CASE CONFERENCE

April 26th 2013
Kyungmin Lee
Chief Complain

- 47/F
- Decreased Vision (OD)
  - Sudden onset
  - Duration: 2 weeks
  - Associated symptoms:
    - Pain(-), Redness(-), discharge(-), flashes (±), Floaters(+)

Clinical History

- No specific medical /surgical history
- No Family history of ocular disease
- Personal history
  - Travel history (-)
  - Pet affinity(-)
  - Drug History(-)
  - Denial of exposure to raw meat
Review of System

- HEENT: N-S
- Skin rash (-)
- Oral/genital ulcer (-)
- Arthralgy: Back pain (+), knee pain (+)
- GI system: N-S
- Other system: WNL
Clinical Examination

◦ Visual acuity
  ❖ OD > 20/100 (N-C)
  ❖ OS > 20/30 (20/25x1.50Dsph : -2.0Dcyl: Ax 90)
◦ IOP : 17/20mmHg by Pneumo
◦ Anterior chamber
  ❖ Conj > WNL
  ❖ Cornea > WNL
  ❖ AC>
    ▪ OD > Deep & Cell(+)
    ▪ OS > Deep & Cell(-)
  ❖ Lens> WNL
Clinical Examination

Vit. Haze(+++)
Vit. Cell(+++)
Clue of Diagnosis

- Middle age
- Female
- Sudden onset decreased of vision (unilateral)
- Back pain & knee pain
- Ant. chamber > deep & cell(+)
- Post. cavity > Vit. Cell(+++), Vit. Haze(+++), Exudative focal change at post. Pole
- FAG> early hyperfluorescence with leakage
  - disc leakage, perivascular leakage at superotemporal arcade
Q1. DO WE HAVE TO START STEROID PO MEDICATION?

Immune related vS Infection
Differential Diagnosis

- Behcet's disease
- Sarcoidosis
- Tuberculosis
- Toxoplasmosis
- <Toxocariasis>
Treatment Plan

◦ Check serology
◦ Check Chest CT & Xray
◦ Predforte QID OD
◦ Cycloplegics BID OD
◦ Follow up in 2 weeks
Follow up 2 weeks

- C.C) Increased of floaters (OD), No change of visual acuity
- VA (OD) : 20/100(N-C)
- IOP (OD) : 22mmHg at AM 9:20 by Pneumotonometry
- ConJ (OD) Not injected
- Cornea (OD) clear
- AC (OD) deep chamber with trace cells
- Lens (OD) mild posterior subcapsular opacity
Vit. Haze(++)
Vit. Cell(+++)
Exudative change (+)
R/O Granuloma
Serology

<table>
<thead>
<tr>
<th>검사항목</th>
<th>2013-02-15 (1)</th>
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<tbody>
<tr>
<td>ACE 검사</td>
<td>68.6/▲</td>
</tr>
<tr>
<td>VDRL, RPR, ART</td>
<td>Non-Reactive</td>
</tr>
<tr>
<td>HIV 항체 - 일반</td>
<td>Negative</td>
</tr>
<tr>
<td>CMV Ab IgG (정말)</td>
<td>Reactive(143.2)</td>
</tr>
<tr>
<td>CMV Ab IgM (정말)</td>
<td>Nonreactive(0.18)</td>
</tr>
<tr>
<td>HSV Ab IgG (정말)</td>
<td>Positive(2.39)</td>
</tr>
<tr>
<td>HSV Ab IgM (정말)</td>
<td>Negative(0.25)</td>
</tr>
<tr>
<td>VZV-Ab IgG (정말)</td>
<td>Equivocal(0.95)</td>
</tr>
<tr>
<td>VZV-Ab IgM (정말)</td>
<td>Negative(0.19)</td>
</tr>
<tr>
<td>Toxoplasma IgG</td>
<td>Negative(0.13)</td>
</tr>
<tr>
<td>Toxoplasma IgM</td>
<td>Negative(0.22)</td>
</tr>
<tr>
<td>항인자결합-1gG (확진)</td>
<td>Negative(1.37)</td>
</tr>
<tr>
<td>항인자결합-1gM (확진)</td>
<td>Negative(1.65)</td>
</tr>
<tr>
<td>HLA-B27-PCR</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Chest Xray & CT: No evidence of Sarcoidosis & Tuberculosis
Treatment Plan

- Prednisone 60mg orally
- Predforte QID OD
- Cycloplegics BID OD
- Follow up 1 week later
Follow up 1 week

- C.C) No change in ocular symptoms
- VA (OD) : 20/400(N-C)
- IOP (OD) : 22mmHg at AM 10:25 by Pneumotonometry
- ConJ (OD) Not injected
- Cornea (OD) clear
- AC (OD) deep chamber with rare cells
- Lens (OD) mild posterior subcapsular opacity
Treatment plan

- Check history again
- Check serology
- Tapering Prednisone PO to 50mg orally: 10mg taper every week
- Predforte BID OD
- Stop cycloplegics
- Follow up in 1 week later

“History of eating raw liver of cow”
Toxocara ELISA with TES-Ag
Follow up 1 week

◦ C.C) No change in ocular symptoms
◦ VA (OD) : 20/400(N-C)
◦ IOP (OD) : 33mmHg at AM 11:20 by Goldmann Applanation
◦ ConJ (OD) Not injected
◦ Cornea (OD) clear
◦ AC (OD) deep chamber with rare cells
◦ Lens (OD) mild posterior subcapsular opacity
◦ Vitreous & Retina(OD): Vit Haze (++), cell(++) , exudative RD (+), granuloma(stationary)
◦ Serology
  ◦ Ig G (+) for ELISA with Toxocariasis Ag
Treatment Plan

- Start Albendazole 400mg BID for 1 week
- Taper Prednisone 10mg every week: currently 40mg PO
- Start Cosopt BID OD
- Predforte QD OD
- Follow up in 1 week
Follow up 1 week

- C.C) Improvement in visual acuity but still blurry, floaters (+)
- VA (OD) : 20/200(N-C)
- IOP (OD) : 18mmHg at AM 9:00 with Cosopt BID OD by Goldmann Applanation
- ConJ (OD) Not injected
- Cornea (OD) clear
- AC (OD) deep chamber with rare cells
- Lens (OD) moderate posterior subcapsular opacity
Vit. Haze(++)
Vit. Cell(+)
Exudative retinal detachment
Granuloma(sl. Increased)
Tractional membrane(+) - From optic disc ~ over fovea
Q2. ALBENDAZOLE EFFECT??
KEEP MEDICATION VS SURGERY
Treatment Plan

- Keep Albendazole 400mg BID for 1 week
- Taper Prednisone 10mg every week: currently 30mg PO
- Keep Cosopt BID OD
- Stop Predforte QD OD
- Plan for Phaco+PCL+pars plana vitrectomy+membrane peeling+endolaser OD
  - OCT: no reliable findings due to vitreous haze
  - FAG: patients' refusal
  - Purpose: remove inflammatory tissues, relieve vitreomacular traction
  - Plan for vitreous sampling
    - Cytology for differentiate Sarcoidosis and Lymphoma
    - ELISA for Toxocariasis
POD 1 day

- C.C) Ocular pain(+), redness(+), decrease of floaters
- VA (OD) : 20/400(N-C)
- IOP (OD) : 13mmHg at AM 7:30 with Cosopt BID OD by Goldmann Applanation
- ConJ (OD) subconjunctival hemorrhage with mild injection
- Cornea (OD) clear
- AC (OD) deep chamber with cells(+)
- Lens (OD) PCL in good position
Vit. Haze(-)
Vit. Cell(rare)
Well marginated mass with laser scar
Well removed tractional membrane

CRT: 285μm
Treatment Plan

- Keep Albendazole 400mg BID
- Keep Prednisone 30mg PO
- Vigamox QID OD
- Predforte QID OD
- Homatropin BID OD
- Stop Cosopt BID OD
- Plan to follow up 1 week
POD 1 week

- C.C) Improve in visual acuity and ocular pain, No floaters
- VA (OD) : 20/60(N-C)
- IOP (OD) : 19mmHg at AM 10:40 by Pneumotonometry
- ConJ (OD) Relieve of subconjunctival hemorrhage
- Cornea (OD) clear
- AC (OD) deep chamber with cells(rare)
- Lens (OD) PCL in good position
- Vitreous sample
  - Toxocara ELISA with TES Ag : IgG (+)
Vit. Haze(-)
Vit. Cells(rare)
Well marginated mass with laser scar
Well removed tractional membrane
R/O SRF or PED at fovea

CRT : 283μm
Treatment Plan

- Keep Albendazole 400mg BID
- Taper Prednisone to 20mg PO with 10mg every week
- Vigamox TID OD
- Taper Predforte TID OD with 1 drop every week
- Stop Homatropin BID OD
- Plan to follow up 3 weeks later
POD 1Month

- C.C) No ocular pain nor redness, blurry vision OD
- VA (OD) : 20/50(N-C)
- IOP (OD) : 20mmHg at AM 11:30 by Pneumotonometry
- ConJ (OD) normal
- Cornea (OD) clear
- AC (OD) deep chamber with no cells
- Lens (OD) PCL in good position
Vit. Haze(-)
Vit. Cell(rare)
Well marginated mass with laser scar
Well removed tractional membrane
No SRF

CRT: 240μm
Treatment Plan

- Stop PO medication
- Stop Vigamox TID OD
- Continue Predforte QD OD
- Encourage lubricating eye drops OD
- Plan to follow up 1 month later
REVIEW
OCULAR TOXOCARIASIS
Introduction

- **Zoonotic disease** caused by *Toxocara canis* or *Toxocara cati* larvae
  - More frequent in *T. canis*

- Transmission to human by ingestion of embryonated eggs
  - Contaminated raw vegetables
  - Infected raw meat (chicken, lamb, rabbit)
  - Contaminated water
  - Geophagia, pica
Epidemiology

- 36% of dogs in nationwide (+)
- 52% of dogs in Southeastern US (+)

- Susceptible group
  - Pet owners
  - Childrens

- Low prevalence of Toxocara in human
  - 10,000 new infection/yr

- Seroprevalence test
  - 5% of children
  - 50% of children with regular contact with pets and soils, having chronic respiratory problems
**Toxocara canis**

- **Ascarid**: Member of Ascariditae family
- Only complete its lifecycle in the dogs
  - Stage I encapsulated larvae
  - **Stage II larvae**
  - Stage III larvae
  - Stage IV larvae
  - Adult worm
- Lifecycle ends at the stage II larval state in human (brain, lung, eye, liver)
Systemic manifestations (VML)

- Fever
- **Pulmonary symptoms**
  - Dry, hacking cough
  - Asthma-like attacks
- Splenomegaly
- Hepatomegaly
- Skin lesions
- Neurologic symptoms
  - Convulsion
  - Meningitic pictures
Systemic manifestations (VML)

- Fever
- Pulmonary symptoms
  - Dry, hacking cough
  - Asthma-like attacks
- Splenomegaly
- Hepatomegaly
- Skin lesions
- Neurologic symptoms
  - Convulsion
  - Meningitic pictures
Systemic manifestations (VML)

- Fever
- Pulmonary symptoms
  - Dry, hacking cough
  - Asthma-like attacks
- Splenomegaly
- Hepatomegaly
- Skin lesions
- Neurologic symptoms
  - Convulsion
  - Meningitic pictures
Ocular manifestations (1)

- Average age: 7.5 years (2~31 years)
  - 80% patients: under age 16
- Typically unilateral
  - 3%: bilateral
- ‘Typical’ ocular presentation
  - **Granuloma** either in post. pole or in periphery
    - Raised, whitish in color, width 0.75~3DDS
    - Stage II larva lodged in the choroid and becomes encysted
      - 50%: periphery/ 25%: macula
  - Associated with **massive vitritis**
Ocular manifestations (2)

- Live larvae in the retinal vessels
  - Peripheral retinitis
- Hypopyon uveitis
- Fuchs’ heterochromia
- Leukocoria
- Motile subretinal nematode
- Diffuse chorioretinitis
- Optic nerve involvement
Ocular manifestations(2)

- Live larvae in the retinal vessels
  - Peripheral retinitis
- Hypopyon uveitis
- Fuchs’ heterochromia
- Leukocoria
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Ocular manifestations (2)

- Live larvae in the retinal vessels
  - Peripheral retinitis
- Hypopyon uveitis
- Fuchs’ heterochromia
- Leukocoria
- Motile subretinal nematode
- Diffuse chorioretinitis
- Optic nerve involvement
Differential diagnosis

- Due to Leukocoria
  - Retinoblastoma
  - Coats’ disease
  - ROP

- Due to focal choroiditis
  - Sarcoidosis
  - Retrolental fibrosis

B-scan
1) Solid highly reflective mass
2) Vitreous band or TRD extended from the mass to post. pole

Toxocariasis
Retinoblastoma
Coats’ disease
Diagnosis

- **Laboratory workup**
  - Eosinophilia
  - Hyperglobulinemia
  - Immune complex level
    - Good for monitoring treatment efficacy
  - No eggs in stool

- **ELIZA**
  - Most reliable & readily available test
  - Used by 2 Toxocara-derived Ag
    - Embryonated egg
    - Excretory-secretory antigen: more consistent
  - Reasonable efficient in acute Toxocariasis but not in inactive and ocular disease
    - evidence of ocular toxocariasis: Serum titer 1:8
  - High false (+): due to cross reaction
    - Western blotting technique
    - PCR from aqueous humor
Diagnosis

Sensitivity and specificity of ELISA for diagnosis of ocular toxocariasis (From Hagler WS, Pollard ZF, Jarrett WH et al. Results of surgery for ocular Toxocara canis. Ophthalmology 1981;88:1081-6)

<table>
<thead>
<tr>
<th>Cutoff titer of positive test</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
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<tbody>
<tr>
<td>1:2</td>
<td>95</td>
<td>72</td>
</tr>
<tr>
<td>1:4</td>
<td>93</td>
<td>86</td>
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<tr>
<td>1:8</td>
<td>90</td>
<td>91</td>
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<td>1:32</td>
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<td>1:64</td>
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<td>97</td>
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<td>1:128</td>
<td>24</td>
<td>99</td>
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<tr>
<td>1:256</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>1:512</td>
<td>5</td>
<td>100</td>
</tr>
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</table>

- ELISA
  - Most reliable & readily available test
  - Used by 2 Toxocara-derived Ag
    - Embryonated egg
    - Excretory-secretory antigen: more consistent
  - Reasonable efficient in acute toxocariasis but not in inactive and ocular disease
    - evidence of ocular toxocariasis: Serum titer 1:8
  - High false (+): due to cross reaction
    - Western blotting technique
    - PCR from aqueous humor
## Treatment

### Medical therapy
- Anthelmintic drugs
  - Thiobendazole / Albendazole
    - 800mg BID for adult
    - 400mg BID for children
  - Prednisone
    - Reduce secondary inflammation
    - Use anthelmintic drug simultaneously
- Disappearance of the active larva 24 hours after the initial Tx.
- No change in pre & post Tx. VA

### Surgical therapy
- Effective method to manage the secondary effects of Toxocariasis
  - Favorable outcomes were reported
    - Hagler et al: 15/17 stabilized or improved post OP VA
  - Photocoagulation: kill the larvae
  - Cryopexy: treat vasoproliferative tumors secondary to organism
Ocular Toxocariasis in Korea

Table 1. Demographic characteristics of the patients with ocular toxocariasis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Finding</th>
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</thead>
<tbody>
<tr>
<td>No. of patients (eyes)</td>
<td>33 (33)</td>
</tr>
<tr>
<td>Sex (male/female)</td>
<td>24/9</td>
</tr>
<tr>
<td>Age at presentation (years)</td>
<td>41.6 ± 11.0 (8-65)</td>
</tr>
<tr>
<td>Male</td>
<td>42.0 ± 12.1 (8-65)</td>
</tr>
<tr>
<td>Female</td>
<td>40.6 ± 7.8 (24-49)</td>
</tr>
<tr>
<td>Time from onset to presentation (months)</td>
<td>2.9 ± 5.1 (&lt;1-24)</td>
</tr>
<tr>
<td>Male</td>
<td>2.1 ± 3.3 (&lt;1-12)</td>
</tr>
<tr>
<td>Female</td>
<td>5.0 ± 8.1 (&lt;1-24)</td>
</tr>
<tr>
<td>Puppy/kitten exposure</td>
<td>10 (36%)</td>
</tr>
<tr>
<td>Raw food consumption (raw meat, liver, freshwater fish)</td>
<td>23 (82%)</td>
</tr>
</tbody>
</table>

Values are means ± SD (range) unless otherwise indicated.

Table 3. Clinical characteristics of the patients with ocular toxocariasis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number (% of patients)</th>
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<tbody>
<tr>
<td>Chronicity</td>
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<tr>
<td>Acute</td>
<td>22 (67)</td>
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<tr>
<td>Chronic</td>
<td>7 (21)</td>
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<tr>
<td>Recurrent</td>
<td>4 (12)</td>
</tr>
<tr>
<td>Laterality</td>
<td></td>
</tr>
<tr>
<td>Unilateral</td>
<td>33 (100)</td>
</tr>
<tr>
<td>Bilateral</td>
<td>0</td>
</tr>
<tr>
<td>Severity</td>
<td></td>
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<tr>
<td>Mild</td>
<td>19 (58)</td>
</tr>
<tr>
<td>Moderate</td>
<td>12 (36)</td>
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<tr>
<td>Severe</td>
<td>2 (6)</td>
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<tr>
<td>Location</td>
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<tr>
<td>Anterior</td>
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<td>Intermediate</td>
<td>2 (9)</td>
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<td>Posterior</td>
<td>26 (70)</td>
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<td>Diffuse</td>
<td>4 (12)</td>
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<tr>
<td>Type</td>
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<tr>
<td>Posterior pole granuloma</td>
<td>12 (36)</td>
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<td>Peripheral inflammatory mass</td>
<td>17 (52)</td>
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<td>Chronic endophthalmitis</td>
<td>1 (3)</td>
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<tr>
<td>Atypical</td>
<td>3 (9)</td>
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</tbody>
</table>
Reference

○ YJ Kim, CH Moon, JH Chang, Toxocariasis of the Optic Disc, Journal of Neuro-Ophthalmology 2013;0:1–2
THANK YOU FOR YOUR ATTENTIONS