Visual Field Interpretation

“I’m leaving you, Mitchell. You’ve never had tunnel vision; you never will.”
Objectives

• Describe pros and cons of different types of perimetry.

• List the 3 anatomic correlates.

• Describe & Identify common patterns of visual field loss.
The Hill of Vision

Gray scale

fovea
Assessing Peripheral Vision

- Confrontation
- Goldman Static Perimetry
- Computerized Automated Perimetry
How do you usually assess peripheral vision?

1. Confrontation
2. Goldman Static Perimetry
3. Computerized Automated Perimetry
Automated Perimetry

very sensitive

technician independent

good for scotomas

good for following

but

garbage in, garbage out
CENTRAL 10-2 THRESHOLD TEST

FIXATION MONITOR: GAZE/BINDSPOT

FIXATION TARGET: CENTRAL

STIMULUS: III, WHITE

BACKGROUND: 31.5 ASB

STRATEGY: FULL THRESHOLD
FIXATION LOSSES 0/15
FALSE POS ERRORS 0/8
FALSE NEG ERRORS 1/7
QUESTIONS ASKED 239
FOVEA: 34 DB
MD - mean deviation, PSD - pattern standard deviation
SF - short term fluctuation, CPSD - corrected psd
Goldmann Perimetry

- technician dependent
- low availability
- poor for scotomas
- questionable reproducibility
- but,
- patient friendly
Isopter: a line connecting points denoting areas of equal sensitivity to light.
Scotoma: area of abnormality within area of normality.
Confrontational Visual Fields

If main issue is loss of peripheral vision get formal perimetry.
Papillo-macular bundle - smaller fibers sensitive to compression/inflammation
Damage to the papillo-macular bundle causes central scotoma
Causes of central scotomas?

A. Optic neuritis
B. Ethambutol
C. Folate deficiency
D. All of the above
Optic Neuritis -

MRI with plaques
Compressive Lesions
Bilateral Cecocentral Scotomas:
toxic/nutritional/hereditary
Papillo-macular bundle - small fibers sensitive to compression/inflammation/systemic insult

So, look centrally!
Nerve fibers temporal to the fovea arc around it to optic disc
Glaucoma - most common cause of arcuate VF defects
Poor blood supply - Anterior Ischemic Optic Neuropathy
Optic Disc Drusen - accumulation of calcium at the nerve head
Optic Disc Drusen - accumulation of calcium at the nerve head
Nerve fibers temporal to the fovea arc around it to optic disc

So, Look at the horizontal midline!
Nasal nerve fibers cross in the chiasm
Damage at or behind chiasm causes respect to the vertical midline.
Lesion is in the

A. Bilat optic nerves
B. chiasm
C. Optic tract
D. None of the above
Lesion is in the

A. Bilat optic nerves
B. Nerve & chiasm
C. Tract
D. radiations
Left Anterior Chiasmal Syndrome
Homonymous Hemianopsia

Anterior choroidal artery infarct gives opposite.
Superior Right Homonymous Hemianopsia
Probable cause in a 28 yr-old

A. MS
B. Trauma
C. Tumor
D. Stroke
Homonymous Hemianopsia
Homonymous Hemianopsia
Most likely cause in a 63-yr-male

A. Stroke
B. Tumor
C. Nonorganic
D. Other
Homonymous Hemianopsia
spared temporal crescent
Both eyes open
Homonymous Hemianopsia
Homonymous Hemianopsia
Nasal nerve fibers cross in the chiasm

So, Look at the vertical midline!
Big Physiologic Blind Spot
Summary

Look for patterns:

- central scotoma
- horizontal midline
- vertical midline