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AYURVEDIC MANAGEMENT OF KERATOCONUS - A CASE REPORT

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ABSTRACT

Keratoconus, one of the corneal ectasias, is a condition in which the cornea assumes the shape of a cone. Its symptoms are myopia and astigmatism. It is diagnosed by a set of characteristic signs. Although not described as a separate disease by *Āyurveda,* it may be correlated with *Timira* and *Kāca* based on its symptoms. The management of *Timira* and *Kāca* involve both *Śodhana* (purificatory therapy) and *Kriyākalpa* (external ocular therapy). The case of a 26-year-old male who presented with a 3½-year history of blurring of vision is being presented here. The patient was managed using *Śodhana*, *Kriyākalpa,* and internal medication. He showed signs of visual improvement after treatment.

Keywords: Keratoconus, *Āyurveda, Timira, Śodhana, Netra Kriyākalpa*

INTRODUCTION

Keratoconus is a bilateral (85%) non-inflammatory, ectatic condition of the cornea in which the ectasia affects its axial part. Based on morphology, keratoconus is divided into 3, *viz.,* nipple conus, oval conus, and globus conus. The main symptom is defective vision due to myopia and astigmatism. The astigmatism becomes irregular on progression of the condition. Signs include a distorted window reflex, irregularity of the circles on Placido's disc, scissor reflex on streak retinoscopy, an annular dark shadow separating the central and peripheral cornea ("oil-droplet" reflex) on distant direct ophthalmoscopy, and Munson sign in advanced cases, where the lower eyelid bulges on downgaze. Early cases may be amenable using contact lenses; however, late stages and patients who are intolerant toward contact lenses require keratoplasty and epi-keratoplasty (corneal transplantation). (1)

Keratoconus is not described in *Āyurveda* as a separate entity; however, the symptoms of myopia and irregular astigmatism seen in the condition may allow comparison with *Timira* and *Kāca.* According to *Ācāryās Suśruta* and *Vāgbhaṭa*, *Timira* and *Kāca* are *Drṣṭigata Rogas* (diseases of vision). *Timira* is when the *Doṣās* (humors) lodge into the 3rd *Paṭala* (layer) according to *Ācārya Suśruta.* (2) *Acārya Vāgbhaṭa* explains *Timira* as the condition in which the *Doṣās* lodge into the 2nd *Paṭala,* and *Kāca* when the 3rd *Paṭala* is afflicted. (3) Diminished distant vision, the cardinal feature of myopia and astigmatism, is seen in

Timira. Progressive deterioration of vision is seen in *Kāca.* The management of both conditions is repeated *Sneha* (unction), *Asra-visrāvaṇa* (bloodletting), *Reka* (purgation), *Nasya* (nasal medication), *Añjana* (collyrium), *Mūrdha-Basti* (retention of oil on the head), *Basti Kriyā* (enema), *Tarpaṇa* (retention of ghee in the eye), *Lepa* (application of paste), and *Seka* (pouring over the eyes). [4] *Jalaukāvacaraṇa* (leeching) is the mode of *Asra-visrāvaṇa* (bloodletting) in *Kāca*.

Case Report

A 26-year-old non-diabetic and non-hypertensive male, based in Kannur District, Kerala, presented to Sreedhareeyam Ayurvedic Eye Hospital and Research Center, Koothattukulam, Kerala, with a 3½-year history of blurring of vision. He experienced gradual deterioration of vision, for which he consulted an ophthalmologist, who advised power glasses. Despite using the glasses, he did not get complete clarity in vision. In 2015, he consulted at Sreedhareeyam, where he was diagnosed with keratoconus. He took one course of IP treatment from Sreedhareeyam, after which his vision became slightly clear. He took two more courses of treatment in 2016 and 2017, after which his vision stabilized. His past history does not reveal anything significant, his personal history was normal, and none of his immediate family members reported any complaints.

Based on the findings in **Table 1**, the patient was diagnosed with keratoconus.

Table 1: Visual Examination, External Examination, and K-Readings at the Time of Admission

Parameter		**Right Eye (OD)**			**Left Eye (OS)**		
Distant Visual Acuity		2½/60			6/36P		
Near Visual Acuity		N8			N6		
Sclera		Within Normal Limits			Within Normal Limits		
Cornea		Thinning			Thinning		
Pupillary Reactions		Within Normal Limits			Within Normal Limits		
K-Reading	**Date**	**K_1**	**K_2**	**Average**	**K_1**	**K_2**	**Average**
	07/11/2015	45.00	49.75	47.50	46.75	50.50	48.75
	12/11/2015	47.25	51.25	49.25	47.25	51.75	49.50

Therapeutic Intervention: The patient was prescribed internal medicines **(Table 2),** external therapies **(Table 3)**, and *Pañcakarma* (purifying) treatments **(Table 4)**.

Table 2: Internal Medicines

Medicine	**Dosage**	***Anupāna* (Post-Prandial Drink)**	**Time**	**Duration**
Pathyākṣadhātryādi Kaṣāya	60mL	Lukewarm Water	Twice a day before food	Day 1
Varaṇādi Kaṣāya	60mL	Lukewarm Water	Twice a day before food	Day 2-Day 7
Sudarśanam Tablet	1 Tab			
Vidāryādi Kaṣāya	60mL	Lukewarm Water	Twice a day before food	Day 7-Day 9
Daśamūlārişṭa	10mL	-	Twice a day after food	Day 9

Table 3: External Therapies

Treatment	**Medicine**	**Procedure**	**Duration**
Talam (paste of herbs over the middle of the scalp)	*Kaccūrādi Cūrṇa* and *Nimbāmṛtādi Eraṇḍa Taila*	The medicines were made into a paste and applied to the patient's scalp.	Day 2-Day 4
Seka (pouring of	*Kāśyapam Kvātha**	The patient lay supine and the lukewarm medicine was	Day 2-Day 10

liquids)		poured from a height of 4 *Aṅgula* over the closed eyes.	
Śirodhāra (pouring of oil over the head)	*Śaśāṅka Taila**	The patient lay supine on the *Droṇi* (table). The medicine was poured from a hanging coconut shell with a hole in its center.	Day 4-Day 10
Āścyotana (eye drops)	*Vināyakāñjana**	The patient lay supine and the medicine was instilled into the eyes using a medicine dropper.	Day 2-Day 10
Massage over the lacrimal punctum	*Kṣīrabala* 21 *Āvartana*	A drop of medicine was put on the finger and massaged over the punctum.	Day 9-Day 15
Tarpaṇa (retention of ghee in the eyes)	*Vināyakāñjana* and *Saptāmṛta Ghṛta**	Two circular fences made using a paste prepared from gram flour and water were placed over the orbital margins. The lukewarm medicine was instilled into the cavities. The patient was instructed to blink at regular intervals	Day 15-Day 20

Table 4: *Pañcakarma* Treatments

Treatment	Medicine	Procedure	Duration
Snehapāna (drinking of fats)	*Saptāmṛta Ghṛta** and *Jīvantyādi Ghṛta*	The medicine was administered in a gradually increasing dosage in the morning for 7 days.	Day 3-Day 9
Virecana (purgation)	*Avipattikara Yoga*	One tablespoon of the powder was administered in the early morning with lukewarm water. The number of urges was recorded.	Day 10
Pratimarśa Nasya (nasal instillation)	*Aṇutaila*	The patient was asked to lie supine and 2 drops of the lukewarm oil were instilled into each nostril after doing massage over the face.	Day 12-Day 20

*Patented medicines of Sreedhareeyam Ayurvedic Eye Hospital and Research Center

Outcome Measures: The patient was assessed for visual acuity **(Table 5)**. He was given medication at discharge **(Table 6)** and advised for regular follow-ups.

Table 5: Visual Acuity and K-Readings at Discharge and at Follow-ups

Parameter	Discharge			Follow-up 1			Follow-up 2	
	OD	OS		OD	OS		OD	OS
Distant Visual Acuity	3½/60	6/36P		3/60	6/36		6/24	6/36
Near Visual Acuity	N6	N6		N6	N6		N6	N6
K-Reading	K_1	K_2	Average	K_1	K_2	Average	-	
	45.75	48.00	47.00	46.00	48.50	47.25	-	

Table 6: Medicines Prescribed at Discharge

Medicine	Dosage	*Anupāna* (Post-Prandial Drink)	Time
Guḍūcyādi Kaṣāya	60mL	Lukewarm Water	Twice a day before food
Netrarakṣā Kaṣāya	60mL	Lukewarm Water	Twice a day before food
Saptāmṛta Lauha	1 Tab	Lukewarm Water	Twice a day after food
Daśamūlāriṣṭa	10mL	-	Twice a day after food
Netrāmṛtam Eye Drops	-	-	1 drop in both eyes twice a day
Vināyakāñjana	-	-	1 drop in both eyes twice a day

DISCUSSION

An ectasia is the distension or dilation of a hollow duct or viscus. Corneal ectasias include keratoconus (conical cornea), keratoglobus (globe-like cornea), pellucid marginal degeneration, Terrien's marginal degeneration, and cornea plana. Systemic causes of keratoconus include Down's syndrome, Turner's syndrome, Ehlers-Danlos syndrome, and osteogenesis imperfecta, while ocular causes include blue sclera, aniridia, ectopa lentis, and retinitis pigmentosa. Keratometry can be used to grade the severity of keratoconus from mild to severe. [5] *Timira* and *Kāca* encompass a wide range of visual disturbances that range from indistinct vision without any appreciable cause when the 1st *Paṭala* (layer) of the eye is affected to progressive diminution of vision and field defects when the 3rd *Paṭala* is affected. Affliction of the 3rd *Paṭala* was explored for this patient on admission because of the gross diminution of visual acuity. Improvement of visual acuity after treatment and medication indicates that the *Doṣās* were eliminated from the 3rd *Paṭala* and were eventually localized in the 2nd *Paṭala. Snehana* (unction) for this patient is because of the presence of corneal thinning, which indicates involvement of *Vāta* in the *Samprāpti* (pathogenesis) of the disease. The use of *Taila* (oil) in both *Tala* and *Śirodhāra* pacify *Vata. Śaśāṅka Taila* has *Azadirachta indica* A. Juss, *Tinospora cordifolia* Miers., *Adathoda vasica* Nees., and oil extracted from *Sesamum indicum* Linn. as its ingredients, and is indicated in *Netra Roga. Aṇutaila* pacifies all *Doṣās* and is indicated for strengthening the sense organs. [6] *Tarpaṇa,* the retention of ghee in the eye, allows more absorption of lipids into the corneal stroma, which is made lipophilic by the liquid consistency of the ghee and regular blinking of the eyelids. [7] Increased number of stromal cells helps to bring the cornea back into normal shape. *Kāśyapam Kvātha* has *Terminalia chebula* Retz., *Terminalia bellerica* Linn., *Emblica officinalis* Gaertn., *Sida cordifolia* Linn., *Adathoda vasica* Nees., *Eclipta alba* Linn., and *Santalum album* Linn, and is indicated in all eye diseases. *Saptāmṛta Ghṛta* has *Alstonia scholaris* R. Br., *Emblica officinalis* Gaertn., *Cyperus rotundus* Linn., *Berberis aristata* D. C., and *Piper longum* Linn., and is indicated in corneal disease, refractive errors, and other eye ailments. *Vināyakāñjana* has *Cynodon dactylon* Linn., goat's milk, and goat's ghee, and is indicated in eye diseases as *Ropaṇa* (healing agent). *Mukulāñjana* has *Jasminum grandiflorum* Linn., red ochre, rock salt, *Santalum album* Linn., and rose water, and is indicated in eye diseases. The internal medicines are aimed at *Tridoṣa Śamana* (pacification of all three *Doshas*), promoting eyesight, and maintenance of the corneal curvature. *Netrarakṣā Kaṣāya*, with *Emblica officinalis* Gaertn., *Symplocos racemose* Roxb., *Santalum album* Linn., *Cyperus rotundus* Linn., and *Vitis vinifera* Linn. as its main ingredients, and *Kāśyapa Kaṣāya,* with *Terminalia chebula* Retz., *Terminalia bellerica* Linn, *Emblica officinalis* Gaertn., *Sida cordifolia* Linn., *Eclipta alba* Hook., and *Santalum* album Linn as its ingredients, provide strength to the eyes.

CONCLUSION

Keratoconus may be correlated with *Timira* and *Kāca* based on the symptoms of the disease. The use of *Śodhana* (purification) and *Kriyakalpa* (external ocular therapy) help in improving vision and bringing back the shape of the cornea. After *Śodhana, Tarpaṇa* was done to further improve vision and return the cornea. Visual acuity improved for the patient both at discharge and at 2 subsequent follow-ups.

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