CASE REPORT

Advanced Squamous Cell Carcinoma of Cornea in a Child with Xeroderma Pigmentosa

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ABSTRACT

Xeroderma Pigmentosum (XP) presents in early childhood with photophobia, photosensitivity, cutaneous pigmentary changes, and a predisposition for malignancy in sun-exposed mucocutaneous areas and ocular structures. Ocular diseases are evident in at least 40% of XP patients and often cause visual impairment. Eight-year-old male child, a diagnosed case of XP at the age of 6 years, came to ophthalmology outpatient department with watering, redness, photophobia and gradually increasing mass on nasal side in the left eye for the last 6 months. In the left eye, almost the entire cornea was involved with a grayish-white, irregular, and limbal mass of 10 mm × 12 mm in size. Excision biopsy of the growth in the left eye was performed under general anesthesia. Cryotherapy application was done over the excised area. Histopathology report revealed well-differentiated squamous cell carcinoma. Ophthalmologist's role in early detection and excision of suspected lesions, counseling as well as prompt referral to the dermatologist and oncologist are vital in the management of such cases.

Keywords: Squamous cell carcinoma, surgical excision, Xeroderma Pigmentosum

INTRODUCTION

Xeroderma Pigmentosum (XP), first described by Hebra and Kaposi in 1874, presents in early childhood with photophobia, photosensitivity, cutaneous pigmentary changes, and a predisposition for malignancy in sun-exposed mucocutaneous areas and ocular structures.[1] XP is a rare autosomal recessive, precancerous dermatosis. There are fatal neoplastic changes in sunlight exposed areas of the skin and eyes. Chronic sun exposure causes marked alterations in the skin leading to keratosis, telangiectasia, atrophy, and development of malignant tumors such as squamous cell carcinomas, (SCCs) basal cell carcinoma, malignant melanoma, fibrosarcoma, etc., The pathogenesis in a majority of these cases involve a defect in the mechanism of DNA repair due to an inability to initiate nucleotide excision repair (NER) of pyrimidine dimers and other photoproducts.[2] Ocular diseases are evident in at least 40% of XP patients and often cause visual impairment. The retina is generally shielded from ultraviolet (UV) radiation and mostly the lids, conjunctiva, and cornea are affected by the disease process.[3] A case of XP who presented with advanced SCC of cornea is being discussed.

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CASE REPORT

Eight-year-old male child, a diagnosed case of XP at the age of 6 years, came to ophthalmology outpatient department with watering, redness, photophobia, and gradually increasing mass on the nasal side of the left eye in the last 6 months. He was apparently well until the age of 2 years when his parents noticed multiple discrete, dark pigmented lesions over his forehead. Similar lesions gradually appeared in subsequent

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years on his face, neck, forearms, and legs. Since early childhood, he was unable to open his eyes in bright light, and there was constant watering from both eyes. There was no history of consanguinity in the family and no history of similar skin condition in the family. However, he did not seek any medical advice until 6 years of age.

On general examination, he was underweight and short for his age. There was freckling of the skin over all the exposed areas of the face, neck, arms, and legs. Systemic examination for the respiratory system, cardiovascular system, and abdomen revealed no abnormality. Ocular examination revealed that the patient was highly photophobic; a vision in both eyes was counting fingers at 5 m. Bluish-black mottled hyperpigmentation was seen over the lids of both eyes [Figure 1]. Conjunctival congestion was seen in both eyes. The cornea in the right eye was hazy, with vascularization of the inferior part of the cornea. In the left eye, almost the entire cornea was involved with grayish-white, irregular, limbal mass of 10 mm × 12 mm encroaching over about 2 mm of the cornea, with hemorrhagic spots over it [Figure 2]. The rest of the anterior segment of both eyes was normal. Extraocular muscle movements of the right eye were normal. In the left eye, they were restricted medially and inferiorly.

Hematological parameters, renal and liver function tests were normal. Excision biopsy of the growth in the left eye was performed under general anesthesia. The pre- and post-operative periods were uneventful. Exposed sclera and conjunctiva was sutured. Cryo-application was done over the bed of the excised lesion. Histopathology report revealed well-differentiated SCC with extensive hyperkeratosis, acanthosis and stromal invasion [Figure 3]. The patient was put on topical mitomycin drops 0.2% 4 times a day for 6 weeks. The patient was referred to Oncology Department for chemotherapy and was followed up regularly for 6 months without any local recurrence.

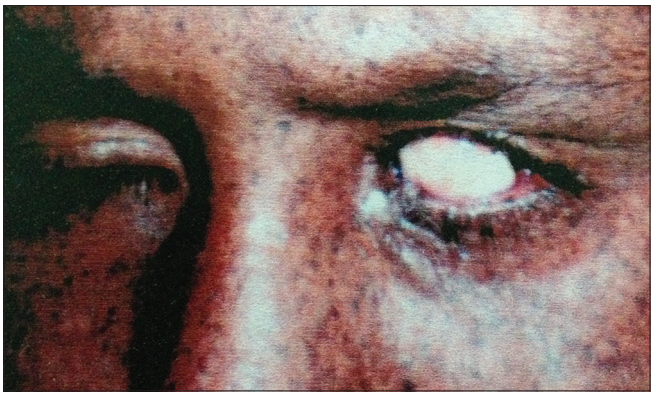

Figure 1: Bluish-black mottled hyperpigmentation over skin with grayish-white, irregular, limbal mass

Figure 2: 10 mm × 12 mm excised mass

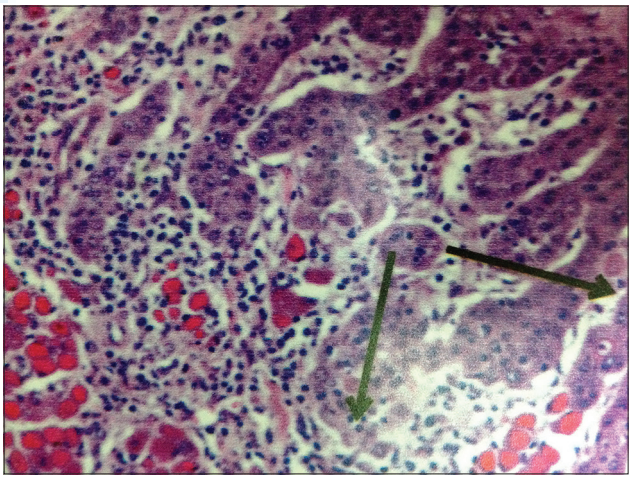

Figure 3: Histopathology of squamous cell carcinomas showing hyperkeratosis with acanthosis

DISCUSSION

XP was first described in 1874 by Hebra and Kaposi.[1] In 1882, Kaposi coined the term "XP" for the condition referring to its characteristic dry pigmented skin. It was also named as atrophoderma pigmentosum by Crocker.[4]

XP is inherited as an autosomal recessive disorder with a prevalence rate of 1:2,50,000.[4] XP is seen either in infancy or early childhood especially around the age of 2 years with equal sex incidence. It is a disorder of DNA repair in which the ability to repair the damage, caused by UV light is deficient. Basic defect is in NER. If tumor suppressor genes are affected, the result is fatal cancer such as malignant melanoma, basal cell carcinoma, and SCC, which are the common causes of death in XP victim. The mean age of skin cancer is 8 years,

but actinic damage occurs between 1 and 2 years. The clinical course of the disease can be divided into three stages.

Typically, the first stage makes its appearance after the age of 6 months. This stage is characterized by diffuse erythema, scaling, and freckle-like areas of increased pigmentation in sun-exposed areas, with the initial involvement of the face. With progression of the disease, the skin changes appear on the lower legs, neck, and arms. While these features tend to diminish during the winter months with decreased sun exposure in the initial stage of the disease, they become permanent as time passes. The second stage is characterized by poikiloderma, which consists of skin atrophy, telangiectasias and mottled hyper and hypopigmentation. The third stage is heralded by the appearance of numerous malignancies, including SCCs, malignant melanomas, basal cell carcinomas, and fibrosarcomas. These malignancies may occur as early as 4–5 years of age, and are more prevalent in sun-exposed areas.[5,6]

Ocular disease is evident in at least 40% of XP patients, and blepharospasm and photophobia are common symptoms. Eyelid skin changes reflect local skin changes, including usually erythema, pigmentation, atrophy, and malignant change.[7] telangiectasias, loss of lashes, and chronic blepharitis are also seen.[7] Atrophic scarred skin may cause ectropion of the lower eyelid and symblepharon.[8] Lower lid loss may result in exposure keratitis, edema, and even corneal ulceration and perforation.[9] Corneal opacification, neovascularization, pterygia, and band keratopathy are common, and band shaped nodular dystrophy and SCCs have also been reported. Conjunctival involvement usually includes conjunctivitis, pinguecula, symblepharon, melanosis, and tumors developing from the interpalpebral zone of the limbus.[7] Limbal tumors are common, and SCCs, malignant melanomas, and limbal stem cell deficiency have been reported. The iris can be affected by iritis, stromal atrophy, pigment abnormalities and rarely malignant melanoma.[10] Ocular tumors include basal cell carcinomas, SCCs, and malignant melanomas. As the posterior segment is protected from UV damage by the cornea and lens, fundus abnormalities are not common; however, choroidal melanoma rarely develops.[11]

Clinical management of XP includes avoidance of sunlight, minimizing UV and cigarette smoke exposure, early excision of skin lesions, and genetic counseling.[11] Oral 13-cis retinoic acid has been shown to reduce the incidence of new cancers in XP patients.[12] Ophthalmic management includes UV-absorbing sunglasses with side shields, artificial tears, intermittent topical steroids, surveillance for ocular neoplasms, and management of complications. Eyelid and conjunctival cancers are the most commonly reported. Current management of eyelid tumors is complete resection using Mohs' micrographic surgery, with or without reconstruction, or other tissue-sparing techniques.[11] Malignant conjunctival tumors that can be excised should be removed and treated with adjuvant cryotherapy/irradiation/topical chemotherapy.[12] Some malignant limbal tumors can be removed by iridocyclectomy, while others may require enucleation.[11] Corneal tumors have been managed with keratoplasty and topical chemotherapy. Iris tumors may be managed with local excision, plaque radiotherapy, or enucleation.[11] Choroidal melanomas are commonly managed with plaque radiotherapy, but this has not been specifically studied in XP patients.[11] If a tumor involves the orbit, imaging is required, and surgical excision with adjunctive radiation can be therapeutic.[10] Despite their extreme sensitivity to UV light, XP patients can be treated with standard doses of radiation for treatment of neoplasms.[10] Large or invasive ocular or orbital tumors may require enucleation and/or orbital exenteration.

The prognosis of this disease is poor with fewer than 40% of patients surviving beyond the age of 20.[12] Malignant melanomas and SCCs are the two most important causes of mortality in patients with XP.[8,9] Malignant skin neoplasms are seen in 60% and SCC is seen in 20% of XP patients.[8,9] SCC can affect both eyes of an XP patient together, in our case, only left eye was involved. Late presentation of SCC of the cornea in XP patient with no other ocular involvement and skin malignancy makes this as one of the rare case reported so far.

CONCLUSIONS

Xeroderma Pigmentosa, though rare, may present with ophthalmic problems ranging from just conjunctival congestion to ocular surface neoplasm-like SCC of cornea or limbus or conjunctiva, for which total excision of mass with cryotherapy gives good results. Ophthalmologist's role in early detection and excision of suspected lesions, counseling as well as prompt referral to the dermatologist and oncologist are vital in the management of such cases.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/ their images and other clinical information to be reported in the journal.

The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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