Multimodal imaging characteristics of refractile drusen

Samarth Mishra, Sugandha Goel, Subham Sinha Roy, Barun Garg, Marina Parvin, Kumar Saurabh, Rupak Roy

Key words: Calcified drusen, drusen, ossified drusen, refractile drusen

Refractile drusen (RD) appears as yellow, glistening, hyper-refractile dots and are best visualized when the normally overlying retinal pigment epithelium (RPE) is absent.[1] They are seen in association with age-related macular degeneration (AMD) and are thought to be an important prognostic biomarker for developing central geographical atrophy (GA).[1] Here, we describe the multimodal imaging characteristics of a case of RD.

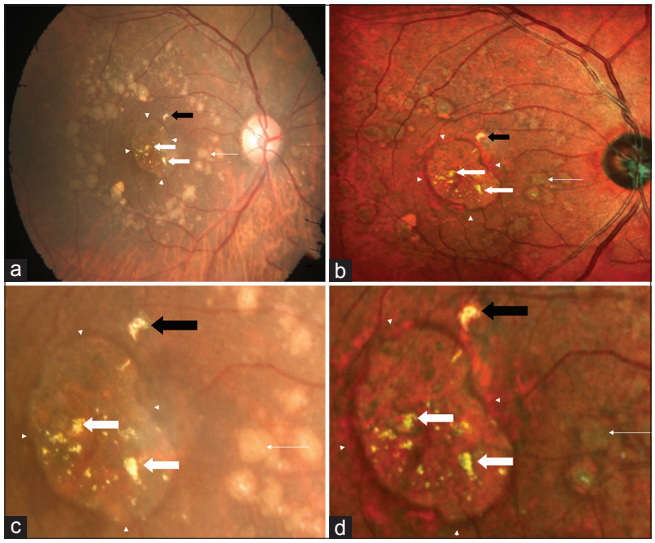

Figure 1: (a) Color fundus photograph of the right eye showing refractile drusen as yellow, glistening deposits in the macular and perimacular area (thick white arrow), and soft drusen circumferentially (thin white arrow) with an area of central retinal pigment epithelium atrophy (arrowhead). Hyper-reflectant structure seen superonasal to the fovea is artifactual (black arrow). (b) Multicolor composite image highlights the refractile drusen as small, yellow, glistening deposits (thick white arrow), whereas the soft drusen appears as green with an orange border (thin white arrow). (c and d) Magnified conventional fundus photography and multicolor composite image view of refractile drusen (thick white arrow), soft drusen (thin white arrow), and artifact (black arrow)

Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_867_18

Department of Vitreo Retina, Aditya Birla Sankara Nethralaya, Kolkata, West Bengal, India

Correspondence to: Dr. Rupak Roy, Department of Vitreo Retina, Aditya Birla Sankara Nethralaya, 147, Mukundapur, E. M. Bypass, Kolkata - 700 099, West Bengal, India. E-mail: rayrupak@gmail.com

Manuscript received: 24.05.18; Revision accepted: 26.08.18

Case Report

A 72-year-old, one-eyed female presented with complaints of decreased vision since 2 years. Best corrected visual acuity in her right eye was 20/40. Color fundus photograph showed multiple glistening yellow lesions in fovea and surrounded circumferentially by multiple soft drusen (SD) [Fig. 1a (1c magnified)]. There was a lamellar macular hole surrounded by a central area of geographic atrophy. Spectral domain optical coherence tomography (Heidelberg Spectralis, Heidelberg Engineering, Germany) showed RD as hyper-reflective deposit at the RPE level with significant back shadowing, in contrast to SD that appeared as dome-shaped elevations of the RPE with uniform hyper-refractile material inside with no back shadowing [Fig. 2]. In multicolor composite image, SD appears green with orange borders, while RD stands out as glistening, light yellow structures [Fig. 1b (1d magnified)]. RD were distinctly hyper-reflectant in green [Fig. 3e] and blue reflectance [Fig. 3d] images, whereas SD appeared to be mildly hyper-reflectant. The infrared reflectance image was not much informative [Fig. 3c]. The blue autofluorescence [Fig. 3b] and near-infrared autofluorescence [Fig. 3a] highlight the area of central GA.

Discussion

RD or "ossified drusen" or "crystalline drusen" are a distinct clinical entity with very limited studies. They are believed to

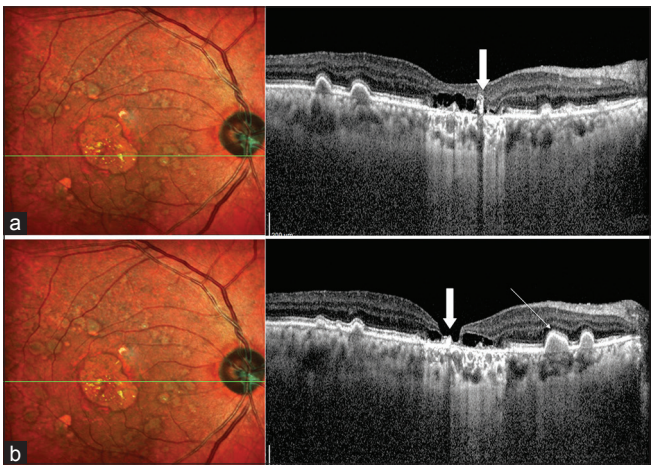

Figure 2: (a and b) Spectral domain optical coherence tomography scan of the right eye passing through the refractile drusen (thick white arrow in the optical coherence tomography scan), with significant back shadowing. Soft drusen (thin white arrow) appears as bumpy elevations in the optical coherence tomography with uniform hyper-reflective material inside without any back shadowing

Cite this article as: Mishra S, Goel S, Roy SS, Garg B, Parvin M, Saurabh K, *et al*. Multimodal imaging characteristics of refractile drusen. Indian J Ophthalmol 2019;67:128-9.

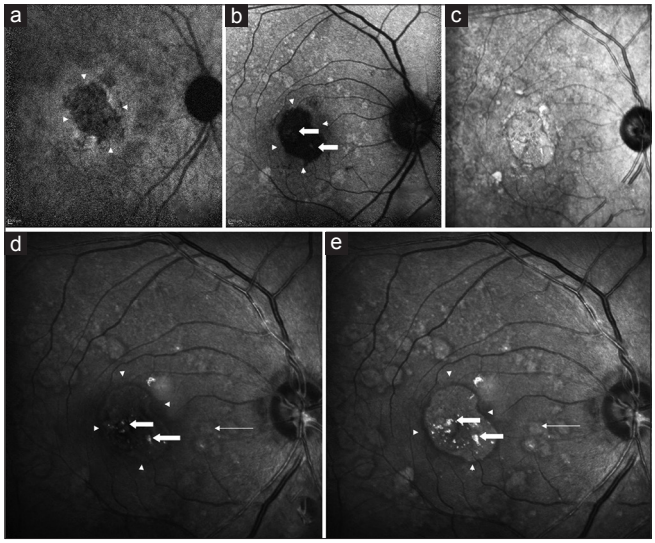

Figure 3: (a and b) Near-infrared autofluorescence (a) and blue autofluorescence (b) highlight the area of retinal pigment epithelium atrophy. (c) Infrared reflectance fails to highlight the drusen. (d) Blue reflectance image shows refractile drusen as hyper-reflectant lesions (thick white arrow). Soft drusen appears mildly hyper-reflectant with surrounding dark borders (thin white arrow). Arrowhead shows the area of retinal pigment epithelium atrophy. (e) Green reflectance image distinctly highlights the refractile drusen as hyper-reflectant material (thick white arrow), whereas soft drusen as mildly hyper-reflectant with dark borders (thin white arrow) surrounding it with distinct retinal pigment epithelium atrophic area (arrowheads)

be composed of calcium, and thus, sometimes also referred to as "calcified drusen."[2] Oishi *et al*. have shown in their recent study that patients with RD are at a risk of developing central GA.[1] Suzuki *et al*. recently concluded in their study that these were probably a stage of drusen regression, which was marked by a loss of RPE; thus, contributing to the development of GA in a mean period of 2.5 years.[3,4]

Conclusion

The current photo essay highlights the multimodal imaging characteristics of RD. Multicolor composite image with blue and green channels appears most effective in picking them up. Multimodal imaging helps in picking up RD, and thus, prognosticates patients with AMD.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Oishi A, Thiele S, Nadal J, Oishi M, Fleckenstein M, Schmid M, *et al.* Prevalence, natural course, and prognostic role of refractile drusen in age-related macular degeneration. Invest Ophthalmol Vis Sci 2017;58:2198-206.
2. Gass JD. Drusen and disciform macular detachment and degeneration. Arch Ophthalmol 1973;90:206-17.
3. Suzuki M, Curcio CA, Mullins RF, Spaide RF. Refractile Drusen: Clinical imaging and candidate histology. Retina 2015;35:859-65.
4. Klein ML, Ferris FL 3rd, Armstrong J, Hwang TS, Chew EY, Bressler SB, *et al.* Retinal precursors and the development of geographic atrophy in age-related macular degeneration. Ophthalmology 2008;115:1026-31.