Case Report

Normal electro-oculogram in sibling and parents of a south Indian patient having Best's disease

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Abstract

Best's disease is responsible for a gradual decrease in visual acuity with deterioration beginning in the vitelliruptive stage. This normally presents as painless progressive decrease in vision in the 3rd to 4th decade of life. In this case, an unusual presentation of vitelliruptive stage in a child during the first decade of life is discussed. Normal electrooculogram findings observed in both parents and sibling of the patient are suggestive of an uncommon autosomal recessive inheritance pattern. To the best of our knowledge, this is only the second case reported from India. Counseling and awareness are likely to minimize the morbidity associated with this disorder.

Key words: Best's disease, vitelliform dystrophy, vitelliruptive stage

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INTRODUCTION

First described in 1905, Best's disease is an autosomal dominant disorder (Chromosome 11q12-q13) with incomplete expression and variable penetrance.[1] The onset of the disease typically occurs in late childhood and teens, and usually, it is associated with a gradual diminishing of visual acuity in the 3rd to 4th decade. Inheritance pattern, abnormal electrooculogram (EOG) findings and macular changes are the diagnostic clinical characteristics of this condition.[2] In this case report, an unusual presentation of Best's disease (vitelliruptive stage) with suspected autosomal recessive inheritance is described.

CASE REPORT

A 7-year-old male child was brought by his parents to the department of ophthalmology, with the complaint of a painless, progressively defective vision in both eyes for at least 12 months. He was not evaluated by a physician prior to this visit. On examination, the child had a visual acuity of 6/24 (Snellen's chart) with no improvement with either glasses or pin hole. Cycloplegic refraction of both eyes was diagnostic of hyperopia (+3.0) with no improvement on glasses. The anterior segment examinations and intraocular pressure were normal in both eyes. Fundus examination disclosed a bilateral, symmetrical, well-defined, half-disc diameter, yellowish elevated lesion at the macula [Figure 1a and b]. The disc and the background retina were unremarkable. On B-scan, a slightly elevated and well-defined homogenous isoechogenic mass was observed in the posterior pole [Figure 2a and b]. EOG revealed a severely subnormal Arden's ratio of 1.283 (right eye) and 1.050 (left eye) [Figure 3]. A provisional diagnosis of Best's disease (vitelliruptive stage) was made, which is conventionally expected only in the 3rd to 4th decade of life. Subsequently, both parents and sibling underwent an ophthalmic screening and no EOG abnormalities were detected in any of them. The parents were counselled regarding the prognosis, and the patient was prescribed low-vision aids and advised long-term follow up at regular intervals. The parents were then referred to a genetic counsellor for education and awareness.

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DISCUSSION

Usually, Best's disease evolves through several stages based on the changes in the fundus-vitelliform,

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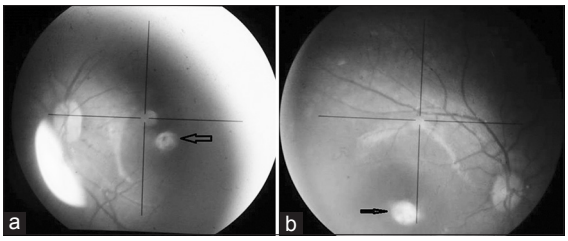

Figure 1a and b: Macular lesion of both eyes

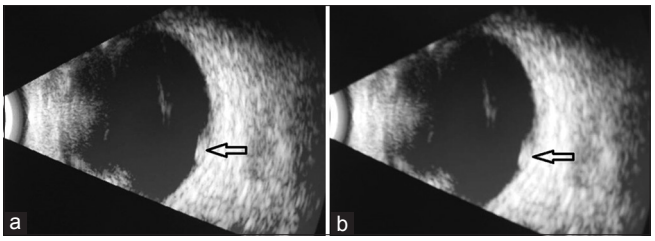

Figure 2a and b: Isodense mass in posterior pole of both eyes

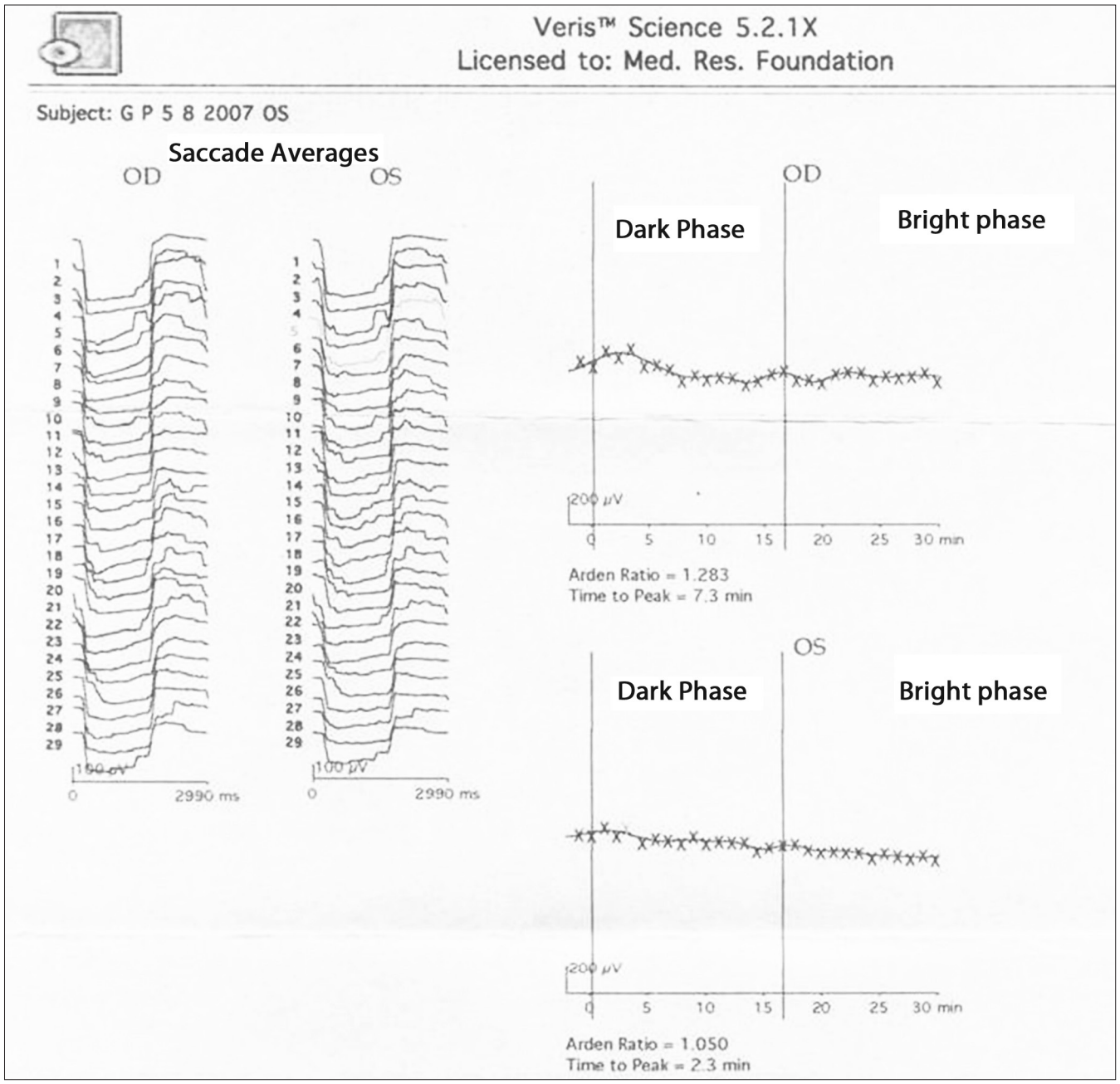

Figure 3: Electrooculogram of the patient showing subnormal Arden's ratio

pseudohypopyon, vitelliruptive, atrophic, and choroidal neovascularisation-that occur over many years.[3] Most often, the disease is diagnosed during adulthood when the patient presents with diminished vision. Visual deterioration begins in the vitelliruptive stage and maximal decrease in visual acuity is associated with the atrophic stage of the disorder and with choroidal neovascularisation. Optical coherence tomography

has shown accumulation of vitelliform material in the subretinal space with disruption of the photoreceptors due to the mass effect in the vitelliruptive stage leading to metabolic dysfunction of retinal pigment epithelium and photoreceptors, with a resultant vision deficit.[4] The occurrence of the vitelliruptive stage in a young child is extremely rare with only a handful of cases been recorded in western countries and only one so far from India.[4-6]

A hallmark of this condition is a suppressed light peak of EOG in all stages of the disease, and it is seen in both patients and phenotypically normal carriers.[7] This EOG finding is believed to result from compromised chloride channel function of bestrophin-1 in the retinal pigment epithelium.[8,9]

Recent evidence of an autosomal recessive pattern has challenged the traditionally observed autosomal dominant pattern of inheritance of this disorder.[10] This recessive form has been attributed to homozygous or compound mutations in the Best-1 gene.[10,11] The distinctive features of autosomal recessive Best's disease are extrafoveal and extramacular subretinal deposits, disseminated punctate retinal flecks, hyperopic refraction, and subnormal delayed electroretinogram responses.[10,12,13]

Unlike in the autosomal dominant variety, no clinical or electrophysiological abnormalities were identified in heterozygote carriers of the recessive variant. Some workers have suggested that the autosomal recessive phenotype only manifests when the bestrophin-1 activity drops below a functional threshold.[10] A carrier may not be having sufficient structural changes in bestrophin-1 to compromise its activity. This may explain the normal EOG in carriers of the recessive variant in this condition.

A clinical diagnosis of Best's disease in this patient has been made owing to characteristic macular pathology and subnormal EOG. The unexpected normal ophthalmic findings and EOG seem to support an autosomal recessive pattern of this condition. While a chromosomal analysis would have provided definitive proof for a recessive phenotype in the proband, it was not feasible due to technical constraints. The use of low vision aids helps in limiting the morbidity of the disorder. Counseling the parents and patient on the outcome of the Best's disease is essential to ensure a regular follow up and monitoring of this distressing condition.

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