Visual Field Screening and Analysis

PART 2
A SYSTEMATIC APPROACH TO INTERPRETATION

Revised 1/16/2011

VF Screening
Systematic Approach to Interpretation

Patient info
Field testing strategy and test point pattern
Reliability indicators
  Is the VF reliable?
Decision - normal or abnormal VF?
  Is true, organic VF loss present?
    “True, organic VF loss” = VF loss due to a disease not
due to an artifact like a lensholder, lens rim, droopy
lid, small pupil, wrong age entered, tired patient etc.
If abnormal - diagnostic decision - cause of VF defect?
  Site of lesion?
Ta
N 30 test
Pt info: 45 y/o
Test: N 30-5
Reliability indicators:
Fix errors
False positive errors
Normal?

Testing Strategy and Test Point Pattern

- Single intensity strategy - artifactuous misses on edge due to subthreshold testing - common
- Appropriate testing level?
  - Central reference level on HFA
    Central reference level is an index of the patient’s sensitivity – the higher the central reference level the higher the instrument thinks the patient’s sensitivity is
    - Central reference too high → stimuli too dim → artifactuous misses
- Appropriate age/birthdate entered?
  - Age too low → stimuli too dim → artifactuous misses (reduced specificity)
Testing Strategy and Test Point Pattern (cont’d.)

- Test point pattern
  - Few points are tested in general VF screening, i.e., 40 points on HFA Central 40 screening test, 17 areas (10°x10° squares) on the FDT/Matrix C20-5 test, 19 areas on the FDT/Matrix N30-5 test.
    - VERY IMPORTANT: Since there are very few points or areas tested in the general screening tests that we do, one (1) miss may be the only sign of a VF defect, particularly on FDT/Matrix.
  - If more points tested, i.e., 80 points → more often get 2, 3 or more misses at site of a true VF defect.

Inferior VF loss on FDT N30-5 & on HFA C30-2
Only one miss on FDT due to few test points on N30-5 and because most of VF loss is outside of the central 20° where the N30 tests.
More points tested – more points missed in the VF defect
Dicon Central 40 (40 points) 2 misses in nasal step area OD
Dicon Central 80 (80 points) 4 misses in nasal step area OD

Interpretation Strategies

- The greater the number of adjacent misses the greater the likelihood of true VF loss rather than artifact
- Patient has 2 chances to hit each point (exception Octopus). Misses are retested.
- Artifactuous misses more common in peripheral edge of the field, i.e., very common outside of central 30°
  Do not test beyond 30° in general VF screening
- Artifactuous misses more common beyond 20° in superior VF due to the normally steeper decline in sensitivity, the even greater decline and increased fluctuation with age in this area, the much greater chance of obstruction from lids, lashes, brow (deep-set eyes) etc.
FDT C20-5

One miss sup in OS

Real VF loss vs. artifact? What should be done to differentiate true from artifact?
Assessment of Test Reliability

*Fixation Losses – Ways to Evaluate Fixation*

- Fixation loss index
  - Automatic fixation monitor
  - Heijl-Krakau (blind spot) monitor
- Gaze tracker on new HFA (at the bottom of the printout)
  - Shows continuous graph of fixation quality and blinks
  - Upward deflection is a fixation loss
  - Downward deflection is a blink
- Perimetrist monitors fixation and writes comments
  - Cannot monitor fixation on the FDT since no way to see the eye

“Fixation Losses” on Blind Spot Monitor - Possible Causes

- True fixation losses/shifts
- Head misalignment after BS localization
- False positive responses during the test
- False negative responses during BS localization
- Poor BS localization
- High refractive error
- Small/hypoplastic ONH
Matrix C24-2-5 screening

Fix errs: 5/10 in each eye

Reliable or not???
How should you determine?

False Positive Errors

*FP Catch Trials*

Periodically no stimuli presented though projector moves and makes noise as usual
False Positive Responses

• Patient responds to something other than seeing the stimulus
• May respond to stimulus projector movement or the noise caused by the projector movement
• May respond to “timing” the interval between stimuli

False Positive Responses
Possible Effects

• If false positives occur on threshold sampling may cause perimeter to think the patient has higher than his/her actual sensitivity.
  Stimuli are made too dim → many misses on the screening
• If during the screening test VF defects may not be detected → patient hits the button when the stimulus is presented in a VF defect where the patient could not actually see it
• Many “fixation losses” → patient hits the button when the stimulus is actually in the blindspot
False Positive Responses
What to do about them

• If one FP occurs remind the patient to “Hit the button only when they see or think they see the light (or flickering/wavy area)”

• If 2 FPs advise the patient to hit the button only when they know they see the light. Repeat these instructions.

• If even more FPs stop test, advise the patient that they were hitting the button when there was no light. Repeat instructions above. Rerun test.

False Negative Errors

FN Catch Trial

• Periodically perimeter presents a much brighter than previously seen stimulus to patient at a location that has been previously found to be normal→ if missed → false negative response
HFA C40
2/2 False Negatives
Reliable VF??
Normal or abnormal VF?
Is there a pattern to the misses?

HFA C80
Reliable VF?
Normal or abnormal VF?
Is there a pattern to the misses?
False Negative Errors

**Possible Causes**

- Fatigue
- Inattention
- VF loss

Artifactual VF Loss

**Common Causes**

- Small pupil
- Lensholder, lens rim artifact
- Fatigue
- Cataract, media opacity
Pupil Size

- Small pupil (<2-1/2 mm) can cause generalized depression
- Dilation may also cause generalized depression
- Small pupil may reduce the level of retinal adaption
- Cholinergic agents (pilocarpine) may significantly depress sensitivity due to small pupil
- If a threshold sampling technique of setting the screening level is used a small pupil will likely have little effect
- If age/birthdate is used to adjust screening level → possible significant effect

Refractive Error

- Significant uncorrected refractive error can cause significant generalized depression on threshold perimetry
- Greatest effect is at fovea
- Screening - since screening is at 4 to 6 dB brighter than expected threshold → less effect (misses) on screening
- Most effect would occur on screeners using age-adjusted (you enter the date of birth or the age) method of setting screening level
Fatigue

- May cause general depression
- Not a common cause of artifactual VF loss on screening
  - Screening should be very quick <1 to 2 minutes
- May affect longer tests, i.e., Full Field 120
  - We don’t use longer tests for general VF screening
- Dicon’s moving fixation may reduce fatigue

Media Opacities

- Effects: scatter light, retinal image blur, decrease retinal illuminance
- Can cause a variety of VF defects
- Cataract extraction may eliminate the VF loss
- Carefully correlate VF misses to other signs
Age

- Age effect on VF
  - Generalized depression
  - Steepens the VF (Hill of Vision)
  - Increases variability (short term fluctuation) of responses
  - **MUST** enter correct age/birthdate into perimeter (HFA Fast Pac, Octopus, FDT, Synemed)

VF Artifact in the Superior VF

- Beyond ~20° superior - common site of artifact
- Factors causing the artifact
  - Steeper and more variable/fluctuating Hill of Vision superiorly
  - Many possible obstructions: lids, lashes, brows, deep set eyes, lens rim, etc.
- Glaucmatous VF loss is also very common in this area; this is true VF loss and must be detected!!
- **CAREFULLY** correlate any apparent VF loss in superior VF to other signs, i.e., ONH damage, RNFL defect, etc.
Recognizing Patterns of VF Loss

The Visual Pathways & Patterns of VF Loss

Recognizing Patterns of True VF Loss

Why is the pattern of misses important in VF screening?

- Recognizing the pattern helps to determine that the misses on a screening are due to true, organic VF loss rather than artifact
- Recognition of the pattern is very important in localizing the site of the lesion causing the misses and determining the probable cause/type of lesion (important diagnostically)
The Visual Pathways

*Four Territories*

- Territory 1 - outer retina, choroid
- Territory 2 - inner retina and optic nerve (ON)
  - Ganglion cells and their axons, ONH, ON up to the chiasm
- Territory 3 - optic chiasm
- Territory 4 - post chiasmal visual pathway
  - Optic tract, LGN
  - Visual radiations
  - Visual cortex
Visual Pathways

**Territory 1**

- Outer retina, choroid
- VF loss tends **not** to follow the patterns of other territories
- VF characteristics:
  - Monocular or binocular depending on the disease. Many of these diseases are bilateral.
  - Ophthalmoscopic appearance correlates to location, size, shape of VF loss usually – ophthalmoscopy very important!!
    - Macular degeneration, dystrophies and other macular disorders tend to produce central scotomas
    - The VF loss of other Territory 1 retinal disorders corresponds to the ophthalmoscopic location of the disorder i.e. early RP – VF loss about 40º to 60º from fixation (the mid-periphery of the VF)
- Common examples of Territory 1– diseases of the outer retina and choroid:
  - Age-related macular degeneration, choroidal melanoma, RP, retinal detachment, choroidal scars etc.

If VF loss is caused by this where would it be??
If VF loss is caused by these where would they be? Mark the location(s) on the N30 VF in next slide
52 y/o male with c/o of 2 day onset of blur OS
In your entrance tests:
Would confrontations detect this?
Would color vision be helpful?
Would pupils be helpful?
What type of VF defect is present – name it?
Ddx of the cause of the VF defect?

Wet AMD
(age-related macular degeneration)
Central scotoma
Possible presentations

Macular Degeneration

Amsler grid
Normal Amsler grid  Scotoma and metamorphopsia
If this produces a VF defect where would it be? At fixation.
Are there other tests in the comp exam that could show evidence of this? VAs, color vision (blue-yellow defect)

The pointer is used to mark the fovea; patient is instructed to look at the tip of the pointer.
If this causes a VF defect where would it be in the VF?
_immediately adjacent to fixation in the superior temporal quadrant_
You are performing BIO on a patient’s right eye, standing to the patient’s right side with the patient looking up to his left. Area of fundus in this BIO view? If this causes VF defect where would it be?

OPTOMAP of OS
Will the lesion show on CF confrontations? On FDT? Where would this lesion be in the VF?

Answer: About 60º nasal and just above the nasal horizontal midline
Visual Pathways

**Territory 2**

- Ganglion cells and their axons up to the optic chiasm
  - Ganglion cell body, RNFL, ONH, ON
- VF loss characteristics
  - Usually monocular VF loss (unless bilateral lesions)
    - Some diseases tend to be bilateral such as glaucoma
  - Correspond to distribution of axon bundles in the affected structure, i.e., RNFL, ONH or ON

Retinal Nerve Fiber Bundles

- Papillomacular bundle
- Arcuate bundles
- Nasal radial bundle
Papillomacular (PM) Bundle

- About 70-90% of all ganglion cell axons
- From macula to temporal side of ONH
  - Enters ONH from about 8:00 to 10:00 on right ONH and from 2:00 to 4:00 on left ONH
- Very fine caliber bundles → very thin RNFL with very fine bundles → PM bundles are very difficult to visualize clinically
- Damage to PM bundle → central scotoma or centrocecal scotoma

Damage to PM Bundle

Possible Clinical Signs

- Central or centrocecal scotoma
- Reduced visual acuity
- Reduced contrast sensitivity
- Color vision loss/change
  - By Kollner’s rule - R-G defect for ganglion cells (RNFL, ONH, ON)
- Decreased direct pupillary light reflex causing: L-N dissociation and APD if unilateral or if asymmetric damage
- PM RNFL loss (but very hard to see clinically) &/or temporal pallor of ONH (hard to detect due to the wide variation of color of temporal rim in normals – myopes tend to have a pale temporal rim)
Arcuate Bundles

- From **all** retina temporal, superior and inferior to fovea
- **All** temporal retinal fibers are arcuate fibers
- A **few** nasal retina fibers are arcuates
- **IMPORTANT**: temporal retina means temporal to an imaginary vertical line through the **fovea**. This corresponds to the vertical midline of the VF
- Arcuates from temporal retina arc over/under the PM bundle - **they do not cross the temporal horizontal raphe'** which corresponds to the nasal horizontal midline of the VF

Arcuate Bundles

- **Thicker bundles** – much easier to visualize ophthalmoscopically than PM bundle or NR bundle
- Enter superior and inferior ONH
  - For right ONH from about 10:00 to 1:00 and 8:00 to 5:00
  - For left ONH from about 11:00 to 2:00 and 7:00 to 4:00
OPTOMAP of OS
Note defect in inf arcuate bundle loss

Key VF Landmarks
Anatomic Correlates

<table>
<thead>
<tr>
<th>VF Landmark</th>
<th>Anatomic Correlate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical midline</td>
<td>None- <em>imaginary</em> vertical line through the fovea</td>
</tr>
<tr>
<td>Fixation point</td>
<td>Fovea</td>
</tr>
<tr>
<td>Nasal horizontal midline</td>
<td><em>Temporal</em> horizontal raphe’</td>
</tr>
<tr>
<td>Temporal horizontal midline</td>
<td>None – the temporal horizontal midline is <em>not</em> an important landmark because there is no anatomic correlate</td>
</tr>
<tr>
<td>Blindspot</td>
<td>Optic nervehead</td>
</tr>
</tbody>
</table>
RNFL Bundles
*Corresponding VF Regions*

- PM bundle - centrocecal region
- Arcuate bundles - Bjerrum or arcuate region
- Nasal radial bundle - temporal wedge region
- Note: damage may produce loss of whole region or, more likely, VF loss in small part of the region.

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**Damage to Arcuate Bundle**
*Possible VF Defects*

- Arcuate scotoma - arc-shaped scotoma in arcuate region
- Vertical enlargement of BS (Seidel’s sign)
- Paracentral scotoma - small scotomas within 20° or 30° of fixation
- Nasal step - scotoma immediately adjacent to nasal horizontal midline, has edge at the nasal horizontal midline
- Complete arcuate scotoma - entire arcuate region is abnormal
Damage to Arcuate Bundles

Key Characteristics of VF Loss

- Unilateral (unless bilateral lesions)
- In arcuate region of VF
- Does not cross ("respects") the nasal horizontal midline
JB
HFA C 24-2 threshold

OD
Reliable? Yes though 11% false negatives

Pattern? Yes - same as on the C40 screening: sup & inf paracentral scotomas and sup & inf nasal steps

EG
FDT C20-5 Screening

OD: Pattern?

OS: Pattern?
HFA C40
2/2 False Negatives
Reliable VF??
Normal or abnormal VF?
Is there a pattern to the misses?

PvS
HFA C40 Screening
Reliable? Yes
Normal?
1 miss in OD
2 misses in OS
Are these misses artifactuous?
 Territory 2 VF Loss

**Common Causes**

- Glaucoma
- Branch retinal vein obstruction (BRVO)
- Ischemic optic neuropathy
- Optic neuritis
- Congenital ONH anomalies
  - Optic pits, drusen, ON hypoplasia
- Many other causes
Nasal Radial Bundles

- From retina nasal to ONH and somewhat superior and inferior nasal to ONH
- Enter nasal ONH from about 1:00 to 5:00 for right ONH
- NR bundles do not respect the nasal horizontal midline of the eye → no respect for temporal horizontal midline of VF
  - The temporal horizontal midline is NOT diagnostically important
- Damage if at ONH produces wedge- or pie-shaped VF defect pointing to the temporal side of the BS

Optic Nervehead

- Cup contains no axons
- Rim tissue contains axons
Retrobulbar ONH

- PM bundle migrates to central core of ON about 2 to 3 mm behind globe
- Fibers from temporal retina take the place of PM bundle in temporal ON
Territory 2 Damage

Differentiation of the Cause

• Ophthalmoscopy very helpful
• Retrobulbar ON damage will progress down ONH (retrograde atrophy shows as pallor of the ONH rim tissue) and will appear in ONH in 1 to 3 months after the damage
• Before 1 to 3 months neuroimaging may be needed differentiate the cause of retrobulbar ON damage
• Pupil signs - decreased direct light reflex, L-N dissociation and +APD (APD if asymmetric or unilateral)

FDT C20-5

Reliable?
Normal or abnormal VF?
Pattern?
If this is true, organic VF loss where could the lesion be that caused it?
**Territory 3 - Optic Chiasm**

**Key Anatomy**

- Nasal retina fibers from each eye cross in median bar of chiasm (53-55%)
  - Fibers from inferior nasal retina are inferior in chiasm and loop into the contralateral optic nerve
    - Anterior knee of von Willebrand
  - Fibers from superior nasal retina are superior in chiasm, may loop into the contralateral tract
    - Posterior knee of von Willebrand
- Temporal retina fibers from each eye continue posteriorly in lateral sides/angles of chiasm
  - Fibers from inferior temporal are inferiorly
  - Fibers from superior temporal are superiorly
Nasal Retinal Fibers vs Temporal Retinal Fibers

- All temporal retinal fibers are in the arcuate bundles
  - Temporal fibers are those that arise from ganglion cells temporal to an imaginary vertical line that goes through the fovea
  - Damage to temporal fibers causes pallor at the superior & inferior poles of the ONH
- Nasal retinal fibers are:
  - Nasal radial bundles → enter the nasal ONH
  - PM bundles → enter the temporal ONH
  - Very few arcuate bundles → enter the sup & inf ONH
  
    *Damage to all nasal fibers causes a band of pallor across the ONH (nasal rim & temporal rim pallor)*

Patterns of Chiasmal VF Loss

- Anterior junctional scotoma
- Bitemporal heteronymous VF loss
- Inferior bitemporal VF loss
- Binasal heteronymous VF loss
Anterior Knee of Von Willebrand
Anterior Junctional Scotoma

- Fibers from inferior nasal retina OU loop anteriorly into the inferior posterior contralateral ONH where it meets the chiasm
- Damage (usually from below anterior chiasm) causes superior temporal quadranopsia to contralateral side and optic nerve VF loss (central scotoma, arcuate, etc.) ipsilateral to lesion - anterior junctional scotoma
- Common cause is post-fixed chiasm (chiasm posteriorly displaced so that the anterior chiasm sits over pituitary) with pituitary adenoma

Left anterior junctional scotoma
OS: ON nerve fiber bundle (PM bundle) VF defect
OD: Sup temp VF defect, respects vertical midline
**Crossing Nasal Fibers**

**Bitemporal Heteronymous VF Loss**

- Classic chiasmal VF loss
- Damage to crossing nasal fibers, mostly the PM and nasal radial bundles
- Most common cause is pituitary adenoma
  - Since pituitary comes from below chiasm, superior bitemporal heteronymous quadranopsis are common early
  - Later the VF loss spreads into the inferior temporal quadrants of each eye but the VF loss is largest &/or deepest/densest in the superior temporal VF
  - Later still the superior temporal fibers can be compressed causing the VF defect to cross the vertical midline into the inferior nasal VF
Heteronymous vs Homonymous

- Heteronymous
  - Due to chiasmal damage where **VF loss is in opposite sides of the vertical midline**, i.e., nasal OD and nasal OS (binasal OU) or bitemporal OU

- Homonymous
  - Due to post chiasmal damage → crossing nasal fibers are anatomically close to temporal fibers from the contralateral eye (corresponding retinal points)
  - **VF loss is on the same (left or right) side of the midline**, i.e., left VF loss OD with left VF loss OS - left homonymous VF loss
Inferior Bitemporal Heteronymous Quadranopsia

- Lesions coming from superior and posterior to posterior notch of the chiasm compress crossing superior nasal fibers
- VF loss appears initially in the inferior temporal VF of each eye and/or is deepest in the inferior temporal VF
- Most common cause is craniopharyngioma

Binasal VF Loss

- Temporal fibers occupy the lateral sides of the chiasm
- Lesions on both lateral angles of the chiasm may cause binasal VF loss
- Very, very uncommon to get true (does not cross the vertical midline) binasal since there must be lesions in 2 places
- VF loss that is due to arcuate damage to each eye in Territory 2 is very common but it is not true binasal VF that respects the vertical midline. It is MUCH more common than true binasal VF loss.
- Can cause binasal heteronymous hemianopsia
**Territory 3 VF Loss**

**Clinical Differentiation**

- Pattern of VF loss, i.e., superior bitemporal, anterior junctional scotoma, etc. is very helpful
- Ophthalmoscopy - ONH pallor and RNFL loss will likely have a characteristic pattern
  Pituitary adenoma - crossing nasal fibers (PM & NR bundles) → “bow tie atrophy” - across both ONHs
- Pupils - depends on lesion location
  - Pupils only affected if lesion anterior to brachium of superior colliculus
  - Right tract lesion → L-N dissociation OU + mild (1-2+) left APD
- Neuro-imaging
QUICK REVIEW

• Territory 1 - outer retina/choroid
  “What you see is what you get”
  What you get in the VF should be what you see in the eye
  VF loss does not follow the patterns of other territories (unless by coincidence)
  Monocular lesions most common but binocular lesions are not uncommon
  Macular lesions can occur and cause central scotoma; ARMD is common cause

QUICK REVIEW

• Territory 2 – RGCs and their axons up to but not including the chiasm
  One or more of 3 nerve fiber bundles
  PM – macular dysfunction → ↓VA, ↓color vision, central or centrocecal scotoma, pallor of temporal rim, loss of RNFL in PM bundle
  Arcuate bundles (inf or sup or both) → various VF defects confined to the arcuate (Bjerrum) area of the VF & does not cross the nasal horizontal midline
QUICK REVIEW

• Territory 2 – continued
  Nasal radial bundle – corresponds to
temporal wedge of the VF because the
fibers go directly into the ONH from
retina nasal to the ONH → wedge
shaped VF defects temporal to the BS

IMPORTANT DATES IN OHP 1

• Tuesday 1/25/11 – last lecture!!!!
• Monday 1/31/11 2:00 to ~3:30 – VF
  review by Danielle Leong – optional
  but recommended
• Monday 2/7/11 – final lab proficiency
• Monday 2/14/11 12:30 to 3:00 – final
  exam
Territory 4
Post-Chiasmal Visual Pathways

- Optic tracts
- LGN
- Visual radiations
  - Temporal lobe
  - Parietal lobe
  - Occipital lobe
- Visual cortex
Territory 4 VF Loss

Common Characteristics

- Homonymous
  - Respects vertical midline
  - VF loss is to the same side in both eyes, i.e., left side or right side
- VF defect is contralateral to lesion
- VF defect may look similar or even identical in the two eyes (congruity)

Homonymous VF Loss

- Characteristic of post chiasmal lesion
- VF is damaged to the same side of the vertical midline in each eye, i.e., right side OD & right side OS - right homonymous hemianopsia
- A characteristic of post chiasmal VF loss ONLY
Congruity

- A characteristic of post chiasmal VF loss only
- As the visual radiations approach the visual cortex the fibers from corresponding retina points are anatomically close together → damage to fibers from one eye is more likely to be associated with damage to the other fibers from the other eye
- VF defects are much more similar, usually identical, in lesions of the visual cortex
- Congruity increases the more posterior the lesion is in territory 4
- **Cannot** judge congruity if the VF defect is total/complete (all points in the whole hemifield) and absolute (no sensitivity at all)
Optic Tract

- Not a common site of lesions
- Characteristics of VF loss
  - Homonymous
  - Congruity is not good
- Other clinical signs
  - Pupils - mild contralateral APD if very destructive lesion in anterior optic tract (anterior to brachium of sup colliculus)
  - ONH pallor at 12:00 and 6:00 (arcuate bundles) ipsilateral to lesion and pallor at 3:00 and 9:00 (PM and nasal radial bundles) contralateral to lesion

Left homonymous inferior incongruous sector defect
Temporal Lobe

- Fibers from superior retina are located more medially toward interhemispheric fissure
- Fibers from inferior retinas loop far out around the inferior horn at lateral ventricle - Meyer’s loop
  - Long course makes the inferior fibers much more likely to be damaged than superior fibers
Temporal Lobe
*Characteristics of VF Loss*

- Homonymous
- Poor congruity
- Superior VF more affected than inferior VF
  - Deeper (lower sensitivity on a threshold test) superior VF loss (than inferior VF) on threshold perimetry
  - Larger amount of superior VF loss (more affected points in superior VF than in inferior VF)

**Right homonymous superior incongruous quadrantanopsia**

“Pie in the sky”
FDT C 20

**Dense sup left homonymous quadranopsia**
**Parietal Lobe**

- Fibers from corresponding points are physically closer together → greater congruity
- Fibers from superior retina are more likely affected → VF loss in inferior field or densest VF loss inferiorly
Parietal Lobe

*Characteristics of VF Loss*

- Homonymous
- Good congruity
- Densest inferiorly or most area of the VF loss is inferiorly
- Extinction phenomenon possible
Inferior left homonymous quadrantanopsia
“Pie on floor” defect

FE
FDT C 20

Dense inf left homonymous quadrantanopsia
**Occipital Lobe/Cortex**

- Fibers from corresponding retinal points are anatomically very close/adjacent → **very high congruity**
- Macular fibers project to the most superficial posterior portion of cortex
- Temporal crescent fibers (from far nasal peripheral retina) are far anteriorly on contralateral side of the interhemispheric fissure e.g. left visual cortex for temporal crescent of the VF in the right eye
- Inferior vs. superior split
  - Fibers from superior retina project above the calcarine fissure; inferior fiber project below
- Dual blood supply (MCA & PCA) to macular region - macula often “spared” if a stroke
Dual (PCA & MCA) blood supply to visual cortex - at occipital pole (macular region)

Occipital Lobe/Cortex

Characteristics of VF Loss

- Homonymous
- High congruity
- Macular sparing common with stroke
- Small, highly congruent homonymous scotomas are common
Right homonymous hemianopic scotoma
High congruity - likely visual cortex

KN
HFA C 40
Complete right homonymous hemianopsia
Cannot tell density. Cannot localize the precise site of the lesion - can only tell that it is left postchiasmal & very destructive.
Reliable?
Normal?
If VF loss where is lesion?
How would you find lesion?
Where to look for lesion?