“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 advanced 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. [1] In All Ayurvedic Literature Ayurveda is Explained as Ashtang Ayurved and Has Been Divided Into 8 Branches. [2] 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. [3] Sharir has five dyanendriyas 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) Shalakya Tantra 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.

DIAGNOSTIC 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 classified them According to Mandalas and out of these Shuklamandalgat Diseases are 11. [4]

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 [5]

NETRA ROGA SAMPRATI: Due to wrong dietary, living and behavioral habits, doshas gets aggravated, vitiates 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. [6]

NETRA ROG PURVARUP: Muddiness in eyes, congestion, itching, lacrimation discharge, matting of eyelashes and lids,
heaviness, burning sensation, prickling sensation, redness, pain and oedema of eyelids and prickling 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.[7]

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[8]

1) Prastari Arma (Progressive Pterygium) – Thin (tanu), elongated (vistrit), soft(mridu), red coloured(rudhirprabh), painless, fibrovascular (mandal vridhi), growth occurring on Shuklamandal is Prastari Arma

Dosh dushti – tridoshaj
Sadhyasadhyata-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
Sadhyasadhyata-sadhya

3) Lohitarma (Shonitarma/Raktarma/Kshataj Arma)
Uniform in size, soft, colored like that of Red Lotus, Smooth Called Lohitarma/Shonita Arma

Dosh Dushti – Rakt Dushti
Sadhyasadhyata – 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
Sadhyasadhyata – sadhya

5) Snayu Arma (symblepharon/pterygium)
Mascular growth of Shuklamandal which is hard like tendon, spread more muscular mansal, atrophied, rough and white coloured is called Snayu arma

MODERN REVIEW:
According to modern point of view Pterygium is the degenerative condition of subconjuctival 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[9] So here brief discription of Conjuctiva and Corneal histology is given. The Conjuctiva is translucent mucous membrane, which lines the posterior surface of the eyelids and anterior aspect of the eyeball. The conjuctiva has been given to this mucous membrane that it joins the eyeball to the lids.

PARTS OF CONJUNCTIVA:
1) Palpebral conjuctiva-marginal, tarsal and orbital
2) Bulbar conjuctiva-scleral and limbal
3) Conjuctival fornix-superior, inferior and lateral and medial

Histologically conjuctiva 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 conjuctiva. Adenoid and fibrous layer are collectively known as the substantia propria of the Conjuctiva.

Conjuctiva 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),
- Descemets membrane and endothelium.
- Clinical appearance of pterygium
  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 tara pulling in advance of cap leads to deposition of corneal epithelial iron line (stoker’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 punctuate 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,
- Diminess 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 Occular 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 degeneartion of conjuctival 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 oveation of basal corneal epithelial cells overlying the fibroelastic tissue.
3) Destruction of bowmans 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 topic as only sutra swaroop description of eye is given in samhita.

Following structurs are seen:
First Orbicularis Oculi muscle of eyelid is dissected. Intermasculair 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 mycoid 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 Rakta Arma 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 Rakta Arma, 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 squamos 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.
size, to enlight 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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