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Whitish Outer Retinal Spots in Rhegmatogenous Retinal Detachment

Jonathan F. Russell, MD, PhD,[1] *Stephen R. Russell, MD*[2]

Purpose: To characterize the whitish outer retinal spots that are occasionally present in rhegmatogenous retinal detachment (RRD).

Design: Retrospective series.

Participants: Patients who presented to Bascom Palmer Eye Institute or the University of Iowa with RRD and whitish outer retinal spots in some areas of detached retina.

Methods: Four patients who underwent clinical examination for evaluation of RRD and were found to have whitish outer retinal spots were identified, and records were retrospectively reviewed. Case histories or color fundus photographs and OCT images were summarized. Also, we searched the American Society of Retina Specialists Image Bank to assess the frequency of spot recognition and to identify 4 additional cases.

Main Outcome Measures: Clinical examination, photography, and OCT.

Results: Whitish outer retinal spots, which vary in size from punctate to approximately 100 μm, are occasionally observed clinically in well-circumscribed geographic areas of detached retina. In all 4 cases, the lesions were located between the retinal break and attached retina. The 4 American Society of Retina Specialists Image Bank cases demonstrated similar distributions. OCT imaging demonstrated hyperreflective foci co-localizing with the spots that are located in the outer photoreceptor segment layer.

Conclusions: We propose that these lesions represent a transitory stage of retinal degeneration several weeks after detachment. Clinical observation of whitish outer retinal spots may assist in dating an RRD as subacute and may help to identify the associated retinal break. *Ophthalmology Retina 2017;■:1−7 © 2017 by the American Academy of Ophthalmology*

In 1938, Vogt[1] described 3 patients with retinal detachment who presented with numerous "subvascular white flecks." He noted that the lesions "affect large parts of the detached retina and are usually most numerous in the intermediary zone, and are more sparse peripheral and axial…after surgical healing of the detachment the spots disappeared in all cases without a trace."

These spots were largely overlooked or ignored in the literature until 1978, when Robertson[2] noted "subretinal precipitates" in 12% of a 575-case series of rhegmatogenous retinal detachment (RRD). The presence of the spots, observed before RRD repair surgery, was highly correlated with delayed subretinal fluid absorption following surgical repair. He collected intraoperative subretinal fluid and noted enrichment of pigment-laden macrophages within his samples from cases with the spots. This led him to propose that the spots represent aggregates of macrophages, and that their presence reflects a disruption in the choriocapillaris−retinal pigment epithelium (RPE) complex, significant tissue phagocytosis of the outer receptors, or both.

Based on careful ophthalmoscopy, Schepens[3] in his classic text located the spots in the outer retinal layers. He wrote that the whitish outer retinal spots are pathognomonic of retinal detachment, but that they "may exist in traction detachments as well as in rhegmatogenous cases. We have not seen them in attached retina or in a retinoschisis." He agreed with Vogt[1] that the lesions disappear when the retina reattaches.

Because there is no consensus on the origin, distribution, and significance of the whitish outer retinal spots associated with RRD, we reviewed our clinical observations and imaging from cases with the lesions. Confirming our observation that these lesions are often overlooked, we are unable to identify prior publication of color photographs and OCT co-localization of these spots. We herein report that the spots are located in the outer retina rather than the subretinal space. Based on their distribution, we suggest several hypotheses as to why the lesions are rarely observed and why their observation may have clinical utility.

Methods

This study was performed in accordance with the Health Insurance Portability and Accountability Act, and the institutional review board protocols of both Bascom Palmer Eye Institute and the University of Iowa. This study was determined to be exempt at the University of Miami/Bascom Palmer Eye Institute and was concurrently approved by the Human Subjects Committee at the University of Iowa (IRB# 201707741).

In 1 year of examining patients with RRDs, we collected 4 patients from either Bascom Palmer or the University of Iowa

https://doi.org/10.1016/j.oret.2017.10.020
ISSN 2468-6530/17

with RRD-associated whitish outer retinal spots. When possible, we performed color fundus photography or spectral-domain OCT (Heidelberg Spectralis OCT, Heidelberg Engineering, Franklin, MA). These patients were operated on by 3 different vitreoretinal surgeons; only 1 patient (case 3) was operated on and followed serially by one of us (S.R.R.); thus, postoperative follow-up and serial photographs or OCT images were not obtainable in all cases. In an effort to identify additional cases, and to assess the frequency of spot recognition, we searched the American Society of Retina Specialists Image Bank and PubMed to determine whether others have reported on the localization or time course of the lesions. We reviewed the 894 American Society of Retina Specialists Image Bank images identified with the search term "retinal detachment" and the 245 images identified with the search term "retinoschisis."

Results

Case 1

A 63-year-old woman presented with 2 weeks of cloudy vision in the right eye. She had type 2 diabetes mellitus without retinopathy for 10 years; her ocular history was otherwise normal. She was obese and had hypertension and arthritis. Visual acuity was hand motions in the right eye and 20/20 in the left eye. She was phakic. Dilated fundus examination revealed a macula-involving retinal detachment from 7 o'clock to 12 o'clock, with a retinal tear at 10 o'clock. There was no lattice retinal degeneration. She had scattered drusen in both eyes and a sub−disc diameter macular choroidal nevus with benign features in her contralateral eye.

Numerous whitish spots were located in a bandlike geographic distribution at approximately 10 o'clock between the retinal break and the macula (Fig 1A). The spots varied in size from punctate to approximately 100 μm (Fig 1A). Images from OCT through the area of detached retina containing the whitish spots showed corresponding hyperreflective foci in the outer retinal layers (Fig 1B and C). It is difficult to pinpoint the exact layer or layers involved, given the inherently poor quality of the OCT imaging in the setting of RRD. However, the lesions are certainly in the photoreceptor layers and seem to be concentrated in the outer photoreceptor segment (Fig 1B and C). Larger lesions were associated with bulging of the outer retina posteriorly (Fig 1B and C). Images from OCT through the contralateral eye showed multiple small drusen but no outer retinal hyperreflective foci.

The patient underwent pars plana vitrectomy with fluid−air exchange, endophotocoagulation, evacuation of the subretinal space, and instillation of octafluoropropane gas. At her 1-day, 1-week, and 1-month postoperative visits, the residual gas bubble precluded adequate visualization and repeat imaging of the retinal area that contained the lesions preoperatively. Her 1-month pinhole visual acuity was 20/40.

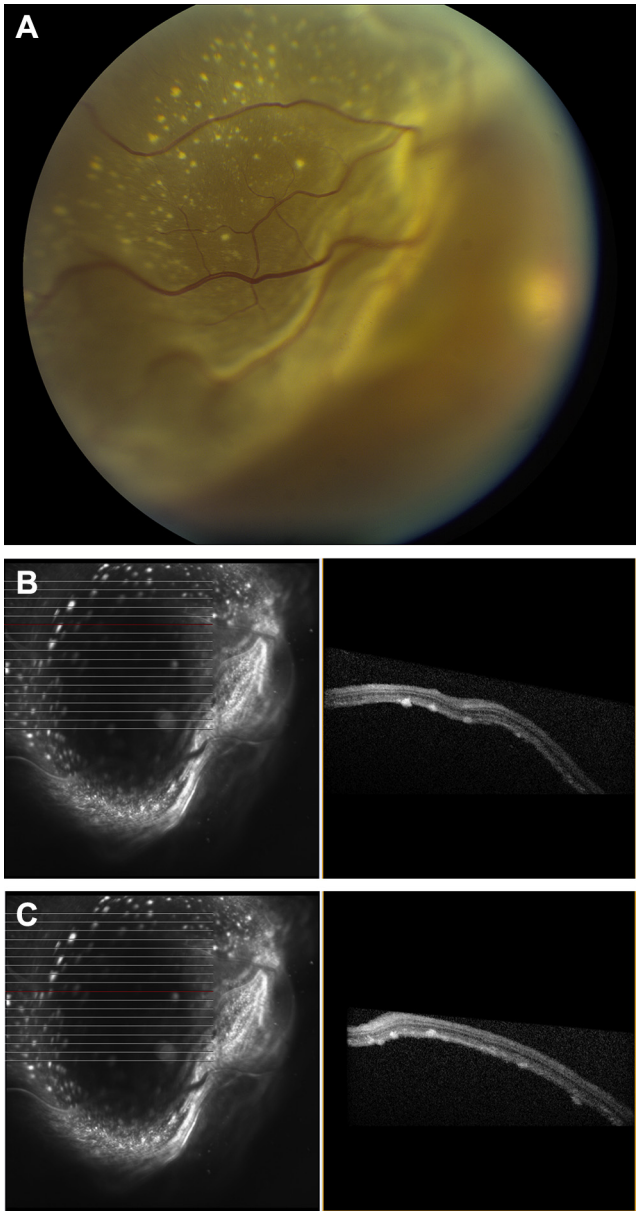

Figure 1. Whitish outer retinal spots in rhegmatogenous retinal detachment, case 1. **A**, Color fundus photograph of whitish outer retinal spots that were located in a bandlike geographic distribution at approximately 10 o'clock between the retinal break and the macula. **B**, **C**, Optical coherence tomography images through the area of detached retina containing the whitish spots showed corresponding hyperreflective foci in the outer retinal layers.

Case 2

A 9-year-old boy presented with decreased vision in the right eye, which he had not noticed. His mother noted visual behavioral changes for between 1 and 6 months (his vision had been measured at 20/20 in that eye 1 year prior). He had attention deficit hyperactivity disorder, but an otherwise normal medical and ocular history. There was no history of trauma. Visual acuity was E at 1 foot in the right eye, and 20/20 in the left eye. Examination revealed a retinal dialysis from 6 o'clock to 8 o'clock, with a shallow, macula-involving retinal detachment from 3 o'clock to 10 o'clock (Fig 2A). Numerous punctate whitish outer retinal spots were located inferior to the macula in a well-circumscribed geographic area (Fig 2B). Images from OCT demonstrated foci of hyperreflectivity corresponding to the visualized lesions in the outer photoreceptor segment (Fig 2C). There was no such similar lesion observed on examination, photograph, or OCT image through the detached macula in that same eye, nor in the contralateral eye. The patient underwent uncomplicated scleral buckling with cryotherapy.