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34 y/o female

- 4/19/19 – Sudden painless loss of Va OD seen in ER
- Va CF OD; 20/25 OS

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34 y/o female

- FHx: Grandfather developed DVT after surgery
- Meds:
 - Pravastatin 80 mg daily
 - Clomid 50 mg (last cycle in February)

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34 y/o female

- 4/19/19
 - CRAO diagnosed in ER
 - IV Solumedrol administered
 - Diamox 500 mg
 - Heparin anti-coagulation initiated
 - Brimonidine 0.15% OD TID initiated

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Brown GC et al. Retinal arterial obstruction in children and young adults. *Ophthalmology* 88:18-25 (1981)

- 28 eyes in 27 patients < 30 y/o (8% x 12 years)
 - CRAO (9); BRAO (13); Cilioretinal artery occlusion (5)
 - Coagulation abnormalities (8); Migraine (8); High IOP/Buried optic nerve drusen (6); Contraceptives/pregnancy (5); Cardiac valvular disease (2)

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Greven CM et al. Retinal artery occlusions in young adults. *Am J Ophthalmol* 120:776-783 (1995).

- 27 eyes in 21 patients < 40 y/o
 - CRAO (5); BRAO (15); Cilioretinal artery occlusion (1)
 - Hypercoagulable/emboli risk factors (19); Emboli (7); Cardiac valvular disease (4)

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Ratra D & Dhupper M. Retinal arterial occlusions in the young: Systemic associations in Indian population. Indian J Ophthalmol 60: 95-100 (2012).

- 35 eyes in 32 patients < 40 y/o
 - CRAO (28); BRAO (3); Cilioretinal artery occlusion (2)
 - Hypercoagulable/emboli risk factors (21); Cardiac valvular disease (6); HTN (2); Vasculitis (3)

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CRAO Evaluation AAO Focal Points

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CRAO Evaluation AAO Focal Points

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No "hypercoagulability" lab panel

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Nakashima MO & Rogers HJ. Hypercoagulable states: an algorithmic approach to laboratory testing and update on monitoring of direct anticoagulants. Blood Res. 49:85-94 (2014)

SCREENING PANEL TESTING	REFLEX TESTING, depending on screening test results	HYPERCOAGULABILITY RISK FACTORS
PT/APTT	Lupus anticoagulant testing, DRVVT, PNP, and incubated APTT mixing study	Antiphospholipid syndrome
Hexagonal phase PL neutralization		
Anticardiolipin antibody assay	B2GPI antibody assay	Deficiency of a natural anticoagulant
Protein C, Protein S, Antithrombin Functional assays	Protein C, Protein S, Antithrombin Antigenic assays	
CRP, Factor VIII, Fibrinogen		Thrombo-inflammatory markers
Activated protein C resistance assay	Factor V Leiden SNP analysis	Genetic predisposition
Prothrombin G20210A SNP analysis		
Homocysteine	MTHFR SNP analysis	

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Nakashima MO & Rogers HJ. Hypercoagulable states: an algorithmic approach to laboratory testing and update on monitoring of direct anticoagulants. Blood Res. 49:85-94 (2014)


- Prevalence
 - Antiphospholipid syndrome (3-5% of general population)
 - > Factor V Leiden mutation (3-8% with European ancestry)
 - > Prothrombin gene G20210A mutations (2-4% with European ancestry)
 - > Hyperhomocystenemia
 - > antithrombin/Protein C/Protein S deficiencies

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34 y/o female

- 4/19/19: Admitted x 5 d
 - Cardiologist: Negative TEE; Negative carotid ultrasound
 - Neurologist: Negative MRI/stroke w/u
 - Hematologist: **Factor V Leiden**



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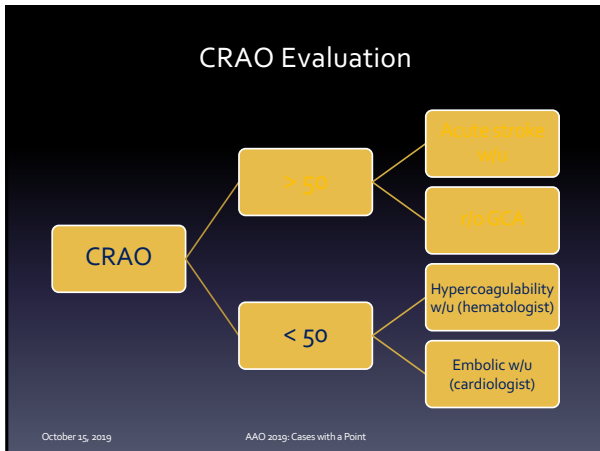
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Factor V Leiden (1994)

- Protein C does not adequately bind to (inactivate) Factor V Leiden
- Autosomal dominant with incomplete penetrance
- “Excessive clotting usually restricted to veins”
- Venous thrombosis risk is increased 4- to 8-fold in FVL heterozygotes and 80-fold in homozygotes
- Female FVL heterozygotes using oral contraceptives appear to have a 30- to 60-fold increased risk of thrombosis

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