Basal Cell Carcinoma in Children

Report of 3 Cases

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Background: The peak incidence of basal cell carcinoma occurs in the seventh decade of life and is rare in children. When found in the pediatric age group, basal cell carcinoma is usually associated with a genetic defect, such as basal cell nevus syndrome, xeroderma pigmentosum, or nevus sebaceous. In areas of intense UV radiation exposure, such as the southwestern United States, children may be at increased risk of developing this malignancy de novo.

Observations: Three children (2 boys, aged 8 and 16 years, and an 11-year-old girl) from Tucson, Ariz, with isolated basal cell carcinoma unassociated with any other disease or syndrome are described.

Conclusions: Basal cell carcinoma in children is probably the result of a combination of UV radiation exposure and genetic background. Early recognition in children can prevent extensive tissue destruction and excess scarring after excision. A higher index of suspicion for basal cell carcinoma may also aid in prompt diagnosis of a possible genetic disorder, such as basal cell nevus syndrome.


**ASAL CELL carcinoma (BCC) in children is rare. Cases of BCC in the pediatric population have been reported in association with basal cell nevus syndrome, xeroderma pigmentosum, and nevus sebaceous and after high-dose radiotherapy.** Isolated cases of BCC unrelated to one of these causes are seldom reported in pediatric patients. Consequently, clinicians often have a low index of suspicion, leading to delay in diagnosis. We report 3 cases of de novo BCC in children who presented to the dermatology clinic at the University of Arizona Medical Center, Tucson. These children had no known genetic syndromes and had not undergone radiotherapy.

**REPORT OF CASES**

**CASE 1**

A 16-year-old Hispanic boy presented with a solitary heme-crusted nodule that had a raised ringlike border below the left orbit (Figure 1). He had first noticed the lesion 2½ years earlier, when it was a much smaller papule. Since that time, the lesion had enlarged considerably. No family history of skin cancer was noted. The differential diagnosis included BCC, discoid lupus erythematosus, and deep fungal infection. A diagnostic biopsy specimen was obtained and sent for histologic evaluation. The specimen showed BCC. A dermatologic surgeon excised the lesion using the Mohs micrographic surgery technique. There were no recurrences or new primary skin cancers during 4 years of follow-up.

**CASE 2**

An 11-year-old white girl with skin type III was seen for the evaluation and treatment of nonresponsive acne vulgaris. During the initial examination, a 3-mm dome-shaped, slightly translucent papule was noted on the left nasal labial fold. The patient’s family history was negative for skin cancer. The differential diagnosis included epithelial cyst, fibrous papule, and BCC. Histologic examination of a diagnostic biopsy specimen showed nodular nests of basal neoplastic cells invading the dermis, consistent with nodular BCC. The lesion was excised using the Mohs micrographic surgery technique. Follow-up 4 years later revealed no recurrences and no new primary tumors.

**CASE 3**

An 8-year-old boy with a history of several severe sunburns presented with a
growing, spontaneously bleeding, 3-mm papule under the left eye (Figure 2). The lesion was umbilicated and had overlying telangiectasias. The patient had no family history of skin cancer. The differential diagnosis included BCC and molluscum contagiosum. A diagnostic biopsy specimen revealed nests of basal neoplastic cells in the dermis, consistent with nodular BCC. The patient and his parents elected to have the lesion removed by electrodesiccation and curettage. Two years after treatment, the patient had no recurrences and no new skin cancers.

Nonmelanoma skin cancers are the most common malignant neoplasms in the United States, representing one third of all cancers diagnosed every year. Basal cell carcinoma represents 75% of nonmelanoma skin cancers and has an estimated annual incidence of more than 700,000 cases nationally. The US average annual incidence of BCC in whites is currently 191 per 100,000 and is increasing at a rate of 3% to 7% per year.

Ultraviolet radiation exposure is partly responsible for both BCC and squamous cell carcinoma, as evidenced by their increased prevalence after chronic exposure to sunlight and the preponderance of these lesions on sun-damaged skin. Although squamous cell carcinoma is associated with cumulative sun exposure, BCC in younger patients does not show this association. D’Errico et al report that BCC arising before the age of 40 years corresponds with childhood or recreational sun exposure but does not correlate directly with cumulative sun damage. Thus, in areas of the world where the UV radiation is most intense, such as the Sunbelt in the United States, childhood sun exposure is at a maximum and younger patients are at a higher risk of developing BCC.

Other factors besides sunlight are reported to influence the development of BCC. Gailani et al note a strong association between BCC and the inactivation of a gene at chromosome 9q22, which is thought to be a tumor suppressor. Inactivation of this gene was found in tumor tissue in 68% of BCCs examined and did not correlate directly with sun exposure or age. The cause of this mutation is unknown, but possible factors may include ionizing radiation, arsenicals, and polyaromatic hydrocarbons.

Basal cell nevus syndrome and xeroderma pigmentosum represent inherited genetic mutations that predispose those affected to BCC. Patients with basal cell nevus syndrome are found to have a germline mutation on chromosome 9. Basal cell nevus syndrome and xeroderma pigmentosum represent inherited genetic mutations that predispose those affected to BCC. Patients with basal cell nevus syndrome are found to have a germline mutation on chromosome 9.

The peak incidence of BCC occurs in the seventh decade of life. In the pediatric age group, BCC usually occurs in the setting of a known genetic defect (Table). Although uncommon, isolated BCC in children without these conditions has been reported. Price et al described a 17-year-old boy with a solitary BCC of the nose. The patient had a history of sunburns 1 or 2 times per year.
year since the age of 9 years. His mother had a BCC re-
moved at the age of 44 years. Histologically, the tumor was
described as superficial BCC. Scobie and Preston\textsuperscript{17} de-
scribed a 4-year-old boy with a BCC of the scalp. The
patient presented with a small "cyst" on the occipital re-
region of the scalp and a family history of skin cancer. The
lesion, described histologically as well defined, re-
curred 8 months after excision. Excision was repeated
without recurrence of tumor, based on follow-up 1 year
later.\textsuperscript{17} A 12-year-old boy living in Arizona was de-
scribed by Comstock et al\textsuperscript{18} with a BCC on the nose. The
lesion had been present since his nose was scratched by a
cat 1 year earlier. The youngest patient with BCC, a 27-
month-old infant, was described by Keramidas and An-
agnostou.\textsuperscript{21} In this case, the lesion grew rapidly and ul-
cerated after a 4-month delay in diagnosis.

It is debatable whether BCC is more aggressive in
children. Leffell et al\textsuperscript{30} defined aggressive-growth BCC
as sclerosing, morpheaform, infiltrative, or invasive into
nerves. Their retrospective review showed an increased
occurrence of aggressive-growth BCC in patients younger
than 35 years old compared with older patients. In con-
trast, Betti et al\textsuperscript{13} and Dinehart et al\textsuperscript{16} found no increase
in the frequency of the morpheaform pattern in younger
patients. All 3 of our patients had histologically less ag-
gressive forms of BCC.

As total incidence rates of BCC continue to rise,
childhood cases may become more common. This in-
crease in pediatric BCC may be especially true in areas
of high-level UV radiation exposure. The percentage of
sunny days during the year, higher altitude, and loca-
tion closer to the equator may place children in these ar-
eas at increased risk. Early recognition can prevent ex-
tensive tissue destruction and scarring after excision and
aid in prompt diagnosis of a possible genetic syndrome.
We recommend that clinicians have a higher index of sus-
picion for BCC when evaluating questionable lesions in
children.

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