Age-Related Macular Degeneration

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Case 1

- 58 year-old man
- Exudative AMD diagnosed 4/8/05
- Previous therapy:
  - Laser photocoagulation
  - Photodynamic therapy
- Now has persistent exudation and visual acuity of 20/70
Recent Fluorescein Angiogram
**AMD Classification**

**Early:** Drusen, Pigment changes

**Late:** Atrophy, Exudation
Hypothesis

Causes/Risk Factors for Tissue Injury
Sunlight, Lipofuscin, Anti-retinal antibodies, Excessive complement activation, Systemic inflammation

Excessive Activation of Complement

Maculopathy
Bruch’s membrane deposits, drusen, RPE changes, decreased blood flow, hypoxia, inflammatory mediators

Disease Phenotype
Vision loss, Atrophy, Exudation
### Management of AMD: Overview

<table>
<thead>
<tr>
<th>Feature</th>
<th>Prevention</th>
<th>Epidemiology</th>
<th>Treatment</th>
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<td>- Lifestyle</td>
<td>- Anti-VEGF</td>
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AMD Eligibility Categories

1. Less than 5-15 small drusen
2. Over 15 small drusen, one intermediate drusen, or pigment
3. About 20 intermediate or one large drusen, or noncentral GA
4. Central GA, CNV, or vision <20/32 from AMD in fellow eye
Treat the Fellow Eye
Risk of progression at 5 years:
- Category 3: 6%-27%
- Category 4: 43%

Treat High-Risk Patients
Reduction in progression to advanced AMD with Moderate VA loss:
- Category 3: OR = 0.76
- Category 4: OR = 0.52

Bottom Line:
Overall 25% Reduction in development of advanced AMD in category 3 and 4 subjects taking supplements
AMD Prevention: Summary I

• Medical and surgical management
  – AREDS supplements only proven method for preventing complications of AMD in high-risk patients
  – Perform cataract surgery when clinical evidence suggests substantial visual benefit to patient

• Environment
  – Avoid cigarette smoking (multiple studies)
  – Wear protection against sunlight exposure (possible)
AMD Prevention: Summary II

Life style for prevention of AMD

• Heart Healthy Diet
  – Low fat diet (incidence and case-control)
  – Fatty fish > 2 servings per week (4 studies)
  – Leafy green vegetables (some studies)
  – Fruit 3 servings per day (unconfirmed)
  – Consider 2 or more servings of nuts per week (unconfirmed)

• Physical activity (unconfirmed)

• Weight loss (unconfirmed)
Treatment Options for Subfoveal CNV

Extrafoveal and most juxtafoveal CNV can be managed with photocoagulation
Laser Photocoagulation

- Thermal burn destroys retina, RPE, choriocapillaris, and CNV
- Cost effective treatment option for extrafoveal CNV and subfoveal CNV with poor initial vision
Photodynamic Therapy

• Photochemical reaction induced by activating verteporfin with 689 nm (red) light
• Relatively greater retention of drug to CNV gives some selectivity to surrounding tissue
Macugen

• Pegaptanib: binds extracellular isoform of VEGF (165) up-regulated during pathologic neovascularization
• Does not inhibit revascularization
Lucentis/Avstin

- Ranibizumab: a Recombinant, humanized Fab fragment against VEGF
- Binds all isoforms of VEGF
- Penetrates through all retinal layers unlike full IgG molecule
Returning to our Patient: PL

• Medical Management
  – AREDS
  – Fatty fish
  – Stopped smoking

• Surgical Management
  – Avastin injection
  – Vision improved to 20/30 within 6 weeks
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