

# Spectrum Of Ocular Surface Squamous Neoplasia – A prospective study

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## Abstract

**Introduction:** Introduction: The corneal epithelial stem cells located at the basal layer of the limbal epithelia proliferate continuously and give rise to the superficial layer that subsequently differentiate into superficial cells. Regulation of cell growth and metabolism are critical to maintain an intact ocular surface and transparent cornea. Primary tumors of the conjunctiva and cornea can be grouped into two major categories: congenital and acquired. The acquired lesions are composed of a variety of neoplasms which originate from squamous epithelia, melanocytes, and lymphocyte cells. Tumors of squamous epithelium occupy a large spectrum of lesions, ranging from benign lesions like squamous papilloma, to precancerous lesions which are confined to the surface epithelium (intraepithelial neoplasia or dysplasia, previously known as Bowen's disease). There are even more invasive squamous cell carcinomas that break through the basement membrane to the underlying substantia propria of the conjunctiva or corneal stroma.

**Methods:** The study aim to include 50 eyes of 50 patients with biopsy-proven ocular surface neoplasia at C.H. Nagri Eye Hospital, Ahmedabad. The details of patients were taken regarding Age, Gender, Laterality and Risk factors. Each patient was assessed bio microscopically for type and complications of ocular surface neoplasia.

**Results:** A clinical case series was conducted on 50 eyes of 50 patients who are histopathologically diagnosed as ocular surface squamous neoplasia at a tertiary care eye hospital. Out of the 50 patients, there were 28 females and 22 males, with mean age being  $51.70 \pm 10.84$  Years.

**Conclusion:** Ocular Surface Squamous Neoplasia is a spectrum of diseases ranging from simple Dysplasia to Invasive carcinoma. This lesion is considered a low grade malignancy, but its invasive counterpart can spread to the globe or orbit. It is the most common ocular surface tumor. OSSN was commonly seen in elderly female patient (56%). The main risk factor was UV-B exposure (42%). However we couldn't find any risk factors in many patients. This might happened because it was not possible to use certain higher diagnostic tools in lower socio-economical patients. Most of the patients presented without any symptoms. Clinically, these tumors most commonly arise in the interpalpebral area, particularly at the limbal region in the temporal quadrant. Morphologically Gelatinous (56%) and leukoplakic (30%) were the most common types to be present. In clinical practice, OSSN is generally evaluated by Histopathological examination. Invasive forms (42%) were commonly seen, this might be related to ignorance of the patient. Surgical excision adjunct with Cry therapy combined with alcohol abrasion in cases of corneal involvement are the main treatment strategy. Recurrence rates were found higher for more severe grades of OSSN. Topical chemotherapy such as MMC may reduce the recurrence rate, but incomplete excision still remains the main reason for recurrence. Invasive disease may cause intraocular or orbital involvement with eye loss. Recurrence after initial treatment is variable and warrants life-long follow-up in all case of OSSN.

**Keywords:** Ocular spectrum; UV exposure; Gelatinous; Cryotherapy; Limbus

## Introduction

The corneal epithelial stem cells located at the basal layer of the limbal epithelia proliferate continuously and give rise to the superficial layer that subsequently differentiate into superficial cells. Regulation of cell growth and metabolism are critical to maintain an intact ocular surface and transparent cornea. Primary tumors of the conjunctiva and cornea can be grouped into two major categories: congenital

and acquired. The acquired lesions are composed of a variety of neoplasms which originate from squamous epithelia, melanocytes, and lymphocyte cells. Tumors of squamous epithelium occupy a large spectrum of lesions, ranging from benign lesions like squamous papilloma, to precancerous lesions which are confined to the surface epithelium (intraepithelial neoplasia or dysplasia, previously known as Bowen's disease). There are even more invasive squamous cell carcinomas that break through the basement membrane to the

underlying substantia nigra of the conjunctiva or corneal stroma

### Materials and Methods

The study aim to include 50 eyes of 50 patients with biopsy-proven ocular surface neoplasia at C.H. Nagri Eye Hospital, Ahmedabad. The details of patients were taken regarding Age, Gender, Laterality and Risk factors. Each patient was assessed bio microscopically for type and complications of ocular surface neoplasia.

### Results

Out of the 50 patients, there were 28 females and 22 males, with mean age being  $51.70 \pm 10.84$  Years. OSSN was associated with Sun exposure (UV) in 42%, no risk factors were found in 48%, while HIV was found in only 4% patients. All the lesions in study were found in interpalpebral region, more commonly at limbus followed by bulbar conjunctiva with temporal location. No patient had isolated corneal involvement in my study. Gelatinous was commonest morphological type (56%) followed by leukoplakic (30%) in my study. On HPE, Invasive carcinoma is more common (42%). No evidence of MEC, ASCC, and PSCC found. There was not even a single case of intra-ocular or orbital invasion. Out of 50 patients, 31 were treated with surgical excision combined with cryotherapy while 19 patients were additionally given MMC post-operatively 4 times/day, 1 week on and 1 week off for 2 months. Two patients (6.45%) in Group A were recurred while one patient (5.26%) in Group B had recurrence, which was very low as compared to other studies.

### Exclusion Criteria:

Cases which are histopathologically ruled out of ocular surface squamous neoplasia.

### Preoperative Assessment

All patients underwent complete preoperative ocular examination. Detailed history including personal data (name, age, sex, address) was taken. Detailed systemic history including DM, hypertension, ischemic heart disease or hypercholesterolemia was taken. Detailed ophthalmic history of previous intra ocular surgery, ocular disease or trauma was taken. Detailed Ophthalmic examination was done including Best Corrected Visual Acuity (BCVA) measurement with Snellen's visual acuity chart at a distance of 6 meters, Slit Lamp Bio Microscopy, and Intraocular Pressure (IOP) recorded with a Goldmann Applanation Tonometer (Haag Streit, Germany) under topical anesthesia using 0.5% proparacaine and fluorescein staining of the tear film.

The detailed Retinal examination was done with Binocular Indirect Ophthalmoscope using the 20-D lens. Ultrasonography was done to rule out any posterior extension.

### Surgical Technique:

Prior to surgery, the limits of lesion must be determined by staining. The edges of the area to be excised marked with a marking pen, using 4-mm margins around the tumor. Any additional foci must be carefully looked for. Peribulbar anesthesia given. Conjunctival peritomy done

### Discussion

OSSN is a slow growing tumor; however in neglected cases it can invade the globe and orbit. It has a potential for recurrence after treatment. Out of the 50 patients, there were 28 females and 22 males, with mean age being  $51.70 \pm 10.84$  Years. Basti et al showed that OSSN occurs predominantly in the elderly patient, more in male as compared to female. Ruchi Mittal et al reported the average age of occurrence of OSSN as 56 years with male predominance. In my study OSSN was associated with Sun exposure (UV) in 42%, no risk factors were found in 48%, while HIV was found in only 4% patients. All the lesions in my study were found in interpalpebral region, more commonly at limbus followed by bulbar conjunctiva with temporal location. No patient had isolated corneal involvement in my study. Among the different morphological types, gelatinous was common (56%) followed by leukoplakic (30%) in my study. On HPE, Invasive carcinoma is more common (42%). No evidence of MEC, ASCC, and PSCC found. There was not even a single case of intra-ocular or orbital invasion. Out of 50 patients, 31 were treated with surgical excision combined with cryotherapy while 19 patients were additionally given MMC post-operatively 4 times/day, 1 week on and 1 week off for 2 months. Two patients (6.45%) in Group A were recurred while one patient (5.26%) in Group B had recurrence, which was very low as compared to other studies.

Cuidados Intensivos Orientados a la donación de órganos recommendations (CIOD). Grupo de trabajo Semi CYUC-ONT. September 2017.

Table 1: Sex Distribution

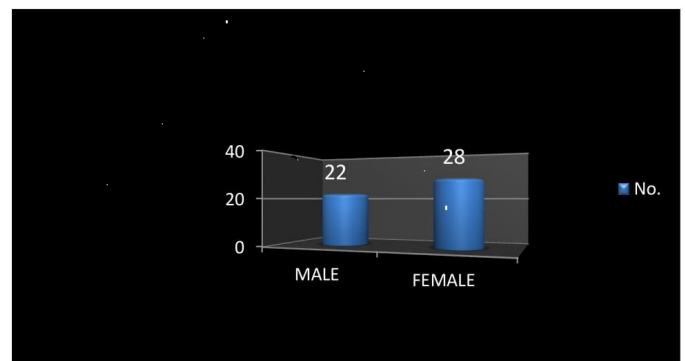
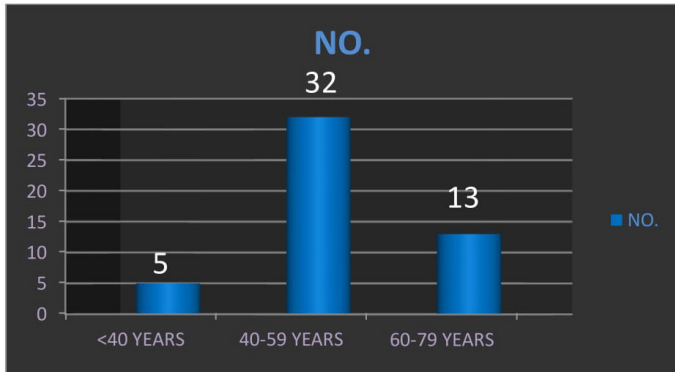


Table 2: Age Distribution

| AGE   | NO      |
|-------|---------|
| <40   | 5(10%)  |
| 40-59 | 32(64%) |
| 60-79 | 13(26%) |
| TOTAL | 50      |

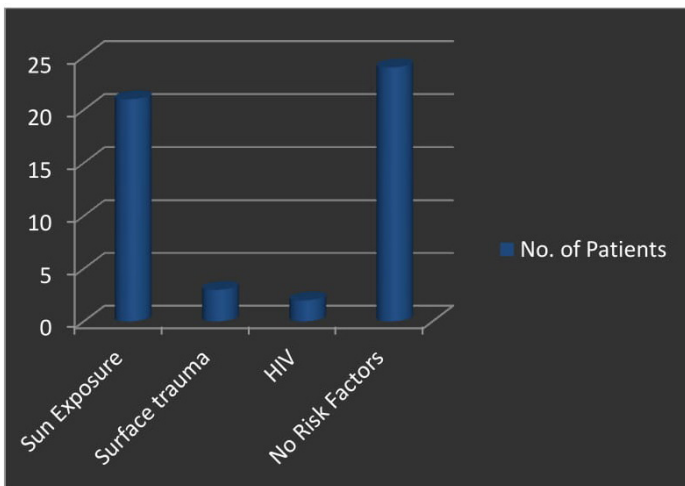
**Table 2: Age Distribution**



**Table 3: Risk Factor Distribution**

| RISK FACTOR                  | NO. OF PATIENTS |
|------------------------------|-----------------|
| SUN EXPOSURE                 | 21(42%)         |
| SURFACE TRAUMA               | 3(6%)           |
| HIV                          | 2(4%)           |
| NO IDENTIFIABLE RISK FACTORS | 24(48%)         |

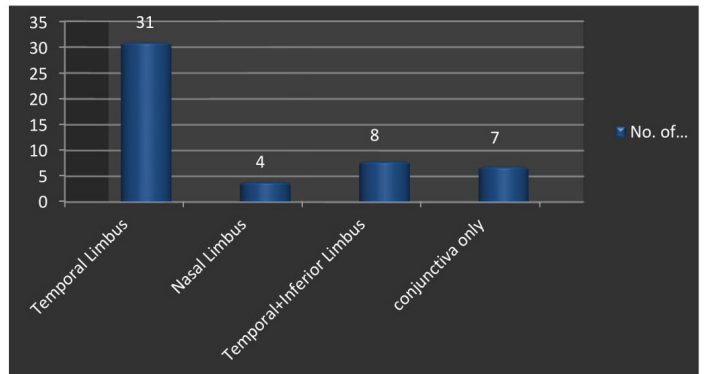
**Table 3: Risk Factor Distribution**



**Table 4: Location Distribution**

| SITE                     | NUMBER OF PATIENTS |
|--------------------------|--------------------|
| TEMPORAL LIMBUS          | 31(62%)            |
| NASAL LIMBUS             | 4(8%)              |
| TEMPORAL+INFERIOR LIMBUS | 8(16%)             |
| CONJUNCTIVA ONLY         | 7(14%)             |

**Table 4: Location Distribution**



**Table 5: Morphological Distribution**

| MORPHOLOGICAL TYPE   | NUMBER OF PATIENTS |
|----------------------|--------------------|
| GELATINOUS NODULAR   | 29(56%)            |
| LEUKOPLAKIC NODULAR  | 15(30%)            |
| PAPILLIFORM          | 3(6%)              |
| DIFFUSE INFILTRATIVE | 3(6%)              |

Table 5: Morphological Distribution

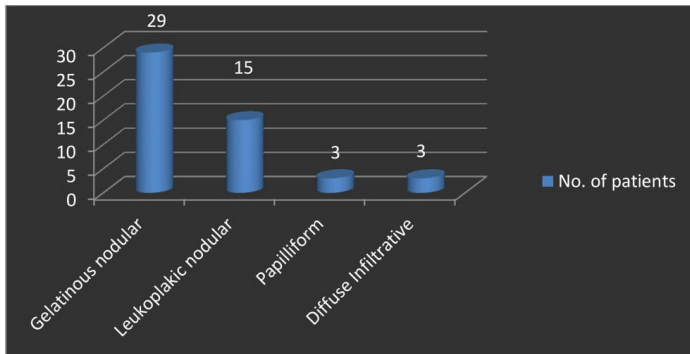


Table 7: Comparison of Treatment Modalities

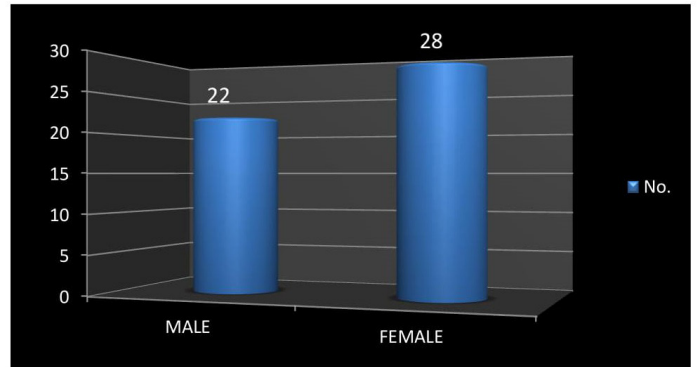


Table 6: Treatment Modality

| TREATMENT MODALITY                         | NO. OF PATIENTS |
|--|-----------------|
| EXCISION+ CRYOTHERAPY                      | 31              |
| EXCISION+ CRYOTHERAPY+ MITOMYCIN-C EYEDROP | 19              |

Table 8: Histopathological Distribution

| HP GRADING   | NO. OF PATIENTS |
|--------------|-----------------|
| PAPILLOMA    | 2(4%)           |
| CIN GRADE- 1 | 8(16%)          |
| CIN GRADE-2  | 8(16%)          |
| CIN GRADE-3  | 13(26%)         |
| INVASIVE SCC | 19(42%)         |

Table 6: Treatment Modality

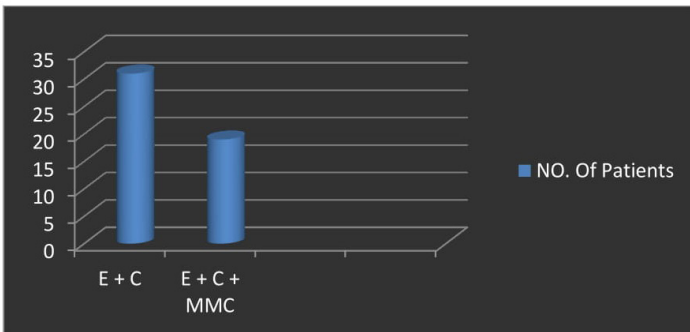


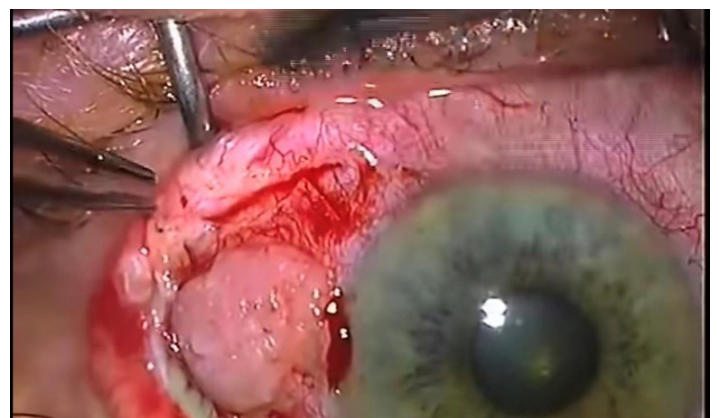
Table 7: Comparison of Treatment Modalities

GROUP A: Excision+Cryo Therapy

GROUP B: Excision+Cryo Therapy+ Post Op. Mmc Eye Drop

|         | RECURRENCE PRESENT | RECURRENCE ABSENT | TOTAL |
|---------|--------------------|-------------------|-------|
| GROUP A | 2                  | 29                | 31    |
| GROUP B | 1                  | 18                | 19    |
| TOTAL   | 3                  | 47                | 50    |

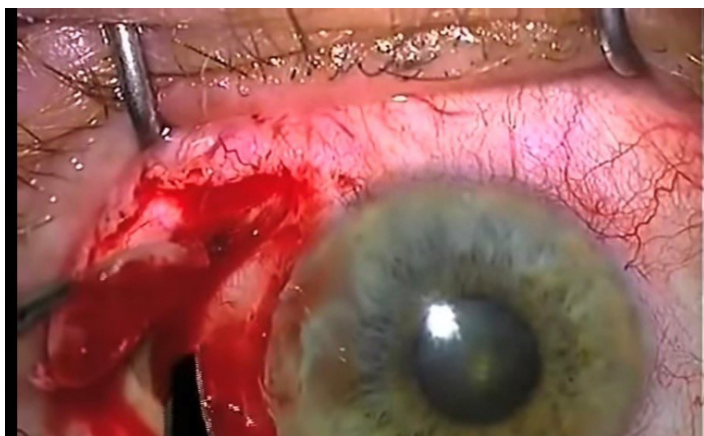
Fig 1



Absolute alcohol soaked on an applicator gently applied on the entire corneal component in Figure 1. This causes epithelial cellular devitalization and allows easier release of the tumour cells from bowmen's layer. Corneal dissection done started 2 mm away from the tumour margin gently towards limbus. Conjunctiva and tenon's capsule removed including 3-4 mm away from the tumour margin. Whole mass removed.

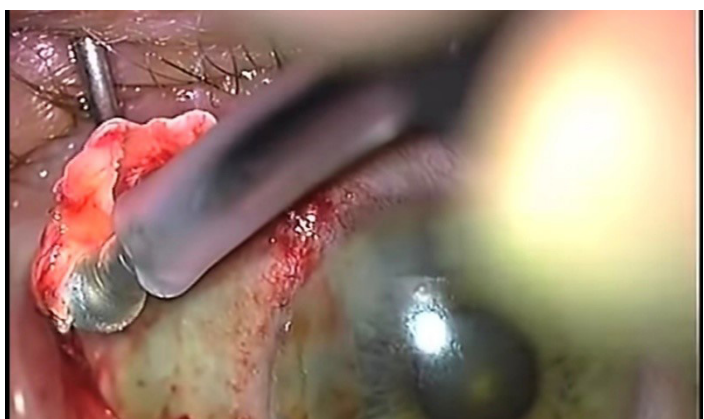


Fig 2



Specimen sent for histopathological examination in Figure [2]. Saline irrigation done to remove any adherent tumour cells. Cryoprobe applied at the inner margin of remaining part of conjunctiva by lifting away from sclera freezing it up to iceball reaches the size of 4-5 mm. Entire conjunctival margins are treated by double freezing thaw technique. (Limbus+conjunctiva). It includes rapid freezing followed by slow thawing.

Fig 3



Primary closure of the conjunctiva was done in case of small defect shown in Figure [3]. But if the defect is large closure was typically carried out by using conjunctival auto graft or Amniotic membrane to cover the exposed sclera

Fig 4



#### Postoperative Assessment :

- Postoperative examinations were done at 1 month, 3 months and 6 months.
- At each postoperative visit: BCVA measurement, IOP measurement, slit lamp bio microscopy, Fundus examination were done.
- Patients were examined for any Recurrence

#### Conclusion

Patients were followed up for short period of time (6 months). PCR (Polymerase chain reaction) could not be included in the study as a diagnostic tool to detect HPV due to its high cost. Interferons could not be included in the study as a treatment modality due to its high cost.

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