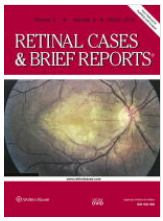

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[Case Report]

A CASE OF HYPOTRICHOSIS WITH JUVENILE MACULAR DYSTROPHY

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Abstract

Purpose: To report a very rare case of hypotrichosis with juvenile macular dystrophy.

Methods: Clinical case report and literature review.

Results: A 6-year-old boy was referred to us for a retinal evaluation after retinal defects were found bilaterally by his optometrist. His ocular symptoms included decreased visual acuity and light sensitivity. His ocular history was unremarkable. Review of systems was positive for hypotrichosis. Fundus examination revealed bull's eye maculopathy bilaterally. The patient was found to have a cadherin-3 genetic defect, which is associated with hypotrichosis with juvenile macular dystrophy. In follow-up, fundus autofluorescence revealed severe hypoautofluorescence with severe retinal pigment epithelium loss, and spectral domain optical coherence tomography showed evidence of retinal pigment epithelium, photoreceptor, and inner segment/outer segment disruption bilaterally.

Conclusion: Hypotrichosis with juvenile macular dystrophy is a very rare genetic disorder that should be in the differential for macular degeneration during the first 4 decades of life. A detailed review of systems should always be performed on these patients.

Hypotrichosis with juvenile macular dystrophy (HJMD) is a rare autosomal recessive disorder that is characterized by macular degeneration and short scalp from birth. Central vision loss usually occurs between the second and fourth decades of life. In 2001, it was found that HJMD was associated with a defect in cadherin-3 (CDH3), a P-cadherin concentrated in hair follicle and retinal epithelial cells.1

Hypotrichosis with juvenile macular dystrophy is so rare that it has only been described in two ophthalmologic journals.2,3 Although the prevalence is unknown, only approximately 50 patients have been described since the first case described in 1935.4 Differentials of HJMD include Stargardt disease with a concurrent hair disorder and ectodermal dysplasia, ectrodactyly, and macular dystrophy syndrome, which can also be associated with CDH3 mutations.5

We describe a case of a 6-year-old boy with decreased visual acuity and light sensitivity bilaterally (in both eyes) who was referred to us for a retinal evaluation. Ocular history was unremarkable. Review of systems was positive for poor hair growth.

Case Report

A 6-year-old boy was referred by his optometrist for retinal defects in both eyes. The patient's ocular symptoms included poor vision and light sensitivity. The patient had no past medical diagnosis, and his procedural history included tympanostomy tube placements in both ears and an adenoidectomy. The patient was taking no medications at the time and had no known drug allergies. Review of systems was positive for poor hair growth (Figure 1).

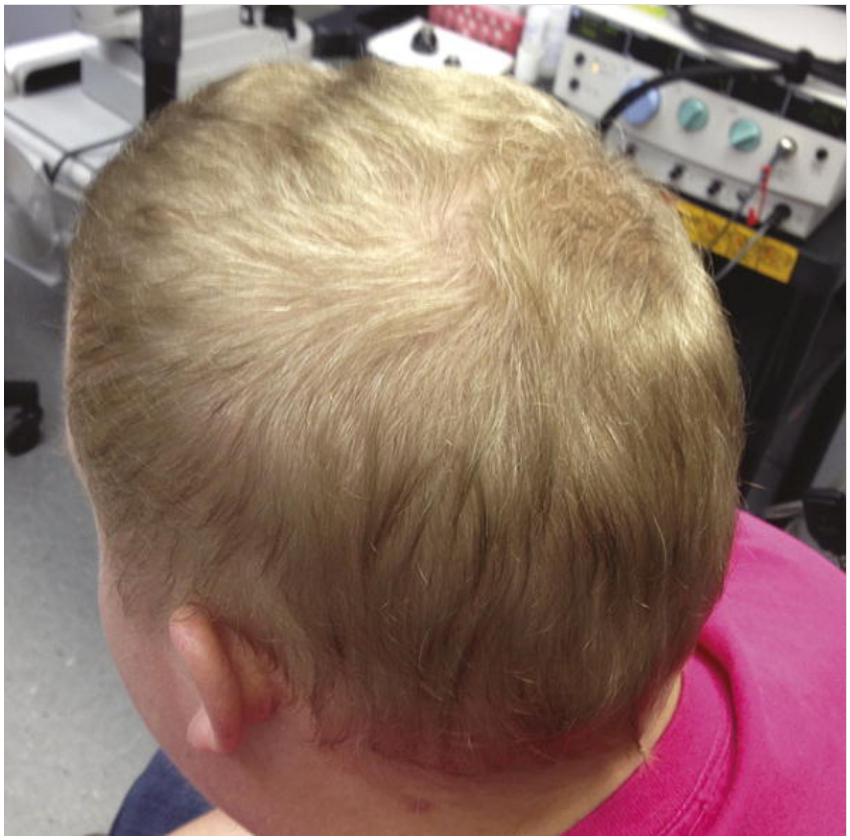

Fig. 1. Sparse hair in the child with hypotrichosis and no hair cut in more than 1 year.

During his initial visit, visual acuity was $20/50^{-1}$ in the right eye and $20/30^{-2}$ in the left eye. Confrontation field test was normal in both eyes. Extraocular movements were intact, and external examination, lids, sclera, conjunctiva, cornea, anterior chamber, and lens were normal in both eyes. Ocular pressures were normal at 16 mmHg in the right eye and 14 mmHg in the left eye. Pupils were equal, round, and reactive with no afferent pupillary defect in both eyes. Transillumination examination showed no blocking defect in both eyes. Fundus examination showed bull's eye maculopathy in both eyes and a cup-to-disc ratio of 0.3 in both eyes (Figures 2 and 3). Electrooculography and electroretinography were unremarkable in both eyes, and genetic workup for Stargardt disease, which consisted of a genetic blood test for mutations in the ATP-binding cassette (*ABCA4*) gene, was negative. After collaboration with genetics and dermatology, a genetic test for the CDH3 gene was ordered, and a mutated CDH3 gene was found, which is associated with HJMD. The patient later underwent fundus autofluorescence of both eyes, which showed a symmetrical wedge-shaped confluent loss of retinal pigment epithelium (RPE) (Figure 4). Spectral domain optical coherence tomography revealed a disruption of the photoreceptors, inner segment/outer segment junction, and the RPE layer bilaterally (Figures 5 and 6).

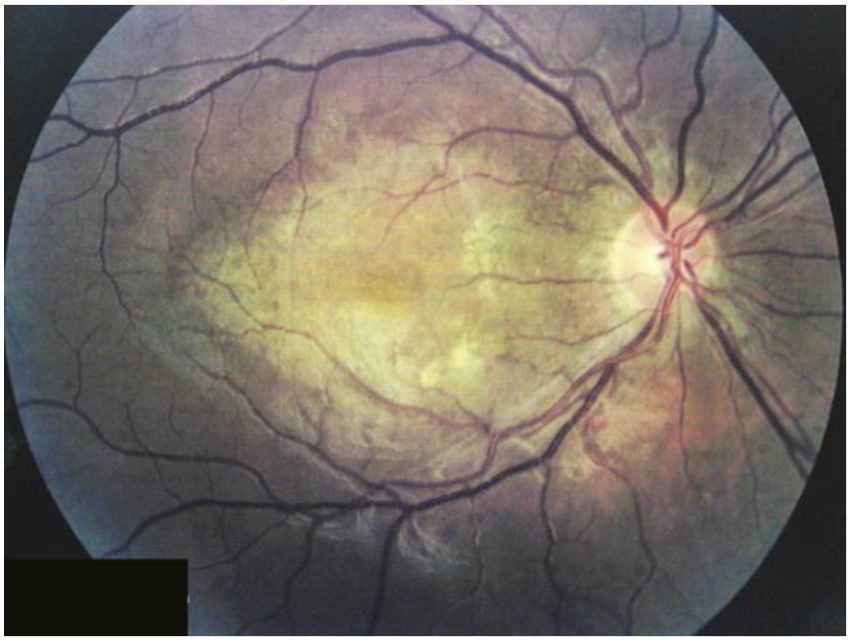

Fig. 2. Color photograph of bull's eye maculopathy in the right eye.

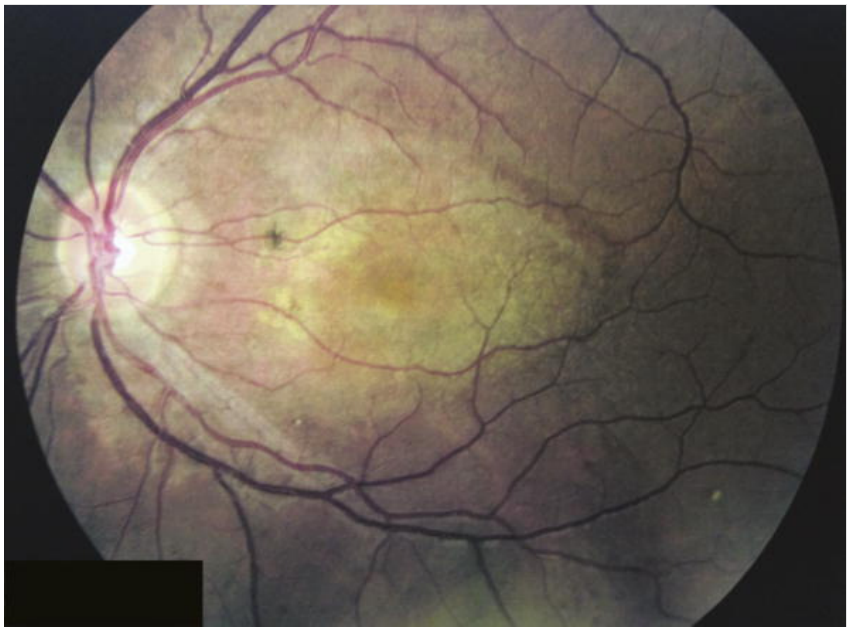

Fig. 3. Color photograph of bull's eye maculopathy in the left eye.

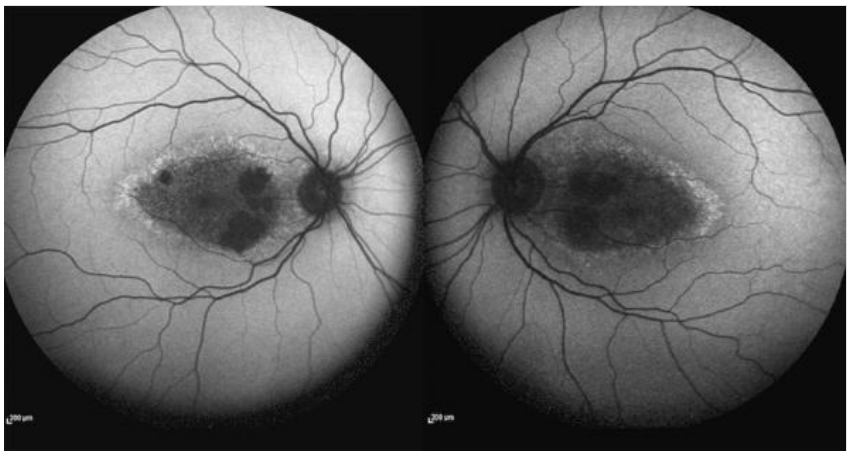

Fig. 4. Fundus autofluorescence of the right and left eyes.

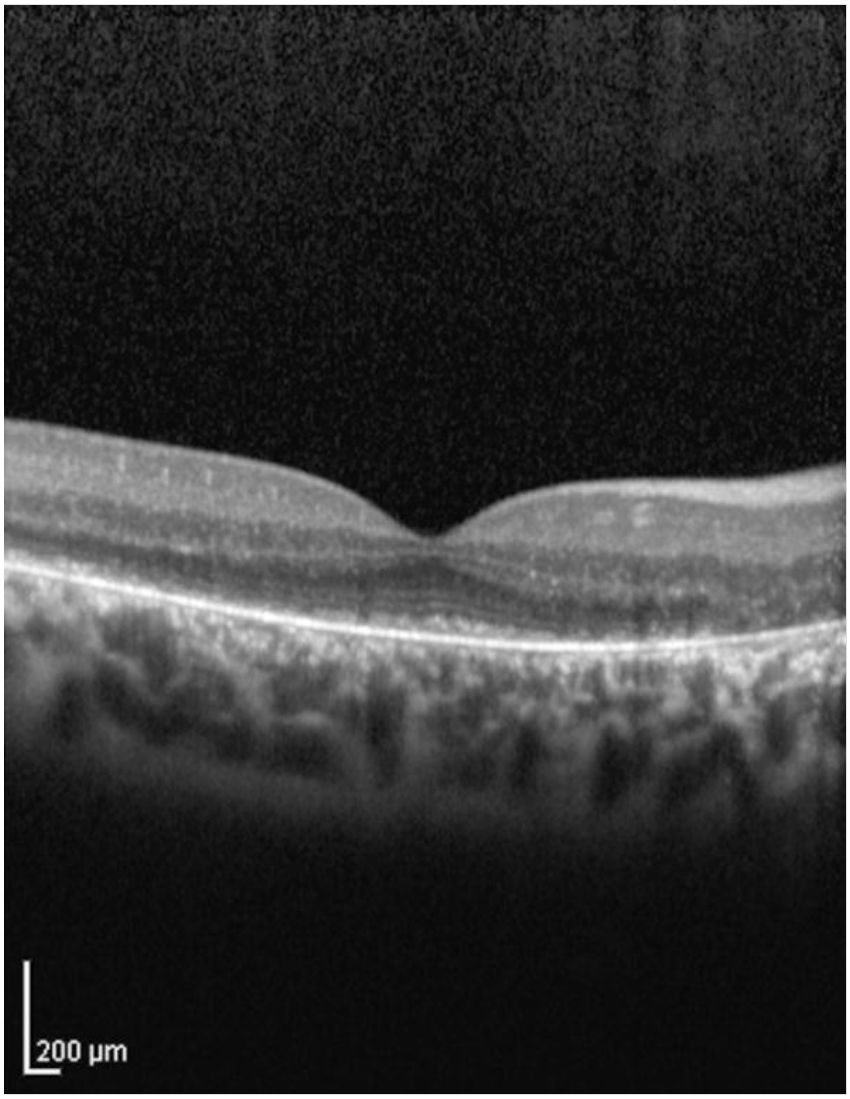

Fig. 5. Spectral domain optical coherence tomography of the right eye.

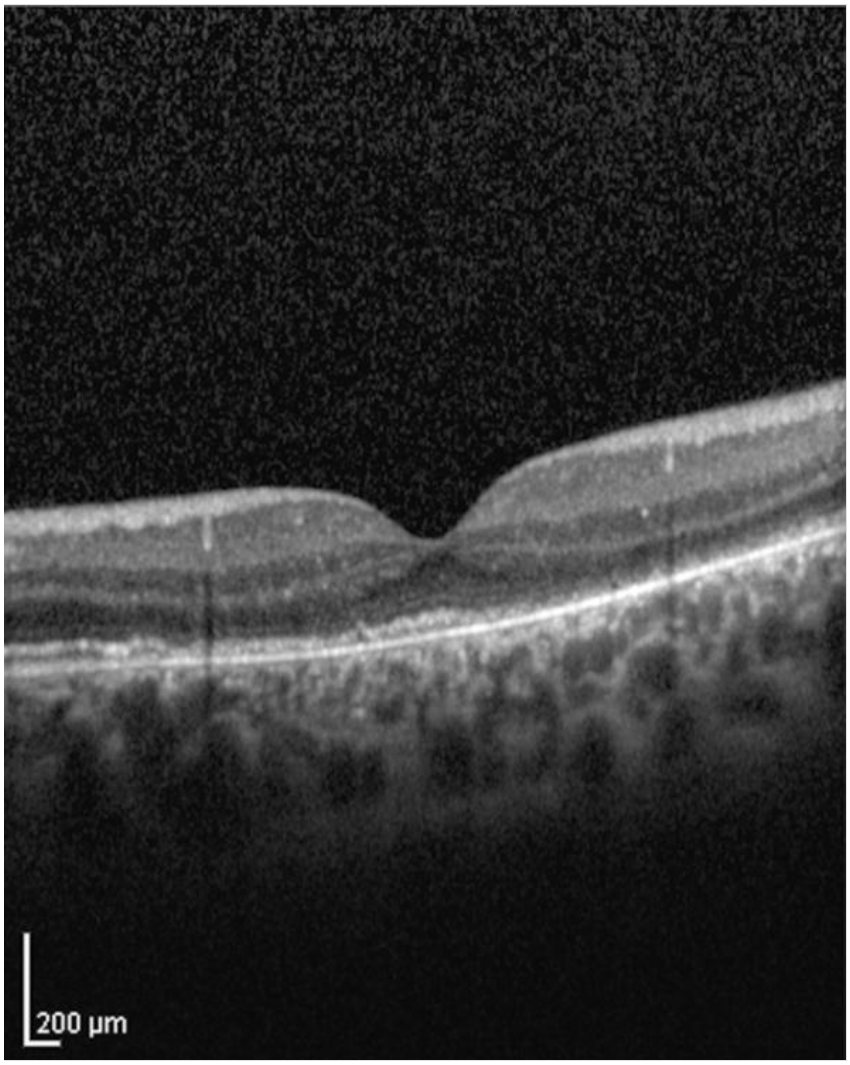

Fig. 6. Spectral domain optical coherence tomography of the left eye.

Discussion

Hypotrichosis with juvenile macular dystrophy is vey rare disorder that is caused by a mutation in CDH3 gene, which encodes for an epithelial P-cadherin. Ever since 2001, when Sprecher et al reported the first mutation in the CDH3 gene in a patient with HJMD, there have been multiple types of mutations described, including splice, missense, and nonsense mutations.6,7

Although visual loss from HJMD typically occurs during decades 2 to 4 of life, our patient presented at the very young age of 6 years, which makes him the youngest patient to present with visual loss due to HJMD in ophthalmologic journals. Leibu et al 3 noted that in their study of 16 patients with HJMD, 12 patients had their first visual examination for vision loss in decades 2 to 4, and the other 4 patients had their first visual examination before the age of 10 years, ranging from 8 years to 9 years. In this same study, the average age of the first visual examination was 14.7 years. In 2012, a patient in the study by Halford et al 2 was described to first experience vision loss at the age of 17 years.

Similar to a patient in the study by Leibu et al, the initial concerns when our patient first presented to us was Stargardt disease, which is more commonly inherited by an autosomal recessive mutation on the ATP-binding transporter gene.8 Similar to HJMD, Stargardt disease can occur as early as the first decade of life. As specific genes have been linked to Stargardt disease, genetic tests for mutations in these genes can be performed to diagnose Stargardt disease. Ectodermal dysplasia, ectrodactyly, and macular dystrophy syndrome is a related disease similar to HJMD that should be included in the differential; however, as ectodermal dysplasia, ectrodactyly, and macular dystrophy syndrome include features like hypotrichosis, macular dystrophy, abnormalities in hands and feet, and dental abnormalities, a thorough review of systems can differentiate it from HJMD. Our patient did not have any abnormalities in his hands, feet, or teeth.

This is the first report showing fundus autofluorescences and spectral domain optical coherence tomographies of a patient with HJMD. These tests were helpful as they showed photoreceptor loss, inner segment/outer segment junction disruption, and RPE disruption. The photoreceptor loss and disruption of the inner segment/outer segment junction support the finding of Leibu et al of HJMD affecting both cone-mediated and rod-mediated vision. In fact, they argued that HJMD should more appropriately be categorized as a cone–rod dystrophy.3 Although HJMD involves photoreceptor damage, a small percentage of patients with HJMD can still have normal electroretinographies, just like in our patient.3 In addition, the disruption of RPE is expected as CDH3 gene encoding P-cadherin protein is expressed in RPE.9

In conclusion, a careful review of systems for extraocular features needs to be obtained in patients with early-onset macular degeneration, and HJMD should be in the differential for macular dystrophy during the first 4 decades of life.

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Key words: hypotrichosis with juvenile macular dystrophy; juvenile macular degeneration; juvenile retinal dystrophy; macular degeneration; retinal degeneration; cone rod dystrophy

IMAGE GALLERY

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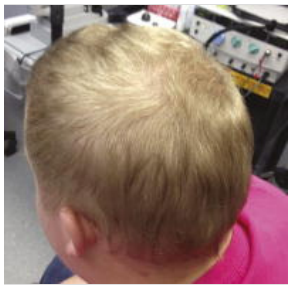

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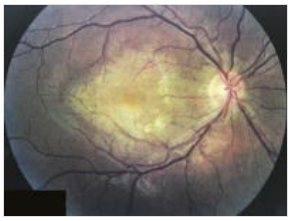

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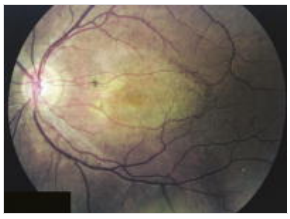

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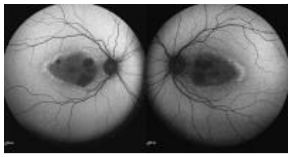

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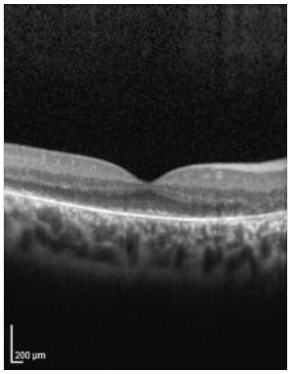

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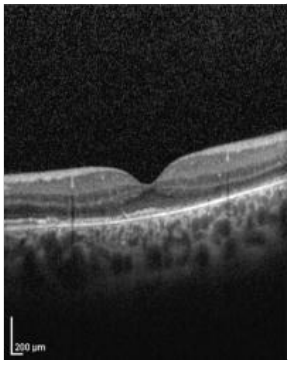

☐ Fig. 6

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