should we treat?
  - NSAID
  - Close monitoring
  - Laser therapy?
  - Anti-VegF?

TOUGH DECISIONS WITH PIGMENTARY DISPERSION

EXAM FINDINGS

- Initial IOP – 16mm OD, 16 mm OS
- 3+ K Spindle OD, 3+ K Spindle OS
- C/D - OD .3/.3 OS .5/.5
- Fundus – OD -ERM OD, Scleral Buckle well positioned
- OS – Retinal grounds normal
- Gonio – Heavy TM pigment 360 degrees OU, but open (Gr 4) OU
- Pachymetry – OD 485, OS 487
- VF – OD GHT Borderline, mild sup edge defect
- OS – no defect, GHT wnl, PSD normal

SO… IS THIS PIGMENTARY GLAUCOMA?

How Do You Know??

How Do You Not Know??

WHAT ELEMENTS DO YOU NEED TO MAKE A DIAGNOSIS OF PIGMENTARY GLAUCOMA?

PIGMENTARY GLAUCOMA

Krukenberg Spindle

Pigment in Angle (trabecular meshwork)

Elevated IOP!!

Iris Transillumination is not a necessary element to the diagnosis!

MONITOR FOR ~8 MTHS

IOP Range 15-22 OD, 16-21 OS

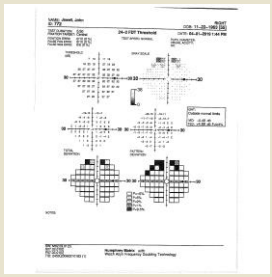
Grey outs continue to occur, perhaps lasting a little longer

Now Do You Treat?

If so, with what?

FLASH FORWARD 2 YEARS

- Grey Outs continue (but less frequently)
- C/D increases OD .3/.3 OS .5/.5
- VF defect worsens sup OD to an incomplete arcuate
- But IOP is "controlled" between 15- 17 mm
  - Or is it??
- What's Your Next Step ??



PIGMENTARY GLAUCOMA

- Pathophysiology- Lens Zonules rub against posterior Iris Pigment Epitheliuim
  - Pigment gets caught up in AC current and gets deposited in angle and Corneal endothelium
  - Incidence – PDS: 4.8/100,000 PG : 1.4/100,000
  - More likely seen in younger, myopic pxs

PIGMENTARY GLAUCOMA

How Do We BEST Treat it???

LONG TERM OUTCOMES OF SELECTIVE LASER TRABECULOPLASTY (SLT) TREATMENT IN PIGMENTARY GLAUCOMA PATIENTS

- Ayala, Marcelo
- Journal of Glaucoma: December 2014 - Volume 23 - Issue 9 - p 616–619
- doi: 10.1097/IJG.0b013e318287abb7
- Original Studies

PRIMARY OUTCOME – TIME TO TREATMENT FAILURE

- Treatment Failure defined as:
  - <20% IOP reduction
  - Change in Medical Treatment
  - Additional SLT procedure
  - Surgical Referral
- 180 degree SLT
- Previous treatment allowed

RESULTS

- Average time to failure after SLT – 27.4 mths
- Success Rate after:
  - 12 mths – 85%
  - 24 mths – 67%
  - 36 mths- 44%
  - 48 mths – 14%
- SOOO….???

CASE 2 - A TOUGH INHERITANCE

- 62 y/o BF, (+) fam hx- treated for POAG for 6 years
- VA 20/20 OD, 20/20 OS
- Pachs – OD 490, OS 495
- No systemic meds
- IOP maintained around 18 OU on Lumigan QHS, AlphaganP OU TID, T1/2 OU BID
- Initial IOP 28 OD, 29OS
- Condition was stable but px developed hypersensitivity (After patient was switched to Brimonidine 0.15%)
- IOP 22 OU on Lumigan only

WHAT WOULD YOU RECOMMEND?

- 1. Switch to Rocklatan
- 2. SLT OU 180
- 3. Add Azopt OU BID
- 4. add Timoptic ½ OU BID
- 5. Trabeculectomy
- 6. d/c Lumigan, try Travatan Z OU QHS
- 7. Cosopt OU BID
- 8. Combigan OU BID

- What is the target IOP?
  - 1.~18
  - 2. ~15
  - 3. ~12

SLT OU IOP 19 OD, 20 OS

- What would you do now?

HOW DO YOU KNOW IF THE IOP NEEDS TO BE LOWER?

- What are the risk factors for progression?
  - Age
  - IOP at diagnosis
  - Neuroretinal rim tissue
  - Disk hemes
  - Corneal hysteresis
- Is she progressing?

HOW OFTEN DOES POAG REALLY PROGRESS?

- POAG affects 2.7 million people over age 40 in the US (NEI website 2017)
- Glaucoma decreases visual function – at a rate far greater than previously thought
  - ~10% of all TREATED POAG pxs experience VF loss (GRF website 2017)
- It may stay stable for years!

RATE OF PROGRESSION

- RGC loss in normals ~0.5% /yr
- RGC loss in Glaucoma – 3.5% / yr
- RGC loss in treated G – 1.5%/yr

RATE OF PROGRESSION FOR VARIOUS GLAUCOMAS

- NTG- 56% progression at 6 yrs
- POAG -74% progression rate (6 yrs)
- PXG – 93 % - progression rate at 6 yrs
- Pxs older than 68 progressed much faster compared to younger pxs

PROGRESSION ACCORDING TO CIGTS

- Seen in 56.7% in 6 years
  - Biggest risk factors
    - Inadequate IOP control
    - Disk hemorrhage
- Proving once again that if you diagnose a px with POAG REALLY treat them!

PREDICTIVE FACTORS FOR PROGRESSING POAG

- Older age
- Advanced VF damage
  - Worsening MD (-4)
- Smaller neuroretinal rim
- Larger zone Beta
  - Martus, Jonas, et.al. AJO, June 2005
- Baseline IOP, *but not Mean IOP*
  - Martinez-Bello, et al, AJO March 2000.
- Lower CH