A 70-Year-Old Female with Constant Blurry Vision in Both Eyes

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Introduction:

A 70-year-old female presented to the clinic for evaluation of constant "blurry vision" in both eyes. She was noted to have a past ocular history of non-exudative macular degeneration and a past medical history of interstitial cystitis, atrial fibrillation, systemic lupus, and hypercholesterolemia.

Exam:

On exam, she was found to have best corrected visual acuity of 20/25 OU, normal intraocular pressures with no APD. Her anterior segment exam was notable for mild cataracts OU. Her funduscopic examination was notable for parafoveal macular pigmentary changes with no significant peripheral abnormalities (Fig 1). OCT was performed which showed the presence of pseudo drusen and focal areas of outer retinal attenuation (Fig 2). Autofluorescence of the macula revealed alternating areas of hypo and hyperautofluorescence (Fig 3). Upon further questioning, the patient relayed no history of color vision abnormalities nor family history of ocular conditions. She endorsed a history of pentosan polysulfate sodium (Elmiron) use for the past 15 years to treat her interstitial cystitis. The constellation of her history and ocular findings concerned us for Elmiron retinal toxicity.

Discussion:

Pentosan polysulfate sodium (Elmiron) was FDA approved in 1996 for the treatment of bladder pain and discomfort associated with interstitial cystitis (IC). IC is a urological chronic regional pain syndrome more common in women than men, with an estimated prevalence of 1 million affected individuals in the United States alone.[1] Elmiron acts an analogue of semi- biologic glycosaminoglycans, coating the urothelium of the bladder with the goal of relieving irritation associated with IC and regulating cellular permeability. However, beginning in 2018, case reports began to appear of macular pigmentary changes in patients taking Elmiron with no genetic predisposition to hereditary macular dystrophy.

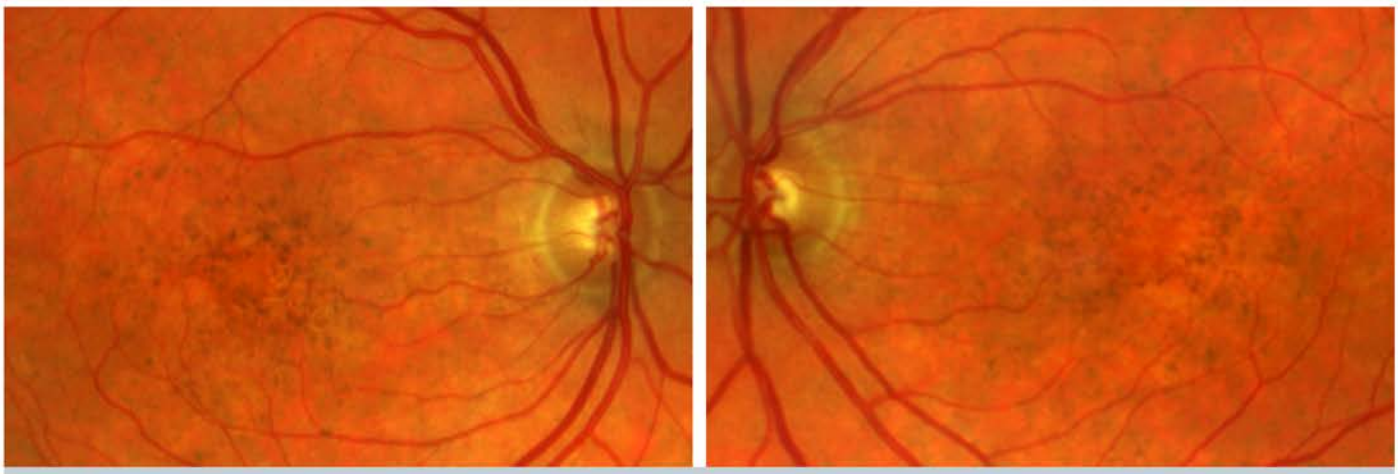

Figure1: Color photographs of the macula demonstrating parafoveal pigmentary changes

In retrospective single institution study of 38 patients using Elmiron for IC, 6 (16%) patients presented with bilateral macular pigmentary changes concerning for drug toxicity.[2] These patients tended to be older with a higher mean cumulative dose and duration of exposure. The most common (66%) presenting complaint in these patents was difficulty reading. All eyes showed paracentral hyperpigmentation at the level of the retinal pigment epithelium (RPE) with surrounding vitelliform lesions or pseudodrusen. A follow-up investigation from the same institution showed that in patients diagnosed with IC and not exposed to Elmiron, none went on to develop retinal toxicity, implying causality between the drug and its characteristic retinal findings.[3] No underlying etiology for Elmiron toxicity has been elucidated, but an underlying insult to the RPE/photoreceptor complex possibly due to drug or downstream byproduct accumulation has been postulated. Unfortunately, macular toxicity associated with Elmiron may worsen even after its cessation. In a study of 12 patients with known Elmiron toxicity who had stopped using the drug after initial diagnosis, 10 (83%) noted subjective worsening of visual symptoms and all patients were noted to have enlargement of RPE atrophy on autofluorescence in the follow-up interval.[4] Thus, in patients using Elmiron for IC, emphasis has been placed on screening and prevention strategies. All patients with documented Elmiron use should have a baseline retinal screening examination with color photography, OCT and fundus autofluorescence. Patients documented to have a greater than 1500g cumulative dose of Elmiron should be followed closely, as these patients are at significantly higher risk of retinal toxicity.[5] In all cases, cessation of Elmiron should be discussed with the patient's primary care physician or urologist to prevent more rapid progression of toxicity.

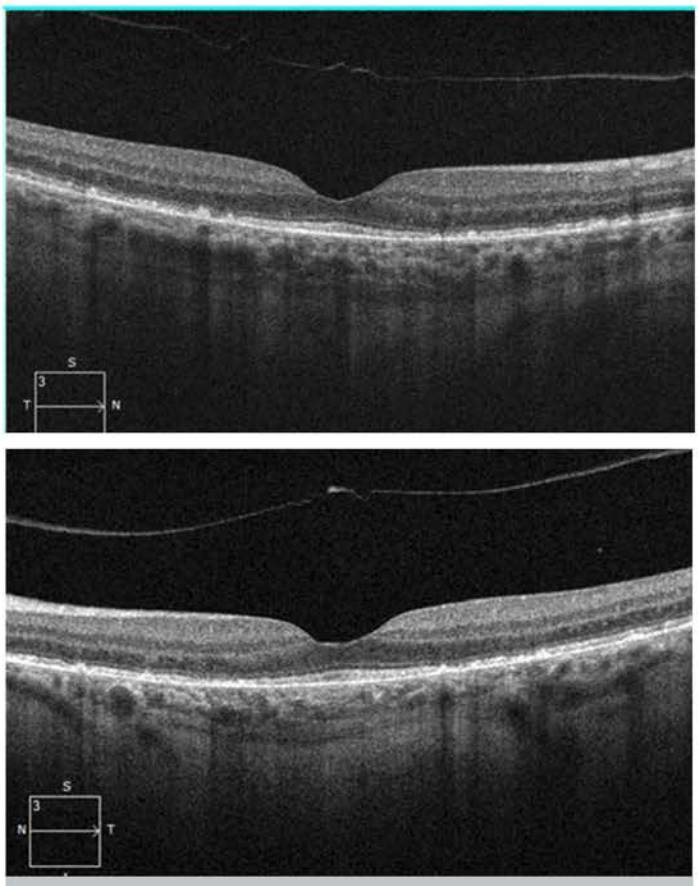

Figure 2: OCT demonstrating outer retinal attenuation and pseudodrusen.

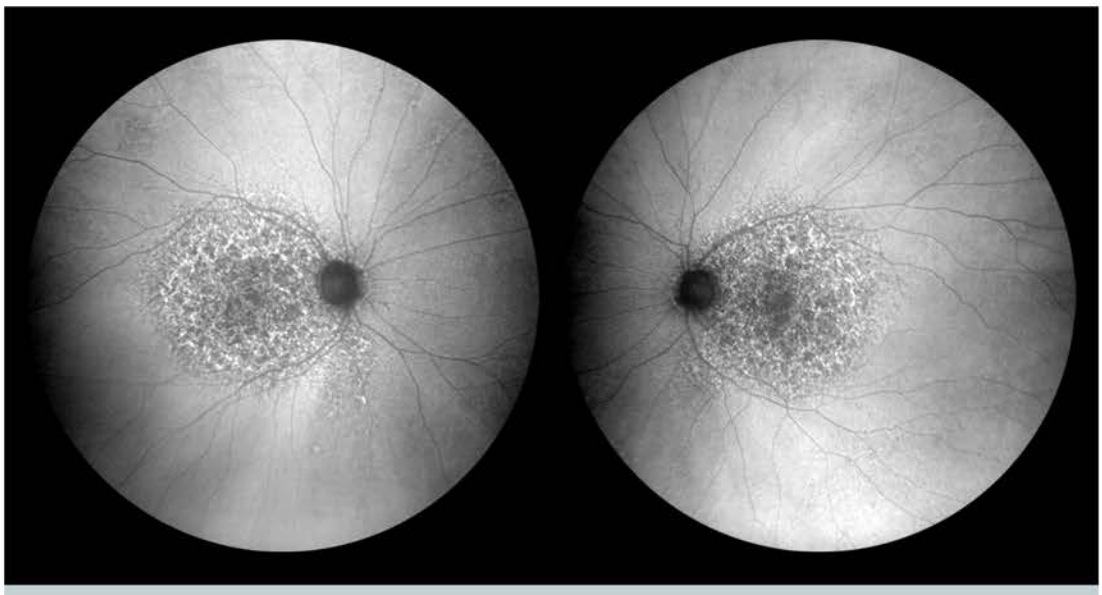

Figure 3: Fundus autofluorescence demonstrating alternating hyper and hypoautofluoresence indicating macular RPE dysfunction and loss.

References:

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3. Hanif AM, Shah R, Yan J, et al. Strength of association between pentosan polysulfate and a novel maculopathy. Ophthalmology 2019 Apr 18

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5. Wang D, Au A, Gunnemann F, Hilely A, Scharf J, Tran K, Sun M, Kim JH, Sarraf D. Pentosan-associated maculopathy: prevalence, screening guidelines, and spectrum of findings based on prospective multimodal analysis. Can J Ophthalmol. 2020 Apr;55(2):116-125.

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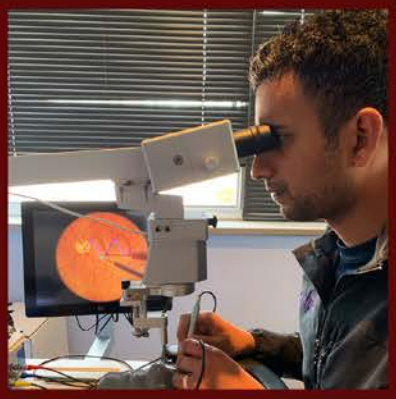

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