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Case Report

Association of neurosensory detachment with choroidal folds in a hypermetrope: An unusual presentation

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Introduction

Choroidal folds are seen at the posterior pole of the eye in the form of lines or striae. Choroidal folds were first described by Nettleship, as “peculiar lines in choroid”¹ in expanding Orbital tumors. Norton was the first to label them as choroidal folds.² Choroidal folds appear clinically as yellow dark bands corresponding to the crests and troughs of folds.³

Case report

A 27-year-old female patient presented for her routine checkup. She gave history of spectacle use since early

childhood with progressive increase in her hyperopia with age. However, her refractive status was stable since the last 6 years. She had no history suggestive of raised intracranial hypertension, scleritis, and cerebral or orbital malignancy.

Clinical findings

Patient's unaided vision for both eyes was 6/60, which improved to 6/6, with a spherical correction of +4 diopter spherical in both eyes. Her ductions and versions were full, free, and painless, with no proptosis. Anterior segment was within normal limits with normal pupillary reactions and intraocular pressure was noted to be 16 and 18 mm of Hg in Right eye (RE) and Left eye (LE), respectively. On routine fundus

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Fig. 1 – RE and LE color fundus photo showing choroidal folds in the area of superior arcade as seen by the undulations in the form of alternate light and dark streaks.

Fig. 2 – OCT macula RE showing chorioretinal folds with undulations of choroid, Bruch's membrane, retinal pigment epithelium, and overlying retina. The retina is seen to be of uniform thickness and thus suggestive of chorioretinal folds. OCT macula LE shows similar choroidal folds with neurosensory detachment.

examination, she was found to have choroidal folds in RE and choroidal folds with yellowish intraretinal exudates near superotemporal arcade in the LE, as shown in Fig. 1. Optic discs were within normal limits, with the rest of the fundus being unremarkable. Amsler's grid examination was within normal limit. She was evaluated further and underwent Axial scan (A-scan) wherein the axial length was found to be 20.21 and 20.16 mm, respectively, with no posterior scleral thickening seen on B-scan.

Optical coherence tomography (OCT) was done, as shown in Fig. 2; RE was showing choroidal folds and LE was showing choroidal folds with neurosensory detachment (NSD).

Autofluorescence images were taken showing choroidal folds as alternate light and dark bands with area of hyperfluorescence and intraretinal exudates in LE, as seen in Fig. 3.

Fundus fluorescein angiography (FFA) in Fig. 4 shows alternate dark and light bands suggestive of choroidal folds

Fig. 3 – Autofluorescence RE showing alternate light and dark bands around superior arcade. LE shows similar findings along with pinpoint hyperautofluorescence superotemporal to fovea corresponding to the area of neurosensory detachment suggestive of accumulation of subretinal fluid.

Fig. 4 – ICG LE shows absence of any localized hyperfluorescence suggestive of hyperpermeability. FFA LE shows alternate bands of hyper- and hypofluorescence with the crests of the fold showing hyperfluorescence and troughs showing hypofluorescence. No focal leaks or pooling is seen in the area of NSD in LE. The hyperfluorescent streaks appear due to relative thinning of RPE in the area of crests.

with no leaks in LE. FFA of RE showed similar dark and light bands.

Indocyanine green angiography of both eyes was within normal limits, as shown in Fig. 4.

The patient was evaluated for posterior scleritis, autoimmune disorders, and thyroid eye disease, but her B-scan and other systemic investigations were WNL.

Discussion

The unusual feature in our case was the presence of an NSD as documented by OCT. NSD is generally seen in diseases like central serous chorio-retinopathy (CSCR), diabetic macular edema, and choroidal neo vascular membrane (CNVM). The association of NSD with choroidal folds is not widely reported as a literature search showed only 1 case report⁴ that has documented the same. A similar case has been published by Gass et al.³ but literature has no other reports of this variant.

Choroidal folds are widely known to be associated with hypermetropia but hypermetropia has no association with NSD. There is only one previously documented evidence of choroidal folds with NSD⁴ but an ICG was not mentioned in that article. Moreover, the said article fails to mention the area involved in NSD and whether it corresponds with the area of choroidal folds.

In this case, we have documentary evidence of NSD present in area of choroidal folds and absence of any focal leak or a choroidal hyperpermeability explaining the NSD. To further refute the likelihood of CSCR and choroidal folds as two standalone diagnoses:

- (a) NSD is present extrafoveally in the area of choroidal folds (incidence of extrafoveal NSD in CSCR – 14.10%)⁵
- (b) Our patient is a 27-year-old female (incidence of CSCR in females is 13.29% and in a 27-year-old patient it is less than 5%, as mean age is 42 years with SD of 8 years)

Thus, it seems unlikely that patient has a standalone CSCR with an incidental finding of choroidal folds. While we accept that hypermetropia is the commonest association with choroidal folds and likely to be the underlying cause in our

case too, our emphasis is on whether the patient's choroidal folds are a cause of her developing a NSD.

The hypothesis for pathogenesis of NSD resulting from choroidal folds include:

- (a) Choroidal folds may lead to a breakdown in the blood retinal barrier at RPE level; however, we did not find any focal leak on FFA
- (b) Localized capillary and venous congestion in the area of choroidal folds due to the peaks and troughs, as a result of the folds, can lead to hyperpermeability of the vessels causing an NSD. Hyperpermeability of choroidal vessels as a cause of NSD has already been established in CSCR.⁶ However, we did not visualize any focal hyperpermeability in our case but a functional abnormality can still persist in the absence of demonstrable hyperpermeability on ICG.
- (c) Another hypothesis is that the choroidal folds are interfering with the RPE pump in the area of folds causing them to hypersecrete, but then NSD is seen only in LE while the patient has choroidal folds in both eyes.

All of these hypotheses have weaknesses to explain the presence of NSD in choroidal folds with certainty. Whether this subretinal fluid is to be classified as a NSD due to CSCR with choroidal folds being the underlying etiology for CSCR or whether it should be classified as an NSD due to choroidal folds is a matter of debate.

In conclusion, we present a relatively uncommon condition with an even rarer variant that raises interesting questions of classification of the disease and the etiology of another common condition.

Conflicts of interest

The authors have none to declare.

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