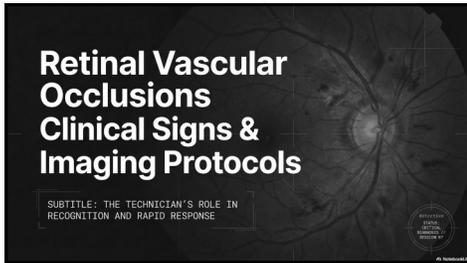


# Retinal Vascular Occlusions Clinical Signs & Imaging Protocols

SUBTITLE: THE TECHNICIAN'S ROLE IN RECOGNITION AND RAPID RESPONSE



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## Session Objectives

 <b>Foundations</b> Master dual blood supply & AV crossing vulnerability	 <b>Recognition</b> Differentiate visual signatures: CRVO, BRVO, CRAO, BRAO	 <b>Investigation</b> Apply imaging protocols (OCT, OCT-A, FA) to find ischemia	 <b>Action</b> Execute rapid response workup for painless vision loss
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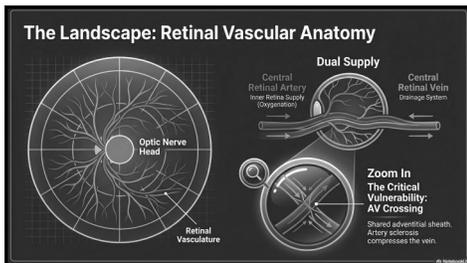
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## The Landscape: Retinal Vascular Anatomy



**Dual Supply**  
Central Retinal Artery (Oxygenated) | Central Retinal Vein (Deoxygenated)

**Zoom In The Critical Vulnerability: AV Crossing**  
Shared adventitial sheath, Artery acrosses, compresses the vein.

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### The Pathophysiology: Thrombus vs. Embolus

<b>VEIN OCCLUSION (The Clog)</b>  <b>Mechanism:</b> Compression + Stasis <b>Virchow's Triad:</b> Vessel Damage, Stasis, Hypercoagulability <b>Result:</b> Rupture & Hemorrhage	<b>ARTERY OCCLUSION (The Blockage)</b>  <b>Mechanism:</b> Embolic Shower <b>Source:</b> Carotid Plaque or Cardiac Valve <b>Result:</b> Starvation & Ischemia
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### Suspect 1: Branch Retinal Vein Occlusion (BRVO)

**Diagnostic File**

**VISUAL SIGNATURE:**

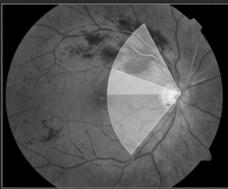
- Sectoral, wedge-shaped hemorrhage
- Apex points to AV Crossing
- Common Site: Superotemporal Quadrant

**BONNET SIGN:**

- Distal banking/dilation of the vein.

**SYMPTOM:**

- Missing sector of vision. Δ



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### Suspect 2: Central Retinal Vein Occlusion (CRVO)

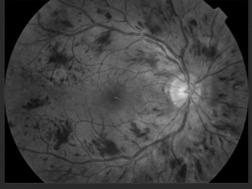
**Diagnostic File**

**VISUAL SIGNATURE:**

- Diffuse hemorrhages in all 4 quadrants
- Dilated, tortuous veins ('Sausage-link')
- Disc Edema

**CLASSIFICATION:**

1. Non-Ischemic (Perfused)
2. Ischemic (Non-Perfused): >10 disc areas of non-perfusion. \*High Risk of Neovascular Glaucoma\*



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### Suspect 3: Branch Retinal Artery Occlusion (BRAO)

**Diagnostic File**

**VISUAL SIGNATURE:**

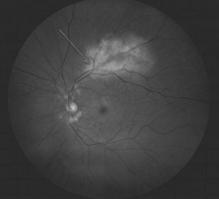
- Localized retinal whitening (Edema)
- Distal to obstruction
- Pallor replaces hemorrhage

**THE SHOKING GUN:**

- Hollenhorst Plaque (Refractile Cholesterol)

**SYMPTOM:**

- Sudden altitudinal field defect.



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### Suspect 4: Central Retinal Artery Occlusion (CRAO)

**OPHTHALMIC EMERGENCY**

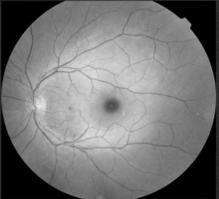
**Diagnostic File**

**VISUAL SIGNATURE:**

- Cherry-Red Spot (Choroid remains perfused)
- Diffuse Retinal Pallor
- Box-carring of blood column

**URGENCY:**

Time is Retina. Stroke Protocol Required.



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### Evidence: Fluorescein Angiography (FA)

<b>ARTERIAL DELAY</b>  <b>ROBOTO MONO</b> Abrupt cutoff & delayed arc-to-retina time.	<b>VENOUS LEAK</b>  <b>ROBOTO MONO</b> Staining, leakage, and capillary non-perfusion.
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**KEY DIFFERENTIATOR: Artery = Cutoff // Vein = Leakage**

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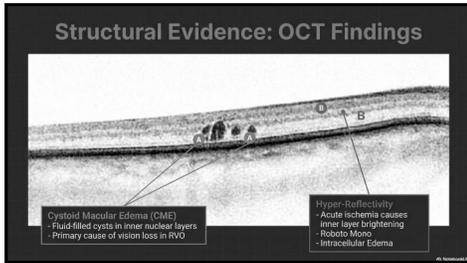
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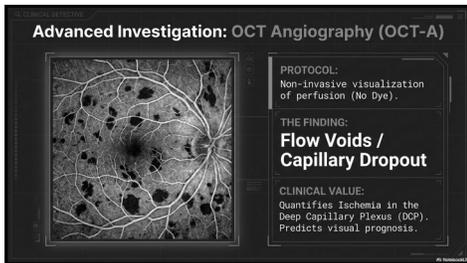
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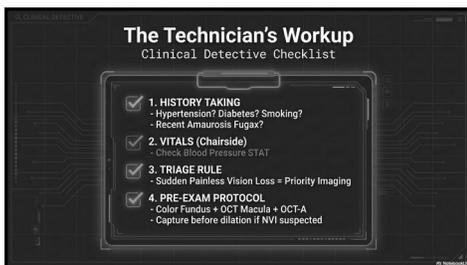
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CLINICAL DETECTIVE

### Case Study: The Collision

Reference: Zhang et al., Frontiers in Medicine, 2025



**RETINAL WHITENING (BRAO)**

**HEMORRHAGE (BRVO)**

**PATIENT:**  
65-year-old Male

**COMPLAINT:**  
Sudden blurry vision

**THE CONFLICT:**  
Simultaneous Pallor (Artery) + Blood (Vein)

**ROOT CAUSE:**  
Carotid Atherosclerosis

**LESSON:**  
Always look beyond the eye.

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CLINICAL DETECTIVE

### The Verdict: Management & Treatment

**Diagnosis**

**VEIN OCCLUSION (Target: Edema)**

- Anti-VEGF (Ranibizumab, Aflibercept, Faricimab)
- Steroids (Ozurdex)
- Laser (PRP) if Neovascularization

**ARTERY OCCLUSION (Target: Life)**

- Stroke Center Referral
- Goal: Prevent CVA
- Visual recovery is rare

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CLINICAL DETECTIVE

### Summary: The Clinical Detective Matrix

ENTITY	VEIN (RVO)	ARTERY (RAO)
Mechanism	Thrombus (Compression)	Embolus (Plaque)
Visual Sign	Hemorrhage & Edema (RED)	Pallor & Cherry-Red Spot (WHITE)
OCT Sign	Cystoid Macular Edema	Inner Layer Hyper-reflectivity
Action	Treat the Eye (Anti-VEGF)	Treat the Patient (Stroke Workup)

"Your imaging and history taking are the first steps in saving vision and potentially saving a life."

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