



Summertime, and the Livin' is Easy^{1/2}

Himanshu Banda, MD; Thomas K. Krummenacher, MD



Introduction:

A 31-year-old Caucasian female presents for consultation of retinal deposits seen on examination by an optometrist during routine examination. The patient denies any sudden vision change, flashes of light, floaters or nyctalopia. The patient also denies any medical problems. She takes no other prescription medications other than progestin-only oral contraceptive. She also denies any family history of vision loss or renal disease.

Exam:

Visual acuity 20/20 in both eyes. No relative afferent pupillary defect was noted. Confrontation to visual field and extraocular motility was intact. Anterior segment was unremarkable. Fundus examination revealed highly reflective crystal-like retinal deposits in the perifoveal region (Figures 1 & 2).

On further questioning regarding non-prescription supplement use, the patient discusses regular use of an over-the-counter tanning supplements in lieu of sun exposure (Figure 3). The patient was instructed to stop this supplement. Additionally, she was referred for basic renal function testing to rule out other metabolic sources of her retinopathy.

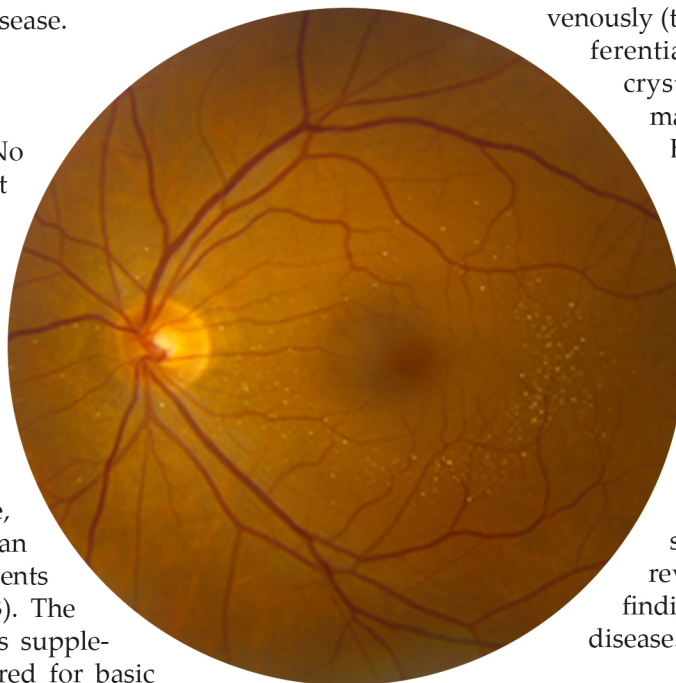
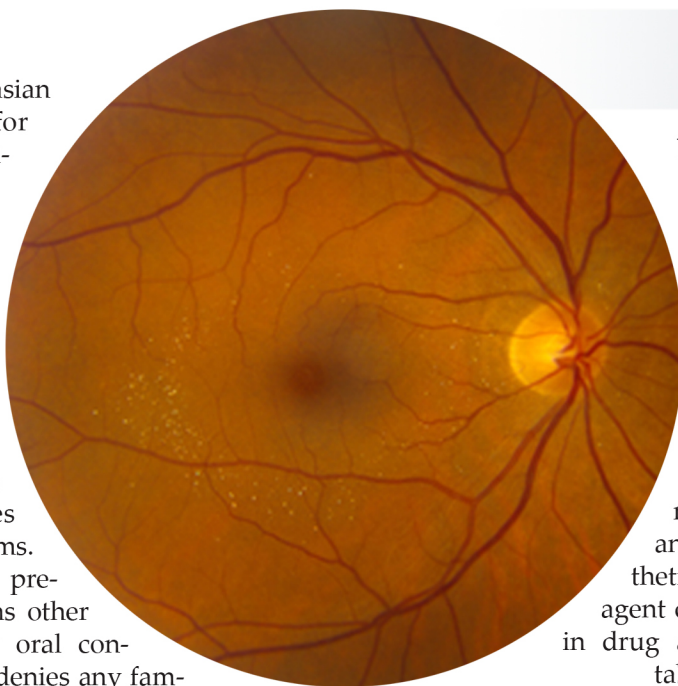


Figure 1 & 2: Perifoveal crystalline retinopathy noted in both eyes.

Discussion:

The differential diagnosis of asymptomatic crystalline retinopathy in a young patient is broad. Such deposits in the retina may be associated with a wide variety of systemic disorders such as oxalosis, cystinosis, hyperornithinemia and Sjögren-Larsson syndrome. Refractive crystalline deposits may also be a manifestation of drug toxicity like the antineoplastic agent tamoxifen, the anesthetic methoxyflurane and the oral tanning agent canthaxanthin. Crystals may also occur in drug abusers who inject multiple crushed tablets of methadone or meperidine intravenously (talc retinopathy). The differential diagnosis of retinal crystals also includes primary ocular diseases like Bietti's crystalline retinopathy, calcified macular drusen, idiopathic parafoveal telangiectasis and longstanding retinal detachment¹. Though the medical history suggests canthaxanthin as the culprit, a thorough history and workup should be considered to rule out other reversible causes of such findings related to systemic disease.

Canthaxanthin crystalline retinopathy is a rare entity that is related to over-the-counter

canthaxanthin supplement use. The products create the appearance of a "suntan" by direct skin coloring². Canthaxanthin crystals may also deposit in the retina in the perifoveal region. The exact reason for the location of deposition is not completely understood, however it is thought to be related to the affinity of canthaxanthins to metabolically active cells in the retina³.

Incidence and prevalence are challenging to predict given the asymptomatic course of canthaxanthin retinopathy. Some reports state an incidence between 12 and 14%⁴. Harnois et al. notes a dose dependent relationship with canthaxanthin use and retinal crystal burden⁵.

Funduscopy examination generally reveals highly reflective, tiny (30 μ m) crystals accumulating in the perifoveal area³. High resolution OCT has shown that canthaxanthin retinopathy crystals are found in the outer plexiform layer⁶. While the vast majority of patients with canthaxanthin retinopathy remain asymptomatic, visual field defects, decreased visual acuity, abnormal electroretinogram testing, and low static luminance threshold may be present^{7,8}. While often normal, fluorescein angiography may show a perifoveal ring of blocked fluorescence corresponding to areas of crystal deposition.

The importance of collecting accurate information on the use of dietary supplements, hormone therapy or recreational drugs is often overlooked in eye clinics. Patients tend to view such non-prescribed supplements as 'safe' or irrelevant to the discussion, and therefore omit them from the medical history. However, it is important to present concerns that link supplement or recreational drugs to the ophthalmic problem. Though young patients may not be willing to reveal such information to a triage technician collecting data



Figure 3: Over-the-counter canthaxanthin supplement purchased by the patient.

on medical reconciliation, a study has shown that simply asking about specific drug tends to yield more accurate results than open ended questioning⁹. After ascertaining this information in our case, we recommended discontinuing the medication as well as routine follow up.

References:

1/2. Gershwin G, Heyward D, Gershwin I. Summertime. Porgy and Bess; 1935.

1. Nadim F, Walid H, Adib J. The differential diagnosis of crystals in the retina. *Int Ophthalmol* 2001;24:113-21.

2. Hueber A, Rosentreter A, Severin M. Canthaxanthin retinopathy: long-term observations. *Ophthalmic Res* 2011;46:103-6.

3. Beaulieu RA, Warwar RE, Buerk BM. Canthaxanthin retinopathy with visual loss: a case report and review. *Case Rep Ophthalmol Med* 2013;2013:140901.

4. Rousseau A. Canthaxanthine deposits in the eye. *J Am Acad Dermatol* 1983;8:123-4.

5. Harnois C, Samson J, Malenfant M, Rousseau A. Canthaxanthin retinopathy. Anatomic and functional reversibility. *Arch Ophthalmol* 1989;107:538-40.

6. Chan A, Ko TH, Duker JS. Ultrahigh-resolution optical coherence tomography of canthaxanthine retinal crystals. *Ophthalmic Surg Lasers Imaging* 2006;37:138-9.

7. Harnois C, Cortin P, Samson J, Boudreault G, Malenfant M, Rousseau A. Static perimetry in canthaxanthin maculopathy. *Arch Ophthalmol* 1988;106:58-60.

8. Fraunfelder FW. Ocular side effects from herbal medicines and nutritional supplements. *Am J Ophthalmol* 2004;138:639-47.

9. Saitz R, Cheng DM, Allensworth-Davies D, Winter MR, Smith PC. The ability of single screening questions for unhealthy alcohol and other drug use to identify substance dependence in primary care. *J Stud Alcohol Drugs* 2014;75:153-7.

Case of the Month
Supported by:



Retina Research &
Development Foundation

Midwest Ophthalmologic Symposium

September 8, 2018

Visit our website at tri-stl.com

Register
Today!



THE
RETINA
INSTITUTE

1600 S. Brentwood Blvd., Suite 800
St. Louis, MO 63144

(314) 367-1181
tri-stl.com

Kevin J. Blinder, MD
Sabin Dang, MD
Nicholas E. Engelbrecht, MD
M. Gilbert Grand, MD
Daniel P. Joseph, MD, PhD

Thomas K. Krummenacher, MD
Richard J. Rothman, MD
Gaurav K. Shah, MD
Bradley T. Smith, MD
Matthew A. Thomas, MD