

Five Neuro-Op diagnoses that no eye resident (or any eye MD) can afford to miss

- Andrew G. Lee, MD
- Chair Ophthalmology, **Houston Methodist Hospital**, Professor of Ophthalmology, Neurology, & Neurosurgery, Weill **Cornell** Medical College; Adjunct Professor: **Baylor** College of Medicine, U. **Iowa** & Clinical Professor, **UTMB** Galveston, **UT MD Anderson Cancer Center**, U. **Buffalo**, SUNY



I have no financial interest in the contents of this talk



I will not be discussing any off label uses of drugs



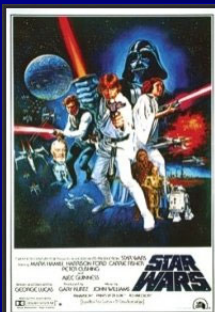
**On July 20, 1969, I was 5 years old,
the moon landing was on tv....**



**When I was a little kid (like
every American kid in 1969)
I wanted to be an astronaut**



**But in July 1978: I wanted to be a doctor...
2nd choice NASA
3rd choice Jedi knight**



It turns out that the Jedi superpower: The force is real



Our ability to look at people's eyes and see and deflect the grim reaper is a real superpower (it is the Force)



Overview

- List five potentially life threatening diagnosis in neuro-op
- Define "rule of the pupil"
- Define best imaging study for the 5 dx
- Show key clinical or radiographic features for the above 5 dx

Overview: Lee's "A"s: The five chances to save the life of your next neuro-ophthalmology patient

1. Arteritis (Giant cell)
2. Apoplexy (Pituitary)
3. Abscess (Mucor)
4. Aneurysm (pupil involved third nerve palsy)
5. Arterial (carotid or vertebral) dissection



Initial symptoms in GCA (n = 100)

Symptom or complaint	Presenting symptom	Finding at diagnosis
Headache	32	68
Polymyalgia rheumatica	25	39
Fever	15	42
Visual symptoms without loss of vision	7	30
Weakness, malaise, fatigue	5	40
Tenderness over arteries	5	27
Myalgias	4	30
Weight loss, anorexia	2	50
Jaw claudication	2	45
Permanent loss of vision	1	14
Tongue claudication	1	6
Sore throat	1	9
Vasculitis on angiogram	1	NA
Stiffness of hands and wrists	1	NA
Decreased temporal artery pulse	NA	46
Erythematous, nodular, swollen arteries	NA	23
Central nervous system abnormalities	NA	15
Synovitis	NA	10
Dysphagia	NA	15
Limb claudication	NA	NA

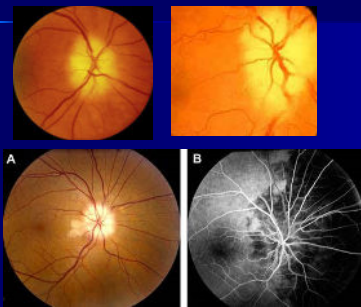
Adapted with permission from Shander GG. Temporal arteritis and polymyalgia rheumatica. In: Zaller TC, et al. Textbook of ophthalmology. 6th ed. Philadelphia: Saunders, 1993:155-157.

OMIC claims: "Whereas...."

1. INDEMNITY PAYMENTS MADE TO SETTLE GCA CASES		
	GCA Claims	All OMIC Claims
Closed with a payment	44%	21%
Mean (average) payment	\$203,250	\$165,282
Median (middle) payment	\$335,000	\$81,875
Highest payment	\$450,000	\$3,375,000

<https://www.omic.com/giant-cell-arteritis/>

Beware "pallid edema"



<http://webeye.ophth.uiowa.edu/dept/aion/13-AION-A-AION.htm>

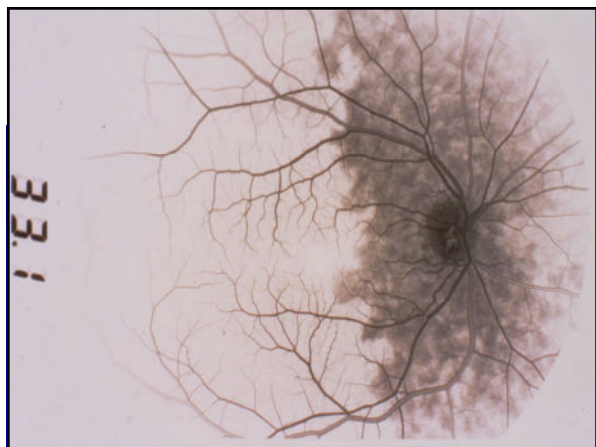
And the MRI of head was normal....

WHY?

20 year old white female with acute loss of vision, pain, RAPD, OD and a normal fundus....







Beware "optic neuritis" in elderly....likely GCA

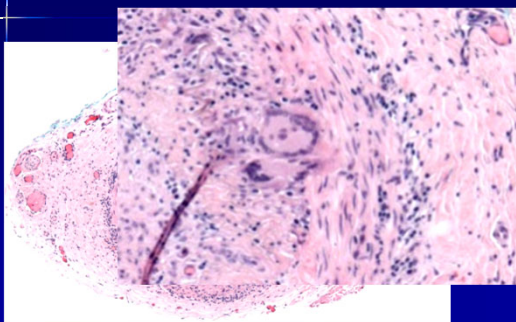
- Wicked good pearl: retrobulbar optic neuritis in elderly might be PION due to GCA....Pallid edema sometimes looks like no edema (dead nerve cant swell)

Big Red Flags in GCA

- Severe visual loss (e.g. LP or NLP)
- Bilateral simultaneous visual loss
- Transient visual loss (not seen in non-arteritic form of ischemic optic neuropathy)
- PMR with visual symptoms

Neurologic Clinics 2016 Aug;34(3):611-29. doi: 10.1016/j.ncl.2016.04.005.

Biopsy proven giant cell arteritis



There are five things to remember about acute visual loss in the elderly

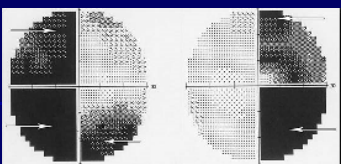
- One is GIANT CELL ARTERITIS....
- And the other four are Giant Cell Arteritis



Perform a confrontation field

- Beware acute bitemporal field loss
- "Unreliable HVF" = "I have no visual field on this patient!"





Life threatening diagnosis?




Pituitary tumors common

- Incidence of pituitary tumors = 7 per 100K population per year
- As high as 1 in 500 > 65 years
- "The average ophthalmologist should see about one pituitary tumor per year....are you missing your quota?" ----B. Katz MD

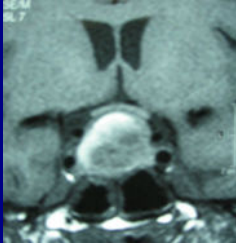
www.abl.curmbs.colostate.edu
www.clinical-blood-testing.com



Pituitary apoplexy



- Acute onset
- Usually severe headache
- Bitemporal hemianopsia
- Apoplexy can kill (8%)
- Hypopituitarism (cortisol)
- Emergent scan



Neurologic Clinics 2016 Aug;34(3):611-29. doi: 10.1016/j.ncl.2016.04.005.

biocomp.stanford.edu

Pituitary apoplexy

- Semple et al. Neurosurgery. 56(1):65-73, 2005.
- 62 patients (Average age 51.1 years)
- Average time presentation: 14 days after ictus
- 81% **no previous history** of pituitary tumor
- Headache (87%) with diminished visual acuity in 56% (bitemporal hemianopia 34%)
- *73% hypopituitarism; 8% diabetes insipidus*
- *Apoplexy is a CLINICAL not radiographic dx*

Unreliable visual field

- Wicked good pearl: Do a confrontation visual field especially in patients with an "unreliable" HVF (same as saying I have no visual field and it could be a brain tumor and I aint doin' a damn thing about it)

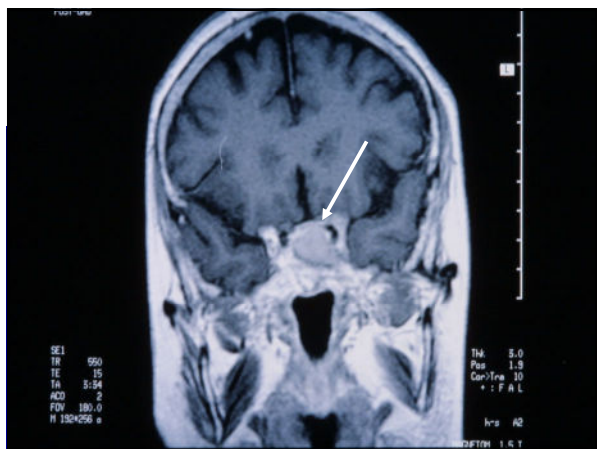
Acute ophthalmoplegia in a diabetic

- 35 y/o WM with diabetes
- History of diabetic ketoacidosis
- Complete left ptosis
- Acute onset almost complete left sided ophthalmoplegia
- What should be the evaluation?



Life threatening diagnosis?

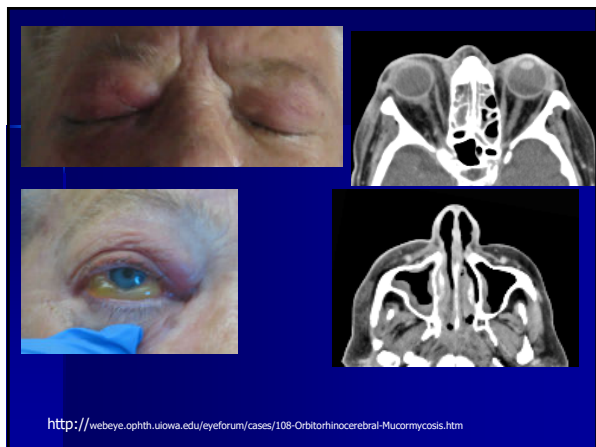




Case from Iowa

- 76-year-old woman with acute myelogenous leukemia (AML)
- Induction chemotherapy (day 13)
- Two day history of worsening right-sided periorbital swelling & erythema

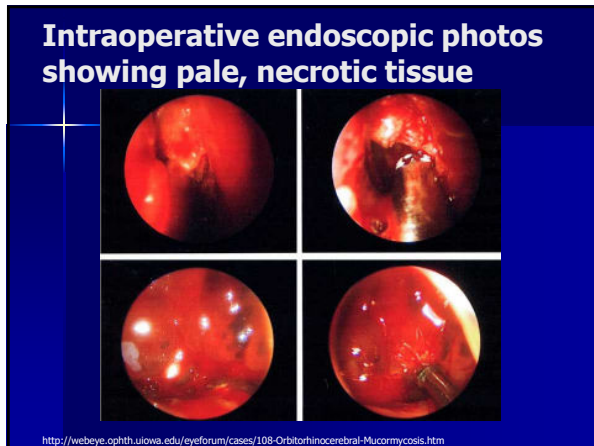
<http://webeye.ophth.uiowa.edu/eyeforum/cases/108-Orbitorhinocerebral-Mucormycosis.htm>

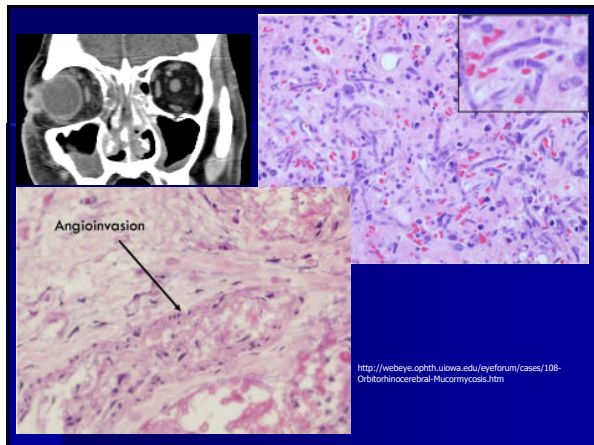


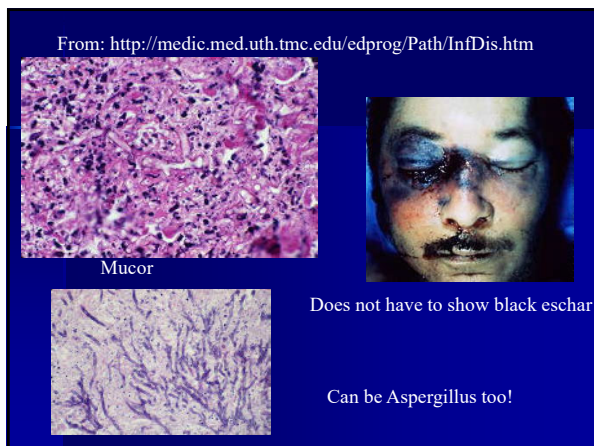
<http://webeye.ophth.uiowa.edu/eyeforum/cases/108-Orbitorhinocerebral-Mucormycosis.htm>

Is this orbital inflammatory pseudotumor? Tolosa Hunt?

- Wicked good pearl: Don't give patients who are immunosuppressed the diagnosis of autoimmune disease!

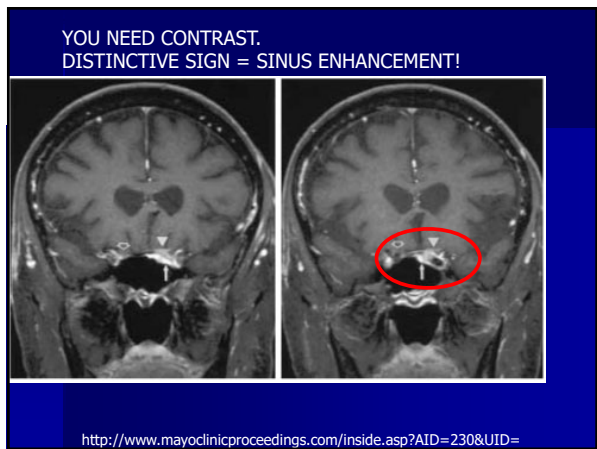


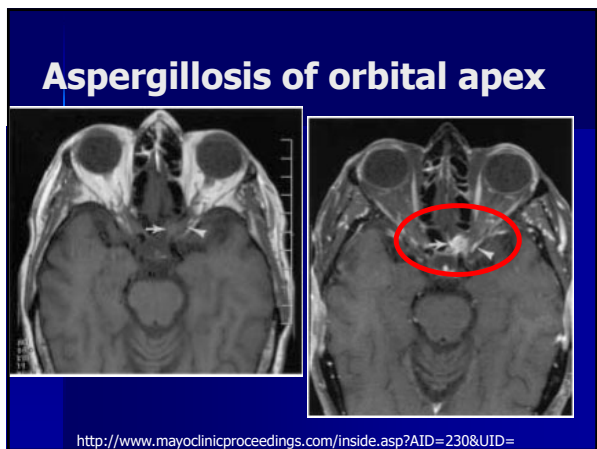




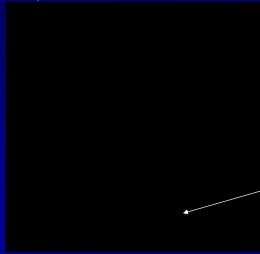
And the MRI of head was normal.....

■ **WHY?**





What happens if you don't give contrast?....



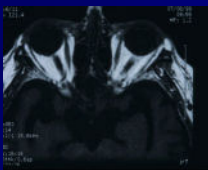
My house at NIGHT!!!

Why didn't they give MRI contrast?

- Diabetic
- Diabetic nephropathy
- Poor renal function (GFR)
- They wont give the gadolinium
- Fear nephrogenic systemic dermatopathy

What is Fat suppression ("fat-sat")? technique

- T1 weighted signal
- Increase contrast (light and dark) between structures
- Fat is "too bright" on T1





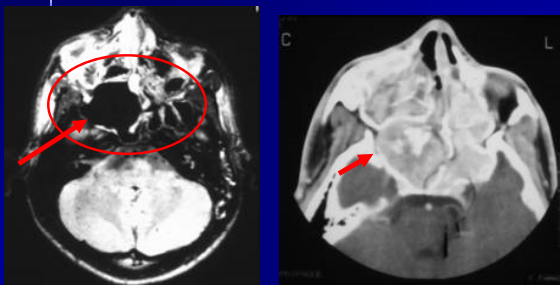


And the MRI of head was normal.....

WHY?

Polar bear in a snowstorm



Complementary roles for CT & MR in fungal orbital apex disease (T2 dark)



<http://endoscopicsinussurgery.co.uk/chapternine.html>

What's wrong with this picture?

- 60 y/o diabetic man
- New onset ptosis right
- Right adduction, elevation, & depression deficit
- 45 exotropia (XT)
- Diagnosis: "Ischemic third nerve palsy"
- Plan: "Return 6 weeks"



Tell your technicians....

- If the patient's complaint is diplopia or ptosis or....
- If you have to lift a ptotic lid to put in the dilating drops then....
- STOP, come get the doctor before dilating





**Acute pupil involved third n. palsy
Life threatening diagnosis?**



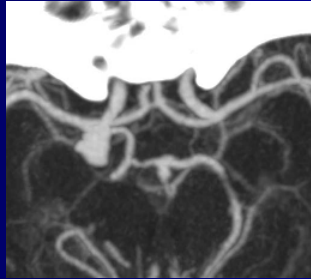
Rule of the pupil

- A pupil involved third nerve palsy
- Aneurysm of posterior communicating artery until proven otherwise

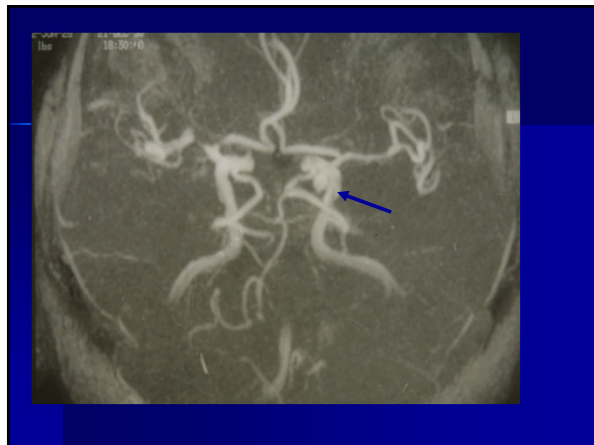


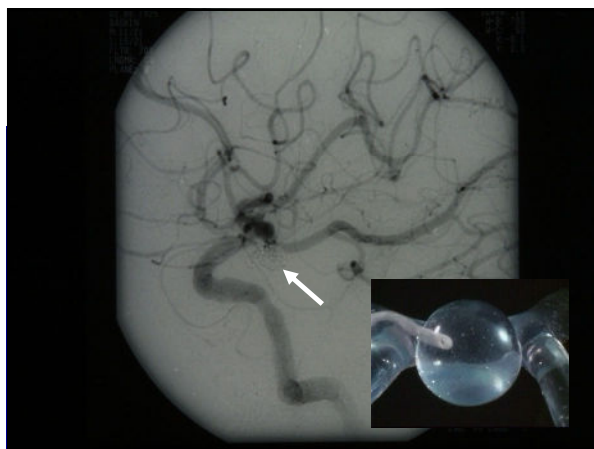
Neurologic Clinics 2016 Aug;34(3):611-29. doi: 10.1016/j.ncl.2016.04.005.

CTA: R posterior communicating a. aneurysm



<http://www.cedars-sinai.edu>





Choice of imaging strategy in third nerve palsy

- CT/CTA first to look for SAH/aneurysm in pupil involved third nerve palsy
- MRI/MRA first to look for non-aneurysmal etiologies or do MRI second if CTA negative first
- Catheter angiography if MRI/MRA and CTA not of sufficient quality or insufficient confidence level to rule out aneurysm

Neurologic Clinics 2016 Aug;34(3):611-29. doi: 10.1016/j.ncl.2016.04.005.

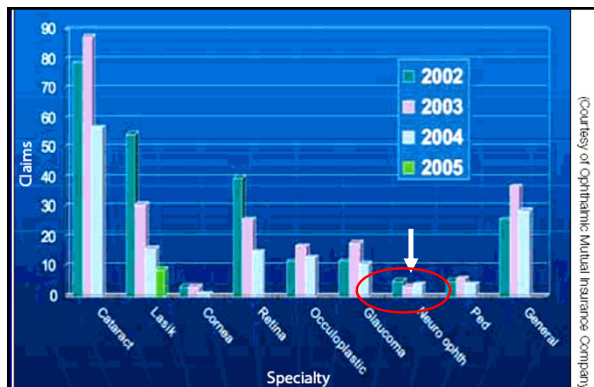


Figure 1. This graph shows OMIC's malpractice insurance claims by specialty,



Figure 2. This chart shows OMIC's average malpractice settlement payment per specialty from 2001 to 2004.

Acute painful anisocoria after car accident



Life threatening diagnosis?



Horner syndrome

- Wicked good pearl: In acute setting just image sympathetic axis for Horner syndrome

As if death weren't enough....



And the MRI of head was normal....

■ WHY?

Summary

- List five potentially life threatening diagnosis in neuro-op
- Define "rule of the pupil"
- Define best imaging study for the 5 dx
- Show key clinical or radiographic features for the above 5 dx

Summary: Lee's "A"s: The five chances to save the life of your next neuro-ophthalmology patient

- 1. Arteritis (Giant cell)
- 2. Apoplexy (Pituitary)
- 3. Abscess (Mucor)
- 4. Aneurysm (pupil involved third nerve palsy)
- 5. Arterial (carotid or vertebral) dissection



But really my teaching point is that using our super power to detect & deflect the reaper is our best defense against physician burnout

Bottom line: Its your job



"Houston" was the first word spoken from the moon



April 1970:
"Houston, we've had a problem"—Jim Lovell



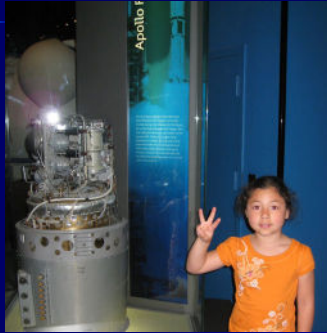
Jim Lovell



Half the spacecraft panel
lost



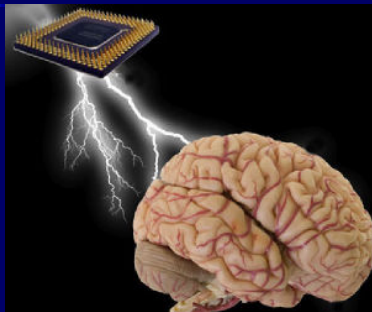
Apollo fuel cell



Most of the computing power was human brains at NASA



It was human brain power that brought Apollo 13 home....

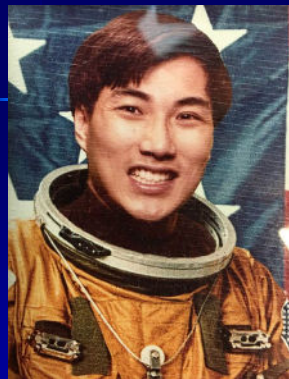


Today I get to fulfill my childhood dreams & work with real rocket scientists at NASA JSC Houston

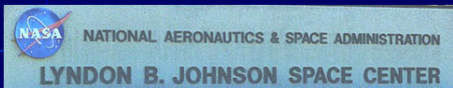


On July 20, 1969, I was 5 years old, the moon landing was on tv...





Today, I get to work with real rocket scientists at JSC at NASA in Houston



There is only one thing to say to the god of death...



Not today, not on my watch





Thanks for your time & attention

- Andrew G. Lee, MD
- Chair Ophthalmology, **Houston Methodist Hospital**, Professor of Ophthalmology, Neurology, & Neurosurgery, Weill **Cornell** Medical College; Adjunct Professor: **Baylor** College of Medicine, U. **Iowa** & Clinical Professor, **UTMB** Galveston, **UT MD Anderson** Cancer Center, U. **Buffalo**, SUNY

A row of logos for various medical institutions: Houston Methodist, utmb Health, BCM Baylor College of Medicine, UNIVERSITY OF IOWA HEALTH CARE, Weill Cornell Medical College, MD Anderson Cancer Center, and University at Buffalo.
