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Ayurvedic Approach in the Management of Keratoconus: A Single Case Study

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ABSTRACT:

Keratoconus is a progressive, non-inflammatory corneal ectatic disorder characterised by paracentral thinning, conical protrusion, and irregular astigmatism, leading to gradual, painless visual impairment. This case report involves a 23-year-old female with a five-year history of progressive bilateral vision loss, requiring continuous spectacle correction. Corneal topography confirmed keratoconus, with central corneal thickness measuring 459 µm in the right eye and 453 µm in the left eye. At presentation, the best corrected visual acuity was 6/18 (OD) and 4/60 (OS). According to Ayurvedic principles, the condition was identified as Vatika Timira, described in the *Drishtigata Roga* of *Prathama* and *Dviteeya Patala*. The pathology of the disease can be described with *Vata prakopa* lakshanas such as *Karsya* (stromal thinning), *Sramsa* (structural loss of compaction), and *Vyasa* (apical protrusion). A complete pharmacological treatment protocol of *Agnideepana, Vata anulomana and Brimhana* was applied. Internal medications included *Rajanyadi Churnam* and *Rasnadasamoola Ghritam*, *Virechana* using *Gandharva Eranda taila*. External therapies included *Nasya*, *Anjana*, *Tarpana* with *Jeevanthyadi Gana Ghrita, Brimhana Putapaka, Shirodhara with Ksheerabala*, and *Karpasasthyadi Sekam with Yashti Kashaya*. The patient reported subjective visual improvement post-therapy. Acuity increased to 6/60 (OS) and remained unchanged at 6/18 (OD). Follow-up corneal topography showed stabilisation of corneal thickness without additional refractive progression during the follow-up period. It was suggested to maintain treatment with *Anu Taila* (2 drops in the nostrils evening for 2 weeks) *as Pratimarsha Nasya.* These clinical outcomes suggest that Ayurvedic interventions for restoring ocular tissue integrity and correcting Vata imbalance may be beneficial for functional stabilisation in keratoconus. There is a need for controlled clinical studies to scientifically validate the therapeutic potential of Ayurveda in corneal ectatic disorders, as reflected by this case.

KEYWORDS: Ayurveda, Corneal ectasia, *Drishtigata Roga*, Keratoconus, *Nasya*, *Tarpana*, *Vatika Timira.*

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INTRODUCTION:

Keratoconus is a slowly progressive, usually bilateral, non-inflammatory corneal ectatic disease characterised by localised thinning of the stroma and protrusion of the anterior cornea, resulting in irregular astigmatism with gradual visual impairment. [1] Epidemiological data have shown a significantly higher prevalence in Asian and Middle Eastern populations and a lower prevalence in Western European populations. [2] The typical onset tends to occur during adolescence, after which the condition progresses into the second or third decade, although earlier onset or continued illness beyond this age range has been reported. Key risk factors include chronic eye rubbing, atopy (allergy, asthma, eczema), and a positive family history. Although generally considered non-inflammatory, recent studies have shown increased inflammatory cytokines and oxidative stress markers in the tear film of affected individuals. [3] The introduction of corneal topography, tomography, biomechanical assessment, and genetic screening has led to earlier diagnosis. Currently, corneal collagen cross-linking (CXL) is considered the standard treatment to halt progression. Other techniques, including scleral lenses, intracorneal ring segments, CAIRS, and deep anterior lamellar keratoplasty (DALK), are indicated according to disease severity.[4-5] However, complications may arise, including progressive myopia, corneal scarring, hydrops, and the need for corneal transplantation. Keratoconus appears to be clinically quite similar to Vatika Timira in classical Ayurvedic texts. Features such as Avila Darshanam (diminution of vision)[6] and Vata prakopa lakshanas, like Karsya (thinning), Sramsa (structural instability), Vyasa (apical protrusion), Shosha (degeneration),[7], are correlated with the disease pathology. Additionally, stage-wise management using Vata-hara and Timira chikitsa principles may support early stabilization or prevention of progression.

CASE REPORT:

Presenting Complaints: Gradual diminution of vision in both eyes (left > right) for 5 years Watering from both eyes for 1 year

Intermittent headache for 1 year History of Present Illness. A 23-year-old female presented with a history of gradual, painless, and progressive diminution of vision in both eyes for the past five years, more pronounced in the left eye. The onset was insidious, and the visual impairment progressively increased over time. She reported frequent changes in spectacle prescription during follow-up visits, with only temporary improvement in vision after correction. Over the past one year, she also experienced occasional watering from both eyes along with intermittent headache, predominantly localized to the left frontal and temporal regions. There was no history of ocular trauma, redness, acute pain, or sudden visual loss.

In view of the progressive visual decline, corneal topography was performed earlier, which confirmed the diagnosis of keratoconus. Corneal collagen cross-linking (C3R) was

advised to prevent further progression; however, the patient declined the procedure. She subsequently underwent one course of outpatient department medical management in June 2025, following which she reported mild symptomatic relief. She has now presented for further evaluation and continued management due to persistent visual difficulty.

Past Medical History: No significant past medical history was reported.

THERAPEUTIC INTERVENTION:

The management protocol was planned in a stepwise manner considering the involvement of Ama, Vata aggravation, and ocular tissue weakness. The treatment included internal medications and external ocular procedures (Netra Kriyakalpa).

Step 1: Amapachana, Deepana and Vatanulomana

he initial stage of treatment aimed to remove Ama, enhance digestive fire (Agni), and normalize the movement of Vata.

Table-1: Examination of Eye-ANTERIOR SEGMENT

Examination	Right Eye (OD)	Left Eye (OS)
Head posture	No squint or ptosis	No squint or ptosis
Forehead & facial symmetry	Symmetrical; no facial palsy or ptosis	Symmetrical; no facial palsy or ptosis
Eyebrows	Normal level, well-curved, cilia present	Normal
Eyelids – Position	Normal; upper lid covers 1/6th cornea	Normal
Eyelids – Movement	No lagophthalmos or abnormal movement	Normal
Eyelids – Margin	Healthy; no entropion/ectropion	Normal
Eyelashes	No trichiasis or poliosis	Normal
Eyelid skin	Normal; no lesions	Normal
Palpebral aperture	Normal	Normal
Lacrimal apparatus	No epiphora or inflammation	Within normal limit
Eyeball – Position	Normal; no exophthalmos/enophthalmos	Normal
Visual axis	Aligned; no squint	No squint
Size of globe	Normal	Normal
Movements (EOM)	Full; no palsy	Normal
Conjunctiva	Normal; no congestion or lesions	Normal
Sclera	Normal	Normal
Cornea – Size	Normal	Normal
Cornea – Shape	Conical	Conical
Cornea – Surface	Irregular	Irregular
Cornea – Sheen	Normal lustre	Normal
Cornea – Transparency	Clear	Clear
Cornea – Vascularization	Absent	Absent
Rizzuti's reflex	Present	Present
Corneal sensation	Intact	Intact
Endothelium	No deposits	No deposits
Anterior chamber	Deep; no flare or foreign body	No flare or foreign body
Iris	Normal pattern	Normal
Pupil – Number	Single	Single
Pupil – Size	Normal	Normal
Pupil – Shape	Round	Round
Pupil – Location	Central	Central
Pupil – Reaction	Brisk	Brisk

Table-2: Posterior Segment (Fundus Examination)

	OD	**OS**
Distant Direct Ophthalmoscopy (DDO)	(Oil droplet sign present B/L)	
Fundal glow	Present(B/L)	
Media	Clear(B/L)	
Optic disc	Round(B/L)	
CDR	0.3(B/L)	
Macula	Foveal reflex present (B/L)	
Vessels	Within normal limit	
General Background	Within normal limit	

Table-3: Therapeutic Intervention

Step 1: Shaman Internal Medication and external therapy		
	Medicine &Duration	**Days & Date**
Ashtachoorna – for Amapachana and improvement of digestive function.	5 g twice daily with Takra (buttermilk), administered one hour before food	7 days (23/07/2025-29/07/2025)
External therapy		
Aschotana (ocular instillation):	*Jeevantyadi Ghrita was instilled as two drops in each eye twice daily*	7days (23/07/2025-29/0 7/2025)
Netra Seka (ocular irrigation)	Yashti Kashaya was poured over the eyes for 4.5 minutes in each eye twice daily	7 days.(23/07/2025-29/07/2025)
Step 2: Shodhana Therapy This stage focused on systemic purification and correction of aggravated Doshas.		
Snehapana:	Rasnadasamoola Ghrita administered internally	3 days. (30/7/2025-01/8/2025)

Abhyanga and Ushnambu Snana:	Abhyangam with Dhanwanaram taila followed by Warm water bath	2 days. (02/08/2025-03/08/2025)
Therapeutic purgation (virechana)	Gandharvahasthadi Eranda Taila (25 ml) administered with warm milk and Triphala Kashaya in the morning on an empty stomach after attaining proper digestive capacity.	1 day (04/08/2025)
Step 3: Shamana and Supportive Therapies		
Internal Medications		
Rajanyadi Choorna	5 g with honey and ghee before food.	(23/07/2025-29/07/2025)
Saptamrita Loha	1 tablet twice daily after food	(23/07/2025-29/07/2025)
Rasnadasamoola Ghrita	5 g twice daily.	(23/07/2025-29/07/2025)
External Therapies		
Nasya	Rasnadasamoola Ghrita administered as 8 bindu in each nostril	3 days (05/08/2025-07/08/2025)
Anjana	Vasa Anjana applied once daily	3days(05/08/2025-07/08/2025)
Sirodhara	Medicated oil pouring therapy is performed using Ksheerabala Taila and Karpasasthyadi Taila.	7 days (08/08/2025-14/08/2025)
Step 4: Netra Kriyakalpa Procedures		
Tarpana	Medicated ghee was retained over the eyes for a prescribed duration. Jeevantyadi Ghrita combined with equal quantity of Vasa, processed with Saindava and Pippali Choorna, was used to stabilize ocular structures.	5 days(19/08/2025-23/08/2025)

Putapaka	A medicated extract prepared from Jeevaniya Gana Choorna and goat's liver processed with ghee and milk was used. The mixture was made into a bolus, wrapped in Eranda (Ricinus communis) leaves, coated with mud, dried, and subjected to heating until red hot. After cooling, the bolus was opened and the expressed filtrate was used for the Putapaka procedure.	1 day(24/08/2025)
Follow-Up The following medications were advised during the follow-up period(2 weeks)		
Rajanyadi Choorna	5 g twice daily with honey and ghee before food.	
Saptamrita Loha	1 tablet twice daily after food.	
Ksheerabala (7) Avarti Taila .	Applied around the eyes (Netra Abhyanga) twice daily	
Anu Taila Nasya	2 bindu in each nostril once daily in the evening.	

Results

Following the above Ayurvedic intervention, the patient demonstrated notable improvement in the clinical symptoms and ocular findings as shown in table-4.

Table-4: Assessment of results:

[redacted]	**Before treatment (At the time of first Visit) 23/07/2025**	**After treatment and follow up period** **01/12/2025**
Visual Acuity	UCVA-Right-6/18	UCVA-Right-6/18

	Left-4/60 BCVA – Right-6/6P Left-6/18p Near vision-Right-N6 Left-N12	Left-6/60 BCVA – Right-6/6P Left-6/12 Near vision-Right-N6 Left-N6
Corneal topography	CCT OD-459micrometer OS-453micrometer	CCT OD-464micrometer OS-455micrometer

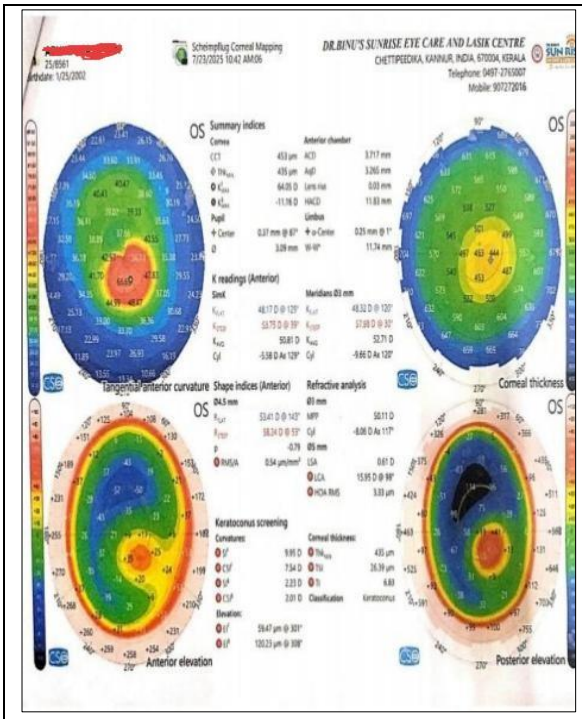

Figure-1-23/07/2025

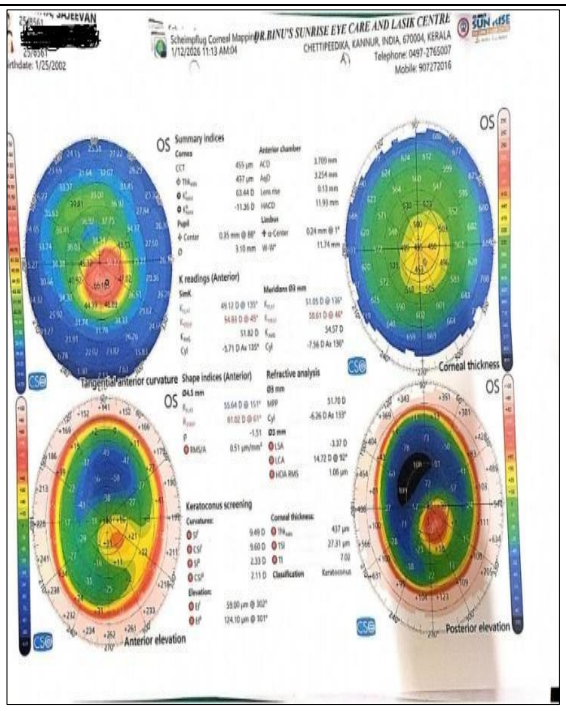

Figure-2-12/01/2026

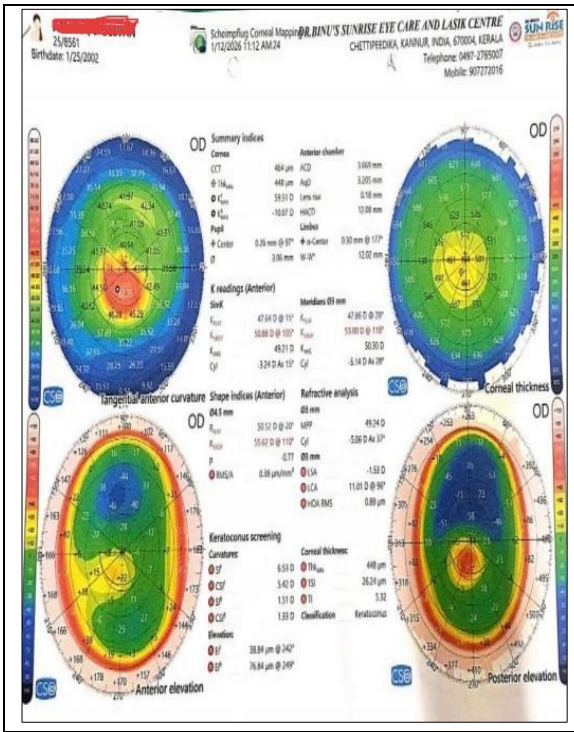

Figure-3 23/07/2025

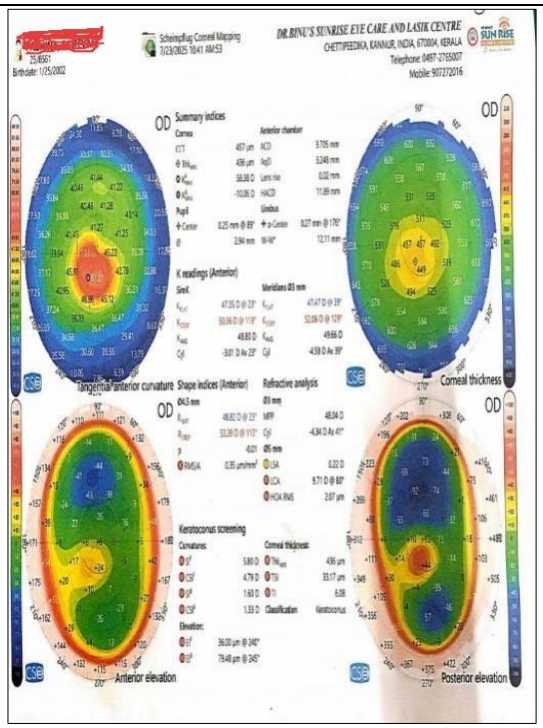

Figure-4-12/01/2026

DISCUSSION:

From an Ayurvedic viewpoint, this patient's clinical signs correspond with those described in Vatika Timira. The underlying pathological mechanism appears to stem from a significant imbalance of Vata Dosha affecting ocular structures, leading to degeneration and functional impairment of vision. Consequently, treatment was aimed at Vatahara pacification (calming Vata), Chakshushya (promoting ocular health), and Brimhana (nutritional therapy). Brimhana therapy is particularly beneficial during the initial stages of ectatic eye diseases as it aids in reinforcing ocular tissue strength and maintaining structural integrity.

The treatment plan integrated these principles as foundational strategies to avert disease progression while preserving visual function(table-3). A sequential protocol tailored to the patient's metabolic state and Dosha dominance was established. Initially, Amapachana (digestion of metabolic toxins) and Deepana (enhancing digestive fire) were introduced as internal treatments. These interventions are effective for enhancing systemic metabolism and eliminating Ama (toxins), thus preparing the body for subsequent therapeutic measures.

At this juncture, external ocular therapies were also administered to promote better nourishment of tissues and enhance local blood circulation around the eyes. The second phase of management commenced when improvements in metabolism were observed—evidenced by increased appetite and satisfactory bowel movements along with decreased Kapha dominance

coupled with relative aggravation of Vata-Pitta Doshas. During this phase, medicated ghee (Sneha therapy) was given internally for nutritional support and cellular repair.

Virechana (therapeutic purgation) was conducted last to cleanse accumulated Doshas from the body's systems while restoring balance internally. In the third treatment phase, Nasya (trans-nasal therapy), Anjana (application of collyrium), and Shirodhara (medicated oil application on the head) were employed; these methods are believed to nourish visual organ structures, improve ocular circulation, and enhance sensory organ functionality.

Towards the end of treatment, specialized ocular procedures like Tarpana—where medicated ghee is retained over the eyes for nourishment—and Putapaka—which delivers concentrated herbal extracts to deeper ocular layers—were executed for tissue fortification and improved eye function. [8] Throughout treatment, regular assessments of visual acuity were conducted alongside evaluations via corneal topography, (fig.1-Fig.4) slit-lamp examinations, and subjective symptom tracking. Observations indicated symptomatic relief along with stabilization in ocular findings.(table-4) Ultimately, this case suggests that Ayurvedic therapeutic strategies could be effective in mitigating keratoconus-related issues pertaining to visual function whilst potentially reducing disease exacerbation. Nonetheless, further well-structured clinical studies involving larger sample sizes over extended periods are necessary to substantiate these findings regarding Ayurvedic approaches in managing keratoconus effectively.

CONCLUSION:

Keratoconus is a progressive corneal ectatic disorder that leads to stromal thinning, irregular astigmatism, and visual impairment. In this case, a staged Ayurvedic treatment protocol based on Vatahara, Chakshushya, and Brimhana treatment principles was implemented. Following the intervention, improvement in visual acuity and reduction in symptoms such as blurring of vision and watering from the eyes were observed, along with stabilization of clinical findings on slit-lamp examination and corneal topography.These findings suggest that Ayurvedic management may play a supportive role in controlling disease progression and improving visual function in keratoconus, although further clinical studies are required to substantiate these results.

Limitation of study:

This study is limited by its design as a single case report, which restricts the generalizability of the findings. Objective parameters such as corneal biomechanics and long-term progression were not extensively evaluated. The absence of a control group and comparison with standard treatments like corneal collagen cross-linking limits the ability to attribute outcomes solely to the Ayurvedic intervention. Additionally, the follow-up period was relatively short to

assess long-term disease stabilization.

Consent of patient:
Written informed consent was obtained from the patient for publication of this case report and any accompanying clinical data and images. The patient was assured that all personal identifiers would be kept confidential, and anonymity would be maintained throughout the publication.

Conflict of interest: The author declares that there is no conflict of interest.

Guarantor*:* The corresponding author is the guarantor of this article and its contents.

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