A Rare Case of SCC in a Pediatric Patient with NF-1

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Abstract
We present a case of a pre-adolescent female with Neurofibromatosis type 1 (NF1) who developed squamous cell carcinoma (SCC) on the dorsum of the nose. This rare presentation has been reported in the literature only twice and in both instances involved adult patients. SCC itself is very rare in children and is usually seen in those with a predisposing condition like immunosuppression, radiation exposure or genodermatoses of which our patient did not have. We also discuss the possible pathogenesis of epithelial tumor development in patients with NF1, a historically non-epithelial tumor producing disorder.

Introduction
Neurofibromatosis type 1 is an autosomal dominant genetic disorder characterized by the presence of cafe-au-lait macules (CALMs), neurofibromas, nerve sheath tumors, lisch nodules and freckling in the axillary or inguinal region. Almost every organ system in the body can be affected from renal dysfunction with essential hypertension and learning difficulties to scoliosis. Skin manifestations like CALMs and plexiform neurofibromas will usually appear congenitally or within the first year of life, whereas other skin findings like simple neurofibromas appear later in childhood. Generally all criteria for diagnosis of NF1 are met in 97% of patients by age 8 years and in 100% of patients by age 20 years. Patients are at increased risk of developing a number of different central nervous and non-epithelial neoplasms.1 It is very rare for patients with NF1 to develop cutaneous squamous cell carcinoma.

Case Report
An 11 year old female with a past medical history of NF1 and positive family history of NF1 including mother and sibling; presented to the dermatology clinic for evaluation of a lesion on her nose that was present for the past 6 months (Figure 1). There was no bleeding, pain or change in size. She denied similar lesions elsewhere. On physical examination the patient had a smooth pink papule measuring 7 mm in diameter on the dorsum of the nose with overlying scale, crust, as well as multiple well defined brown patches and macules on the trunk and extremities. Differential diagnosis included: verruca vulgaris, irritated molluscum contagiosum, and pyogenic granuloma. Cryotherapy using liquid nitrogen was performed on the lesion for presumed verruca vulgaris. Three weeks later the patient returned to clinic with the lesion having grown in size since the last visit. The patient then had a shave biopsy of the nasal lesion which showed atypical squamous cell proliferation invading the dermis consistent with SCC. The patient then underwent Mohs micrographic surgery for complete surgical removal.

Figure 1: Clinical presentation of lesion on patient’s nasal dorsum

Discussion
SCC is the second most common cutaneous malignancy in adults. Classically it occurs in older adults on chronically sun exposed areas as well as in those with radiation exposure, chronic wounds, arsenic exposure and immunodeficiency. Children rarely develop any cutaneous cancers, with an incidence of 1 per 1000 patients. One study by a large pediatric hospital showed that out of ~36k dermatology patients, 53 cutaneous malignancies were diagnosed. Of that 6% were squamous cell cancers.2 In children cutaneous malignancies are mainly seen in association with underlying skin conditions like albinism, xeroderma pigmentosum, nevus sebaceous, and ataxia telangiectasia. Children rarely develop any cutaneous cancers, with an incidence of 1 per 1000 patients. With this knowledge, clinicians can be more informed about all the risks pertaining to NF1 and will hopefully consider SCC when they come across any abnormal lesions that are found in predisposed individuals.

Figure 2: Shave biopsy of nasal dorsum low power

Figure 3: Shave biopsy, higher power nasal dorsum

Dermatopathology
SCC in children is a rare presentation. It is very important to consider any patient who presents with a lesion that is not consistent with the classic presentation of SCC. In our case, the biopsy was consistent with SCC. The patient then considered performing a second wider biopsy, so as to not miss or delay diagnosis. According to one article, pediatric squamous cell carcinoma of all types appears to be increasing in incidence over the past two decades. They believe it is caused by multiple factors including occurrence of SCC after radiation treatments years later and increased HPV infection prevalence.3 Cutaneous malignancy should be considered early on in any child with predisposing factors and atypical presentation.4 It is important to use a dermatopathologist comfortable with diagnosing pediatric lesions. Clinicians may also consider performing a second wider biopsy, so as to not miss or delay diagnosis. At times an adult dermatopathologist may be better suited in diagnosing these classically late presenting lesions. Treatment of these lesions is recommended and full excision is warranted as squamous cell cancers in children have poor a prognosis.4 Our patient underwent Mohs micrographic surgery for full examination of tumor margins and best cosmetic outcomes on this young female’s face. Months out she has no signs of recurrence and is happy with her cosmetic appearance. She is being followed by ophthalmology, neurology, dermatology, and has been offered genetic counseling for her underlying NF1. We expect to have her follow up once a year for a full skin exam for monitoring for further skin cancer development.

Figure 2 & 3: Shave biopsy from patient’s nasal dorsum shows atypical keratinocytes invading the dermis with overlying parakeratosis and peripheral pseudoepitheliomatous hyperplasia

Conclusions
In conclusion, this is the third reported case of cutaneous SCC in a patient with NF1, and the first reported case in a pre-adolescent patient. To our knowledge, this is the first documented case of SCC of the nose diagnosed in a patient with NF1. Due to the rarity of the condition, we were not able to find guidelines for management of pediatric squamous cell cancer and perhaps with its increasing incidence this issue may be addressed in the future. Our case along with prior studies conducted, suggest an increase in risk for developing epithelial tumors in patients with NF1 warranting further study in this topic. With this knowledge, clinicians can be more informed about all the risks pertaining to NF1 and will hopefully consider SCC when they come across any abnormal lesions that are found in predisposed individuals.

References

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