

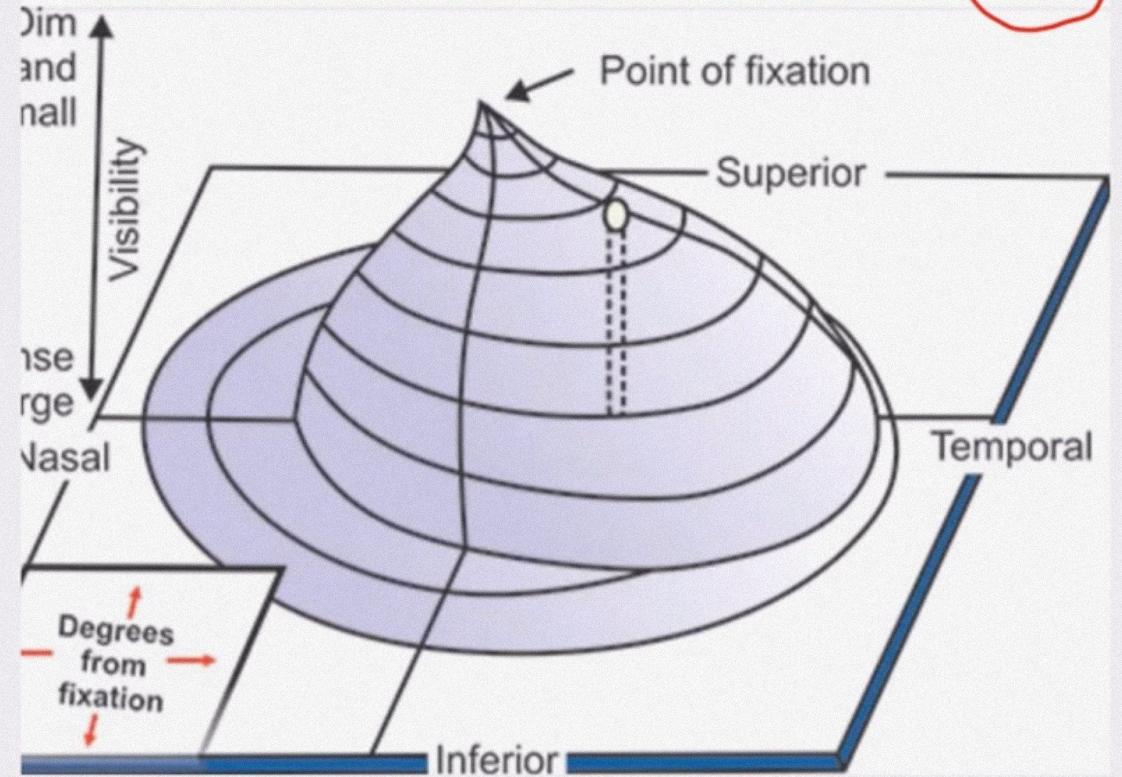
Insight ophthalmology

VISUAL FIELD DEFECTS IN GLAUCOMA



VISUAL FIELD

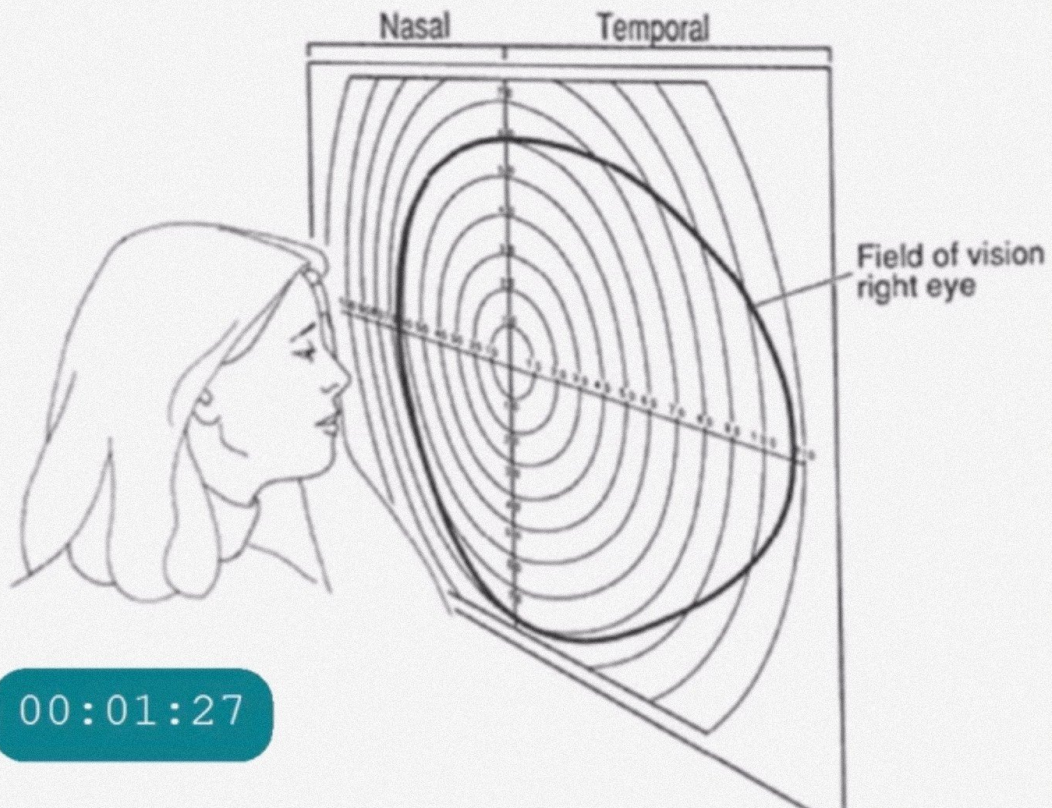
- Defined as the area that is perceived while fixating one central target.
- **TRAQUAIR'S ANALOGY**, visual field is “an island of vision surrounded by a sea of darkness”.



00:00:51



NORMAL FIELD OF VISION



- 50° superiorly,
- 60° nasally,
- 70° inferiorly and
- 90° temporally.

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ABOUT BLINDSPOT

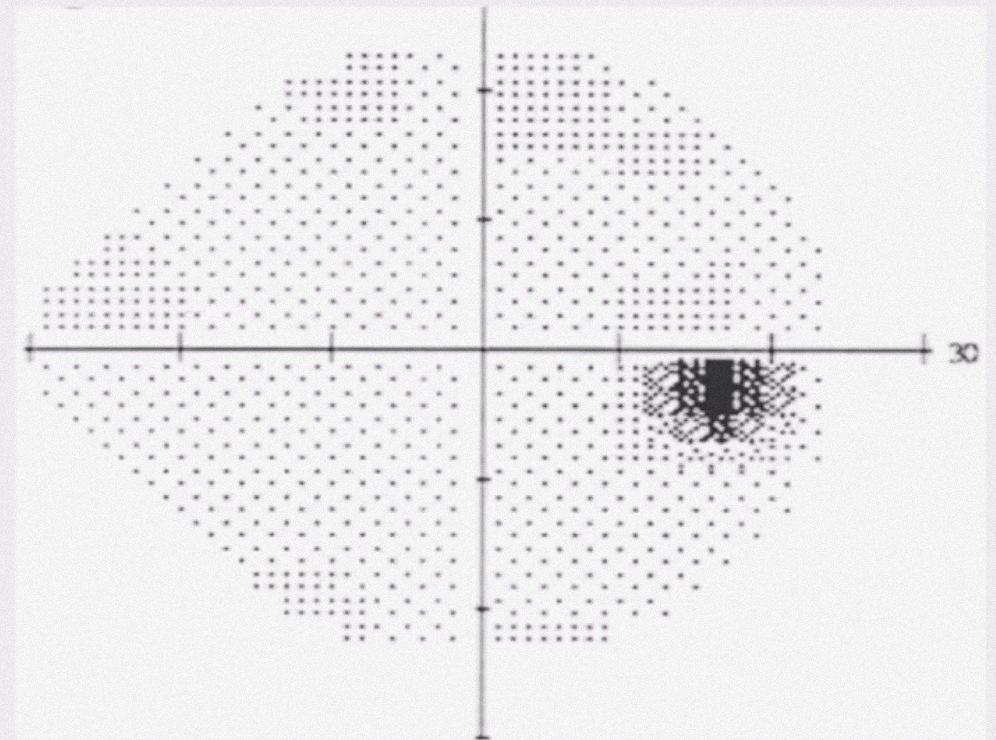
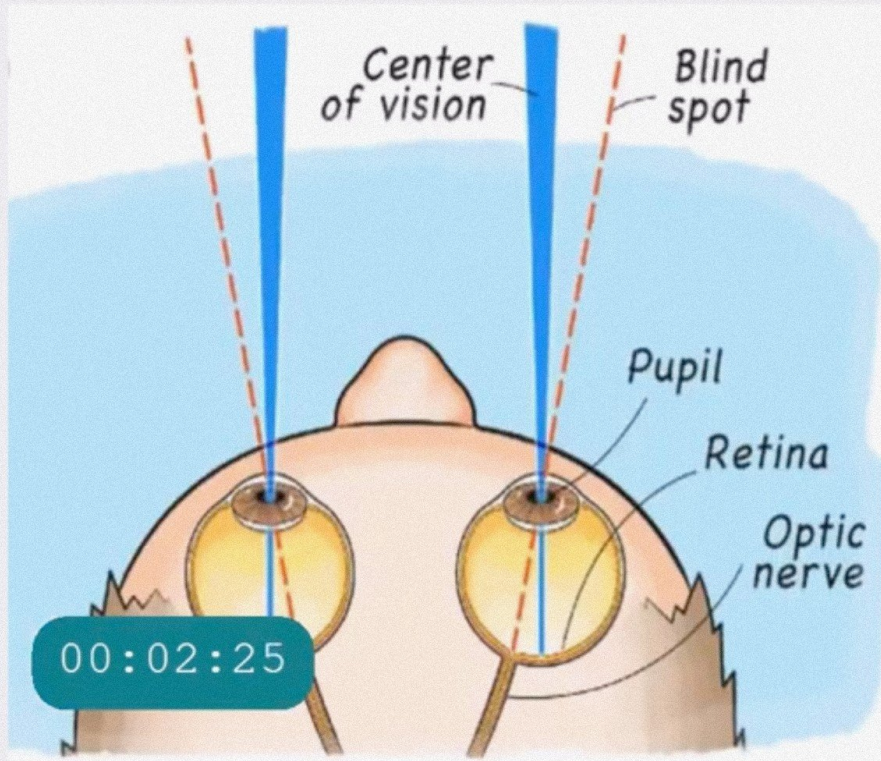


- Normal blind spot is 15° temporal to the fixation and measure 6° wide and 8° high.

00:02:10

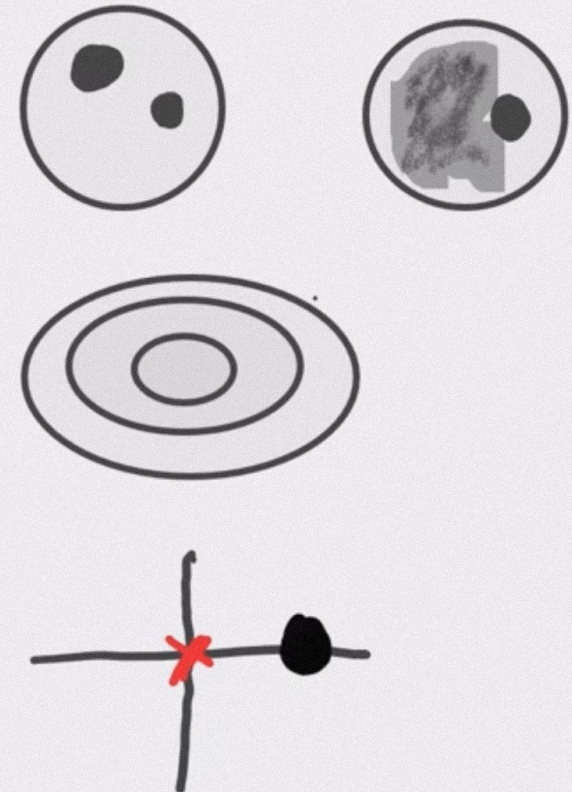


WHAT IS BLIND SPOT?



IMPORTANT TERMINOLOGIES

- **SCOTOMA**: Area of reduced sensitivity surrounded by a more sensitive area.
- **DEPRESSION**: Area of reduced sensitivity without a normal surround
- **ISOPTER**: A threshold line joining points of equal sensitivity on a visual field chart
- **FIXATION**: Part of visual field corresponding to fovea centralis



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- **CENTRAL FIELD:** Portion of visual field within 30° of fixation
- **BJERRUM'S AREA:** Central visual field within 25° of fixation

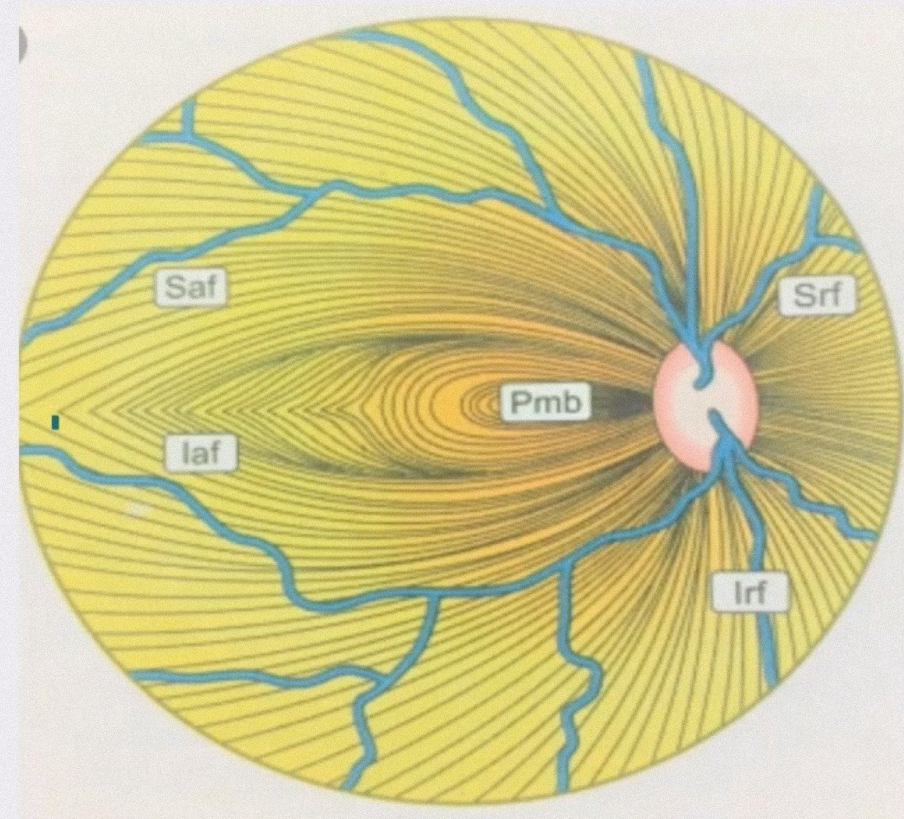
Isopter plot



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DISTRIBUTION OF FIBERS IN RETINA

- **NASAL RETINA** → superior and inferior radiating fibers (srf and irf).

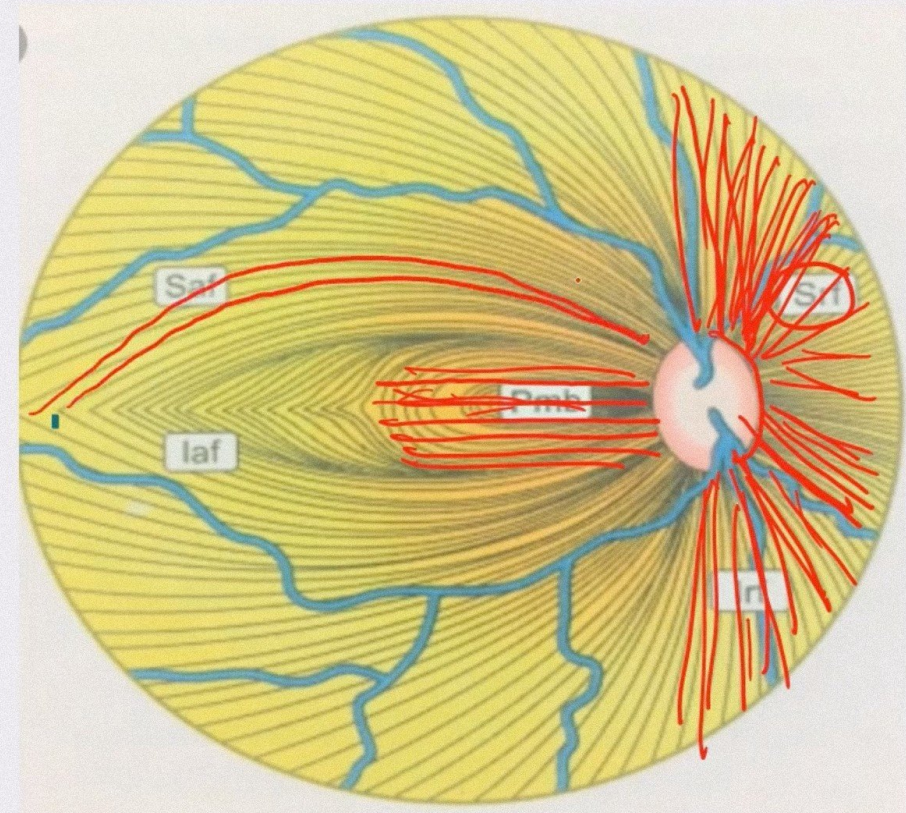


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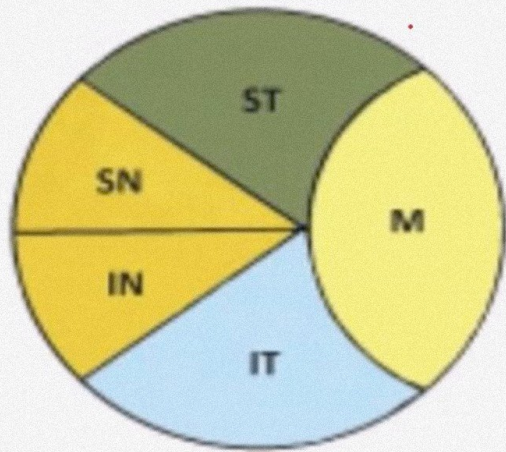
DISTRIBUTION OF FIBERS IN RETINA

- **NASAL RETINA** → superior and inferior radiating fibers (srf and irf).
- **MACULAR AREA** → papillomacular bundle (p.m).
- **TEMPORAL RETINA** → superior and inferior arcuate fibres with a horizontal raphe in between (saf and iaf).

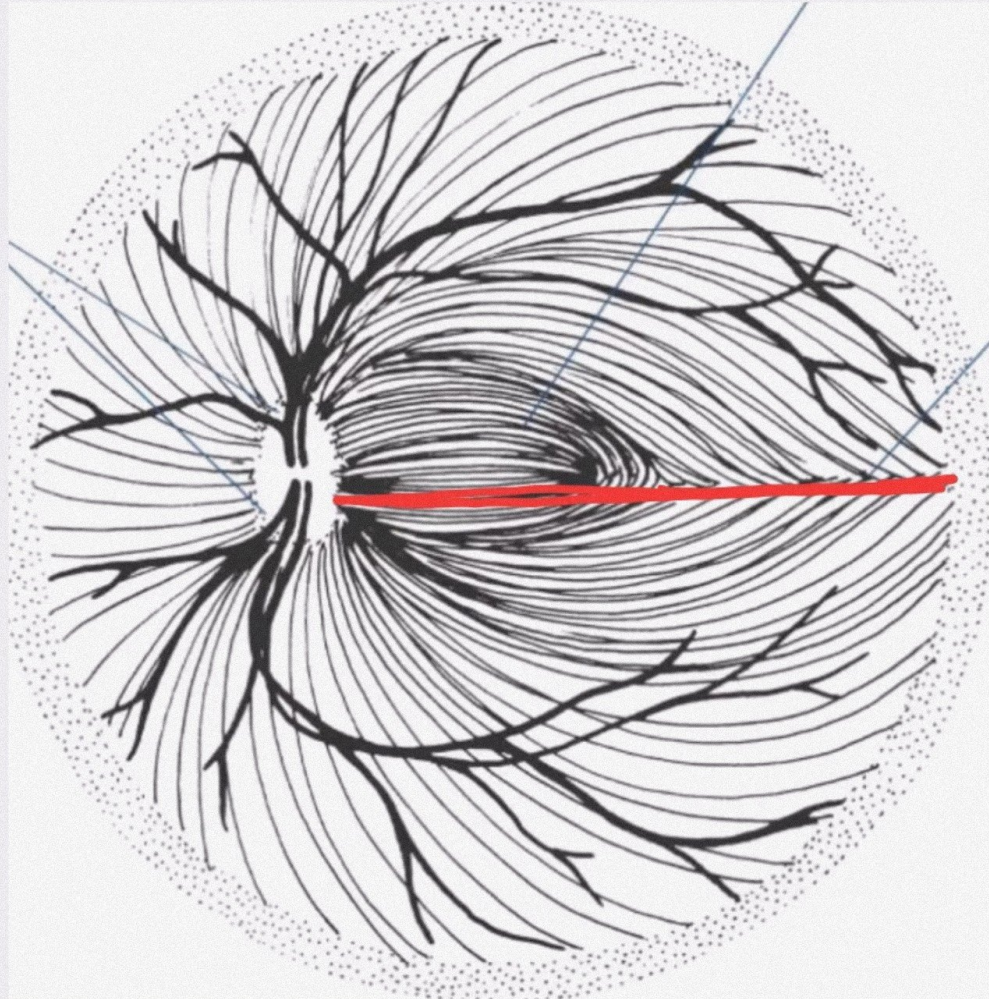


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Optic disc of left eye



HORIZONTAL
RAPHE

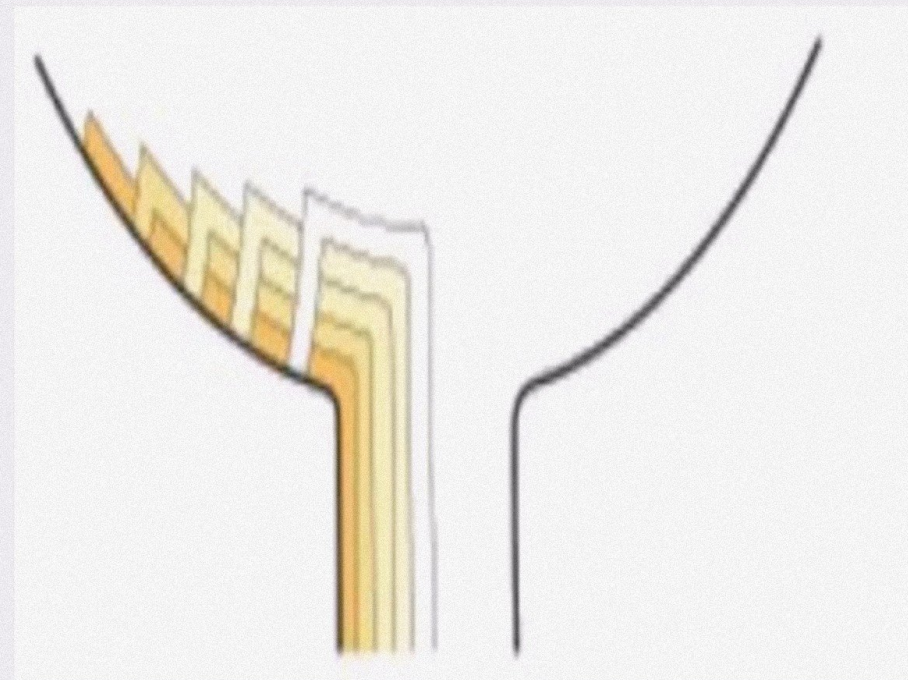
00:09:50



DISTRIBUTION INSIDE OPTIC NERVE

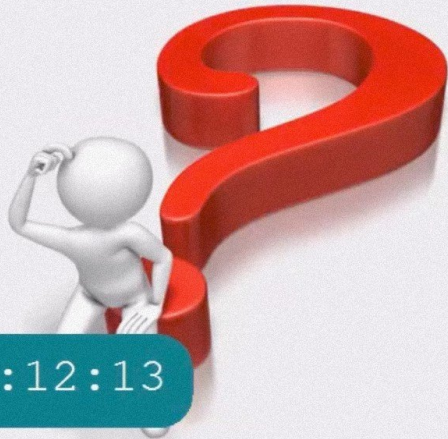
- Arrangement of nerve fibers within Optic Nerve Head (ONH):
- **DEEPER FIBERS** from peripheral retina occupy peripheral or superficial location in ONH
- **SUPERFICIAL FIBERS** from central retina occupy central or deep location in ONH

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WHICH FIBRES ARE THE MOST SENSITIVE?

- **ARCUATE NERVE FIBERS** are the most sensitive to glaucomatous damage and stop at horizontal raphe



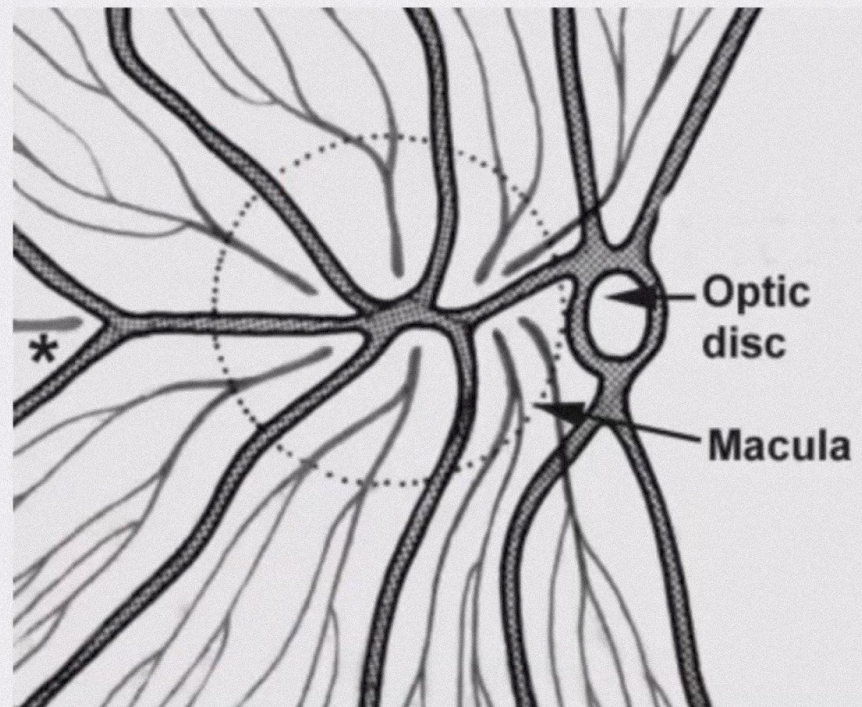
00:12:13

Why is arcuate fibres more susceptible or involved earlier?



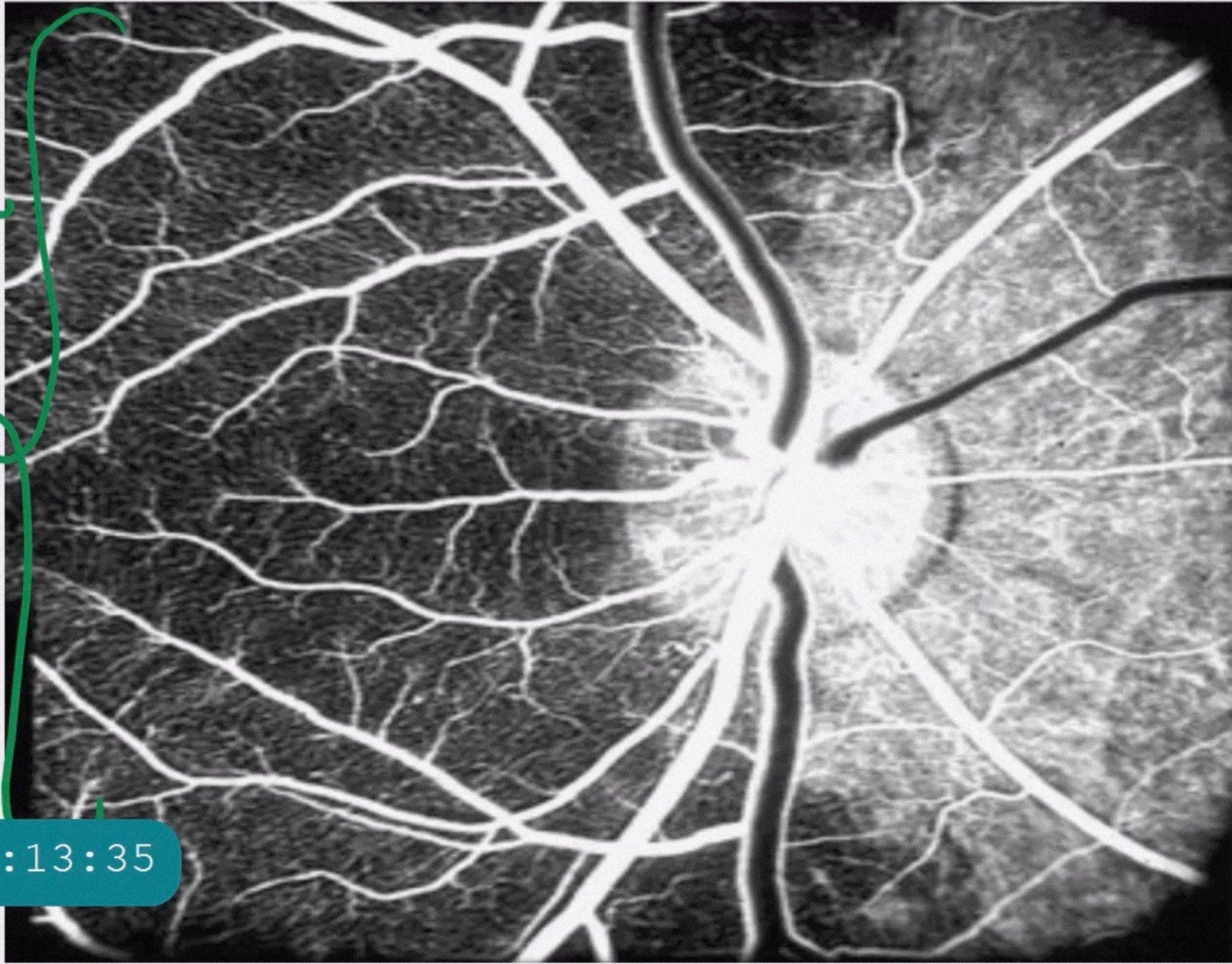
WATERSHED THEORY

- The superior and inferior poles of the optic nerve head may be watershed areas at the junction of the vascular supply from adjacent ciliary vessels.



00:12:43





Lateral
PCA

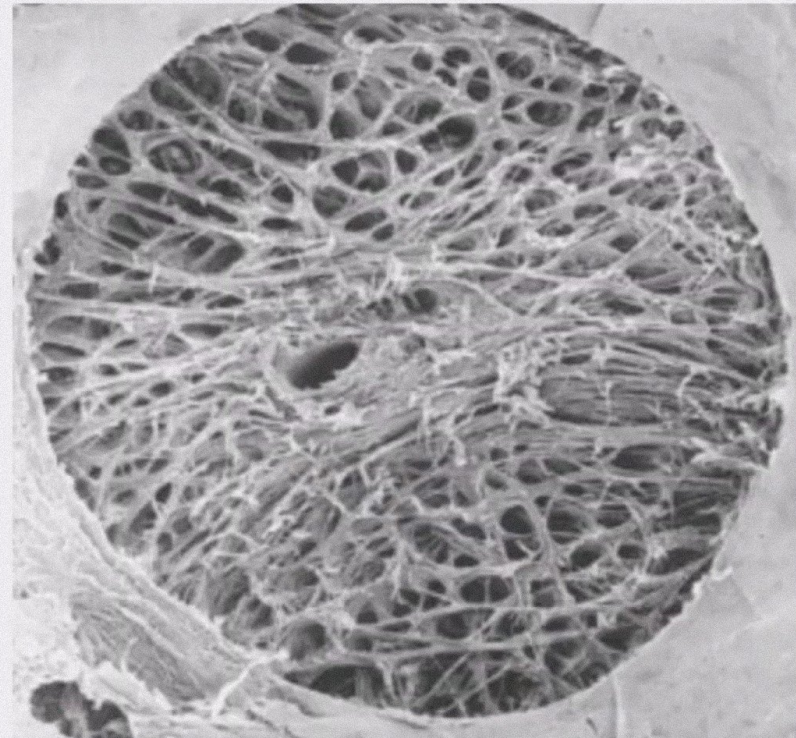
00:13:35

MEDIAL
PCA



PORES THEORY

- Ultrastructural examination of the lamina cribrosa shows that the pores in the superotemporal and inferotemporal areas are larger.
- The large pores may make these regions more vulnerable to compression



00:14:18



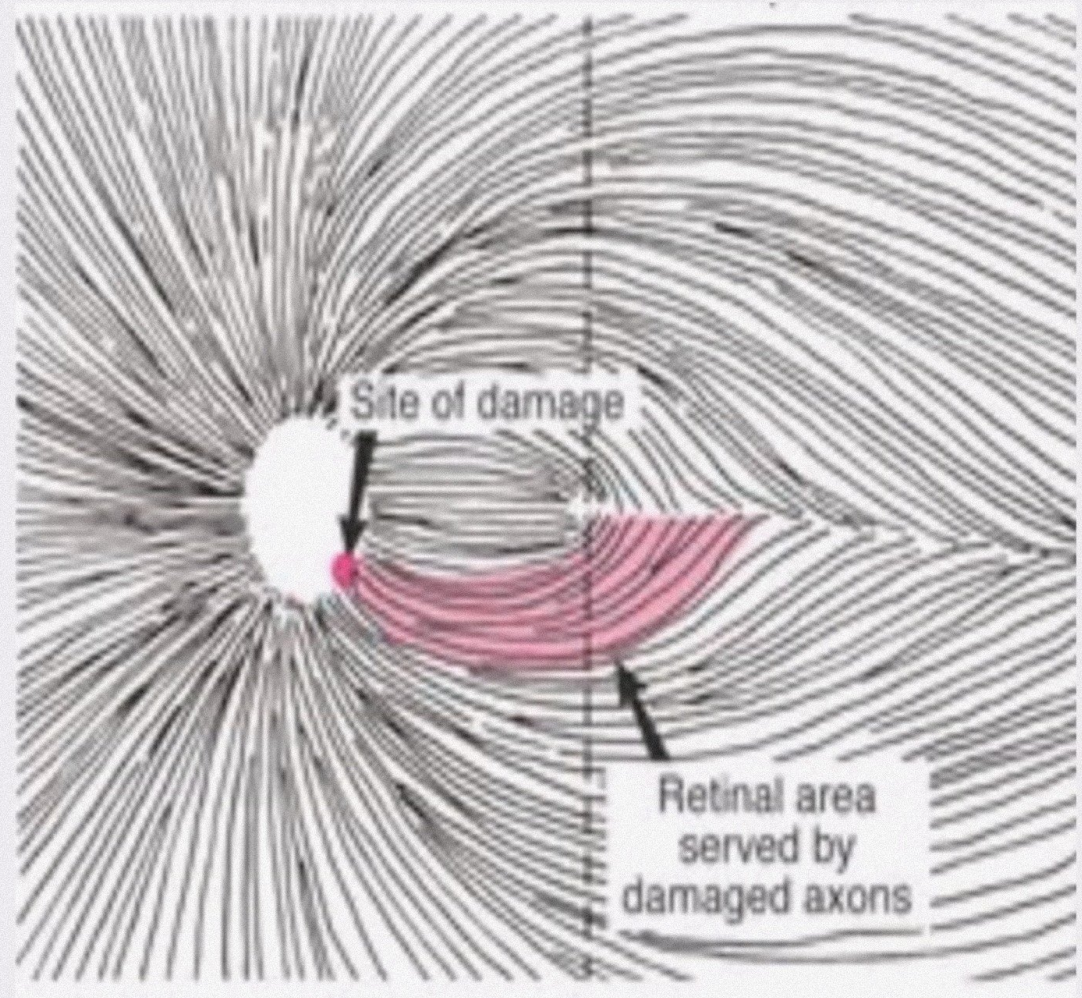
WHAT FIBRES ARE MOST RESISTANT ?

Macular
FIBRES

00:15:15



- **Inferior arcuate fibers** are more susceptible resulting in arcuate scotomas earlier in **Superior visual field**.
- **Radiating fibers** are more **resistant** to glaucomatous damage
- **MACULAR FIBERS ARE THE MOST RESISTANT** to glaucomatous damage



00:15:24

... of central vision till end).



GLAUCOMATOUS FIELD DEFECTS

NON SPECIFIC FEILD DEFECTS

SPECIFIC FEILD DEFECTS

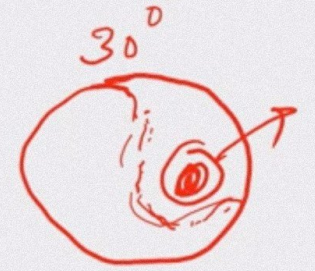
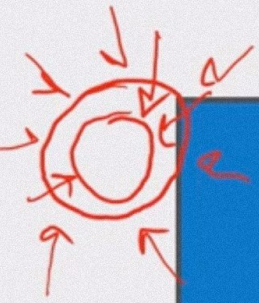
EARLY SPECIFIC

LATE SPECIFIC

ADVANCED

00:00:32





EARLY NON SPECIFIC DEFECTS

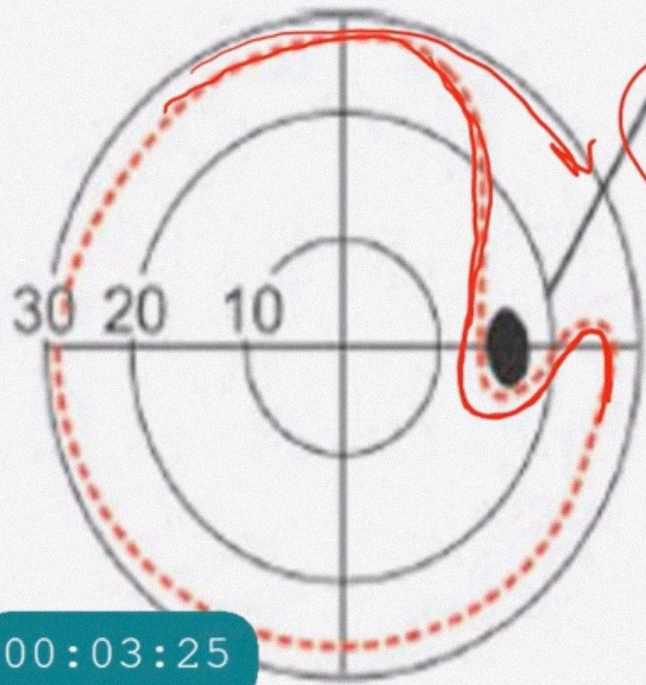
Isopter contraction :- (Generalized depression): Mild constriction of central and peripheral field.

Baring of blind spot: Exclusion of blind spot from the central field due to inward curve of the outer boundary of 30° central field.

Enlargement Of blind spot :- depression of peripapillary retinal sensitivity. β -Peripapillary atrophy, which frequently accompanies glaucomatous damage.

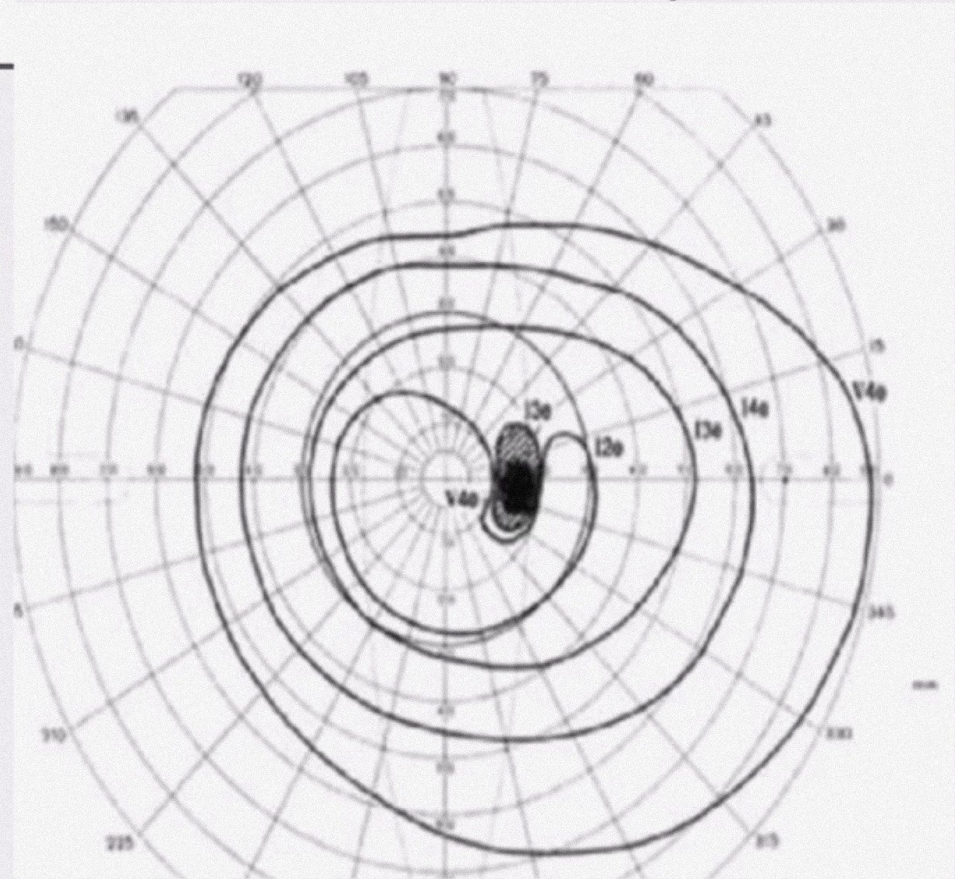
00:01:54



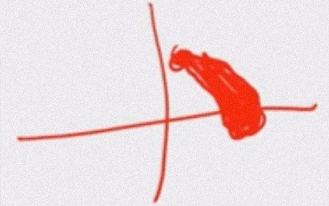


Localized
constriction

00:03:25



EARLY SIGNIFICANT



Paracentral scotoma : usually wing shaped .

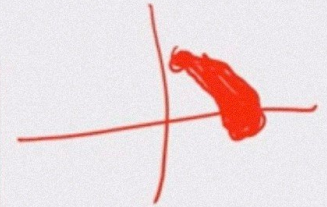
Siedel's sickle-shaped scotoma:
Paracentral scotoma joins the blind spot
(it is also known as **DERRINGER**
SCOTOMA)

NASAL STEP : small area of depression above or below the horizontal raphe in nasal visual field

00:01:09



EARLY SIGNIFICANT



Paracentral scotoma : usually wing shaped .

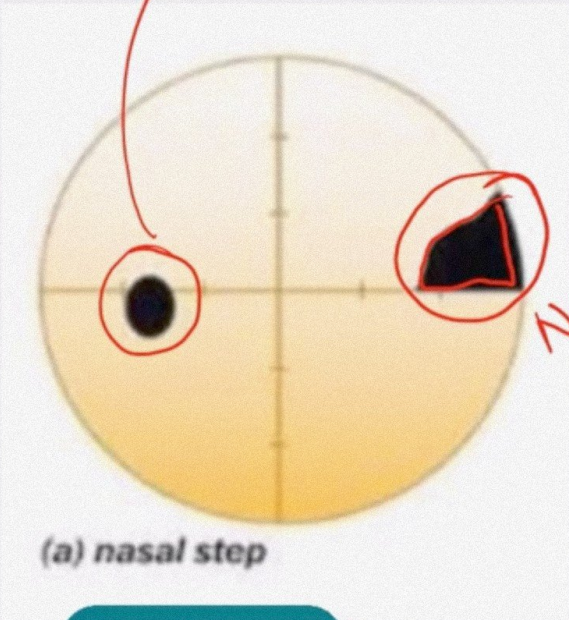
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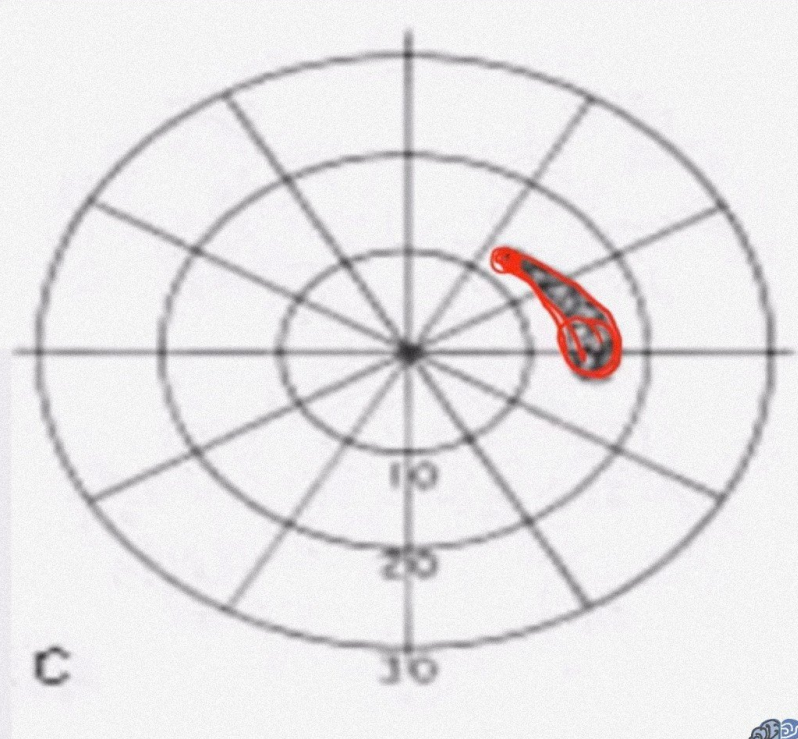
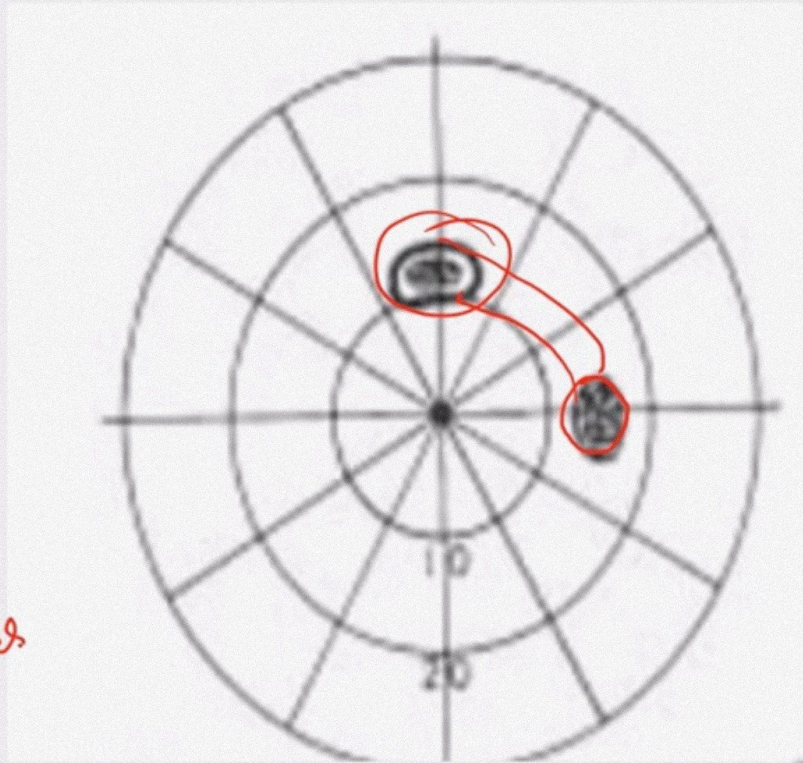
- Paracentral and Siedel Sickle Shape Scotomas are central Scotomas
- Nasal step is in peripheral vision

00:01:09





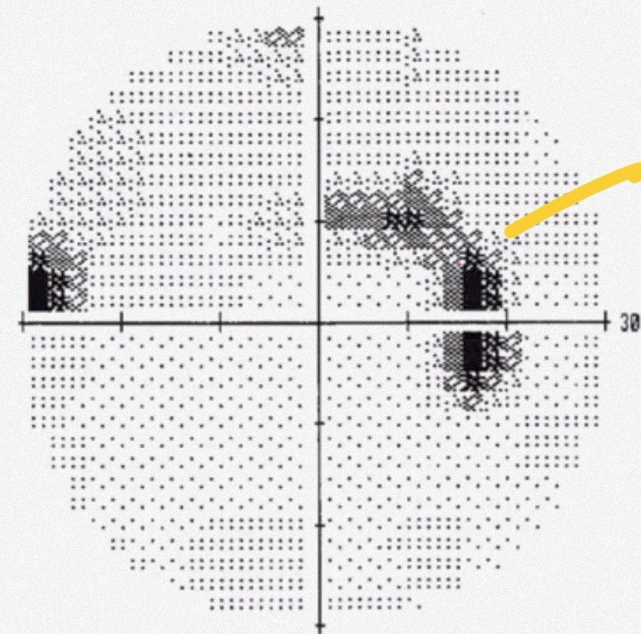
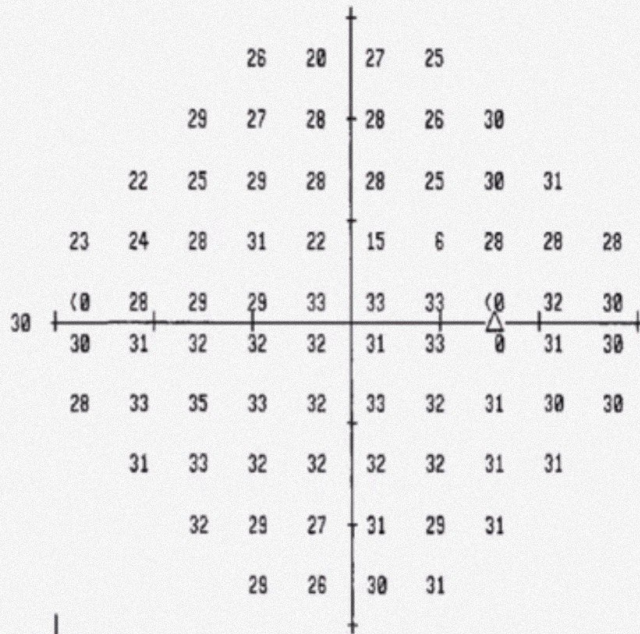
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C



0%
7%
08:02



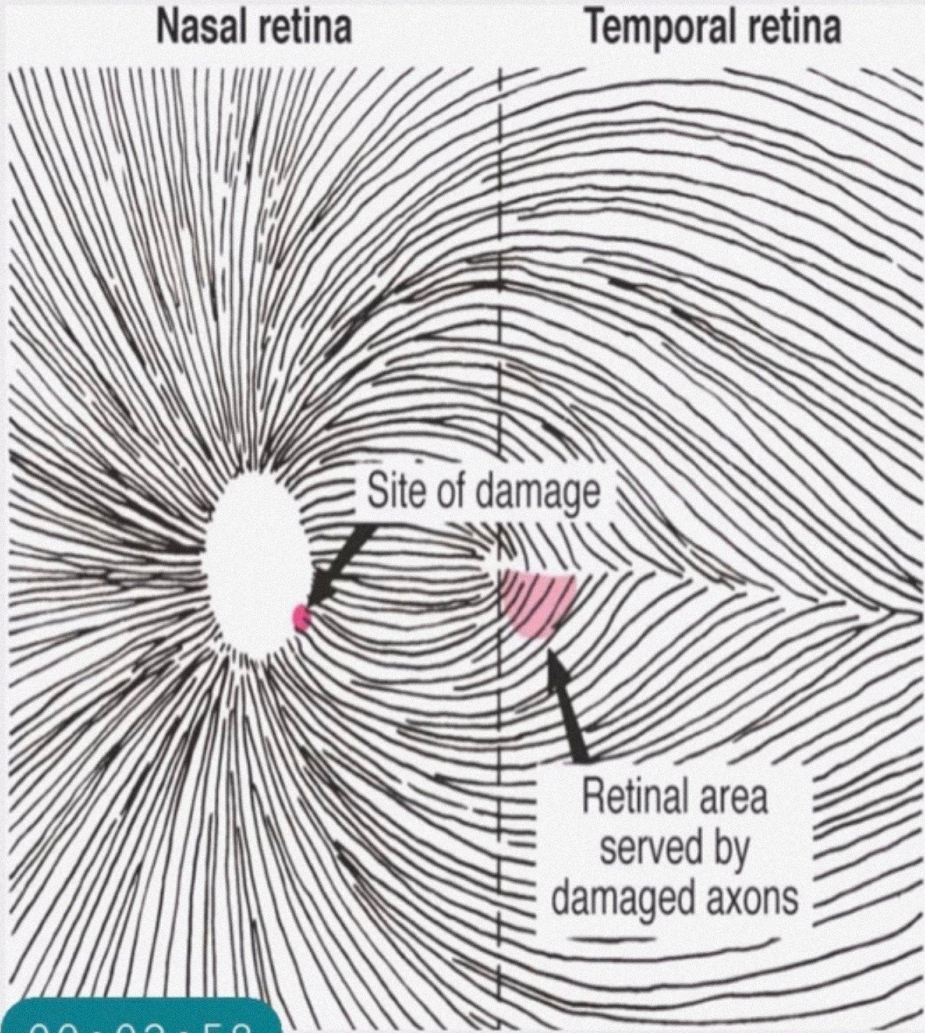
Siedel
Sotomayor

00:02:31

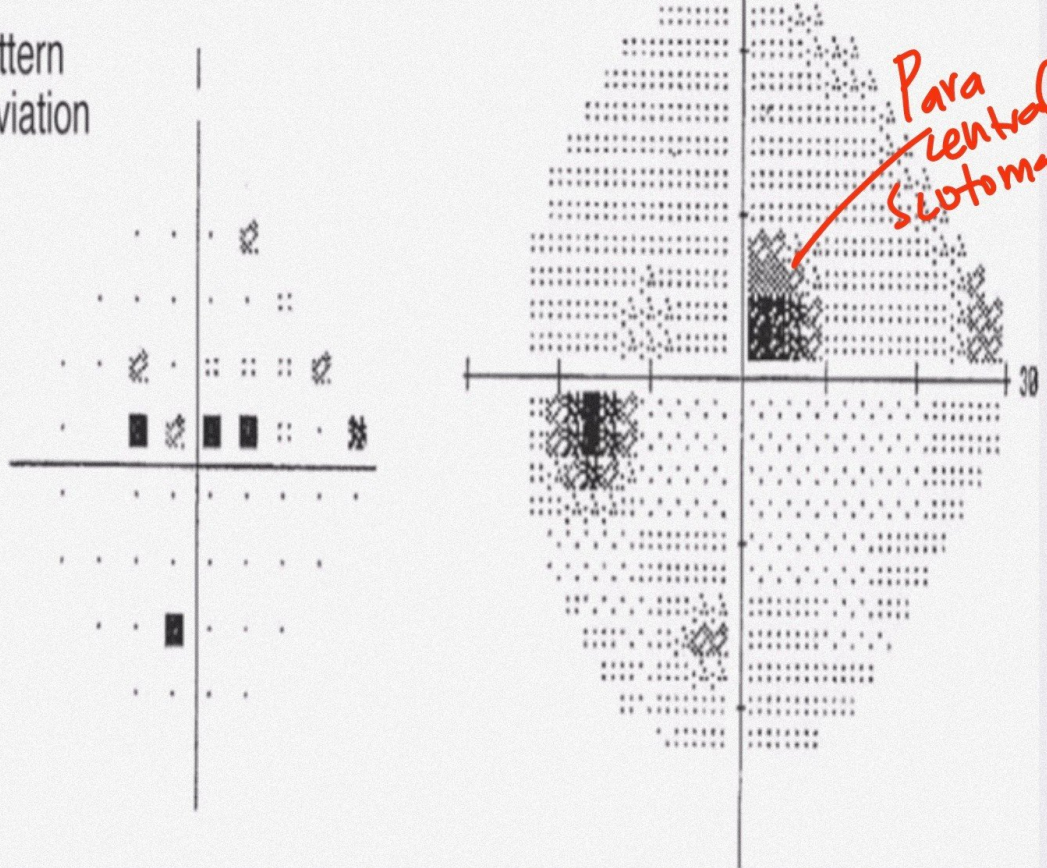
-1	-6	2	0				
-2	0	-1	-1	2			
-1	-2	-3	-4	0	1		
-1	-10	-17	-25	-2	-3	-1	
3	-4	-4	-1	0	0	0	-1

-1	-6	2	0						
0	-2	0	-1	-2	2				
-7	-5	-1	-2	-3	-5	0	1		
-5	-5	-3	-1	-10	-18	-25	-2	-3	-2
-30	-3	-4	-4	-1	0	0	0	-1	





Pattern deviation



00:02:58



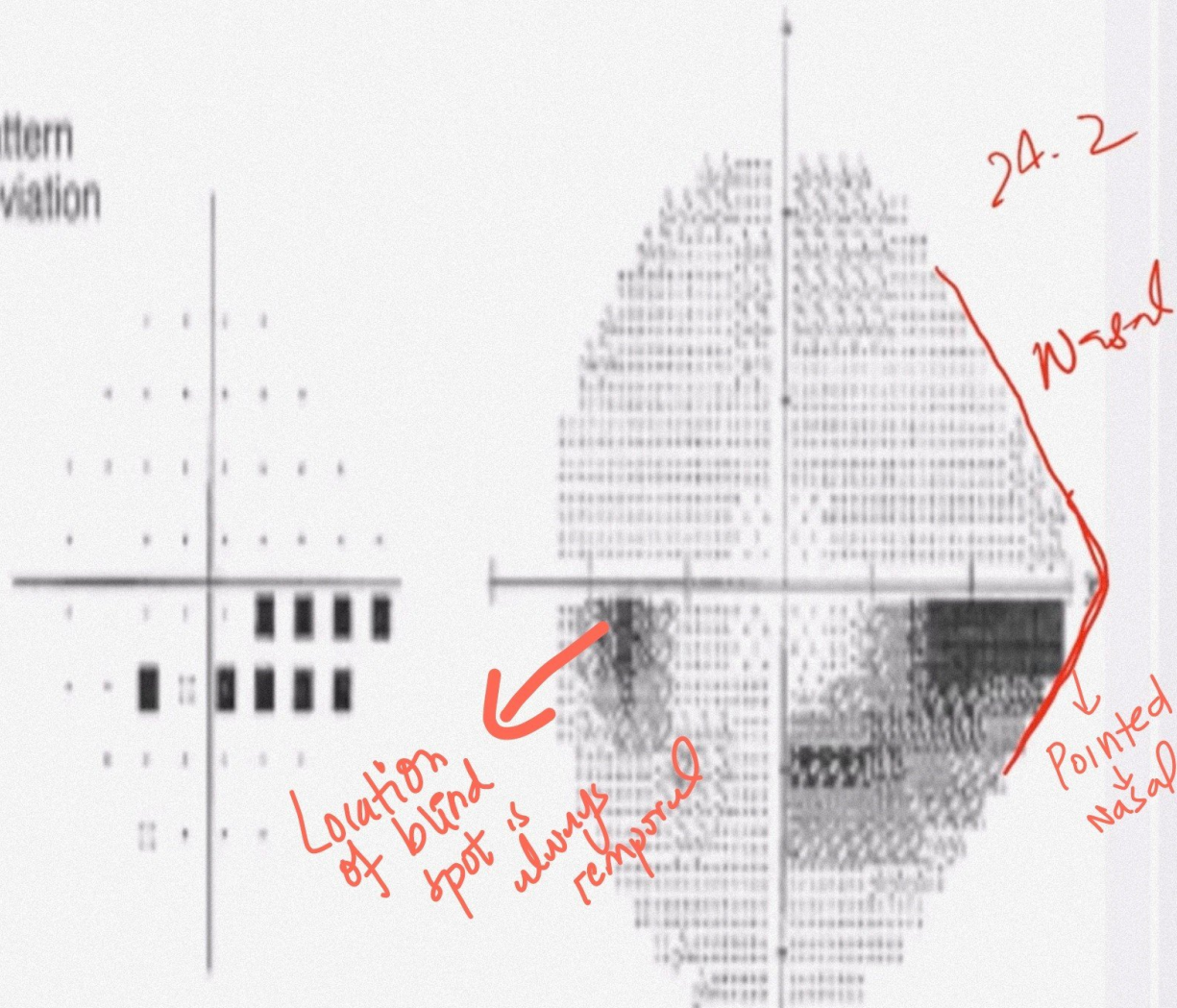
Nasal retina

Temporal retina

Site of damage

Retinal area served by damaged axons

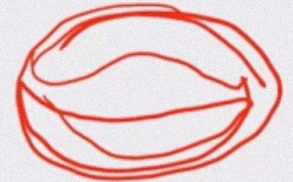
Pattern deviation



00:00:33



LATE SPECIFIC CHANGES



ARCUATE OR BJERRUM SCOTOMA:

Extension of Seidel's scotoma in an area either above or below the fixation point to reach the horizontal line.

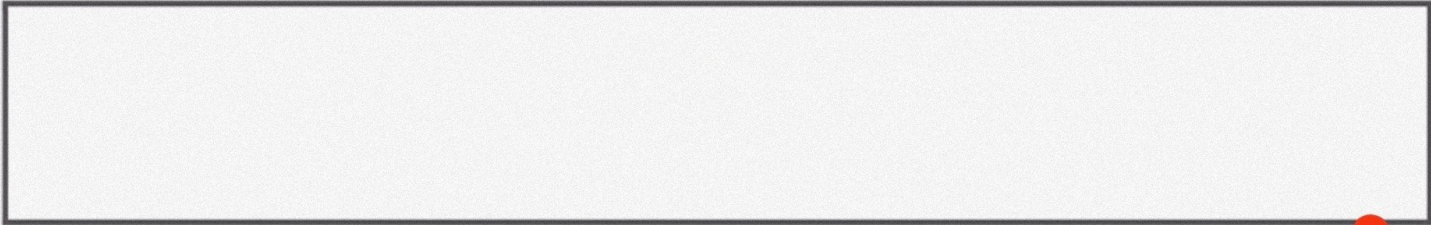
RING OR DOUBLE ARCUATE SCOTOMA: When 2 arcuate scotomas join together

ROENNE'S CENTRAL NASAL STEP:

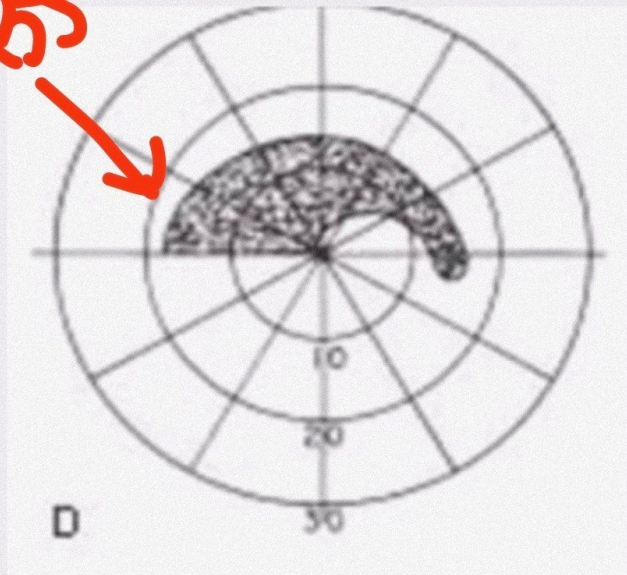
A steplike defect along the horizontal meridian results from asymmetric loss of nerve fiber bundles in the superior and inferior hemifields

00:01:00

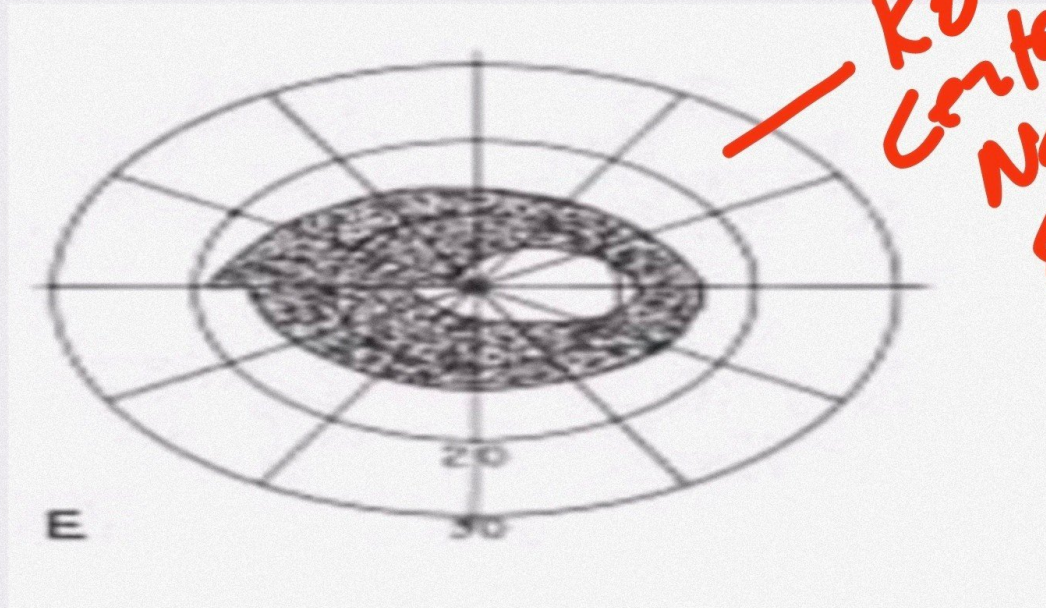




*Arcluate
Sierum*

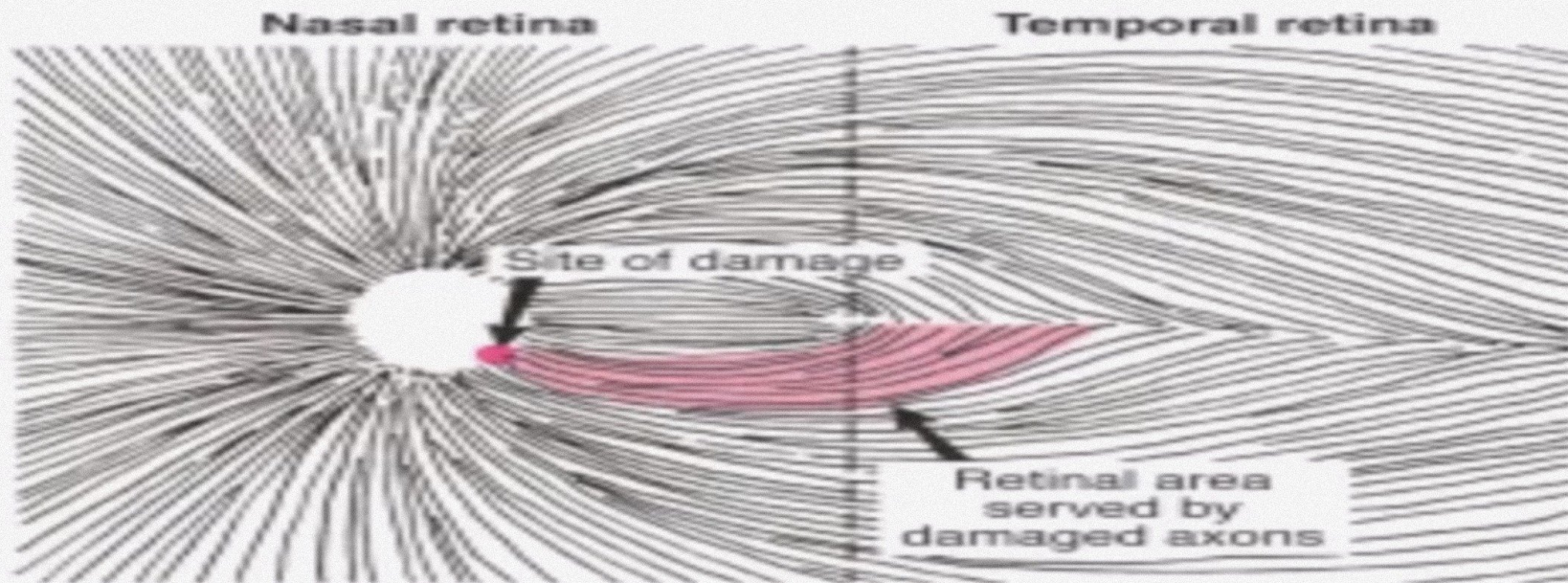


*Roenne's
Central
Nasal
step*

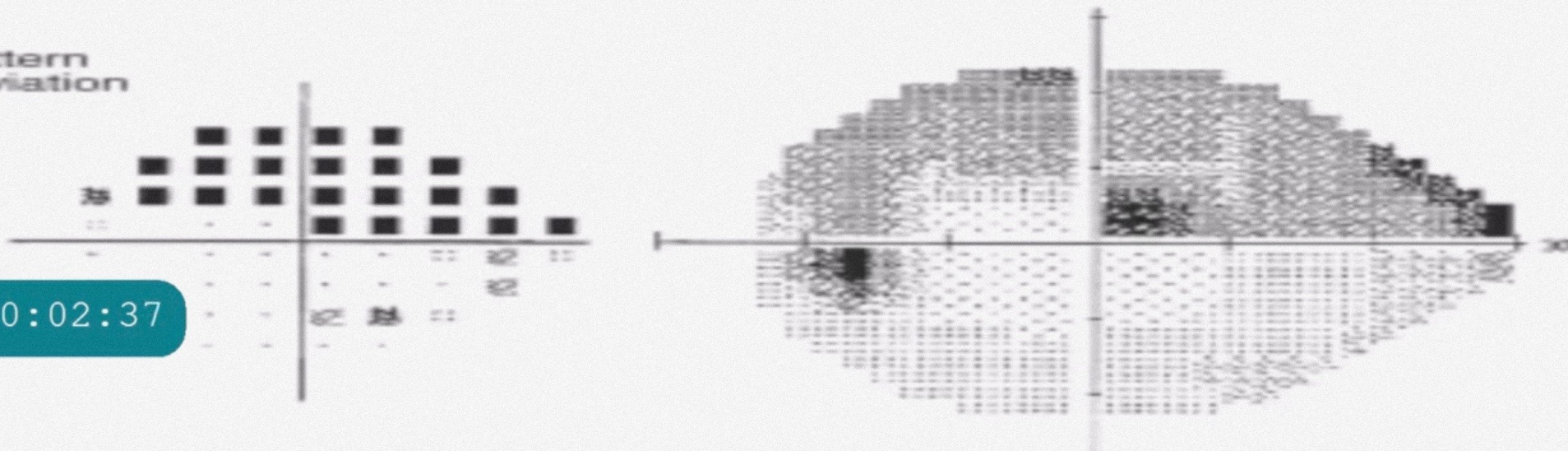


00:01:53





Pattern deviation



00:02:37



ADVANCED CHANGES



- **TUBULAR VISION:** Only a small island of central vision accompanied by temporal island

TEMPORAL ISLAND OF VISION. It is also seen in end stages of glaucoma.

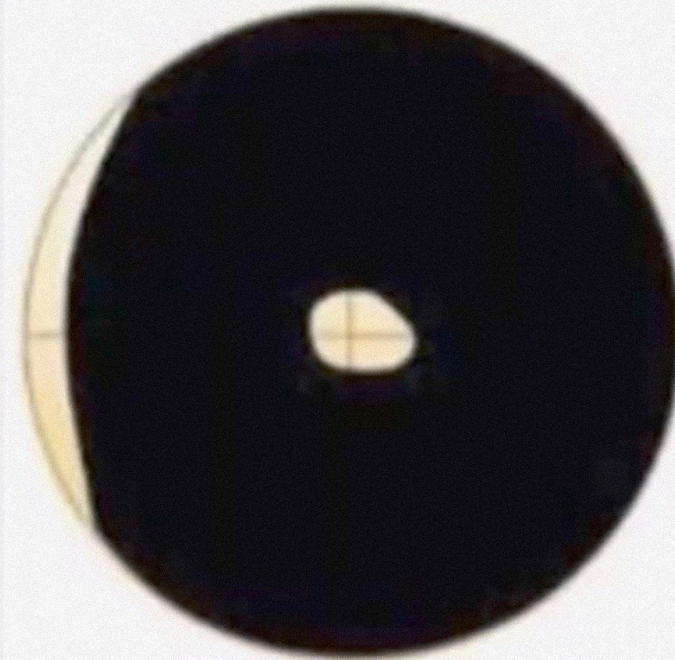
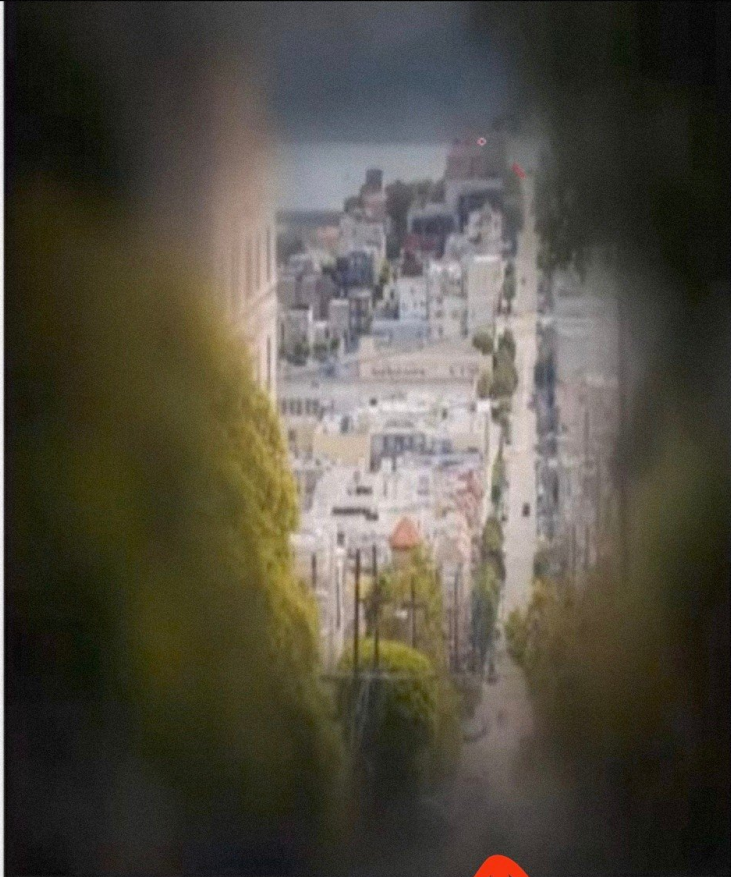
- The temporal islands lie outside of the central 24 to 30° visual field, so it may not be detectable with standard central field measurements done in glaucoma

00:04:31

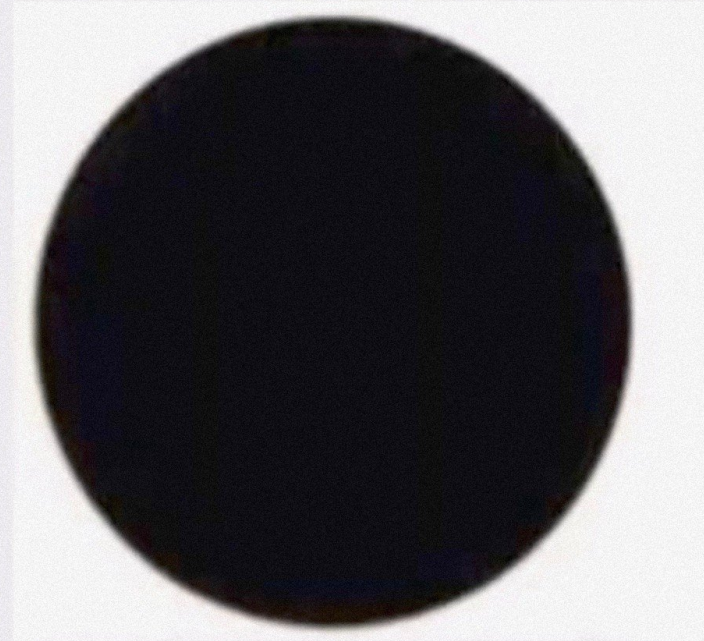
COMPLETE VISUAL FIELD DEFECT

No light perception





(g) tunnel vision defect with temporal crescent sparing



00:04:40

Tubular
VISION

