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Case Report

Basal cell carcinoma in a 14-year-old: A rare case of a common skin cancer

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Abstract

Background: Basal cell carcinoma (BCC) is the most common cutaneous malignancy. It usually arises in sun-exposed areas of the body, with the face and neck being the most common sites for BCC. BCC is typically found in older individuals, but it is becoming more prevalent in people younger than 50. However, such cases in children under 15 are rarely encountered. Pigmented BCC is a common presentation in people of color, while such presentation is relatively unusual in Caucasians. Pediatric cases could be idiopathic, but it is more commonly associated with a genetic defect, such as basal cell nevus syndrome, xeroderma pigmentosum, Bazex syndrome, and albinism. Those cases could also arise from a congenital lesion, e.g., nevus sebaceous, radiotherapy-related, or solid organ transplant.
Case Illustration: We present the case of a 14-year-old boy with a chief complaint of growing tumor on the left cheek since he was 8 years old. He was diagnosed with childhood-onset BCC based on the findings of dermoscopy and skin biopsy. The patient underwent surgical excision of the lesion with 3 mm margins and a full-thickness skin graft obtained from the left retroauricular area.
Discussion: Removal of the tumor with clear margins remains the gold standard for BCC treatment. This case presentation showed the best practice for BCC cases in the childhood population.
Conclusion: The diagnosis of BCC should not be neglected in the childhood population.

Keywords*: idiopathic BCC, childhood, excision*

Background

Basal cell carcinoma (BCC) is the most common type of skin cancer. It typically arises as a slow-growing tumor on sun-exposed areas of the body, with the face and neck being the most common sites of the lesion. Men generally have a higher risk of BCC than women. BCC is typically more common in older individuals, but it is becoming more prevalent in people below 50, although such cases in children under 15 are extremely rare. BCC is associated with inherited basal cell nevus syndrome, xeroderma pigmentosum, Bazex syndrome, vitiligo, and albinism in the pediatric age group. BCC could also arise from congenital lesions such as nevus sebaceous, radiotherapy-treated cancers, solid organ transplant, and *de novo*. Higher sun exposure was also reported to be one of the risk factors for non-genetic childhood BCC. The damage of DNA induced by ultraviolet rays may lead to the over-expression of the oncogene along with the downregulation of tumor suppressor genes (Sonic Hedgehog and p53). However, prior exposure to ultraviolet radiation might be non-significant in several cases.[2] We describe a case of a 14-year-old boy with childhood-onset basal cell carcinoma treated with wide excision and full-thickness skin graft. The patient was managed in accordance with national comprehensive cancer network (NCCN) guideline for basal skin cancer.[3]

Case Illustration

A 14-year-old boy was admitted to our clinic in November 2019 due to a slow-growing tumor on the left cheek since he was 8 years old. At first, the patient thought it was a simple mole. However, it subsequently enlarged into a patch. In the past year, the patch had developed into skin ulceration that easily bled. He denied any history of trauma. No family history of cancer was noted. He had a history of intermittent sun exposure due to his hobby of playing basketball. Physical examination revealed a crusted irregular lesion, measuring 5 cm x 3 cm x 0.2 cm, with a well-defined border (Figure 1). Dermoscopic findings revealed blue-gray ovoid nests, leaf-like structure, ulceration, and crust (Figure 2). The patient had a skin biopsy before in July 2019 by another physician. He had been informed of the result but was lost to follow-up. The second/repeat skin biopsy was conducted accordingly. The diagnostic biopsy specimen revealed nests of basal neoplastic cells, consistent with nodular infiltrative basal cell carcinoma. In December 2019, the tumor was excised with a 3 mm margin, and the skin defect was reconstructed using a full-thickness skin graft technique harvested from the left retroauricular area (Figure 3 and 4). Skin biopsy was performed to determine the adequacy of excised tissue margin and revealed free margin from tumor infiltration. The subject's parents signed the informed consent for publication.

Discussion

The pathogenesis of BCC involves intermittent or excessive exposure to ultraviolet rays, particularly the ultraviolet B (UVB) spectrum (290-320nm), which induces mutation in tumor suppressor genes. The damage of DNA caused by UVB may bring about genetic alterations and may subsequently lead to neoplasm. UV-induced mutation in the p53 tumor suppressor gene has been found in about 50% of BCC cases. BCC has several subtypes based on clinical and histopathological findings, namely nodular, cystic, superficial, morpheaform, keratotic, pigmented, and micronodular BCC. Unlike superficial BCC, which usually presents at the truncal site of the body, most cases of nodular and morpheaform BCC are found on the head and neck. In people of color, pigmented BCC is the most common subtype of BCC.[1]

BCC is most commonly seen in patients with light-colored hair and skin. Major risk factors for BCC include higher sun exposure, vitiligo-albinism, conditions that cause immunosuppression (AIDS, consumption of several types of drugs in cases of organ transplantation), and radiation. Genetic factors also play an important role in the pathophysiology of BCC.[3] In our case, the patient had the risk factor of high sun exposure that might contribute to the development of BCC. Genetic factors also play an important role in the pathophysiology of BCC.[3] In our case, the patient had the risk factor of high sun exposure that might contribute to the development of BCC.

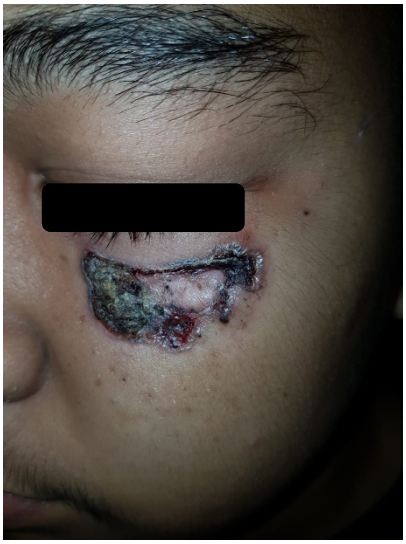

Figure 1. Lesion of BCC appearing as a solitary, hyperpigmented, slightly erythematous plaque with ulceration

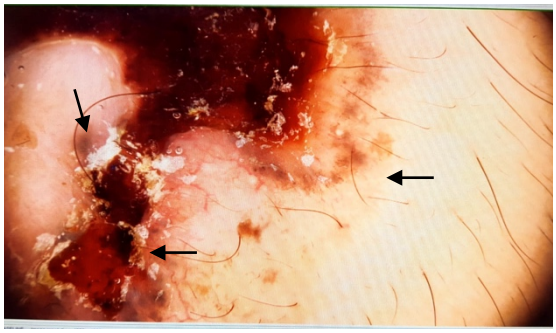

Figure 2. Dermoscopy of peripheral skin lesion showed blue-gray ovoid nest, leaf-like structure, ulceration, and crust

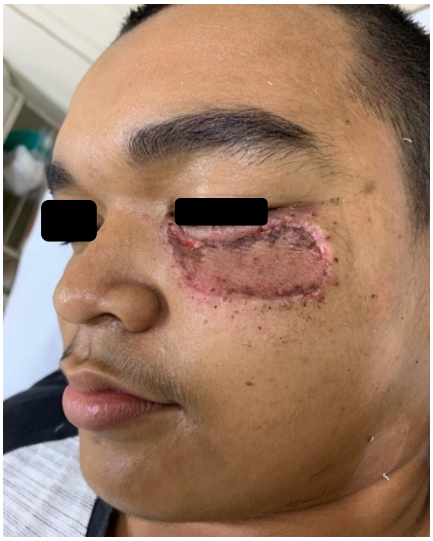

Figure 3. Post-operative defect in two weeks following skin graft

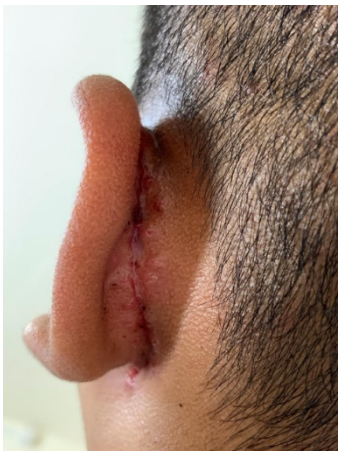

Figure 4. Full-thickness skin graft obtained from the left retroauricular area

Diagnosis of BCC is confirmed by the findings of a skin biopsy. There are specific clinical features to each subtype of BCC that could aid in the diagnosis of BCC. Nodular BCC typically presents as raised red, pearly, translucent lesion with peripheral telangiectasia. Superficial BCC may mimic discoid eczema or Bowen's disease, while morpheaform BCC presents as a subtle scar-like plaque. Dermoscopy plays a huge role in diagnosing BCC because it may reveal specific findings such as arborizing vessels, ulceration, maple-leaf-like structure, blue ovoid nests, blue-gray globules, and spoke wheels, which are the hallmarks of BCC. In our patient, dermoscopic findings revealed blue-gray ovoid nests, leaf-like structure, ulceration, and crust.[1,5]

Basal cell nevus syndrome is an autosomal inherited disorder characterized by multiple lesions of basal cell carcinoma, maxillary keratocyst, multiple pits of the palm and soles, ectopic calcification of the cranial membrane, jaw cyst, and musculoskeletal malformations.[4] In our case, the patient had no family history of BCC, palmar or plantar pits.

According to NCCN guidelines, surgical excision remains the mainstay of treatment for BCC, with Mohs micrographic surgery as the most preferred technique due to its higher success rate. Mohs surgery is particularly beneficial for facial BCC because it tends to exhibit subclinical extension. Several predictors for microscopic tumor extension have been reported, including tumor diameter greater than two centimeters and lesions in high-risk areas ("H" zone) such as nose, eyelids, eyebrows, temples, lips, ear, and periauricular area.[3]

Electrodessication, curettage, topical chemotherapy with 5-fluorouracil, imiquimod, radiotherapy, cryosurgery, photodynamic therapy have been used as a treatment for BCC although most trials have only evaluated BCC in low-risk locations. Surgery and radiotherapy appear to be the most effective treatments with surgery showing the lowest failure rates. Although cosmetic outcomes have been reported to be satisfying with photodynamic therapy (PDT), long-term follow-up data may still need to be warranted. Overall, surgical removal of the tumor with clear margins remains the gold standard in BCC treatment. In our case, the patient underwent surgical excision with 3-mm margins and a full-thickness skin graft obtained from the left retroauricular area.[2,5] The patient underwent regular follow-up to evaluate any evidence of recurrence or new lesions after treatment. This case presentation demonstrated the ideal management for patients with BCC, especially in the childhood population.

Conclusion

Higher exposure to UV rays may contribute to the rising prevalence of childhood BCC in the past few years. In cases with little exposure to UV rays, idiopathic BCC may be considered. It is estimated that the incidence of diseases associated with UV exposure in the childhood population will continue to increase.[2] Therefore, the diagnosis of basal cell carcinoma should not be neglected in pediatric skin lesions with characteristics suggestive of BCC.

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