Bilateral facial squamous cell carcinoma in an 18-month-old girl with xeroderma pigmentosum

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ABSTRACT

Squamous cell carcinoma (SCC) of the skin usually occurs in older patients and commonly develops from actinic keratosis. Patients with xeroderma pigmentosum (XP) are highly sensitive to ultraviolet radiation and prone to develop multiple skin malignancies and can acquire SCC at an early age. We report an 18-month-old girl with XP who presented clinically because of a bilateral facial skin mass that was biopsied and found to be SCC. To our knowledge, the case we describe represents the youngest XP patient to have developed facial SCC.

KEY WORDS: Xeroderma pigmentosum, Squamous cell carcinoma, Children

Xeroderma pigmentosum (XP) is a rare autosomal recessive disease that is characterised by photosensitivity and pigmentation anomalies with sunlight exposure, resulting from a defect in the deoxyribonucleic acid (DNA) repair mechanism. Ultraviolet radiation produces damage to the DNA, which provides an opportunity for mutant malignant growth. All forms of cutaneous malignancies may develop in the exposed areas and death occurs in early adulthood because of metastatic disease.[1-2] We report here a Moroccan 18-month-old girl with XP who exhibited bilateral squamous cell carcinoma (SCC) of the facial skin.

Case History

An 18-month-old girl was referred for evaluation of a bilateral facial mass. The baby was born at term to non-consanguineous parents. Few months after her birth, her mother had noticed cutaneous changes on the child's sun-exposed skin. This was associated with the mother exposing the child to sunlight. Two facial tumours appeared one month prior to presentation and grew rapidly.

Examination of the girl showed atrophic changes, freckles and hyperpigmentation on the skin of the face, neck and dorsum of hands. These findings were consistent with XP. Examination of the face revealed bilateral erythematous, round, elevated, ulcerative cauliflower-like lesions. Routine blood chemistry along with blood counts was within normal range. HPV-PCR (human papilloma virus) was negative.

The computed tomographic scan showed a bilateral solid well-marginated soft-tissue mass with homogeneous enhancement after administration of intravenous contrast medium [Figure 1a and 1b]. That mass did not invade adjacent bones. There was no lymph nodal enlargement or cerebral metastasis.

Histological examination of a biopsy specimen revealed a well-differentiated squamous cell carcinoma (SCC) [Figure 2].

Surgical removal was done and histology confirmed that the two tumours were well-differentiated SCC with free surgical margins. Avoidance of sunlight was recommended.

Discussion

Xeroderma pigmentosum (XP) is a rare (1 case/500,000 newborns), recessively transmitted genetic disease. It affects both males and females in approximately equal proportions. Consanguinity or first cousin relationships between parents of affected children has been found in 30% of cases.[1-2] The genetic defect may be related to a DNA repair system that is malfunctioning. Work by laboratories throughout the world in the past few years has resulted in cloning of more than seven different DNA repair genes (XP-A to XP-G) involved in XP.[1-4] Environmental factors also appear to cause DNA damage and abnormal repair, the most important of which is ultraviolet radiation (UVR). UVR induces damage in DNA strands to form photoproducts that result when adjacent pyrimidine molecules fuse together to produce covalently linked thymine dimers. These must be excised and replaced if accurate DNA synthesis and replication is to occur. In XP patients, enzymatic
excision of these photoproducts is much slower than normal, so that these products will persist longer than usual and will give rise to errors in DNA replication and result in spontaneous mutations.[1-4]

At birth, these patients are usually normal, but within the first 2 years they start developing changes in the skin on sun-exposed areas: progressive irregular freckling, mottled hyperpigmentation and hypopigmentation, dryness, atrophy and telangiectases. These are similar to those observed in older individuals with light-complexioned skin and chronic sun exposure.[5-6]

Patients with XP have a risk of developing skin cancer about 1000 times more than that of the general population.[1-2] The age of onset of non-melanoma skin cancer is reduced by about 50 years in XP patients in comparison to that of the general population (median age, 8 years). To our knowledge, the case we describe represents the youngest XP patient to have developed facial SCC.

The two most common types of cancer found in XP patients are basal cell cancer (BCC) and SCC, with most tumours found on the face, head or neck.[1-2] Melanomas can also occur in approximately one-fourth of cases, of which one-third occur in the head and neck.[11] There are very few reports of other types of cutaneous neoplasms including angioma or fibrosarcoma. Additionally, there is a 10- to 20-fold increase in the frequency of occurrence of lung, uterine and CNS neoplasms in patients with XP. Anterior tongue neoplasms have been reported and are presumably due to direct exposure to the sun.[1-2,5-7]

Early detection of these malignancies is necessary because they are fast-growing, metastasise early and lead to death: most patients with XP do not live beyond the third decade because of development of tumour.[6-8] Surgical excision of the tumours and grafting of skin from non-light-exposed areas is the first line of treatment. Chemo- and radiotherapy have been tried, however, no effective treatment has been found.[8] Since the underlying genetic defect cannot yet be corrected, prophylactic measures are of utmost importance. Children with XP should be protected from exposure to sun. Whenever possible, this is done by having the patients wear protective clothing, applying sunscreens and using sunglasses with side shield. Genetic counselling of affected families is of importance. Amniocentesis for prenatal diagnosis of XP and interruption of the pregnancy may be discussed.[6-10]

**References**

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These cutaneous lesions are characteristic of necrobiosis lipoidica (NL). They are typically multiple, bilateral, and located on the lower legs, most commonly pretibiaally and occasionally on the thighs, ankles and feet, but rarely on the trunk, upper limbs and scalp. Early lesions appear as rounded, dull red, symptom-less papules or plaques that progress slowly and indurate with central atrophy. The lesions have a shiny surface and a waxy, yellowish central area with prominent telangiectasias. The margins may carry comedone-like plugs. Koebner’s phenomenon occurs in some patients. The clinical and histopathological differential diagnoses include rheumatoid nodules, granuloma annulare, necrobiotic xanthogranuloma, sarcoidosis, morphea, stasis dermatitis, subacute nodular migratory panniculitis, erythema nodosum, lichen sclerosus et atrophicus, tertiary syphilis, radiodermatitis, and Hansen’s disease. An association with diabetes mellitus has been recognized for a long time. NL was originally termed dermatitis atrophicans lipoidica diabeatica (Oppenheim 1929) and later renamed necrobiosis lipoidica diabeticorum (Urbach 1932). In one large series, 111 of 171 patients (65%) with NL had diabetes mellitus at presentation;[3] it preceded the onset of diabetes in 15% of patients. Its prevalence is 0.3% in people with diabetes, is three times commoner in women, and occurs usually before 30 years of age. In our patient, Type 1 diabetes occurred two years prior to the first lesion. Her glycaemic control was poor and she had diabetic retinopathy as well.

The aetiology remains obscure, but is not a microangiopathy and not associated with glycaemic control or chronic diabetic complications. Antibody-mediated vasculitis and abnormalities of collagen are the other chief putative mechanisms. Histologically, NL occurs as palisading or pseudotuberculoid granulomatous lesions consisting of foci of degenerate collagen bundles with a hyalinated appearance, surrounded by fibrosis, a diffuse infiltrate of histiocytes and a giant-cell granulomatous reaction. Capillary wall thickening and microvascular occlusion are often present.

Treatment of NL is unsatisfactory with cosmetic camouflage the preferred option. Regression of lesions does not correlate with improved glycaemic control. Topical or intralesional corticosteroids may improve early NL. Psolarens and ultraviolet A therapy can improve patients not responsive to steroids. Antiplatelet therapy with aspirin and dipyridamole has shown no benefit but anecdotal reports with pentoxifylline, tretinoin, nicotinic acid, cyclosporine, and infliximab have all documented benefits. Excision and skin grafting may help some. Other complications include ulceration following trauma, occasionally infections and rarely squamous cell carcinoma.

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References

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