



## AN AYURVEDIC MANAGEMENT OF KERATOCONUS – A CASE STUDY

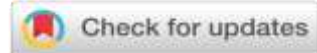
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(Published Online: February 2024)

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Article Received: 13/01/2024 - Peer Reviewed: 03/02/2024 - Accepted for Publication: 13/02/2024.



## ABSTRACT

Keratoconus is a bilateral and asymmetric disease that results in progressive thinning and steeping of the cornea, leading to irregular astigmatism and decreased visual acuity. Integrative medicine has no proper treatment, so an attempt is made with ancient medicine. A case of 17year male patient came to Shalaky OPD at Dr B R K R Govt. Ayurvedic College and Hospital with complaints of blurred vision in both eyes, double vision (Rt>lt) and also itching sensation and giddiness while rotating head for eight months and diagnosed with keratoconus at the previous hospital where he has consulted before. In Ayurveda, there is no direct reference to keratoconus; based on the symptoms, it can be considered *Vataja Timira*, a *Drishtigata netra roga*. This can be correlated to the advanced condition of keratoconus, considering Vata dosha involvement. The plan of treatment for this is *Vatahara* and *Bruhmana Chikitsa*. Firstly, *Snehapana* followed by *Shodhana chikitsa* like *Virechana*, *Nasya* and *Samana chikitsa* like *Saptamruta lauha*, *Triphala ghruta* orally, *Kriyakalpa* procedure like *Akshitarpana*, *Putapaka*, *Pindi* and *Seka*. Treatment has been given for three months, and the subject has reported reduced symptoms and showed signs of improvement in vision. Thus, it can be concluded that with the help of Ayurvedic management, the disease did not progress.

**Keywords:** Keratoconus, *Vataja Timira*, *Nasya*, *kriyakalpa*

## INTRODUCTION

### MODERN REVIEW<sup>1</sup>

- Keratoconus is a progressive, non-inflammatory bilateral ectatic condition of cornea on its axial part.
- It usually starts at puberty and progresses slowly.
- It manifests by adolescence, resulting in considerable visual impairment owing to the development of high degree irregular astigmatism.

### Clinical features

#### Symptoms

- Vision becomes progressively more blurred and distorted with glare, halos around lights, photophobia and ocular irritation.
- Visual loss occurs primarily from irregular astigmatism myopia and secondarily from corneal scarring.

#### Signs

- The window reflex on the cornea is distorted.
- Placido disc examination shows irregularity of the circles.
- Slit lamp examination may show thinning and ectasia of the central cornea, opacity at the apex, Fleischer's ring at the base of the cone and folds in Descemet's and Bowman's membrane.
- On retinoscopy, a yawning reflex (scissor reflex)
- Direct ophthalmoscopy from a distance of one foot shows an 'oil droplet' reflex.
- Moonsun's sign, i.e., localised bulging of the lower lid

#### Treatment

- Spectacle correction may improve vision in early cases.
- Contact lenses (Rigid gas permeable) usually enhance vision in early cases.
- Intacs, the intracorneal ring segments are reported to be helpful in early cases.
- Corneal collagen cross-linking with riboflavin (CXL or C3R) may slow the progression of the disease.
- Keratoplasty may be required in later stages. Deep Anterior Lamellar Keratoplasty (DALK) or Penetrating Keratoplasty (PK) may be performed.

### AYURVEDIC REVIEW

- Though it needs to be mentioned clearly.
- According to *Acharya Sushruta*, the *Krishna mandala* originated from *Vayu Mahabhuta*. In keratoconus, the *Krishna mandala* of *Netra*, created from *vayu* itself, is either malformed or degenerated due to vitiation of *vata*. Based on the symptoms of keratoconus, this can be correlated to *Vataja Timira*.
- *Brahmantiva*- giddiness
- *Vyavidha Darshana* – The straight-line objects appear to be curved.
- *Avila darshana* – Blurred vision<sup>2</sup>
- *Chandra Deepadaya Anekatvam*- the luminous objects like the moon, lamp appear multiple.

### Ayurvedic Management

- Dipana-Pachana drugs
- Snehapana
- Shodhana chikista- Virechan followed by Nasya karma.
- Kriyakalpa procedure like Akshitarpana, Pindi, Seka
- Oral medications

Hence, the present case study evaluated the efficacy of Kriyakalpa procedure and Oral medication in managing Keratoconus w.s.r to Vataja timira.

### Aim and Objectives of the study

- ❖ To evaluate the efficacy of Kriyakalpa procedure in the management of Keratoconus
- ❖ To evaluate the effect of Oral medication in reducing the symptoms of the disease and improving vision
- ❖ To understand Keratoconus in Ayurvedic aspects
- ❖ To improve the quality of life of patient

### Prevalence<sup>3</sup>

Keratoconus has been classically described as a non-inflammatory pathology characterised by a conical shape of the cornea due to thinning and protrusion. The prevalence of keratoconus can range from 0.3 per 100,000 in Russia to 2300 per 100,000 in Central India (0.0003%-2.3%)

In Central India, the prevalence of keratoconus was studied based only on the anterior corneal power

obtained by keratometry. The prevalence of keratoconus, defined as a corneal refractive power  $\geq 48D$ , was 2.3%. The prevalence dropped to 0.6% using a cut-off power  $\geq 49 D$  and 0.1% using a cut-off of  $\geq 50$  dioptre.

### Materials and Methodology

All the relevant Ayurvedic classical textbooks like Sushruta Samhita, Charaka Samhita and Ashtanga Hridaya and various research articles, scientific web-sites and contemporary books on the concerned subjects were referred to and analysed.

A fully conscious male patient aged 17 years came to OPD of the Shalaky Tantra department at Govt. Ayurvedic Hospital, Erragadda, Hyderabad, on 03-08-2022, with signs and symptoms were diagnosed as keratoconus 22-05-2022 in a private hospital.

**Chief complaints:** Blurred vision, double vision (Rt>Lt) for eight months

**Associated complaints:** Itching sensation in the early morning associated with giddiness while rotating the head.

**History of present illness:** The patient was asymptomatic before 1½ years. He gradually started severe itching in both eyes, then he developed blurred and double vision in both eyes (Rt > Lt), but he ignored it after injury to the left eye with a ball. He visited the Allopathy hospital and was diagnosed with keratoconus. He took treatment but didn't get much relief, so he came to GAH for treatment.

**History of past illness:** H/o ball injury in April - 2022 in Lt eye

**Parivarika ittivruttam (family history):** No history of family illness

### Clinical findings

He was afebrile, his pulse rate was 72/min, his respiratory rate was 16/min, and his blood pressure was 110/70mmHg; his systemic examination was within normal limits.

### Dashavidha Pareeksha

- Prakriti- Vata-Pitta
- Vikriti- Dosha- Vata pradhana Pitta dosha  
Dushya- Rasa, Rakta
- Sara- Madhyama
- Samhanana- Madhyama
- Pramana- Madhyama
- Satmya- Madhyama
- Satva- Madhyama
- Ahara shakti- Madhyama
- Vyayama shakti- Madhyama
- Vaya- Yuvavastha

### Asthavidha Pareeksha

- Nadi- Prakruta, 72/min
- Mala- Prakruta (regular, once a day)
- Mutra- Prakruta (Day 3-4times, Night 1-2times)
- Jihwa- Alipta
- Shabda- Prakruta
- Sparsha- Anushnasheeta
- Drik- Vaikruta
- Akriti- Madhyama

### Diagnostic Assessment

1. Based on chief complaints
2. Visual acuity findings
3. 'K' value readings (mild <48D, Moderate 48-54D, Severe >54D)

### Slit-lamp examination findings

	Oculus Dexter	Oculus Sinister
Eyelids	Flat	Flat
Conjunctiva	Normal	Normal
Sclera	Normal	Normal
Cornea	Ectasia with thinning, Fleischer's ring, vogts striae	Ectasia with thinning, Fleischer's ring, vogts striae
Anterior chamber	Normal in contents and Depth PACD=1CT	Normal in contents and Depth PACD=1CT
Iris	Normal	Normal
Pupil	Normal in size and Reactive to light	Normal in size and Reactive to light

### Visual Acuity findings

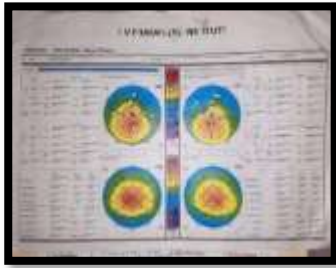
Unaided	Before Treatment	
	OD	OS
Distant vision	6/60	6/18
Near vision	N 06	N 06

Aided	Before Treatment	
	OD	OS
Distant vision	6/18	6/9
Near vision	N 06	N 06

### Corneal Topography

	OD	OS
K1	46.3D	43.9D
K2	51.2D	48.4D
Avg	48.6D	46.0D

### Before Treatment



### Therapeutic Intervention

#### Shodhana chikista:

- Deepana pachana drugs like Citrakadi vati<sup>4</sup> for 3days
- Snehapana with Triphala ghruta<sup>5</sup> for 5days followed by Abhyanga and bhaspa sweda for 1day.
- Virechana with Trivrut churna (6gms) with luke-warm water given at 6AM

- Marsha nasya with Anutaila<sup>6</sup> for 7days (Alternative 3 sittings with a gap of 1 week)

#### Kriyakalpa procedure:

- Akshitarpana with Jeevantyadi ghruta<sup>7</sup> for 5days (Alternative 3 sittings with a gap of 1 week)
- Snehana putapaka for 2days
- Netra seka with triphala, yasthimadhu kasaya for 5days
- Pindi with triphala churna, sigru patra

#### Shamana chikitsa:

- Swarna makshika bhasma+Amalaki rasayana+Yasthimadhu churna+Guduchi satva+Mukta pisti given along with honey.
- Tab Saptamruta lauha<sup>8</sup> (250mg) BD along with water
- Gandhaka rasayana- 3g with ghee and madhu (unequal quantity)
- Triphala ghruta (10ml) along with milk (BT)

### Visual Acuity findings

Unaided	After Treatment	
	OD	OS
Distant vision	6/12	6/6P
Near vision	N 06	N 06

Aided	After Treatment	
	OD	OS
Distant vision	6/6P	6/6
Near vision	N 06	N 06

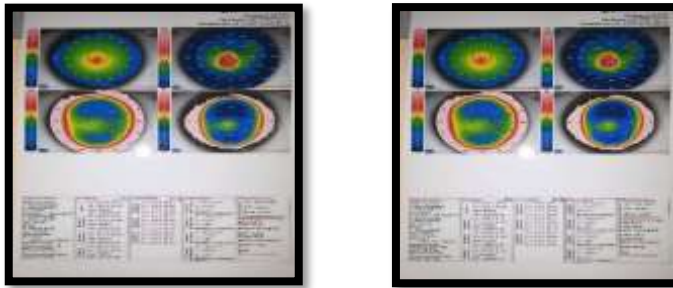
\*P=Partial

### Corneal Topography

	OD	OS
K1	45.29D	43.27D
K2	48.61D	46.86D
Avg	46.90D	44.99D

\*D=Dioptre

### After Treatment



### Medicine Prescribed on discharge for 1 month

S.no	Name of the medicine	Dosage	Time	Anupana
1	Triphala churna + yasthimadhu churna + Abhraka Bhasma + Yasada bhasma	3g-x-3g	Before food	Cow's Ghee followed by lukewarm milk
2	Brihacchagaladi ghritam	6g	Early morning	Lukewarm milk
3	Avipattikara churna	3g	Bedtime	Lukewarm water
4	Netramruta eyedrops	-	2 drops in both eyes twice a day	-

### Observation and Results

S.no	CLINICAL FEATURES	Before Treatment	After 1 <sup>st</sup> sitting	After 2 <sup>nd</sup> sitting	Follow up (After 1 month)
1	Blurred vision	3	2	2	1
2	Diplopia	3	3	2	0
3	Itching sensation	2	2	1	0
4	Giddiness	2	2	1	0

### DISCUSSION

Keratoconus is a type of refractive error due to high degree of irregular astigmatism in this disease cornea

becomes thin which can be understood as *karsyata*, it leads to thinning and protrusion of central part, as this part of corneal loss can be compared with *indriya*

*dourbalya*, blurred vision is said to be *avyakta darshanam*. According to Ayurveda it is considered as *Vataja Timira* the treatment should be followed as mentioned in Samhita, as the disease is progressive long-term treatment required.

#### Discussion on the mode of action

**Snehapana:** Administration of *Triphala ghruta* for five days helps cross the cell membrane as it results in unctuousness and softens the vitiated doshas, thus helping in loosening and easy elimination of the morbid *doshas*.

**Virechana:** Administration of *Trivrut churna* through oral route spreads throughout the body at cellular level and enters into micro and macro channels and dragging dosas from *sakha* to *kosta* and eliminates them through anal route by virtue of dravya property. This *Virechana karma* helps in *samprapti vighatana of vataja timira*.

**Nasya karma:** Drugs in the form of *Nasya* has probable mode of entry into circulation, helps in the improving vision. The drug absorption through mucous membrane, helps in direct pooling into venous sinuses of brain via inferior ophthalmic veins and absorption directly into the cerebrospinal fluid. As this, medicine is absorbed in ophthalmic vessels it helps in nourishing the extraocular muscles and eye proper.

As the *Anutaila nasya* is *brumhana nasya* can be used in *vatapradhana netrarogas* and contains Antioxidant property helps in maintaining and building of the tissue.

#### Akshitarpana and Putapaka<sup>9</sup>

- The corneal epithelium is permeable to lipid soluble substances *Jeevantyadi Ghrita* has high levels of antioxidant which can reduce corneal ectasia, strengthens the stromal collagen fibres by allowing more tissue contact time and bio availability of the drug from the corneal surface. As the *ghruta* contains more vit-A which helps in repairing the corneal epithelium.
- Exerting direct pressure over the cornea, there may be changes in the refractive index of the cornea.
- *Snehana putapaka* is useful as it acts as *brumhana* and improves the vision. It helps in bringing

down the corneal protrusion by *dosha shamana* and mechanical pressure.

**Netra Seka:** Medicine poured over the eyelids continuously for a specific time, it improves the circulation locally and strengthens the muscle and nerves of the eyes. The damaged biproducts from the corneal surface may be washed out by constant flow of medicines.

Drugs used in seka preparation are.

- *Triphala* contains chebulagic acid, tannin, beta-sitosterol which helps in repairing damaged tissues, Ascorbic acid acts as antioxidant, *Sophaghna, Rasayana, chaksusya* properties.
- *Yasthimadhu* having licoricone, prenylated baurone, glycyrrhizine, iso-liquiritigenin, antioxidant, anti-inflammatory, rejuvenation, *balya, chaksushya, vata-pittahara*.
- *Haridra* contains curcumin, dimethoxycurcumin, betacarotene and vit-A act as antioxidant, promotes cell formation, *kandughna, sothahara*, immunostimulant.
- *Saindhava lavana* is best among all *lavana* due to its *chaksushya guna* as it gives hydration to corneal surface.

**Pindi:** Medicine is absorbed through the transcutaneous route and has more tissue contact time. The poultice used is *ushnata*, which leads to a mild increase in the local temperature of the skin, leads to vasodilation and increased circulation. *Pindi* produces mechanical pressure over eyelids, helps to flatten the corneal curvature, and provides strength to the cornea.

*Shigru patra* contains Vit-A and C helps in collagen synthesis, Amino acids like Arginine, histidine, isoleucine, lysine, *sophahara, kandughna, chaksushya, rasayana* and alleviates *vata dosa*, antioxidant, rich in riboflavin which is required for collagen cross linking.

Oral medication includes mostly *Deepana-Pachana, Rasayana, Chaksushya, Balya, Sothahara* vit-A&C, Antioxidants and minerals like Cu, Fe, S helps in remodelling of collagen fibres, strengthen the cornea and improves vision. *Gandhaka* (sulphur) helps in

repairing oxidative damage and restoring cell membrane.

### Discussion on Results

Improvement in clarity of vision with refractive correction indicates the improved corneal health.

The significant changes in visual acuity power and k readings indicates the positive changes in corneal curvature.

Before treatment the visual acuity finding without glasses is 6/60 in right eye and 6/18 in left eye and with glasses it is 6/18 in right eye and 6/9 in left eye. After treatment the Visual acuity without glasses is 6/12 in right eye and 6/6P in left eye and with glasses it is 6/6P in right eye and 6/6 in left eye.

Corneal Topography findings: Before treatment the K1 value is 46.3D in right eye and 43.9D in left eye and K2 value is 51.2D in right eye and 48.4D in left eye and Avg in right eye is 48.6D and 46D in left eye. After treatment K1 value in right eye is 45.29D and 43.27D in left eye, K2 value in right eye is 48.61D and 46.86D in left eye and Avg in right eye is 46.90D and 44.99D in left eye.

### CONCLUSION

Keratoconus is a progressive eye disease in which the spherical cornea changes into bulge, cone shaped cornea. The use of spectacles, contact lens and lasik surgeries are not effective as the disease is progressive and success rate is unknown and even not free from complications. As Ayurvedic treatment on the line of *vataja timira* has shown promising results in controlling the further progression of the disease and also in reducing the symptoms without any adverse effects.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: P Ramya kumari et al: An ayurvedic management of keratoconus – a case study. International Ayurvedic Medical Journal {online} 2024 {cited February 2024} Available from: [http://www.iamj.in/posts/images/upload/433\\_439.pdf](http://www.iamj.in/posts/images/upload/433_439.pdf)