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## “A STUDY OF THE ANATOMICAL CHANGES IN NETRA (EYE) WITH SPECIAL REFERENCE TO ARMA (PTERYGIUM)”

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### ABSTRACT:

*Netra* is very important *dnyanendriya* (sense organ) in all without which one cannot see the universe. *Arma* is one of the *vyadhi* of *Netra Shuklagat* (Sclera and Conjunctiva) having 5 types. It is caused by UV rays, in dusty, sandy water. In advance cases the *Arma* can affect vision as it invades the cornea causing astigmatism and corneal scarring. In *ayurvedic* text, types of *Arma* are described on the basis of symptoms. We don't find any anatomical description about *Arma*. So it is necessary to know the anatomical changes occurring in *Arma*. **Aims And Objectives:** 1. To study the details of *Arma* and Pterygium 2. To study and confirm the anatomical changes in *Netra* in various types of *Arma* with comparison to Pterygium. **Result and Conclusion:** Histopathological investigation of Pterygium tissue of each type of *Arma* was done which showed the almost similar elastoid degeneration along with squamous or columnar epithelium and congestion and chronic inflammation even if severity of signs and symptoms is different in every patient of Pterygium and irrespective of age and sex of patient.

**KEYWORDS:** *Ayurved*, *dnyanendriyas*, *Netra*, *Arma*,

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**INTRODUCTION:**

*Ayurveda* Is “Science of Life “Which Deals with Healthy Well Being of Person and Treatment of Diseased One.<sup>[1]</sup> In All *Ayurvedic* Literature *Ayurveda* is Explained as *Ashtang Ayurved* and Has Been Divided Into 8 Branches. <sup>[2]</sup> It Is Important to Study *Sharir Rachana* Before Knowing All Eight Branches of *Ayurveda*. Detail study of sharir –rachana is important because the vaidya who knows about sharir from every aspect is the only one who has complete knowledge of *Ayurved* and can give healthy long-lasting life to his patients. <sup>[3]</sup> *Sharir* has five *dnyanendriyas* and five *karmendriyas*.among which *Netra* is very important because,it is stated that eyes should be protected from every type of disease or injury all the time, India is a tropical country, due to hot,sandy,dry climate and outdoor occupations,maximum and continuous exposure to uv rays,dark skin complexion and genetic predisposition leads to various systematic and specially ocular disease like ‘*Arma*’.Detail Work On The Anatomical Changes In *Netra* With Reference To *Arma* In Field Of *Ayurveda* is required.

**AIMS AND OBJECTIVES:**

- 1) To Study the Details of *Arma* According to *Ayurveda* and Pterygium According to Modern Science.
- 2) To Study and Confirm the Anatomical Changes in *Netra* in *Arma* According to *Ayurveda* and In Eye in Pterygium According to Modern Science.

**PLACE OF WORK:**

- 1) Department Of *Rachana –Sharir* of Government *Ayurved* College,Nagpur
- 2) *Shalakyatantra* OPD, IPD, OT Government *Ayurved* Hospital, Nagpur
- 3) Pathological Laboratory Of Government Medical College,Nagpur

**INCLUSION CRITERIA:**

- Patients suffering from signs and symptoms of *Arma* on the basis of history and clinical

examination was selected irrespective of sex in OPD and IPD.

- Patients from age group of 20 yrs to 70 yrs.

**EXCLUSION CRITERIA:**

- Patients suffering from active ocular disease like Conjunctivitis, Corneal Ulcer, Iridocyclitis excluded.
- Patient not fit for excision of Pterygium surgery
- Below age of 20 yrs and above age of 70 yrs.

**DIGNOSTIC CRITERIA:**

- Complete history taking,Gross Examination By Torch Light, Slit Lamp Biomicroscopy Pterygium Was Classified As  
Type 1-Pterygium Extending on Cornea Up To 2 Mm  
Type 2-Extending On Cornea Up To 4 Mm  
Type 3-Extending On Cornea More Than 4 Mm.

In *Sushruta Samhita Uttartantra*, while describing 76 types of *Netra Rogas* *Sushrut* has classfied them According to *Mandals* and out of these *Shuklamandalgat* Diseases are 11.<sup>[4]</sup>

**NETRA ROG NIDAN:** Swimming in cold water after coming from hot climate, continuous staring at distant objects,faulty sleeping habits,continuous weeping, anger,grief, distress, trauma to eyes,excessive intake of vinegar,sour,horse gram, black gram,suppression of urges,smoking,trying to stop vomiting or excessive emesis,suppression of tears looking at minute objects,aggravates the *doshas* and cause various eye disease<sup>[5]</sup>

**NETRA ROGA SAMPRATI:** Due to wrong dietary,living and behavioral habits,*doshas* gets aggravated,vitiated and come into circulation,while circulating in body when they get stabilized in various parts of eye i.e *mandal*, *sandhi*,*patal* and cause various eye disease.<sup>[6]</sup>

**NETRA ROG PURVARUP:** Muddiness in eyes,congestion,itching,lacrimation discharge,matting of eyelashes and lids,



heaviness, burning sensation, pricking sensation, redness, pain and oedema of eyelids and pricking foreign body sensation inside eyelids along blurred /diminished vision and photophobia gives clues to eye experts that eye is vitiated by *doshas* and thus diseased.<sup>[7]</sup>

*Arma* is one of the *shuklamandalgat* disease and is described as the continuous outgrowth in *shuklamandal* on the basis of signs and symptoms described by modern medical science, the disease “*Arma*” can be compared with “*Pterygium*” in modern ophthalmology. According To *Sushrutacharya*, 5 Types of *Arma* Are There.<sup>[8]</sup>

### 1) *Prastari Arma* (Progressive Pterygium) –

Thin (*tanu*), elongated (*vistrit*), soft (*mridu*), red coloured (*rudhirprabh*), painless, fibrovascular (*mandal vridhhi*), growth occurring on *Shuklamandal* is *Prastari Arma*

*Dosh dushti – tridoshaj*

*Sadhyasadyata-sadhya*

### 2) *Shuklarma*–

Mascular growth occurring in *shuklamandal* which is uniform in size, flat, soft, white coloured growth growing slowly is called *Shukla Arma*

*Dosh dushti-kapha*

*Sadhyasadyata-sadhya*

### 3) *Lohitarma* (*Shonitarma/Raktarma/Kshataj Arma*)

Uniform in size, soft, colored like that of Red Lotus, Smooth Called *Lohitarma/Shonita Arma*

*Dosh Dushti – Rakta Dushti*

*Sadhyasadyata – Sadhya*

### 4) *Adhimans Arma* (Pterygium)–

Mascular growth of *shuklamandala* of which looks like dried collection of blood spread, thick, soft, having color like that of liver, gray colored is called *adhimans arma*

*Dosh dushti – tridoshaj*

*Sadhyasadyata – sadhya*

### 5) *Snayu Arma* (symblepharon/pterygium)

Mascular growth of *Shuklamandal* which is hard like tendon, spread more mascular

*mansal*, atrophied, rough and white coloured is called *Snayu arma*

### MODERN REVIEW:

According to modern point of view Pterygium is the degenerative condition of subconjunctival tissue which proliferates as triangular fold of tissue mass to invade the cornea, involving Bowman’s membrane and superficial stroma, the whole thing being covered by conjunctival epithelium. The term Pterygium is derived from the greek word ‘Pterygion’ meaning –Wing.<sup>[9]</sup> So here brief discription of Conjunctiva and Corneal histology is given. The Conjunctiva is translucent mucous membrane, which lines the posterior surface of the eyelids and anterior aspect of the eyeball. The conjunctiva has been given to this mucous membrane that it joins the eyeball to the lids.

### PARTS OF CONJUNCTIVA:

- 1) Palpebral conjunctiva-marginal, tarsal and orbital
- 2) Bulbar conjunctiva-scleral and limbal
- 3) Conjunctival fornix-superior, inferior and lateral and medial

Histologically conjunctiva contains three layers:

#### 1) Epithelium

This layer varies from region to region. it is mostly the stratified epithelium.

#### 2) Adenoid layer

It is also called lymphoid layer and consists of fine connective tissue reticulum in the meshes of which lie lymphocytes.

#### 3) Fibrous layer

It consists of a meshwork of collagenous and elastic fibres. this layer contains vessels and nerves of conjunctiva. Adenoid and fibrous layer are collectively known as the substantia propria of the Conjunctiva.

Conjunctiva Contains Two Types Of Glands: Mucin Secretory Glands (Goblets Cells, Crypts Of Henle, Glands Of Manz) And The Accessory Lacrimal Glands (Glands Of Krause And Glands Of Wolfring)

**Cornea:**

Anatomically cornea is transparent, avascular, watchglass like structure. It forms anterior one sixth of the outer fibrous coat of eyeball.

Histologically, the cornea consists of five distinct layers, from anterior to posterior these are :

- Epithelium,
- Bowman's membrane,
- Substantia propria (corneal stroma),
- Descemet's membrane and endothelium.
- Clinical appearance of pterygium<sup>[10]</sup>

Pterygium appears as a fleshy, vascular mass that occurs in interpalpebral fissure. Typically Pterygium is triangular in shape having parts:

- Apex/head: It is an elevated white mass that forms a firm adhesion to globe.
- Neck: It is a constricted portion at limbus.
- Body: It is a fleshy, fibrovascular mass that is demarcated from normal conjunctiva superiorly and inferiorly by sharp folds.
- Cap /gray zone It is an arcuate, greyish white, subepithelial corneal opacity that is at the leading edge of Pterygium. With chronicity, abnormal tearing leads to deposition of corneal epithelial iron line (Stocker's line).

**TYPES OF PTERYGIUMS****1) Progressive Pterygium**

- Thick, fleshy and having prominent vascularity
- Gradually increasing in size and encroaching towards the centre of cornea.
- Opaque infiltrative spot seen just in front of apex of pterygium.
- Deposition of iron as a line seen in corneal epithelium in front of apex.

**2) Atrophic /Stationary Pterygium**

- Thin, attenuated having poor vascularity.
- Stationary and no opaque spot or cap seen

**3) Malignant Pterygium**

- It advances rapidly towards the centre of cornea.

- Stains with fluorescein and gives punctate staining, this indicates pathognomonic activity.

**4) Regressive pterygium:**

Occasionally it stops growing and may even regress. It never disappears.

**5) Pseudo Pterygium:**

Adhesion of fold of conjunctiva to peripheral cornea due to some inflammation.

Usually unilateral, stationary and it is fixed to cornea only at apex so that probe can be passed easily beneath the neck of Pterygium (probe test).

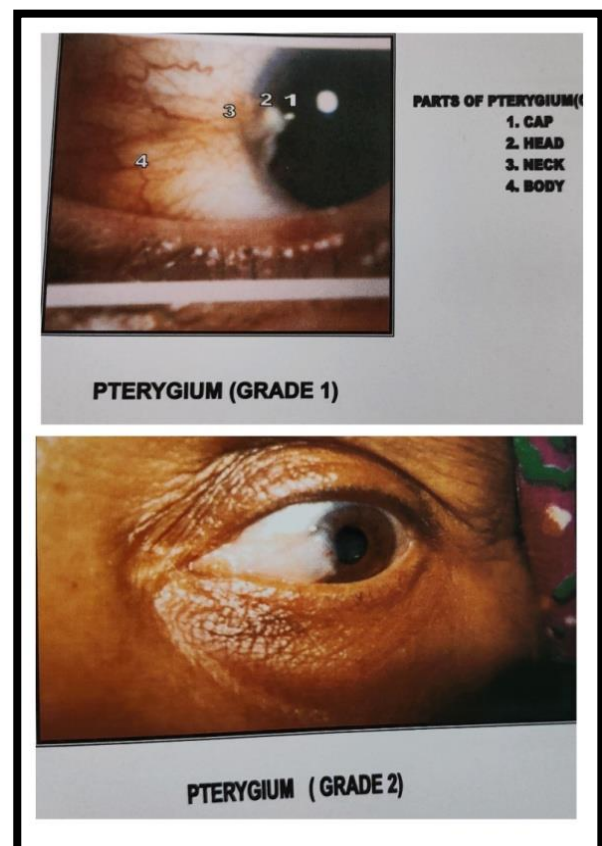
**CLASSIFICATION OF PTERYGIUM ACCORDING TO GRADES;**

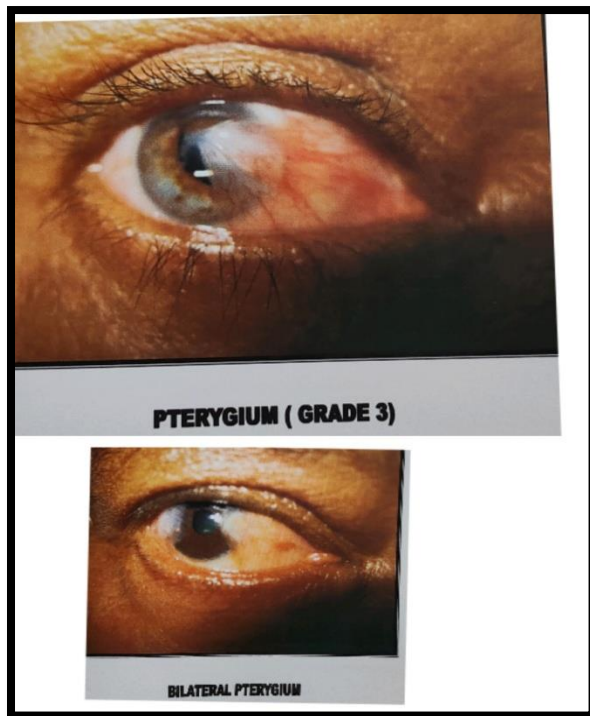
Grade 0 – absent or no growth

Grade 1 – extend less than 2 mm onto the cornea. It is asymptomatic.

Grade 2 – extend up to 4 mm of cornea, may be primary or recurrent following surgery.

Grade 4 – invade more than 4 mm of cornea involving the visual axis.



**SYMPTOMS:**

- Appearance of mass on nasal, rarely temporal side of cornea,
- Diminution of vision,
- Diplopia,
- Foreign body sensation
- ,burning,itching,tearing,
- Poor cosmetic appearance

**Signs:**

Decreased Visual Acuity,  
 Triangular Fold of Conjunctival Mass  
 Encroaching Cornea In Variable Degree.  
 Usually Bilateral, Mainly On Nasal Side At  
 Palpebral Aperture.  
 Limitations Of Ocular Movements.  
 Stockers Line May Be Seen In Corneal  
 Epithelium, Anterior To Advancing Head Of  
 Pterygium.

**ETIOLOGY:** Exact etiology of Pterygium as mentioned earlier is not exactly known. But most strong factors are exposure to uv radiation and geographical location in tropical and sub-tropical areas where dry and dusty environmental conditions prevail. Other risk factors are outdoor occupation, darker skin complexion, increasing age and smoking.

**HISTOPATHOLOGY:** Histopathology features of Pterygium were thoroughly outlined by Fuchs in 1890 's. These are increased number of thickened elastic fibres, hyaline degeneration of conjunctival tissue of conjunctival tissue, concretions and epithelial changes.

Histopathological analysis of leading edge of Pterygium by Cameron, disclosed the following results,

- 1) Fibroelastic tissue separating the basal corneal epithelial layer from Bowman's layer
- 2) Altered orientation of basal corneal epithelial cells overlying the fibroblastic tissue.
- 3) Destruction of Bowman's layer and superficial corneal stroma underlying fibroelastic tissue.

**MATERIALS AND METHODS:**

It is categorised as follows

- 1) Available literature about *Netra* and *Arma* in *Ayurvedic* text and about eye and Pterygium in modern text studied.
- 2) Dissection of eyeball is done.
- 3) Histopathological study of concerned Pterygium tissue was done. For that tissue was obtained during the operative procedure of excision of *Arma*.
- 4) For that 30 patients of *Arma* grouped into different 5 types of *Arma* according to signs and symptoms. Signs and symptoms used to differentiate in 5 types from *Sushruta Samhita* as per described above.

**Dissection:**

Importance of dissection in *Sharir Rachana* has been stated by *Acharya Sushruta*. So by knowing the importance of dissection, dissection of eye is done for these topics as only *sutra swaroop* description of eye is given in *samhita*.

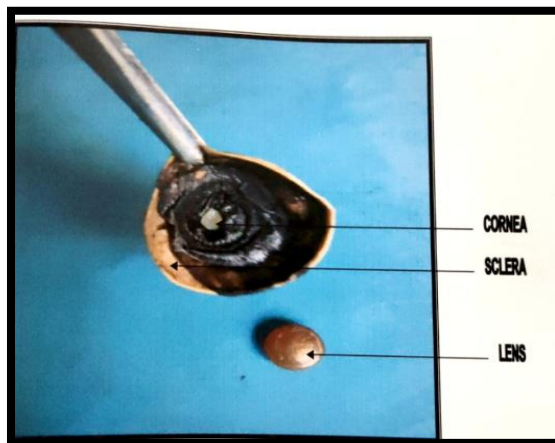
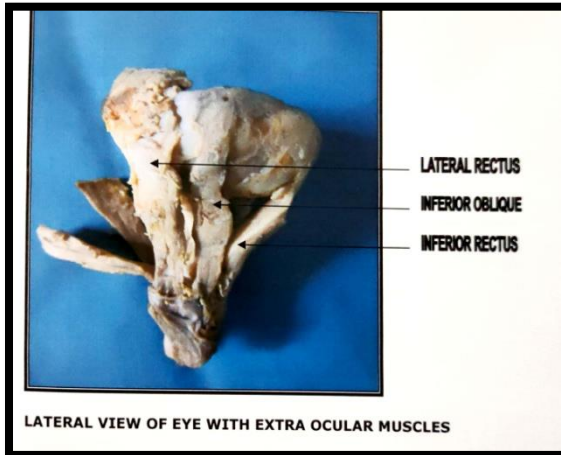
Following structures are seen:

First Orbicularis Oculi muscle of eyelid is dissected. Intermuscular fascia, fat separated. Four muscles of eye separated from superior posteriorly and inferiorly

- 1) Levator palpebrae
- 2) Lateral rectus

- 3) Medial rectus
- 4) Superior oblique
- 5) Inferior oblique
- 6) Inferior rectus

Conjunctiva and sclera separated. whole choroid and sclera separated to see the internal structure of eyeball



**OBSERVATION:** Histopathological findings of the different Pterygium tissue were as follows:

- 1) Pterygium having some symptoms of *Prastari Arma* grade -3 showed double layered columnar epithelium and at places multilayered with squamous metaplasia. the sub epithelium show collagenous tissue, local myoid change dilated blood vessels and sparse Chronic inflammatory infiltrate.
- 2) Pterygium with symptoms of *Adhimansa Arma* showed squamous epithelium with underlying tissue showing congestion and chronic inflammation.

- 3) Pterygium with symptoms of *Snayu Arma* showed stratified squamous epithelium with underlying congestion and chronic inflammation with vacuolated cytoplasm and degeneration. Stroma is loose and edematous with sparse lymphocytes and plasma cells.
- 4) Pterygium showing symptoms of *Shukla Arma* showed stratified epithelium fibro-collagenous stroma showing hemorrhages and scanty inflammation.
- 5) Pterygium with symptoms of *Raktarma* showed stratified squamous epithelium with chronic inflammation and proliferating blood vessels separated by connective tissue stroma.

**OBSERVATION AND RESULTS:** Out of 30 patients maximum patients were from low socio-economic status. Maximum (46.66%) were having Pterygium in right eye. Location wise distribution of pterygium shows that 29 patients i.e maximum number of patients were having nasal Pterygium. Maximum patients (86.66%) patients having grade -2 type of pterygium. 30 patients were divided into 5 types of arma according to signs and symptoms explained in *ayurvedic* text. Maximum patients were having foreign body sensation (93.33%) and (66.66%) patients had complaint of irritation in their eyes. Out of 30 patients 30% patients were of *Prastari Arma*, 16.66% patients were of *Shukla Arma*, 23.3% patients were of *Raktarma*, 20% patients were of *Adhimansa Arma*, 10% patients were of *Snayu Arma*. Histopathological investigation of Pterygium tissue of each type of Arma was done which showed the almost similar elastoid degeneration along with squamous or columnar epithelium and congestion and chronic inflammation even if severity of signs and symptoms is different in every patient of Pterygium and irrespective of age and sex of patient.

#### CONCLUSION:

The study opines to conduct such a series of researches in future with sufficient sample



size, to enlighten detail anatomical study of *Netra* with special reference to *Arma* for the etiopathogenesis, diagnosis and the management and mainly prevention of disease.

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