Morning Report
7/7/2010
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HPI

- 45 year old man presents with painless loss of vision in the right eye for the past 3 days
- No trauma
- No flashes, floaters, shades, curtains
- No systemic symptoms
History

- **PMH:** gout, migraines
- **POH:** CRVO left eye 2005, resulting in Va 20/100 with APD left, macular edema s/p IVTA in 2005.
- **PSHx:** left hand surgery s/p trauma
- **Meds:** Lisinopril, ASA 162mg/daily, simvastatin
- **Allergies:** NKDA
- **ROS:** negative 10 point ROS
- **FH:** no eye / blood problems in family members
- **Social:** chews tobacco x 25 years, works as a mechanic, 5-6 drinks/week, no drugs.
Exam

Vasc

20/400 (was 20/20)
20/100

B/P
117/70

Tp
21
16

EOM
Full

Alignment
Ortho

Pupils

Pharm dilated....
+ subjective brightness left eye.
SLE

L/L: normal

C/S: normal

Cornea: normal

AC: Deep and quiet both

Iris: Normal both

Lens: Trace no both
Fundus Photo Right
Fundus Photo Right
Fundus photo left
Fluorescein right – 16 seconds
Fluorescein right – 18 seconds
Fluorescein right – 22 seconds
Fluorescein right – 42 seconds
Fluorescein right – 2.5 minutes
Fluorescein right – 9 minutes
Fluorescein left
Fluorescein left
OCT right
OCT left
OCT left
OCT nerve right
OCT nerve left
Stimulus V
FP 0/25
FN 0/23
FL 0/35
Stimulus III
FP 3%
FN 0%
FL 2/23
Differential Diagnosis

• CRVO
  – Component of NAION?
  – Component of arteriolar insufficiency?

– ETIOLOGY?
  • Hypercoagulable state
  • Vasculitis
  • Hyperviscosity
  • idiopathic
Central Retinal Vein Occlusion

- 4 quadrants of dot blot heme, tortuous and enlarged retinal veins
  - *Mild, non ischemic form*
    - Good acuity, mild apd, can have mac edema
  - *Severe, ischemic form* – 10 disc diameters of retinal capillary non perfusion
    - Poor acuity, apd, dense central scotoma

- Most CRVOs are caused by thrombosis of the central retinal vein *posterior* to the lamina cribrosa

- Occasionally caused by an atherosclerotic central retina artery impinging the central retinal vein causing turbulence, endothelial damage and thrombosis formation
Central Retinal Vein Occlusion

• 90% of patients are older than 50
• Systemic associations:
  – DM
  – POAG
  – HTN
  – Rarely due to increased intraorbital pressure (ie, graves)
Central Retinal Vein Occlusion

• Other causes
  – Hyperviscous states (polycythemia vera, multiple myeloma, waldenstroms)
  – Vasculitis (sarcoid, syphilis, SLE)
  – Hypercoagulability (hyperhomocystinemia, protein S and C deficiencies)

• Complications of CRVO
  – Neovascularization -> vitreous hemorrhages, neovascular glaucoma
Work Up

- Hyper coag panel:
  - Factor V leiden
  - AT III
  - Protein C and S
  - Lupus anticoagulant
  - PT/PTT
  - Fibrinogen
  - Russel viper venom time
  - B2 glycoprotein IgG and IgM
  - Homocysteine
  - APC
  - Anticardiolipin IgG and IgM
  - Hexagonal phospholipid

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What are the implications of having bilateral CRVOs at the age of 45???
• 89 patients with retinal vein occlusions
• No preexisting cardiovascular disease
• Calculated the coronary heart disease risk and cardiovascular disease risks
• Compared to those in the Framingham study

Increased risk of cardiovascular disease in overall patient populations and in women – when compared to the Framingham standard risk

Table 2: The 10 year calculated cardiovascular disease risk (cCVDR) in RVO, percentage (SD)

<table>
<thead>
<tr>
<th></th>
<th>cCVDR</th>
<th>Std risk</th>
<th>p Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>All (n = 89)</td>
<td>20.6 (1.2)</td>
<td>15.7 (1.1)</td>
<td>0.009</td>
</tr>
<tr>
<td>Males (n = 47)</td>
<td>23.5 (1.4)</td>
<td>19.1 (1.1)</td>
<td>0.120</td>
</tr>
<tr>
<td>Females (n = 42)</td>
<td>17.8 (1.2)</td>
<td>12.7 (1.0)</td>
<td>0.022</td>
</tr>
</tbody>
</table>

* t test after logarithmic transformation to normalise the data.
% males with cCVDR ≥ 20 = 66%.
% females with cCVDR ≥ 20 = 54.8%.
## Table 2. Long-term Cardiovascular Mortality by Presence of Retinal Vein Occlusion at Baseline and by Study Site

<table>
<thead>
<tr>
<th>Baseline Retinal Vein Occlusion Status</th>
<th>Combined Beaver Dam and Blue Mountains Eye Studies</th>
<th>Beaver Dam Eye Study</th>
<th>Blue Mountains Eye Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age and Gender Adjusted</td>
<td>Multivariate Adjusted*</td>
<td>Multivariate Adjusted*</td>
</tr>
<tr>
<td>All ages and both genders</td>
<td>1.0 (0.8-1.7)</td>
<td>1.2 (0.8-1.8)</td>
<td>1.1 (0.6-2.0)</td>
</tr>
<tr>
<td>Absent</td>
<td>1238/8282 (15.5)</td>
<td>29/86 (30.2)</td>
<td>443/5743 (7.7)</td>
</tr>
<tr>
<td>Present</td>
<td>1.0 (1.3-5.4)</td>
<td>2.5 (1.2-5.2)</td>
<td>2.5 (0.9-6.9)</td>
</tr>
<tr>
<td>&lt;70 yrs</td>
<td>1.0 (0.6-1.6)</td>
<td>1.0 (0.6-1.6)</td>
<td>0.9 (0.5-1.8)</td>
</tr>
<tr>
<td>Absent</td>
<td>840/2539 (33.1)</td>
<td>21/69 (35.6)</td>
<td>668/3640 (18.4)</td>
</tr>
<tr>
<td>Present</td>
<td>1.0 (0.6-1.5)</td>
<td>1.0 (0.6-1.5)</td>
<td>1.0 (0.5-3.0)</td>
</tr>
<tr>
<td>70 yrs or more</td>
<td>1.0 (0.6-1.7)</td>
<td>1.0 (0.6-1.7)</td>
<td>1.0 (0.5-2.3)</td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>615/6482 (13.3)</td>
<td>15/58 (25.9)</td>
<td>615/6482 (13.3)</td>
</tr>
<tr>
<td>Present</td>
<td>1.0 (0.6-1.7)</td>
<td>1.1 (0.6-1.8)</td>
<td>1.0 (0.5-2.3)</td>
</tr>
<tr>
<td>Women</td>
<td></td>
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*Adjusted for age, gender, body mass index, current smoking, presence of hypertension, diabetes, and glaucoma.

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In patients >70 years old, baseline retinal vein occlusions are NOT associated with higher cardiovascular mortality.

Retinal vein occlusions in patients under 70 years old may double the risk of cardiovascular mortality.
Treatment

- Optic neurotomy
- Retinal vein cannulation with t-PA infusion
- Steroids
- Aspirin
- Warfarin

None proven to be beneficial
Meta-analysis of randomized trials looking at patients with retinal vein occlusions

3 studies comparing LMWH with ASA (229 patients)

VA difference was -0.23 logMAR in favor of LMWH (p=0.002) after 6 months

LMWH was also associated with a 78% reduction in risk for any adverse ocular outcome (p<0.001)

There was NO increase in vit heme in patients using LMWH
Our Patient

- Work up negative
- Avastin injected
- LMWH to be started in 1-2 weeks when subretinal/peripapillary blood more organized
- Back to Nebraska…
Summary

- Retinal vein occlusions in young patients increases their risk of cardiovascular mortality
- A hematological work up may be warranted in these patients
- Check for underlying systemic and eye conditions (POAG, hyperviscosity, etc)
- LMWH may be a future treatment modality