



## EYELID DISEASES: A COMPARISON OF SUSHRUTA'S DESCRIPTION WITH MODERN OPHTHALMOLOGY

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### ARTICLE INFO

#### Article History:

Received 19<sup>th</sup> June, 2017.

Received in revised form 3<sup>rd</sup> July, 2017

Accepted 18<sup>th</sup> August, 2017

Published online 28<sup>th</sup> September, 2017

#### Key words:

*Vartmagataroga*; Eyelid; Eyelid lesions; Sushruta; Ayurveda; *Lekhana*; *Bhedana*; *Chhedana*

### ABSTRACT

A big part of Indian traditional medical knowledge, the Ayurveda, remains limited to the geographical boundaries of its origin due to the fact that the Ayurvedic literature is written in an ancient language (Sanskrit) and style. The principles and practices of Ayurveda are not easily intelligible to modern mind as they are the product of very different time and culture. Ancient Ayurvedic literature needs to be translated and explained in such a way that it becomes readily comprehensible to modern mind so that it can be utilized to develop new approaches to health and diseases. In this paper, the work of Sushruta (famous authority on Ayurvedic surgery who lived about 1000-800 BC) on twenty-one eyelid diseases is translated, explained and correlated with the diseases described in modern ophthalmology so that the reader can have a better understanding of Ayurvedic approach to these diseases.

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### INTRODUCTION

Man has always sought guidance from his past to solve the current problems of life. This is also true for medical science as many new medical approaches are developed from the past practices or ideas borrowed from traditional medicine. The ideas existing in ancient medical literature, however, are not easily intelligible to modern mind as they are the product of a very different time and culture, written in ancient language (Sanskrit) and style, and based more on philosophical view of the world rather than being limited to the strict boundaries of science. We need to explore the ancient ideas and put them in a language readily comprehensible to modern mind so that they can be utilized to develop new approaches to health and diseases.

The Indian subcontinent has its own heritage of medical knowledge, Ayurveda. It has been developing for centuries through observation, experimentation and reflective thought. Though most of this knowledge could not be preserved, some of it is available today in the form of compilations called *Samhitas* or compendia. One of the most ancient and authentic work available today is *Sushruta Samhita* or the Compendium by Sushruta. Sushruta, the most prominent authority on Surgery, incorporated the surgical principles and

eyelids and few chapters describing their management. We review here Sushruta's description of eyelid diseases and their management in order to explain the surgical practices prevalent in ancient India so that the reader can explore new ideas on this foundation and may incorporate them in practices. Twenty-one eyelid diseases described by Sushruta are translated, explained and correlated with the diseases described in modern ophthalmology.

#### Sushruta's Notion of eyelid

Sushruta's definition of eyelid (*vartma*) is not same as the definition by modern ophthalmology. Sushruta includes the diseases of inner aspect of eyelid (palpebral conjunctiva) under the 'diseases of eyelids' while modern ophthalmology considers these under the category of 'conjunctival diseases'. Twenty-one eyelid diseases described by Shushruta can be categorized as Table 1.

#### Eyelid Abscesses and Cysts

##### *Anjananamika*

"A localized small, soft, copper-coloured eyelid lesion associated with slight pain, burning, and pricking sensation is known as *Anjananamika*".<sup>1</sup> (Verse 15)

Sushruta describes incision (*bhedana*) and drainage as the treatment of *Anjananamika*.<sup>2</sup> (Verse 6)

*Anjananamika* can be correlated with hordeolum which is an acute focal infection involving either the glands of Zeis

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**Table 1** A practical categorization of twenty-one eyelid diseases described by Shushruta

<b>Eyelid Abscess and Cysts</b>	
1.	Anjananamika
2.	Lagana
3.	Kumbhika
<b>Eyelid or Palpebral Conjunctival Inflammations</b>	
4.	Vartmavabandha
5.	Klishtavartma
6.	Vartmakardama
7.	Shyavavartma
8.	Klinnavartma
9.	Aklinnavartma
10.	Vartmasharkara
11.	Pothaki
<b>Benign and Malignant Eyelid Lesions</b>	
12.	Utsangini
13.	Bahalvartma
14.	Visavartma
15.	Arshovartma
16.	Shushkarsha
17.	Vartmarbuda
18.	Shonitaarsha
<b>Diseases related to Eyelid Margin</b>	
19.	Pakshmakopa
<b>Diseases affecting Eyelid Movements</b>	
20.	Vatahatavartma
21.	Nimesha

(External hordeolum or stye) or, less frequently, the meibomian glands (internal hordeolum). Hordeola essentially represent focal abscesses, and present with features of acute inflammation, such as a painful, warm, red swelling on the eyelid.<sup>3</sup> These lesions are treated by incision and drainage even today as they were treated in Sushruta's times.

### Lagana

“A thick, hard, sticky and painless nodular swelling on the eyelid resembling a *Kola* (*Ziziphus jujuba*) fruit in size and marked by itching and absence of suppuration is called *Lagana*”.<sup>1</sup> (Verse 27)

It was treated by incision (*bhedana*) and drainage. In case of a big chalazion incision and drainage was followed by application of *kshara* (herbal caustic cautery) and *agni karma* (*thermal cautery*).<sup>2</sup> (Verse 5-6)

The clinical features and treatment of *Lagana* as described by Sushruta closely resemble with the chalazion, a common inflammatory lesion of the eyelid. It is a slowly enlarging, firm and painless eyelid nodule formed due to obstruction of meibomian glands of the eyelid, and treated by incision and drainage.<sup>4</sup>

### Kumbhika

“A focal eyelid swelling resembling pomegranate seed, that re-fills if drained by pricking, is termed as *Kumbhika*”.<sup>1</sup> (Verse 10)

It was treated by scrapping preceded by excision of the lesion (*chhedana purvaka lekhana*).<sup>5</sup> (Verse 16) At that time scrapping (*lekhana karma*) was done with the help of a scalpel or rough leaves of herbs like *Nyctanthes arbor-tristis* (*Shefalika*) or *Onosma bracteatum* (*Gojihwa*).<sup>5</sup> (verse 6)

The description resembles with cystic swellings such as cyst of moll, cyst of zeis and eccrine hidrocystoma which could not have been differentiated from each other only on clinical grounds with the means available at that time.

Cyst of moll (also known as sudoriferous cyst or apocrine hidrocystoma) is a retention cyst that appears on the lid margin, filled with clear serous fluid and often looks translucent. It may recur if punctured with a fine needle.<sup>6</sup> Cyst of zeis is a benign cyst arising from gland of Zeis filled with yellow oily (sebaceous) secretion and less transparent than cyst of moll. Eccrine hidrocystoma characteristically appears as a clear cystic translucent lesion, usually near the eyelid margin and may be indistinguishable clinically from apocrine hidrocystoma (cyst of moll). It develops from retention of sweat due to blockage of sweat ducts. In contrast to apocrine hidrocystoma, which is almost always solitary, eccrine hidrocystoma is more likely to be multiple.<sup>7,8</sup> All of these cysts are treated by puncture or excision of their surface followed by scrapping of their base. Sushruta also treated these conditions in the same way.

### Eyelid or Palpebral Conjunctival Inflammations

#### Vartmavabandha

“Itchy eyes with pricking sensation and eyelid edema that doesn't allow complete eye closure is called *Vartmavabandha*”.<sup>1</sup> (Verse 17)

It was treated by making small shallow incisions followed by scrapping (*prachchhana purvaka lekhana*).<sup>5</sup> (Verse 14) However this is not clear that this treatment was done on outer surface or inner surface of the eyelid.

The description of *Vartmavabandha* resembles with that of atopy or allergic eyelid edema such as contact dermatoblepharitis and atopic dermatitis. The contact dermatoblepharitis and atopic dermatitis are common eyelid allergies which may presents with swelling of the eyelids, itching, and edema induced incomplete eye closure.<sup>9,10</sup> These conditions, nowadays treated by anti-allergic drugs, were probably treated in ancient India by curettage and subsequent application of herbal ointments.

#### Klishtavartma

“*Klishtavartma* is said to be a condition characterized by floppy and coppery eyelids associated with mild pain and sudden intermittent redness”.<sup>1</sup> (Verse 18)

It was also treated by making small shallow incisions followed by scrapping (*prachchhana purvaka lekhana*) of palpebral conjunctiva.<sup>5</sup> (Verse 14)

*Klistavartma* seems a condition similar to floppiness of eyelid which is characterized by soft superior tarsal plate, rubbery, flaccid and easily everting eyelid. Floppiness of eyelid may be associated with chronic papillary conjunctivitis and can cause sudden redness and ocular irritation.<sup>11</sup>

#### Vartmakardama

“When *pitta* involves *Klishtavartma* and vitiates *raktadosha* causing wet eye is called *Vartmakardama*”.<sup>1</sup> (Verse 19) Here wet eye means a scanty discharge with features of vitiation of *pitta* and *rakta* i.e.; warm and yellowish discharge.

It was treated by scrapping (*lekhana*) of palpebral conjunctiva.<sup>5</sup> (Verse 15)

*Vartmakardma*, thus, is the aggravated stage of *Kilstavartma*. Floppiness of eyelid associated with mild mucous discharge due to secondary infection, therefore, resembles with

*Vartmakardama*. This is generally treated by conservative medical therapy such as lubricating and anti-allergic topical ophthalmic drugs.

#### **Shyavavartma**

“An eyelid having painful, itchy swelling with burning sensation, grayish discoloration and edema both externally and internally is recognized as *Shyavavartma*”.<sup>1</sup> (Verse 20)

It was treated by scrapping (*lekhana*) of the inner side of the eyelid.<sup>5</sup> (Verse 15)

#### **Klinnovartma**

“A not very painful eyelid, edematous externally, discharging internally and associated with excessive itching and pricking sensation is called *Klinnovartma*”.<sup>1</sup> (Verse 21)

It was treated by topical and systemic medications.

#### **Aklinnovartma**

“A non-suppurative affliction of eyelid in which eyelids stick together even after frequent washing is called *Aklinnovartma*”.<sup>1</sup> (Verse 22)

It was also treated by topical and systemic medications.

*Shyavavartma*, *Klinnovartma* and *Aklinnovartma* seem to be the terms given for different clinical presentations of allergic conditions which predominantly affect palpebral conjunctiva. This is pertinent to mention here that according to Sushruta's notion of eyelid, the palpebral conjunctiva is a part of eyelid and not a separate entity as it is considered today. The eyelid allergic conditions or different stages of these conditions which present with swelling, itching, burning sensation and pain were recognized by Sushruta as *Shyavavartma*. Probably *Shyavavartma* includes such allergic conditions which present with papillary hyperplasia. The treatment mentioned by Sushruta for this condition is scrapping (*lekhana*) of papillae. Therefore, the term *Shyavavartma* includes the conditions like vernal keratoconjunctivitis<sup>12</sup>, giant papillary conjunctivitis<sup>13</sup> etc. The palpebral conjunctival allergies when present in milder forms such as seasonal and perennial allergic conjunctivitis<sup>14,15</sup> and not associated with overt papillary hyperplasia, can be included under *Klinnovartma*. The palpebral allergic conjunctivitis which present with excessive mucoid discharge and stickiness can be included under clinical condition of *Aklinnovartma*.

Even few decades back the allergic conditions presenting with papillary hyperplasia were treated by scrapping of the lesions. But this practice replaced by effective topical medications available today.

#### **Vartmasharkara**

“*Vartmasharkara* is a rough and gross lesion that remains surrounded by many small (but similar) lesions”.<sup>1</sup> (Verse 12)

It was treated by removal of the lesion followed by scrapping (*lekhana*).<sup>5</sup> (Verse 16)

*Vartmasharkara* resembles with conjunctival concretions which are small, hard, yellowish white calcified matter, superficially buried beneath the palpebral conjunctiva and usually present in clusters. They are removed by a needle or scrapping.

#### **Pothaki**

“Red mustard seeds like thick or big, painful, itchy eyelid lesions associated with discharge are known as *Pothaki*”.<sup>1</sup> (Verse 11)

*Pothaki* is treated by applying small incisions over the lesions followed by scrapping (*prachchhana purvaka lekhana*).<sup>5</sup> (Verse 15)

This is a condition which most probably resembles with large papillae and follicular hypertrophy accompanied with discharge and itching. It may present in follicular stage of trachoma, in allergic, viral and toxic conjunctivitis.

#### **Benign and Malignant Eyelid Lesions**

Sushruta classified benign and malignant eyelid lesions under the clinical entities such as *utsangini*, *bahalavartma*, *visavartma*, *arshovartma*, *sushkarsha*, *vartmarbuda* and *shonitarsha*. Sushruta's categorization of benign and malignant eyelid lesions is based on the shape of lesion, presence or absence of peduncle, smoothness or roughness of surface, being single or multiple, being hard or soft in consistency, and chances of recurrence. He describes following eyelid lesions in his text *Sushruta Samhita*.

#### **Utsangini**

“A focal and externally visible swelling of lower eyelid surrounded by similar lesions, and which opens internally is known by the term *Utsangini*”.<sup>1</sup> (Verse 9)

It was treated by scrapping after excision of the surface of lesion. (*chhedana purvaka lekhana*).<sup>5</sup> (Verse 16)

*Utsangini*, thus, is a descriptive term for skin colored multiple lesions primarily affecting the lower eyelid. The above description resembles with two types of lesions viz. syringoma and epidermal inclusion cysts. Syringomas are multiple, small and waxy nodules usually affecting lower eyelids, and treated by complete surgical excision.<sup>16</sup> Epidermal inclusion cysts are among the most common benign lesions affecting eyelids. These are keratin filled, smooth and round multiple nodules commonly confused as sebaceous cysts. They are treated by excision of outer surface and leaving it to heal spontaneously.

It is possible that Sushruta treated these lesions by removal of the lesions followed by scrapping of the base.

#### **Bahalavartma**

“*Bahalavartma* is a condition of eyelid thickening caused by identical and skin-colored lesions present all over the eyelid”.<sup>1</sup> (Verse 16)

It was treated by making small shallow incisions followed by scrapping of the lesions (*prachchhana purvaka lekhana*).<sup>5</sup> (Verse 14)

Description of *Bahalavartma* resembles with the milia, the tiny raised lesions on the skin of eyelid. It is a type of epidermal inclusion cyst filled with a protein called keratin. Nowadays milia is treated by excision.<sup>17</sup>

#### **Visavartma**

“Swelling of the eyelid with multiple small pores like the pores in the stem of a water soaked lotus plant is called *Visavartma*”.<sup>1</sup> (Verse 28)

It was treated by incision and drainage (*bhedana*).<sup>2</sup> (Verse 3-4)

Features of *Visavartma* can be correlated with molluscum skin lesions as small pits on the lesions resemble with pores in lotus stem. They are caused by a viral infection of the same name, mostly in immunocompromised persons, characterized by dome shaped waxy lesions with central umbilication. Nowadays these are treated by excision, controlled cryotherapy or curettage.<sup>18</sup>

#### **Arshovartma**

“Small and rough lesions on the eyelids resembling *ervaruka* (cucumber) seeds and associated with very little pain are called *Arshovartma*”.<sup>1</sup> (Verse 13). *Ervaruka* seeds being elongated in shape signify pedunculated lesions.

#### **Shushkarsha**

“Long, rough, rigid, and troublesome outgrowths on eyelid are called *Sushkarsha*”.<sup>1</sup> (Verse 14)

A number of epithelial hyperplasias can be included under the clinical headings of *Arshovartma* and *Sushkarsha*. The clinical appearance of papillomas (a clinical entity not necessarily associated with the papillomavirus) such as seborrheic keratosis, verruca, acrochordon (skin tag, fibroepithelial polyp, squamous papilloma, cutaneous horn etc.), basosquamous acanthoma, squamous acanthomas and various types of nevi resemble with the Sushruta's description of *Arshovartma* and *Sushkarsha*. Among these lesions, small and pedunculated ones should be included under the heading of *Arshovartma* whereas *Sushkarsha* includes bigger, rough and dry lesions.

#### **Vartmarbuda**

“Uneven, reddish, painless and firm outgrowths from eyelid with involvement of deeper tissues is called *Vartmarbuda*”.<sup>1</sup>(Verse 24)

The basal cell carcinoma, squamous cell carcinoma, sebaceous adenocarcinoma and melanomas are the lesions which resemble with the Sushruta's description of *Vartmarbuda*. Basal cell carcinoma is a locally invasive eyelid malignancy arising from basal cells of eyelid skin presenting as firm, raised, nodular growth. Squamous cell carcinoma is a malignancy arising from squamous cells of the eyelid skin presenting as a fast growing nodular mass. It requires prompt treatment as it can rapidly metastasize through lymphatics. Sebaceous adenocarcinoma is a malignant condition that arises from meibomian, zeis or sebaceous glands of the eyelid and may masquerade as benign conditions such as chalazion or chronic blepharitis. Melanomas are malignant masses with variable pigmentation, having irregular borders and associated with ulceration and bleeding.<sup>19,20</sup>

The eyelid malignancies are treated by wide surgical excision of the lesion along with some normal tissue around it in order to insure complete removal of malignant tissue. Cryotherapy or radiation therapy is usually done on the wound margin after resection of malignant mass.

Sushruta treats *Arshovartma*, *Shushkarsha* and *Vartmarbuda* by complete excision in similar manner as they are treated nowadays. He also advocates *agni karma* (thermal cautery)

and *kshara karma* (herbal caustic cautery) after complete excision of the lesion.<sup>21</sup> (Verse 29-32)

#### **Shonitarsha**

“Soft growths on the eyelid which reappear even after excision, and associated with pain, itching and burning sensation are called *Sonitarsha* and should be ascribed to the vitiated condition of *rakta*”.<sup>1</sup> (Verse 26)

Sushruta describes *Shonitarsha* as incurable.<sup>22</sup>(Verse 36)

*Shonitarsha* appears to be a description of small vascular lesions presenting on eyelid skin such as cherry angioma. Cherry angioma is a common, idiopathic lesion varying in number from few to hundreds, and range in size from 0.5 mm to more than 5 mm in size. They are reddish papules generally movable with skin and bleed on trauma. They are treated by excision followed by laser or cryotherapy. Though, these lesions are curable but new lesions may keep on appearing. However, Sushruta described other features of *Shonitarsha* such as burning sensation, itching and pain, are not the features present in Cherry angioma.<sup>29</sup>

#### **Diseases related to Eyelid Margin**

##### **Pakshmakopa**

“The vitiated *doshas* involve eyelid margin turning eyelashes or eyelid margin inwards. Misdirected, rough and sharp eyelashes cause pain by rubbing upon the cornea which is relieved after epilation. The eyes cannot tolerate even slight wind, heat or the glare of fire”.<sup>1</sup> (Verse 29-30)

*Pakshmakopa* was managed by epilation, *kshara karma* (cauterization by caustics), *agni karma* (cauterization by heat) and surgery (eversion of eyelid margin or excision of anterior eyelid margin along with eyelash follicles).<sup>23</sup> (Verse 1-16)

*Pakshmakopa* resembles with trichiasis, entropion and distichiasis. Trichiasis is characterized by misdirected eyelashes that grow inward toward the eyeball whereas entropion is inwards turning of eyelid margin leading to rubbing of eyelashes against the cornea. Distichiasis is an extra row of eyelashes emerging from the ducts of meibomian glands. Nowadays these conditions are managed by electrolysis, cryotherapy, laser, and by various surgical techniques like bilamellar tarsal rotation, anterior lamellar repositioning, tarsal wedge resection, tarsectomy etc.<sup>24</sup>

#### **Diseases affecting Eyelid Movements**

##### **Vatahatavartma**

“When eyelids are disengaged from their junctions, they get devoid of activity and fail to close the eye. This eyelid condition is termed as *Vatahatavartma* and may or may not be associated with pain”.<sup>1</sup>(Verse 23)

Sushruta probably hypothesizes that the function of blinking is only possible if eyelids are properly attached to some relatively fixed structure in the orbit. He believes that the detachment of eyelid from this relatively fixed structure causes loss of function i.e. blinking. He implicates vitiated *vata* as the cause of *Vatahatavartma* and describes it as an incurable condition.<sup>22</sup> (Verse 30)

*Vatahatavartma* can be correlated with lagophthalmos which is incomplete closure of the eyelids. The main cause of lagophthalmos is facial nerve (VII<sup>th</sup> cranial nerve) palsy but it

also occurs due to trauma, burns, infections, tumors, after surgery or during sleep. Nowadays lagophthalmos is managed by tarsorrhaphy, gold weight implantation<sup>25</sup>, palpebral spring insertion, levator lengthening<sup>26</sup>, and by lower eyelid tightening and elevation<sup>27</sup> etc.

### Nimesha

“Vitiated vata affecting nimeshani siras of eyelids causes Nimesha, a disease characterized by excessive blinking”.<sup>1</sup> (Verse 25)

This condition is described as incurable by Sushruta.<sup>22</sup>(Verse 29)

Nimesha resembles with blepharospasm of continuous and recurrent nature which are the neurological conditions characterized by excessive blinking and involuntary closure of the eyelids due to uncontrolled muscle contractions around the eye (orbicularis oculi). One of the most common conditions causing excessive blinking is essential blepharospasm. This condition is nowadays managed by anti-cholinergic drugs, bilateral surgical avulsion of facial nerve and by injection of botulinum toxin.<sup>28</sup>

### CONCLUSION

Sushruta describes twenty-one eye diseases in his famous compendium called *Sushruta Samhita*. Each of these eyelid diseases is, in fact, a category of lesions presenting with similar features. It is known today that the diseases that are histopathologically different may present with similar clinical features, or the diseases that are histopathologically similar may present with different clinical features. Therefore, a single Ayurvedic eyelid disease may include many histopathological conditions and vice-versa. Most of the eyelid conditions and the principles of their management described by Sushruta can be correlated with the diseases described in modern ophthalmology.

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**How to cite this article:**

Ruby Kumar and Manoj Kumar (2017) 'Eyelid Diseases: A Comparison of Sushruta's Description with Modern Ophthalmology', *International Journal of Current Advanced Research*, 06(09), pp. 5695-5700.  
DOI: <http://dx.doi.org/10.24327/ijcar.2017.5700.0781>

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