# GEOGRAPHICAL VARIATION OF CONJUCTIVAL LIMBAL LESIONS

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**ABSTRACT: INTRODUCTION**: Conjunctival limbus presents with variety of lesions. The presentation can vary from tropical to temperate climates, ethnic origin or racial differences. The variation seen in same climatic condition is compared and highlighted in our study, along with the variation seen in different regions as well. The cases ranged from most common-pterygium, to most rare-primary conjunctival myxoma.

**OBJECTIVES**: To study regional differences in conjunctival limbal leisions & to look for most common & most rare limbal leisions.

**MATERIALS AND METHODS**: We did a comparative study & analysed all the conjunctival limbal lesions both clinically & histopathologically in all patients attending ophthalmic OPD at Vydehi institute of medical sciences & Sapthagiri institute of medical sciences, Bangalore. A total of 370 cases of both sex, aged between 5yrs to 78 yrs were analysed from January 2006 to January 2015. A thorough clinical examination was done in all cases. The diagnosis is established clinically & was confirmed by histopathology in all cases. The cases were analysed and ranged from most common pterygium to most rare primary conjunctival myxoma. An effort is also made to study the incidence of disease pattern & its variation with reference to different geographical area.

**CONCLUSION:**To conclude from our study, Even though the climatic condition is same in the studies compared, there seems to be relatively gross difference in incidence of disease pattern with reference to common leision & rare variety. The disease pattern in western whites was not comparable with other studies, including the present study This shows presentation can vary from tropical to temperate climates, ethnic origin or racial differences. Pterygium is the most common conjunctival limbal leision seen in south Indian continent. Primary conjunctival mxoma is rare benign tumour of conjunctiva at limbus.

**KEYWORDS:** Limbal leisions, pterygium, myxoma, geographic variations.

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**INTRODUCTION:** The conjunctiva is a thin and flexible mucus membrane that extends from the internal eyelid margin (palpebral conjunctiva) to the fornix and the anterior surface of the ocular globe (bulbar conjunctiva) up to the sclerocorneal limbus (limbal conjunctiva). Its functions include contributing to the precorneal lacrimal film by means of producing the mucus layer and providing a protective barrier for infections and foreign bodies.[1] Conjunctival leisions comprise a large variety of conditions from benign lesions such as pterygium, or nevus, to malignant lesions such as squamous cell carcinoma (SCC) which may cause visual loss. So, early diagnosis by conjunctival biopsies and treatment are essential to prevent ocular and systemic spread and to preserve visual function. There is a relative paucity of large published series documenting conjunctival lesions. A review of a large series of conjunctival biopsy specimens from an adults US population documented the following distribution: inflammatory/degenerative lesions (12%); benign epithelial (2%); pigmented (53%); premalignant and malignant epithelial (11%); lymphoid (8%); miscellaneous (12%); and congenital lesions (2%).[2] A similar series in the Indian population, reported 46% of the lesions were of epithelial origin (benign, premalignant, and malignant neoplasm). The remaining lesions included miscellaneous lesions (22%), degenerative lesions (14%), melanocytic tumors (12%), and lymphoid tumors (6%), Squamous cell carcinoma occurred in 20% followed by chronic non-specific inflammation (12%), pterygium (10%), squamous papilloma (8%), and Ocular surface squamous neoplasia(OSSN) (8%).[3] An effort is made to study the disease pattern & its variation with reference to different geographical area, along with the most common & the most rare conjunctival leisions**.**

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**MATERIALS AND METHODS**: A total of 370 cases of both sex, aged between 5yrs to 78 yrs were analysed & examined at Vydehi institute of medical sciences & Sapthagiri institute of medical sciences, Bangalore, from January 2006 to January 2015. All the patients were examined in detail & analysed for the conjunctival limbal lesions clinically & sent for histopathological examination in

all patients attending ophthalmic OPD. Visual acuity was measured in all cases prior to thorough slitlamp examination. A detailed dilated fundus examination was done in all cases. Laboratory test was done prior to surgery in all cases. Informed consent was taken in all patients prior to surgery. After excision the specimen was sent for histopathological study. We have analysed only the type of conjuctival limbal leisions, its occurrence to a given geographial area & is compared with same continent & also different continent which has more or less same climatic conditions.

**RESULTS:** In our study we analysed, 370 conjunctival limbal leisions over a period of 10 years. All types of limbal leisions were encountered. The leisions ranged from Congenital, Degenerative, Inflammatory, Benign & Malignant leisions. The congenital leisions includes Isolated Dermoids (9cases) & Its syndrome Goldenhar syndrome (12cases).The degenerative leisions includes pterygiums (195cases) & Pingueculas (41cases). Amongst the inflammatory leisions includes phlyctens (28cases), foreign body (FB) granuloma (18cases), & non specific conjunctival cystic leisions (6cases), Steven Johnson syndrome (28cases). The tumors includes conjunctival naevus (14cases) & conj myxoma (1case) in benign category to squamous cell carcinoma (9cases) in malignant variety. We also had few cases of Bowen's disease (6cases) which is a premalignant condition of squamous cell carcinoma.Out of 370 cases, majority accounted for degenerative conditions, the pterygiums were seen in (52.7%) 195 cases & (11.08%) 41cases were pinguecula. The inflammatory leisions accounted for (22.4%) 83cases. The benign leisions were seen in (4.05%) 15cases, followed by congenital leisions in (5.67%) 21cases. The premalignant & malignant leisions were seen in (4.05%) 15cases. The mean age ranged from 5yrs to 78years. There was not much of difference in incidence between the two sexes with slight preponderance to males, except in pigmented leisions which showed female predilection.

| Sl. No. | Catergory of lesion | % Percentage N(total cases) = 370cases | Type of lesion | No. of cases |
|---|---|---|---|---|
| 1 | Congenital leisions | 5.67% N=9+12= 21cases | Dermoids | 9 |
| | | | Goldenhar syndrome | 12 |
| 2 | Degenerative leisions | 63.7% N=195+41-236cases | Pterygiums | 195 |
| | | | Pingueculas | 41 |
| 3 | Inflammatory leisions | 22.4% N=28+18+3+6+28-83cases | Phlyctens | 30 |
| | | | Foreign body granuloma | 19 |
| | | | Nonspecific conjunctival cystic leisions | 6 |
| | | | Steven Johnson syndrome | 28 |
| 4 | Benign | 4.05% N=14+1-15cases | Conjunctival Naevus | 14 |
| | | | Myxoma | 1 |
| 5 | Pre malignant | 1, 62% N=6cases | Ocular surface squamous neoplasia (OSSN) | 6 |
| 6 | Malignant | 2.43% N=9cases | Squamous cell carcinoma | 9 |

***Table 1 Showing Category and Type of Lesion***

Fig. 1: Photograph showing bilateral nasal pterygium

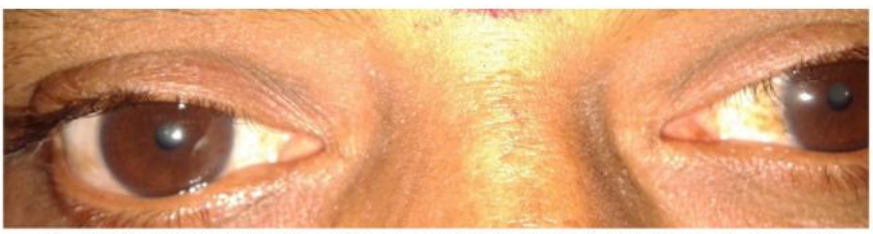

Fig. 2: Photograph showing primary acquired melonosis in left eye on nasal side

Fig. 3: Photograph showing case of squamous cell carcinoma of left eyes

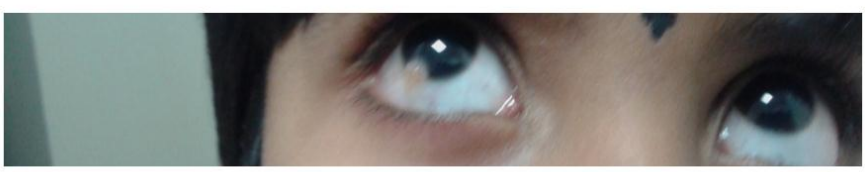

Fig. 4: Photograph showing case of limbal dermoid of right eye

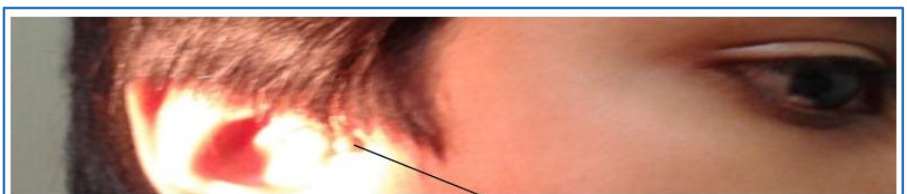


Fig. 5: Photograph showing case of Goldenhar syndrome with auricular tags right side

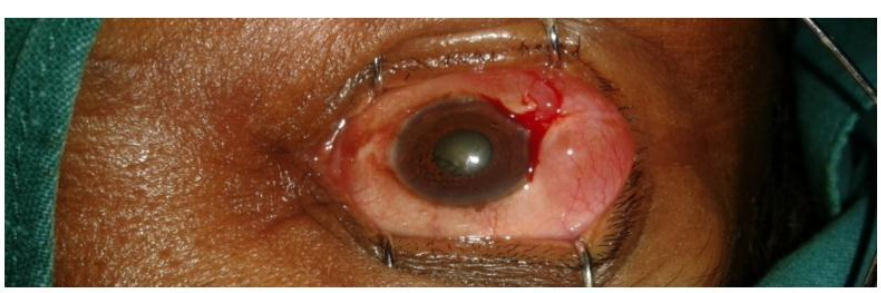

Fig. 6: Intraoperative photograph of right eye cystic mass on temporal limbus, histopathologically was conjunctival myxoma

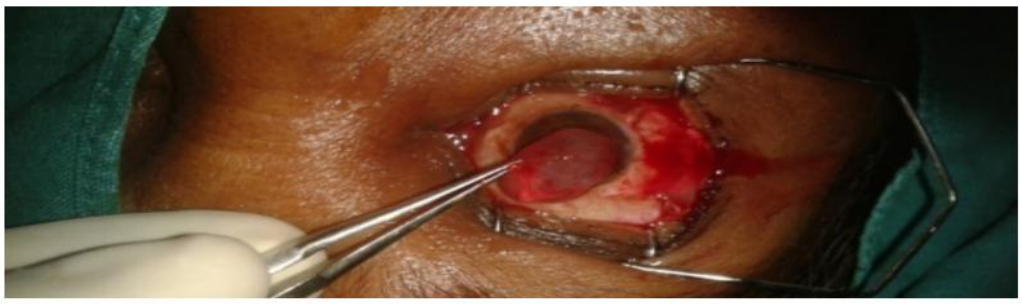

Fig. 7: Intraoperative photograph of right eye cystic mass on temporal limbus, histopathologically was conjunctival myxoma (rare case)

**DISCUSSION:** Yoon and Grossiuklaus[4] published a major series on conjunctival lesions in adults, and found that the common benign lesions were pterygium (18%), dysplasia (7%), inflammation (nonspecific nongranulomatous, 7%) and epithelial inclusion cysts 6%. In a study done by Mondal SK etal (2012),[5] Pterygium accounted for 22.5%.

In the present study,the most common leision noted was the degenerative leision, of which pterygium accounted for the major bulk of 195 cases (52.7%). There was male preponderance, majority were nasal pterygiums. Bilateral nasal pterygiums were seen in nearly 54% of total pterygium patients (fig-1). Both nasal and temporal pterygiums in the same eye were noted in 32% of pterygium patients. Remaining cases had either only unilateral nasal (9%) or only temporal pterygium(5%).

Mondal SK etal (2012),[5] study showed pinguecula in 9.16% of cases of the total cases analysed.

In the present study, Pinguecula was seen in 41(11.08%) cases only. 18% of patients came for follow up with conversion to pterygiums, remaining patients were lost from followup.

The inflammatory leisions accounted for second largest group of disorders 83cases. Inflammatory leisions includes phlyctens (30cases), all these cases resolved with medical treatment.

Z Sbeity et al[6] study,Conjunctival FB granulomas are uncommon and rarely related to surgery. Imbedded cilia, insect wings, and synthetic fibres are most commonly reported when histology is after performed. Suture granulomas are seen commonly after strabismus surgery. In our study, Foreign body granulomas were seen in 19cases, all these cases gave a history of fall of foreign body into the eyes. All these cases underwent excision biopsy. On subjecting to histopathological examination, granulomatous inflammation was observed. 12cases had cilia as foreign body, 4 cases had suture material, remaining 3cases had wodden material.

A study done by Yoon and Grossiuklaus[4] also revealed epithelial inclusion cysts in cases of their conjunctival cystic lesions.In our study, non specific conjunctival cystic leisions were seen in 6cases, which were epithelial inclusion cysts on histopathological examination.

In Di Pascuale MA,et al[7] study, Steven Johnson syndrome( SJS) & Toxic epidemonecrolysis (TEN) patients, ocular morbidity and visual loss can be caused during hospitalization by limbal stem cell deficiency following large corneal epithelial defects affecting the limbus. However, a significant number of patients still retain clear corneas and normal vision upon discharge, but gradually develop corneal blindness at the chronic stage because of cicatricial complications of the conjunctiva, fornix, tarsus, or lid margin prolonged ulceration and inflammation of the ocular surface. In the present study Steven Johnson syndrome was seen in 28 cases, all were drug induced. The limbus was involved in addition to extensive eye involvement. With energetic acute treatment majority of cases improved completely with residual lid deformities, there were 2cases with corneal blinding complication

In Elshazly LHM.[8] study, OSSN was the most frequent tumor in old age with nearly equal sex distribution despite previous report of a fivefold higher incidence among white males.OSSN occurs in about 0.2–12 cases per 1,000,000 per year with geographic and ethnic variations as per Basti S et al.[9] study Causative factors that contribute to OSSN include ultraviolet light (UV-B) exposure, ocular trauma, predisposing genetic factors, and HPV human papilloma virus or human immune virus infection as observed by Kiire CA &Dhillon B.[10] These premalignant neoplasms can develop into invasive squamous cell carcinoma characterized by increased thickness of epithelial dysplastic changes, invasion into the substantia propria with malignant squamous epithelial cell with keratin-filled epithelial pearl formation in well-differentiated tumors. The tumor then grows slowly, invading nearby tissues including the globe, eyelids, and orbital tissues leading to severe visual loss, loss of the eye, and severe facial deformities.[1]

In our study, OSSN was seen in only 6 cases, out of which 2cases was seen in patients less than 50years of age, although occurrence of OSSN below 50 years of age is rare with very few cases reported in the literature.[11]

In Shield JA, etal (2008)[12] study, Juxtalimbal PAM without atypia was present in two subjects aged 34 and 40 years. Previous studies have reported that PAM with atypia carries a 13% risk of transformation to a malignant conjunctival melanoma. Sun exposure was found to induce DNA damage of superficial epithelial cells with activation of transcription factors that stimulate increased expression of melanin-producing enzymes causing increased pigmentation.[13] Additionally benign nevi with mutated

BRAF infrequently become malignant, suggesting additional genetic insults are necessary for malignancy.[14]

In our study, Juxtalimbal Primary acquired melanosis (PAM) (Fig. 2). without atypia was seen in 14cases with a history of increased pigmentation. The histopahologic examination did not reveal atypical melanocytes.

In study done by Santosh K. Mondal et al.[5] A total of 16 cases of malignancies (13.3%) were diagnosed. Of these, SCC formed 7.5%, lymphoma (NHL) constituted 1.66%, and there were 2 cases of malignant melanoma (1.6%) and 1 case (0.83%) each of mucoepidermoid carcinoma, sebaceous carcinoma, and leukemic infiltration of acute myeloid leukemia (AML). In another study by Lee SB et al, [15]. the relative incidence of SCC and malignant melanoma was 50% and 31.25%, respectively. But in our study, incidence of SCC is 100%. (fig. 3)

In Elshazly LHM study,[8] Solid limbal dermoids were excised in three cases (1.6%) due to rapid growth that encroached the cornea and for cosmetic reasons. They were clinically described as solid elevated masses embedded in the superficial sclera and/or cornea on the inferior temporal globe or temporal limbus, with occasional fine protruding hairs. Histologic composition was fibrous tissue and occasional hair with sebaceous glands below the conjunctival epithelium.

In our study, The congenital leisions accounted for 5.67%(21cases) of total conjunctival lesions. Isolated Dermoids were seen in9cases & Its syndrome Goldenhar syndrome in 12cases (fig-4,5). The typical signs of Goldenhar syndrome was just adequate in all our cases

Grossniklaus HE et al.[16] studied in which In a review of 2455 conjunctival lesions submitted to an ophthalmic pathology laboratory, only 4 patients (0.002%) were found to have conjunctival myxoma. In a clinical review of 1643 patients with conjunctival lesions, myxoma was found in 1 case (<0.001%).[17] Because of its rarity, conjunctival myxoma can simulate other conjunctival tumors, such as amelanotic nevus, amelanotic melanoma, squamous cell carcinoma, lipoma, and cyst.[18]

In our study, The following report describes a well documented case of a rare benign neoplasm, primary conjunctival myxoma (fig-6,7) confirmed by histopathological report. A 59yr old female patient complained of a swelling in the temporal conjunctiva of her right eye since 20yrs. The swelling was gradually increasing in size since last 2yrs. There was no history of trauma.The patient also complained of diminished vision since last 3yrs which was gradually progressing and painless for which she sought medical attention. The general physical examination and other systems(cardiac, central nervous system, respiratory system and per abdominal) were clinically normal. The blood and urine investigations were normal and CT orbit was done, which showed normal study.The tumour was completely removed under local anaesthesia in toto along with 2 bits of conjunctival tissue covering the cyst.

**CONCLUSION:** We would like to conclude from our study, Even though the climatic condition is same in the studies compared, there seems to be relatively gross difference in incidence of disease pattern with reference to common leision & rare variety. The disease pattern in western whites was not comparable with other studies including the present study. The conjunctival pigmented leisions being in large percentage of western white population. This shows presentation can vary from tropical to temperate climates, ethnic origin or racial differences. Pterygium is the most common conjunctival limbal leision seen in south Indian continent. Primary conjunctival mxoma is rare benign tumour of conjunctiva at limbus. Pyogenic granuloma was the most common leision noted in Egyptian population. Squamous papilloma is the most common leision seen in north eastern part of india study group. Majority of all types of conjunctival limbal leisions were observed in all the study groups with differences in their incidence pattern. The study can be used to know the disease pattern in the geographic area and plan their management effectively.

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