1. New England Medical Center Grand Rounds - Siderosis Bulbi

New England Medical Center
Grand Rounds

Siderosis Bulbi

My Hanh T. Nguyen, M.D.
May 25, 2006

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2. Case Presentation

Case Presentation

- 88 year old man
- CC: progressive visual loss left eye
- HPI:
  - Referred from outside ophthalmologist
  - Progressively worsening vision OS
  - Past four months
  - One year ago: VA 20/30
  - No pain, redness, photophobia, discharge

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3. Case Presentation

**Case Presentation**

- **POHx:**
  - Phaco/IOL OU (2 yrs ago)
  - “Scratched” OS from dry glue trauma (1 yr ago)
  - No infections

- **PMHx:**
  - HTN
  - NIDDM
  - CAD, s/p CABG x 2
  - Arthritis

- **Medications:**
  - Furosemide, carvedilol, ramipril, warfarin sodium, pravastatin sodium, tamsulosin hcl, Glipizide

- **Allergies:** NKDA

- **Fam Hx:** DM

- **Soc Hx:**
  - Tobacco: denies
  - ETOH: occasional

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4. External Examination

**External Examination**

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5. Differential Diagnosis of Heterochromia Iridis

Differential Diagnosis of Heterochromia Iridis

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6. Heterochromia Iridis - Differential Diagnosis

Heterochromia Iridis Differential Diagnosis

- **Hypochromic**
  - Congenital
    - Simple
    - Horner syndrome
    - Waardenburg Syndrome
  - Acquired
    - Fuchs heterochromic iridocyclitis
    - Nonpigmented tumors
    - Trauma

- **Hyperchromic**
  - Congenital
    - Ocular melanosis
    - Iris nevus
    - Iris hamartoma
    - Iris ectropion syndrome
  - Acquired
    - Pigmented tumors
    - Siderosis bulbi
    - Rubeotic iridis
    - Long standing hyphema
    - Drug induced (Xalatan)

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7. Office Examination

Office Examination

- **BCVA:** 20/30 OD, 20/60 OS
- **T:** 14 OD, 12 OS
- **Pupils**
  - 3 mm → 2 mm OD
  - Fixed 5mm pupil OS
  - Small RAPD OS
- **Pachymetry:** 575 OD, 565 OS

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8. Slit Lamp Examination

Slit Lamp Examination

- **LLL:** dermatochalasis OU
- **C/S:** white & quiet OU
- **K:** OD: clear
  - OS: small linear scar 8 o’clock, diffuse brown anterior stromal deposits
- **A/C:** deep & quiet OU
- **I:** OD: blue, no masses
  - OS: greenish-brown, no masses
- **L:** PCIOL OU

Three images have been published in Ocular Surgery News, 2005:
http://www.ocsuperise.com/department.asp

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9. Corneal Deposits

Corneal Deposits

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10. Dilated Fundus Exam

Dilated Fundus Exam

- Optic Nerve
  - C/D: 0.3 OU
  - No pallor OU

- Macula
  - Decreased foveal reflex OU
  - Mild RPE changes OU

- Vessels: normal OU

- Periphery
  - Normal OD
  - Inferior peripheral atrophy OS
  - Vitreous debris OS

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11. Heterochromia Iridis - Differential Diagnosis

**Heterochromia Iridis**

**Differential Diagnosis**

- **Hypochromic**
  - Congenital
    - Simple
    - Horner syndrome
    - Waardenburg Syndrome
  - Acquired
    - Fuchs heterochromic iridocyclitis
    - Nonpigmented tumors
    - Trauma

- **Hyperchromic**
  - Congenital
    - Ocular melanosis
    - Iris nevus
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  - Acquired
    - Pigmented tumors
    - Siderosis bulbi
    - Rubeotic iris
    - Long standing hyphema
    - Drug induced (Xalatan)

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12. What would you do next?

**What would you do next?**

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13. Old Medical Records - "Scratched" OS from Glue Trauma

Old Medical Records
“Scratched” OS from Glue Trauma

- One year ago
- Working with wood and chisel
- No safety glasses
- OS struck by flying particle
- Findings
  - Full thickness corneal-scleral laceration OS
  - Seidel positive with pressure, but self sealing
  - Significant corneal edema
  - Microhyphema
  - IOP 33
  - Vitreous hemorrhage
- Treated with antibiotics and contact lens

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14. XRay of Orbits Upward and Downward Gazes

XRAY of Orbits
Upward and Downward Gazes

2.3 mm radiopaque foreign body overlying left globe

These images have been published in Ocular Surgery News, 2006: http://www.osnsuperstore.com/department.asp

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15. Ultrasound Biomicroscopy

Ultrasound Biomicroscopy

![Ultrasound Biomicroscopy Image]

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http://www.oasuper.site.com/department.asp

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16. Electroretinogram

Electroretinogram

![Electroretinogram Image]

OD  OS

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17. Siderosis Bulbi

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18. Siderosis Bulbi

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- Deposition of ionized iron in the intraocular tissues, resulting in toxicity
  - Haber-Weiss reaction: formation of powerful oxidants
  - Causes cell membrane damage and enzyme inactivation

- Epithelial tissues
  - Iris sphincter
  - Dilaetor muscle
  - Nonpigmented ciliary epithelium
  - Lens epithelium retina
  - RPE

- Retinal photoreceptors and RPE cells especially susceptible
19. Siderosis Bulbi - Signs and Symptoms

Siderosis Bulbi
Signs and Symptoms

- Nyctalopia
- Concentrically constricted visual field
- Decreased vision
- Tonic or Adie's pupil
- Rust-colored corneal stromal staining
- Iris heterochromia
- Pupillary mydriasis and poor reactivity
- Brown deposits on anterior lens
- Cataract
- Vitreous opacities
- Peripheral retinal pigmentation (early)
- Diffuse retinal pigmentation (late)
- Narrowed retinal vessels
- Optic disc discoloration and atrophy
- Secondary open-angle glaucoma from iron accumulation in TM

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20. Intraocular Foreign Bodies

Intraocular Foreign Bodies

- Risk factors
  - No protective eyewear
  - Hammering
  - High speed
  - Small, sharp metal fragments
  - Minimal corneal damage
  - Self-sealing wound

- Prognosis
  - Anterior FB better than posterior FB
  - Small FB better than larger FB
  - Presenting visual acuity strongest predictor of final VA

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21. Intraocular Foreign Bodies - Workup

Intraocular Foreign Bodies Workup

- Suspicion
- CT
- Plain film
- UBM
- ERG

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22. Case Summary

Case Summary

- 88 year old man
- Presentation:
  - Progressive visual loss left eye x four months
  - History of trauma while working with a chisel
- Findings:
  - Brown corneal stromal staining
  - Iris heterochromia
  - Pupillary mydriasis and poor reactivity
  - Vitreous opacities
  - Metallic IOFB noted on plain film and UBM
- Diagnosis: Siderosis bulbi OS
- Treatment: PPV with endoscopic visualization and removal of IOFB

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Sources

- AAO. Basic and Clinical Science Course: Retina. 2003; 25-34, 272-273.

- AAO. Basic and Clinical Science Course: Pediatric Ophthalmology and Strabismus. 2003; 248-249.


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