



Review on Ayurvedic Anatomical Concept of Eye i.e. Netra Sharir

Pravin Ashok Mane

Dept. of Shalakya Tantra,

G. D. Pol's foundation YMT Ayurved Medical College,

Khaghar, Navi Mumbai, Maharashtra

Author Correspondence: Mob no. 8237993399; pravinmane3399@gmail.com

Abstract:

Ayurveda is ancient science of health.. It deals with treatment of diseases with medicines as well as Surgical procedures. Ashtang Ayurveda has Kaya (Medicine), Shalya (Surgery), Shalakya (E. N. T. and Ophthalmology) etc. eight branches of Ayurveda. Shalakya (E. N. T. and Ophthalmology) branch has described various Urdhva Jatrugat Vikar and their management with surgery and medicine. Eye i.e. Netra has its own importance in Panch Dnyaneneindriyas. The description of anatomy of eye can be traced in Vedic literature. The divine Vaidya Ashwinidwaya used to perform eye surgeries with thorough knowledge of anatomy. Vedas are mankind's source of knowledge. Ayurved is derived from one of the Vedic Samhita called Atharv-ved. One of the eight branches of the Ayurveda is shalakyatantra which deals with diseases of urdhvajatrugatarogas and treatment including surgical one. Father of surgery Sushrutacharya has described eye anatomy in detail in Sushrut Samhita.

Keywords: Netra sharir, Shalya Karma, Ayurveda, Sushrut Samhita.

Introduction:

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Aims and Objects:

To evaluate the importance of Netra sharir in shalya Karma as described in Ayurveda..

Material and Methods:

Literature reviewed from Ancient Ayurvedic classical text.

Literature Review:

Synonyms:

Netra, Nayana, Chakshu, akshi, Netragolak, Nayanabudbud, Drishti, etc.

Etymological Derivations:

Akshi, Chakshu, Drishti, Netra, Nayana, lochana are different synonyms used for organ of site in *Ayurved Samhitas* but it is surprising to note that *Acharya Shushruta* has not used the word *Chakshu*¹ in *Uttartantra*, whereas *Charakacharya* used it frequently.

Akshi: The word *Akshi* is derived from root word *Asu* having meaning a source of reaching or seeing or eye.

Chakshu: *Charaka* defines *Chakshu* as that sensual faculty situated in both eye ball which is responsible for vision. (Cha. Su. 8/8) *Chakrapani* a commentator of *Charak Samhita* comments that *Chkshrendriya* is one situated in two eyeballs located in *Shira*.² This *indriya* develops from *Agni Mahabhuta*. *Acharya Sushruta* defines *Chasku* as *Buddhindriya* originated from *Rup Tanmatra* performing the visual perception through dominance of *Tej Mahabhuta*. (Su. SU. 1/6) *Acharya Dalhana* has repeatedly commented *Chakshu* as *Chakshurendriya*

Drishti:

The word *Drishti* is derived from the root '*Drus*' having meaning to see, when it is sufficed by '*kit karane*' meaning source or a tool with which on can see.

Nayana:

This word is derived from root '*ni*' heaving meaning to drive or to take away, which when sufficed by '*karanelyut*' it becomes *Nayana*. *Nayana* is defined as that source drives towards subject of *Drishti*.

Lochana:

The etymological derivation of *lochana* is from root '*Loch*' having meaning to see, which when sufficed by '*KaraneLyut*' it becomes *Lochana* meaning a source with which one can see. *Acharya Shushruta* and *Acharya Vagbhata* have used this word in anatomical sense as synonym of *Netra*.

Thus from above discussion it is clear that synonyms related to organ of sight i.e. *Akshi, Nayana, Netra* and *lochana* are used an anatomical sense while *Chakshu* is its functional phenomenon whereas *drishti* is having amphotomous meaning. *Netra* is widely used word for organ of sight.

NETRA SHARIRA:

Description of *Netra* is available in all *Samhita* especially *Sushruta* and *Vagbhata*.

विद्याद्द्वयंगुलबाहुल्यं स्वांगुष्ठोदरसंमितम् ।

द्वयंगुलं सर्वतः सार्धं भिषकनयनबुदबुदम् ॥

सुवृत्तं गोस्तनकारं सर्वभुतगुणोद्भवम् ॥

सु. उ. १/९-१०

Shape:

Two terms are available to the Eye viz. *Nayana* and *Netra* in *Uttara tantra* 1st chapter, as narrated by *Acharya Sushruta*. Both are suggestive as shape. The former means the Eye is like a bubble floating over water i.e. round in shape and soft in consistency, which suggests the external appearance of the eye in the orbit. The later means the Eyeball almost round in shape and resembles the cow's teat.

Dimensions:

Acharya Sushruta has used *Anguli Pramana* the unit of measure, in context to the measurement of Eye, it is equal to *swangusthodara*, which has been given supported and clearly mentioned by the commentator *Dalhana* that the dimension of this one *anguli* is equal to the central part of the thumb of an individual.

Circumference:

It is stated that, the thickness or antero-posterior diameter of an eyeball is two *anguli*, and the circumference i.e. horizontal and vertical diameter two and a half *angulas*. The distance between two Eyes is two *angulas*.

Measurement of cornea and pupil:

नेत्रयामात्रिभगन्तुकृष्णमंडलमुच्यन्ते ।

कृष्णात्सप्तममिच्छन्ति दृष्टिदृष्टिविशारदः ॥

सु. उ. १/१३

The black part of the eye (*krishnamandala* / cornea) is said to be one third of its whole extent, while *Drishti* occupies only one seventh of *krishna mandala* i.e. iris.

In reference to the description of Eye, Acharya Sushruta has mentioned the following important structures as:

Drushti:

मसुरदलमात्रातुपंचभूतप्रसादजं

खद्योतविस्फुलिंगाभामिद्धांतेजोभिरव्ययैः ॥

आवृतां पतलेनक्ष्णोर्बाह्वेन विवराकृतिम् ।

शीतसात्स्यांनृणां दृष्टिमाहुर्नयनचिन्तकाः ॥

सु.उ. ७/३,४

Drushti is made up of all five *mahabhuta* with main element of *tejamahabhuta*. It is covered by *patalas* from

inside out. Size of *drushti* is equal to cotyledon of *masura*.

सिराणांकण्डराणांचमेदसः कालकस्यच

गुणाः कालात्परः श्लेष्माबन्धनेअक्ष्णोसिरायुतः॥

सु.उ. ७/५

1. AkshiBandhana:

The *Siras*, *Kandaras*, *Meda*, *Kalakasthi* and *Shleshma* are the responsible factors for the proper alignment of the eye. Especially *Shleshma*, along with *siras* takes part in the *bandhana karma* of the eyeballs. Here, *Dalhana* opines that *Sira* in the reference includes both the *Sira* and *dhamani* and *kandara* is meant for *Snayu* and *peshi*.

2. Peshi and Snayu:

The *Peshis* in the eyes are *Mandala* in shape and are two in number, whereas, the *Snayus* are of *pruthu* type and 30 in number.

3. Marma:

Marma are vital points of the body, trauma to which may result in various complications. Two *Marmas* mainly *Apanga* and *Avarta* are related to Eye. *Apangamarma* is situated on outer side of the orbits below the lateral end of the eyebrows, $\frac{1}{2}$ *angulas* in size and is a *Sira Marma*. *AvartaMarma* is situated above the lateral end of eyebrow, of same size and *Sandhi* type of *Marma*. Any injury to these sites may result in blindness and diminished vision.

4. Sira and Dhamani:

According to Acharya Sushruta, 38 *Siras* are found in the Eye which transports *Vata* (10), *Pitta* (10), *Kapha* (10) and *Raktha* (8). Whereas, Acharya *Vagbhata* states to be 65 *Siras* in the Eye, but details are not available. Among 4 *Dhamani*, 2 are

meant for *Roopavahana* and rest two is for drainage of *ashru* to the Eye.

5. *Asthi and Sandhi*:

Arunadatta, in his commentary opines that *Tarunasthi* is present in *Akshikosha* (Lids).

Mandala Ptala and Sandhi

मण्डलानिचसन्धीश्चपटलानिचलोचने ।

यथाक्रमंविजानीयात्पंचषट्चषडेवच ॥

सु.उ.१/१४

MANDALA

The term *Mandala* is used for the consecutive circular areas of the eye, which are as follows

1. *Pakshma Mandala*
2. *Vartma Mandala*
3. *Shweta Mandala*
4. *Krishna Mandala*
5. *Drushti Mandala*

The *Mandala* are arranged successively from outside to inside:

1. ***Pakshma Mandala*** –*Pakshma* or cilia of the eyelids form the outer most *Mandala* of the eye i.e. eye lashes. These protect eye from dust and wind.
2. ***Vartma Mandala*** – The circle formed by the conjunction of upper and lower eyelids of eye ball is termed as *Vartma Mandala*. Two *Nimeshinisiras*, situated in eyelids perform the function of *Nimesha* and *Unmesha* (blinking). These *vartmamandala* is seat for 21 *vartmagatavyadhis* according to *Shushrutachrya*.
3. ***Shweta Mandala***- The whitish part, inner to eyelid and beyond the black circle is known as *Shweta Mandala*, when both the lids are open i.e.

sclera. *Sushruta* has encountered 11 pathogenesis in *shweta Mandala* and 13 according to *Vagbhata*.³

4. ***Krishna Mandala***- The anterior most circle of the eye, blackish in colour, is the *Krishna Mandala*. *Sushruta* has mentioned the size of this *Mandala* as 1/3rd of the whole Eye. A term *Taraka* for one of the structures of the Eye is also used by *Sushruta*, which is having the same size. The *Drushti Mandala* is enclosed in this *Mandala*. *Sushrutahas* mentioned four clinical entities in this *Mandala*, whereas, they are five in view of *Acharya Vagbhata*. It can be correlated with cornea with iris.

5. ***Drushti Mandala***- This is the last and innermost circular structure of the Eye. It is named as *Drushti Mandala* as the *Drushti* is enclosed in it. According to the statement of *Dalhana*, *Videha* opines that the diameter of *Drushti Mandala* is equal to 1/7th of the *Krishna Mandala* and *Sushruta* also agreed with this. Again it is said to be equal to 1/9th part of the *Tarka*. *Sushruta* in his *Uttaratantra* states that the *Drushti*, encircled by *Drushti Mandala* is equal to the cotyledon of *Masura*.

SANDHI

The junctional region between two *Mandala*, in relation to the Eye, is considered as *Sandhi* of the related *Mandala*, which are 6 in number viz.

1. *Pakshma Vartmagata Sandhi*
2. *Vartma Shuklagata Sandhi*
3. *Shukla Krishnagata Sandhi*.

4. *Krishna Drushtigata Sandhi*
5. *Apanga Sandhi*
6. *Kaneenika Sandhi*

1. ***PakshmaVartmagata Sandhi:***

The juncture line of *Pakshma* and *Vartma* i.e. the lid margins, where cilia grow are termed as *PakshmaVartmagata Sandhi*. i.e. lid margin.

2. ***VartmaShuklagata Sandhi:***

The junctional regional of *Vartma* and *Shukla mandala* is known as *VartmaShuklagata Sandhi*. i.e. fornices.

3. ***Shukla krishnagata Sandhi:*** The circular joining line in between *Shukla* and *Krishna Mandala* is *Shukla Krishnagata Sandhi*. i.e. limbus.

4. ***Krishna Drushtigata Sandhi:*** This *Sandhi* is the juncture line in between the *Krishna Mandala* and *Drushtimandala*.

5. ***Kaneenika Sandhi:*** Junction of *urdhva* and *adhovartma* near *Nasa* i.e. inner canthus.

6. ***Apaanga Sandhi:*** Junction of *urdhva* and *adhovartma* laterally i.e. outer canthus. Three *Sandhi* namely *VartmaShuklagata*, *Kaneenika* and *Apaanga* are supported by *Sandhi Bandhana*.

The clinical entity *VatahataVartma* (Ptosis) occurs here, when it is vitiated by the provoked *Vata*.

PATAL

The term *Patala* means a veil, which denotes a thin membrane, skin or a layer.

Dalhana says, it is having the thickness of $1/5^{\text{th}}$ *Drushti*. Six *Patala* layers are stated to be present in the eye. The 4 *Patala* are in eye proper and 2 *Patala* are situated outside the eye i.e. *UrdhwaVartmaPatala* (Upper lid) and *AdhoVartmaPatala* (lower lid). The disease *Adhimantha* occurs in all the above structures, hence the name “*Sarvakshiroga*”.

1. ***TejojalashritaPatala:*** This is the outer most among the 4 *patala*. *Dalhana* denotes *teja* as “*AlochakaTejaSanshrayaSiragataRakta*” i.e. the *Alochaka Pitta*, responsible for vision, present in the blood vessels and *Jala* as *TwakgataRasadhathu*. *Acharya Indu* has defined the word *Ashraya* as “*Apyayitha*” means thereby ‘to nourish’. Hence this *Patala* is supported or nourished by *Rasa* and *RaktaDhathu* of the body.

2. ***MamsashritaPatala:*** This is the second *Patala*, nourished and supported by *MamnsaDhathu*.

3. ***MedoshritaPatala:*** *Medodhathu* nourishes this 3rd *Patala*.

4. ***AsthyashritaPatala:*** *Asthidhathu* of the body supports the innermost or 4th *Patala* in general and by the *Kalakasthi* in particular.

Discussion and conclusion:

The description of anatomy of eye i.e. *Netra Sharir* plays an important role in surgical as well as Medicinal procedures. *Mandal, Sandhi and Patal* concept is innovative concept of *Ayurveda* which made easy to classification of various diseases of eye. It also helpful to manage the medicinal as well

as surgical treatment of the diseases which occurred in eyes.

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