Spectrum of clinical and subclinical choroidal abnormalities in patients with histiocytosis

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Retina Society Meeting 2020
No Financial Interests or Relationships
Off label Use Drugs
Conclusion/Summary

• 14% of non-LCH histiocytosis patients have **clinically evident** infiltration of the choroid

• However, the vast majority of these patients (80%), have statistically significant **increase** in SFCT compared to age- and gender-matched controls
• With systemic treatment, SFCT decreases

• Choroid morphology:
  - outer retinal infiltrative densities (40%)
  - enlarged Haller’s layer w/ inner ret. distortion (60%)

• There is no association with CNS nor osseous disease
Histiocytic Disorders: Introduction

- Clonal, hematopoietic disorders
- Accumulations of activated histiocytes in affected tissues

- Langerhans Cell Histiocytosis
- Non-Langerhans Cell Histiocytosis
  - Erheim Chester Disease
  - Rosai Dorfman disease
  - Xanthogranuloma
### Histiocytic Disorders: multisystem disease

<table>
<thead>
<tr>
<th>Langerhans Cell</th>
<th>Non-LCH (ECD)</th>
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<tbody>
<tr>
<td><strong>CNS (6%)</strong></td>
<td><strong>CNS (40%)</strong></td>
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<tr>
<td>Hypothalamic-pituitary axis</td>
<td></td>
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<tr>
<td><strong>Lung (10%)</strong></td>
<td><strong>Lung (46%)</strong></td>
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<td><strong>Spleen (13%)</strong></td>
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<td><strong>Liver (16%)</strong></td>
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<tr>
<td><strong>Lymph nodes (19%)</strong></td>
<td><strong>Maxillary sinus (59%)</strong></td>
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<tr>
<td><strong>Skin (39%)</strong></td>
<td><strong>Skin (27%)</strong></td>
</tr>
<tr>
<td><strong>Bone (77%)</strong></td>
<td><strong>Bone (95%)</strong></td>
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</tbody>
</table>
Histiocytic Disorders: Ocular manifestations

- Orbit
- Eyelid
- Other...
Histiocytic Disorders: Published Choroid

Choroidal Langerhans’ cell histiocytosis

Presumed Choroidal Langerhans Cell Histiocytosis Following a Previously Resected Solitary Central Nervous System Lesion in an Adult
Niall Patton, MRCophth
Tze Lai, MBBS(Hons)
Peter Robbins, FRCPA
David Holthouse, MBBS(Hons)
Chris Barry, MMedSci
Ian Constable, FRACO, FRACS
Arch Ophthalmol, 2006

Choroidal Involvement in Erdheim-Chester Disease
Amro Abdellatif, MBBS; Craig M. Mason, MD;
Steven M. Ytterberg, MD; Stephen A. Boorjian, MD;
Diva R. Salomão, MD; Jose Pulido, MD, MS, MPH
Ophthalmology, 2016

ROSAI–DORFMAN DISEASE DIAGNOSED BECAUSE OF BILATERAL CHOROIDAL MASSES
Yoseh Bank, MD, Melissa G. Tong, MD, Todd J. Parkins, MD, Sikomzi Schaal, MD, PhD
Retin Cases Brief Rep, 2012

Choroidal involvement in Rosai–Dorfman syndrome may be depicted and followed using enhanced depth imaging optical coherence tomography (EDI-OCT)
Janelle Fassbender1 · Shlomit Schaal3
DOI 10.1007/s00417-015-2952-5
LETTER TO THE EDITOR

Three Cases of Erdheim-Chester Disease With Intraocular Manifestations: Imaging and Histopathology Findings of a Rare Entity
Anna C.S. Tan, Suzanne Yee, Neal Atebara, Brian P. Mare, Robert M. Verdur, Virgil A.S.H. Duaal, K. Bailey Freund, Lawrence Yannuzzi
Am J Ophthalmol, 2017

Barak et al, Retin Cases Brief Rep, 2012


In histiocytosis:
1. Does the OCT of the choroid have characteristic findings?
2. Does this change with treatment?
Patients included:

- This was compared to an age and gender matched control set of patients.
13 of 94 eyes (14%) had **clinically evident** choroidal infiltration (some more evident than others)
In all cases, the findings are post-equatorial. In the 9 patients, 4 had bilateral findings.
Non-LCH patients had thicker SFCT, as measured by OCT.

Mean subfoveal choroidal thickness (SFCT):

Normal controls = 250µm
Non-LCH patients = 337µm.

The difference, p = 0.00008
Examples of choroidal thickness

NORMAL: mean 250µm

HISTIO: mean 337µm
(80% of eyes had SFCT > 250µm)
Results

Other occult choroidal findings in non-LCH eyes

40% of eyes have an outer choroidal density (infiltrate?)

60% of eyes have an enlarged Haller’s layer (the large choroidal vessels) with distortion of the inner choroidal layers
Results

• 34 non-LCH patients (with imaging at baseline AND follow up): significant **decrease** in SFCT treatment on systemic treatment

The mean change was a decrease of 31µm (p-value = 0.000005)

The length of time on treatment (and f/u exam) did not appear to influence the amount of SFCT
Results

Is CNS/osseous disease a marker for disease burden and would that correlate with choroidal thickness?

- No significant difference in SFCT between patients with or without CNS disease (p-value = 0.35)
- No significant difference in SFCT between patients with or without osseous disease (p-value = 0.35)
Why is the choroid thicker in histio?

• We know the choroid is a site for accumulation of activated histiocytes (in the clinically evident cases). In the subclinical eyes, could the thicker choroid represent disease involvement?

• For instance, lymphoma and myeloproliferative diseases can infiltrate the choroid

• And/or could the choroid be a site where these abnormal activated histiocytes are being generated?

• We know the choroid can be a site of extramedullary hematopoiesis (both in neonates and adults- although our knowledge is limited to enucleation specimens). Therefore, presumably, the choroid could be a source of these cells
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