**ORIGINAL ARTICLE**

## Histological types of oculocutaneous malignancies in hereditary genodermatoses

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**Abstract**

**Background:** Hereditary genodermatoses are characterized by propensity to develop malignancies in cutaneous and ocular structures.

**Objective:** To document in a series of patients with oculocutaneous albinism and xeroderma pigmentosa the histological spectrum of malignant oculocutaneous tumors.

**Materials and Methods:** Biopsies from 6 patients were subjected to histopathological examination for tumor type.

**Results:** A diagnosis of basosquamous cell carcinoma (BSCC) was made in 3 cases, basal cell carcinoma (face) and BSCC (neck) in one, ocular surface squamous neoplasia and SCC in one case each.

**Conclusion:** In the background of genodermatoses, importance of regular and careful follow-up to detect and treat malignancies at an early stage is needed.

**Keywords:** Basosquamous carcinoma, oculocutaneous albinism, xeroderma pigmentosa

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## Introduction

The most common cutaneous neoplasms affecting people the world over are basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). These tumors are sporadic in most, but patients with hereditary genodermatoses such as xeroderma pigmentosum, basal cell nevus syndrome, oculocutaneous albinism, and epidermolysis bullosa are genetically predisposed to develop these tumors. Xeroderma pigmentosum (XP) and oculocutaneous albinism (OCA) are a group of genetic disorders usually inherited in an autosomal recessive fashion characterized by defects in genes encoding nucleotide excision repair pathways and pigmentation, respectively. Somatic mutations resulting from unrepaired damaged DNA following sun exposure predisposes them to develop multiple oculocutaneous malignancies. Affected newborns with XP are clinically normal at birth; following exposure to sunlight they develop multiple pigmented lesions, skin atrophy, and multiple telangiectasias at 1-2 years of age. Oculocutaneous neoplasms are seen later in the first or second decades involving the sun-exposed sites. Patients affected with OCA present with either partial or complete absence of pigmentation involving the skin, eye, and hair. Commonly encountered neoplasms include SCC, BCC, rarely malignant melanoma which develops at a younger age when compared to patients of BCC without any predisposing genetic diseases.[1-4]

## Materials and Methods

The material for this study comprised biopsies of tumors in patients clinically diagnosed as XP and OCA received in the Department of Pathology, Jagadguru Jayadeva Murugarajendra Medical College from 2009 to 2014. Clinical details were collected, and specimens were studied after fixation in 10% formalin. Representative areas were sampled and sectioned to obtain 5 μ thin paraffin sections. H and E stain was performed and microscopic features were analyzed.

## Results

Six cases were seen over a period of 6 years from 2009 to 2015. A total of 8 specimens were received as one case had multiple lesions. Age of presentation varied between 8 and 38 years with majority presenting in the second decade. All the cases had lesions involving the head and neck region. 4 of the 6 patients were females and 2 were males. Both consanguinity and family history were positive in two cases. A diagnosis of basosquamous cell carcinoma (BSCC) was made in 3 cases, BCC (face) and BSCC (neck) in one, ocular surface squamous neoplasia and SCC in one case each. The clinical and histopathologic details are summarized in Table 1.
patients with genodermatoses develop multiple oculocutaneous malignancies commonly BCC and SCC in the first decade as opposed to the general population who develop such malignancies in the fifth or sixth decade. BCCs generally grow slowly and rarely metastasize whereas SCCs grow fast, are invasive and have a higher rate of metastases.\(^4\)

SCC of the left eye was reported in a 20-year-old female XP patient [Case 1 - Figure 1a and b] who underwent excision along with enucleation of the right eye. She had no family history of cutaneous lesions.

Cutaneous neoplasms are known to occur in both types of OCA. Though SCC is the most common malignancy reported,\(^1\) we saw a patient presenting with 3 lesions which were diagnosed as BCC of the nodular and keratotic types and BSCC, respectively [Case 2 - Figure 2a-d]. The patient underwent wide excision of all lesions with margin clearance but was lost to follow-up.

A rare cutaneous neoplasm which is rarely seen in children with XP is BSCC defined by the presence of both BCC and SCC areas in the same tumor with or without a transition zone in between.\(^3,5\) Clinical features at presentation and site of involvement of BSCC resembles that of BCC and a biopsy is necessary for its diagnosis.\(^6\) Although considered as a high-risk variant of BCC, its behavior is known to resemble that of SCC with a greater incidence of metastasis and recurrence. It is important to differentiate it from other cutaneous malignancies because it is aggressive, diagnosis is challenging, has a poor prognosis and demands constant monitoring of patients.\(^5\)

Three patients of XP with BSCC have been reported in this study, two of them presenting in the first decade. An incision biopsy of a lesion on the nose was done in the 8-year-old boy [Case 3 - Figure 3a-c]. His sister also had cutaneous lesions. An 8-year-old girl presented with an ulcerative lesion on the cheek and had multiple pigmented freckles (Case 4). The excision biopsy was diagnosed as BSCC. Both these patients were lost to follow-up. A 22-year-old female with BSCC of the right eye underwent excision along with enucleation of the eyeball with margin clearance and is under follow-up with no recurrence [Case 5 - Figure 3d-e]. Her sibling had cutaneous lesions.

### Table 1: Clinical and histopathological details

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
<th>Case 5</th>
<th>Case 6</th>
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<tbody>
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<td>38</td>
<td>8</td>
<td>8</td>
<td>22</td>
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<td>Male</td>
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<td>Nose</td>
<td>Right cheek</td>
<td>Right lower eyelid</td>
<td>Left limbus lesion</td>
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<td>-</td>
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<td>XP</td>
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<tr>
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</tbody>
</table>

XP: Xeroderma pigmentosa, OSSN: Ocular surface squamous neoplasia, SCC: Squamous cell carcinoma, BSCC: Basosquamous cell carcinoma, BCC: Basal cell carcinoma

### Discussion

Patients with genodermatoses develop multiple oculocutaneous malignancies commonly BCC and SCC in the first decade as opposed to the general population who develop such malignancies in the fifth or sixth decade. BCCs generally grow slowly and rarely metastasize whereas SCCs grow fast, are invasive and have a higher rate of metastases.\(^4\)

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Wide excision with evaluation for metastasis in the lymph node and distant sites along with constant follow-up is the treatment advised for BSCC. Factors indicating bad prognosis include positive surgical margins and invasion of lymphatics and blood vessels. Therefore, early diagnosis and appropriate management is imperative to prevent recurrence.¹⁰

A biopsy is essential to diagnose BSCC, as clinical features are not adequate to distinguish from BCC. XP and OCA are associated with usual oculocutaneous malignancies, but BSCC is seldom reported in these patients in the literature.² In the study of 10 cases in 8 years, skin neoplasms included SCC, BCC, and malignant melanoma. Three patients developed SCC and BCCs of the lower lid.⁸

Eyelid skin similar to that of facial skin is associated with the typical changes of genodermatosis. Eyelids, cornea and conjunctiva protect the deeper structures of the eye; therefore, sun exposure is similar to that of facial skin which explains the higher frequency of malignancies reported involving these areas.⁴ The spectrum of pathologic changes ranging from dysplasia to intra epithelial neoplasia and infiltrative neoplasms involving the cornea and conjunctiva are known as OSSN. XP affected individuals develop OSSN at a younger age and commonly involves the limbus as it is a transition zone and hence more prone to develop dysplastic changes. Early diagnosis and treatment are important to prevent significant morbidity.⁶,⁹ A case of OSSN involved the left eye in the limbal region in this study. The patient was lost to follow-up [Case 6 - Figure 1c and d].

Exposure to sunlight leads to an increase in mutated cells in the skin of patients with XP which causes a direct increase in sunlight-induced cancers such as BCC and SCC, especially in the orofacial region.⁹ All the patients had lesions involving the head and neck region and were from a rural background in our study without awareness of photo-protective measures like protective clothing, eyewear or use of sunscreen lotions.

**Conclusion**

In a tropical country like India with a generally sunny environment where people are exposed to harmful UV radiation, routinely and due to their occupation as agriculture or outdoor workers, the awareness about photo-protective measures to prevent the development of cutaneous malignancies is of utmost importance. The importance of regular and careful follow up to detect and treat malignancies at an early stage is needed, in the background of genodermatoses so as to assist affected individuals lead a normal healthy life. Family history necessitates counseling and need for protective measures.

**Clinical Significance**

This case series emphasizes a multidisciplinary approach in the management of patients affected with XP and OCA comprising ophthalmologists, dermatologists, and pathologists.

**References**

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