CASE REPORT

HARBOYAN SYNDROME

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Harboyan syndrome is a degenerative corneal disorder characterized by congenital hereditary endothelial dystrophy along with progressive, post lingual sensorineural hearing loss. We present the case of a 16-year-old female, who came to us for her follow up after surgical correction for bilateral corneal opacities (bilateral keratplasy) and use of hearing aid for SNHL. Her symptoms resolved significantly. Currently, she's living a healthy life after being treated for Harboyan syndrome. Physical examination and laboratory investigations ruled out other causes (eg: Congenital cataracts, Peters anomaly, Sclerocornea) and the diagnosis of Harboyan syndrome was established.

Keywords: Harboyan Syndrome; SNHL; Sensorineural hearing loss; Keratoplasty; CHED; Congenital hereditary endothelial dystrophy

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INTRODUCTION

Harboyan syndrome is a rare, benign hereditary genetic disorder characterized by loss of vision and impaired hearing. There is bilateral congenital dystrophy of the cornea with bilateral progressive sensorineural hearing loss (SNHL). It was first described in detail by Harboyan in1971.[1] The disease is characterized by dominant, recessive, and X-linked modes of inheritance, with dominant cases reported around 12% associated with other anomalies as well. While X-linked being a mere 1% associated with marked corneal degeneration.[2] The age of onset varies, as inherited corneal dystrophy accounts for a large number of corneal opacities in children under 16.[3] The hearing loss is related to the X-linked recessive variant of Harboyan syndrome and presents typically between 10–15 years of age with progressive SNHL.[4]. The incidence of Congenital hereditary endothelial dystrophy (CHED) makes a very small portion of the congenital corneal pathologies, which is only 6 per 100,000.[5]

CASE PRESENTATION

A 16-year-old female presented to us in our Ophthalmology department as an outpatient for a follow-up case of bilateral keratoplasty. She was a suspected case of Harboyan syndrome and a history of progressive hearing loss for the last 6 years along with a decrease in the vision for 12 years. She primarily presented to us in the Ophthalmology department in June 2016 for visual loss and blurry vision. When examined her visual acuity was recorded to be the perception of light in the right eye, whereas counting fingers in the left eye. Slit-lamp examination revealed bilateral corneal opacities with increased density towards the central cornea, making an irregular corneal surface. There was diffuse bilateral corneal oedema with clouding. Ocular movements were normal. The retina could not be visualized because of the corneal opacities. A diagnosis of bilateral corneal dystrophy was made and the patient was advised to go for bilateral keratoplasty. She has operated for the bilateral corneal central opacities 2 years ago in the right eye, and 6 months ago in the left eye. Her visual acuity had improved from perception to light in the right eye to 6/12 post operation using Snellen's chart. However slight visual improvement has been recorded in her left eye, leaving it at 6/60. Slit-lamp examination revealed clear media with a slight haze and drastic improvement in corneal oedema. Ophthalmoscopy now revealed a normal cup to disc ratio and clear media in both eyes.

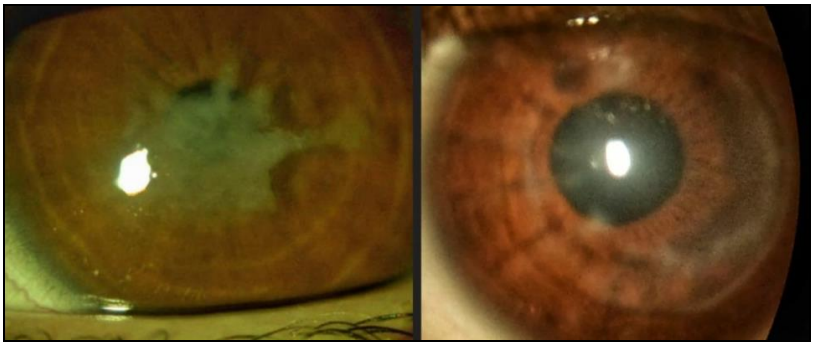

Figure-1: (L to R) Right eye corneal opacity before and after keratoplasty

She reported hearing loss which was gradual by the age of 10. On audiogram findings, she had to ascend SNHL with a threshold of 60/65 decibels bilaterally. She was provided with hearing aids and was reassessed with hearing aids resulting in an improvement in hearing about 50 decibels in low-frequency areas, whereas 30 decibels in higher frequencies. Weber's test was lateralized towards the right side. Bilateral SNHL was recorded with bone conduction masking.

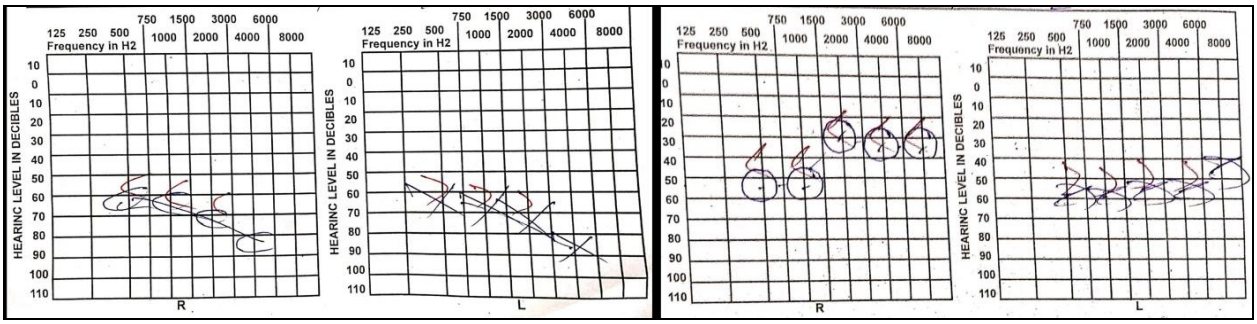

Figure-2: (L to R) Bilateral audiogram before and after using hearing aids for 4 years

Her general physical examination was unremarkable. Laboratory studies showed a white blood cell count of 12.7/mm3. A haemoglobin level of 12.0 g/dL. Platelets count of 445,000/mm3. Serum electrolytes were normal. Abdominal and pelvic ultrasound showed no abnormalities and her chest x-ray was also unremarkable. The patient was sent home after all the relevant investigations and examinations were performed.

DISCUSSION

The pathogenesis of Harboyan syndrome is closely linked to missed mutations in SLC4A11 gene located on the chromosomal locus 20p13.[6] A large number of patients, including our case, present with symptoms of increasing loss of vision due to congenital endothelial dystrophy which is progressive and is accompanied by corneal oedema. The loss of vision becomes prominent by the end of the first decade.[7] This progressive visual loss is followed by sensorineural hearing loss, beginning towards the start of the second decade of life in many patients, such as in our patients case.[8] As far as the rest of the investigations and examinations were concerned, like the majority Harboyan syndrome cases, no other abnormalities were recorded and the patient enjoyed normal health.[9] The definitive treatment for the ocular manifestations of Harboyan syndrome is to go for bilateral keratoplasty. However, other lines of treatment include the use of topical hypertonic to induce corneal dehydration to reduce oedema.[10] Our patient had bilateral keratoplasties by the age of 14 in the right eye and 16 in the left eye, resulting in significant improvement of vision in the right eye. There was no improvement in the left eye. Vision improvement in patients with CHED differs and depends upon different factors such as the density of corneal oedema, the presence of strabismus, and whether or not the keratoplasty was successful. Compared to other aetiologies of congenital corneal clouding, CHED patients tend to have better surgical outcomes after keratoplasty.[11] Congenital glaucoma is very closely associated with CHED as it causes corneal clouding.[12] Our patient had no congenital glaucoma or raised intraocular pressure on multiple examinations recorded at different follow up visits.

Hearing loss is not congenital and is insignificant until the first decade of life. It is SNHL with mild to moderate hearing loss. In some cases, it progresses till the second decade and stops, while in others it is slow and continuous, as in our patient.[13] The best line of management for sensorineural deafness in patients of Harboyan syndrome is Cochlear implantations and has been successful in a few cases as well.[1] Our patient was counselled for cochlear implants but due to financial constraints, she chose hearing aids and showed significant improvement in her hearing. Harboyan syndrome has to be differentiated from Congenital hereditary endothelial disease. In CHED, there is no hearing loss whereas it presents in patients with Harboyan syndrome.[8] In our patient, there was a visual loss since her birth but the hearing loss began in the second decade of life.

CONCLUSION

Since Harboyan syndrome is a rare disorder, it is difficult to come up with an appropriate diagnosis when the patient presents. Although the quality of life of such patients is significantly improved with symptomatic treatment, both medical and surgical. Awareness amongst ophthalmologists and otolaryngologists should be raised regarding this syndrome to ensure prompt treatment and early management.

Furthermore, patient education is also necessary regarding the disease and regular follow ups should be advised to see the pattern of the syndrome changing with age. Parents should be counselled regarding the prognosis of the syndrome once diagnosed. A multidisciplinary approach should be taken involving a team of ophthalmologists, otolaryngologists, physicians, and surgeons.

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