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Case Report

Basal Cell Carcinoma Recurrence after Excision in a Patient with Complex Cardiac history: A Case Report

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ABSTRACT

Basal cell carcinoma is a subtype of keratinocyte carcinoma; a non-melanoma skin cancer which occurs commonly in Caucasians, although it does occur with increased prevalence in Caucasians, patients with skin of color suffer from elevated morbidity and mortality when diagnosed with skin cancer. Extensive research has been established to identify the various mechanisms through which abnormal cell proliferation occurs in the human body; genetic mutations such as hedgehog signal pathway through which patched (PTCH) protein which function as a receptor and binds to the hedgehog receptor complex in the cell membrane have been directly instrumental in the pathogenesis of Basal cell carcinoma (BCC). There is also the indirect implication of ultraviolet DNA nucleotide changes in the tumor suppressor genes P53 and PTCH1 and mutations in the PTCH1 gene can lead to various cancers. Localized damage and disfigurement; BCC near the eyes, nose or ears can invade underlying structures making surgical removal more complicated and riskier. Lymphedema or swelling and cosmetic issues like loss of skin color, suture marks or excessive scarring are potential complications of surgery. Recurrence very frequently occurs even after successful removal excision. Patients may suffer from psychological issues resulting from pain, functional challenges and cosmetic concerns after treatment.

Keywords: Basal cell carcinoma; Keratinocyte carcinoma; Lymphedema

Introduction

We present a case report of a 79-year-old man with previously excised basal cell carcinoma over the subcutaneous border of the right leg 20 months ago **(Figure 1)** who has now presented with recurrence of BCC on the lateral canthus of his right ocular region **(Figure 2)** and anterior scalp **(Figure 3)**. The patient had symptomatic bradycardia awaiting cardiac pacemaker insertion at the hospital. Previous Histology Findings from excised BCC showed that on Microscopy, a diagnosis of Infiltrative basal cell carcinoma was made with the following tissue Thickness of 1.7mm, Clark level IV, Stage: pT1, Peripheral margin distance measured 3.3mm and Deep margin distance measuring 3.5mm. There was no Perineural invasion and squamous differentiation.

Risk status was high risk. All standard advice following prevention of UV radiation (wearing wide hats) was duly followed by the patient. However, there was no strict adherence to wearing of creams with sun protection factor SPF.

Figure 1: Small erosions on right lower leg subcutaneous border.

Figure 2: Papule with rolled up borders on Lateral canthus of right ocular area.

Figure 3: Papule with pearly(transparent) border on anterior scalp.

Background

Skin cancer is the most common cancer in the USA. It is five times more common than breast or prostate cancer[1]. Despite the widespread use of Mohs micrographic surgery (MMS) for periocular basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) - together called keratinocyte carcinoma (KC) - follow-up data regarding recurrences are limited[2]. Due to the specialized character of Mohs micrographic surgery (MMS) for periocular Keratinocyte cancers, A retrospective cohort study by F. Weesie et al. identified the need for a multidisciplinary approach between Mohs surgeons and oculoplastic surgeons is made available in a center of expertise, especially in case of previously incompletely treated, recurrent or aggressive tumors. This collaboration leads to combining the best of both worlds, specifically combining knowledge and skills and further adding complex reconstructions to the benefits of MMS[2].

Approximately 1/4 of periocular Keratinocyte cancers are incompletely removed after standard excision, with histopathologically aggressive tumors and localization in the medial canthus having the highest risk[3,4]. Common Anatomy locations of BCC predominantly implicate sun-exposed skin areas, with the head and neck region accounting for most cases. Within the periocular region, the lower eyelid is most affected, followed by the medial canthus, which carries higher risks of incomplete excision and recurrence due to its anatomical complexity. Additionally, the periocular area lies within the high-risk facial "H-zone," encompassing the nose, nasolabial folds and periorbital regions. Lesions in these areas tend to recur more frequently due to the presence of complex underlying anatomical structures such as orbital fat, muscles and the lacrimal drainage system[3]. It is estimated that 30-50% of incompletely excised KCs result in a recurrence[5-7]. This case underscores the importance of multidisciplinary collaboration in managing recurrent periocular BCC to optimize the best Patient outcomes, especially in complex cases which may require orbital exenteration to prevent recurrence.

Discussion

Pathophysiology

Although the exact etiology of BCC is unknown, there exists a well-established relationship between BCC and the Pilo-sebaceous unit and it is currently thought to originate from pluri-potential cells in the basal layer of the epidermis or the follicle. The patched/hedgehog intracellular signaling pathway plays a central role in both sporadic BCCs and nevoid BCC syndrome (Gorlin syndrome). The sonic hedgehog protein is the most relevant to Basal cell carcinoma; nevertheless, the Patched (PTCH) protein receptor is the ligand-binding component of the hedgehog receptor complex in the cell membrane. The UV-specific nucleotide changes in the tumor suppressor genes, TP53 and mutations in PTCH1, have also been implicated in the development of Basal cell carcinoma[8].

Basal cell carcinoma is the most common skin cancer globally and recurrence represents a notable clinical challenge, especially when it occurs in anatomically sensitive areas such as the periocular region. Recurrences typically arise from incomplete surgical excision, aggressive histological subtypes or tumor localization within high-risk anatomical sites, particularly the medial canthus[9-11]. Although systemic complications from BCC

are relatively uncommon, they can develop if the tumor invades deeper tissues or adjacent anatomical structures. Perineural invasion, while more characteristic of squamous cell carcinoma (SCC), can also occur in aggressive subtypes of BCC and is associated with higher recurrence and morbidity rates[12]. Genetic mutations affecting the PTCH1 gene within the Hedgehog signaling pathway play a pivotal role in BCC pathogenesis, particularly in genetic conditions such as Gorlin syndrome. These genetic alterations lead to uncontrolled cell proliferation, increasing susceptibility to recurrent lesions. Risk factors have a causative role in the susceptibility of Basal cell carcinoma.

Several established risk factors contribute significantly to the development and recurrence of BCC. These include chronic Ultraviolet radiation exposure, fair skin phenotype, older age, male sex, history of prior skin cancers, immunosuppression, exposure to ionizing radiation, genetic predispositions such as Gorlin syndrome and aggressive histologic subtypes. Positive surgical margins, inadequate postoperative follow-up and patient noncompliance further elevate recurrence risk. An accurate diagnosis of BCC involves conducting a clinical evaluation and dermatoscopy followed by confirmatory testing with a biopsy. A classic presentation of BCC is a smooth, shiny bump with arborizing telangiectasias on the surface and pearly borders that appear rolled. This unique appearance of BCC allows for a clinical evaluation to be made. To help clinicians further distinguish BCC from other skin lesions, dermatoscopy can also be performed. This non-invasive technique can showcase the dermatoscopic features of BCC, including small erosions, blue-gray ovoid nests and arborizing vessels[13]. Therefore, dermatoscopy can help facilitate an accurate diagnosis of BCC. To confirm the clinical diagnosis, a biopsy of the skin lesion is performed. Histopathological examination assesses for key characteristics and growth patterns of BCC, which aids in both confirming the clinical evaluation and diagnosing the suspected skin lesion. **(Figure 4)** shows the histopathological characteristics of BCC which includes groups of basaloid cells and peripheral palisading of tumor nuclei, retraction artifacts and mucin deposition are also common findings in slides.

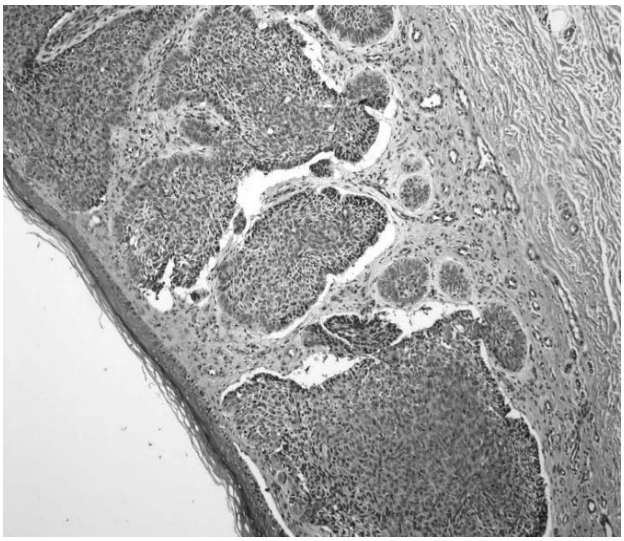

Figure 4: Peripheral palisading of tumor nuclei, groups of basaloid cells.

What is the overall Rate of Recurrence?

The rate of recurrence of BCC can be greatly influenced by treatment modality. As highlighted in a study supported by the American Society for Dermatologic Surgery, for primary BCC, Mohs surgery has a 5-year recurrence rate of 1.0%, while non-Mohs surgery methods have a 5-year recurrence rate of 8.7%. Additionally, standard surgical excision has a 5-year recurrence rate of 10.1%. Curettage and electrodesiccation have a 5-year recurrence rate of 7.7% and radiation therapy and cryosurgery have 5-year recurrence rates of 8.7% and 7.5%, respectively[14].

Associations between diet and Bcc

There are various studies that have explored dietary components that may contribute to the development of BCC. In a nested case-control study conducted by Leone A et al., the greatest adherence to the Mediterranean diet was associated with a 72% relative reduction in the odds of BCC. Adherence to the Dietary Approaches to Stop Hypertension diet was associated with a 68% relative reduction in the odds of BCC. In this study, it was also found that greater intake of fruit and low-fat dairy products was associated with a reduced risk of BCC[15]. The association between these dietary patterns and the lower risk of BCC could be influenced by polyphenols present in plant-derived foods. The photo-protective effects of these bioactive compounds may contribute to the inhibition of carcinogenesis[16]. Additionally, in a systematic review of epidemiological studies conducted by Hezaveh E, et al., it was reported that greater consumption of folate, citrus and alcohol corresponded to a higher risk of BCC. It was also found in this study that caffeine consumption was associated with a reduced risk of BCC[17]. Although these findings suggest that there are certain dietary components that can either protect against or potentially contribute to the risk of BCC, further studies need to be conducted to better understand definitive, causal relationships and specific dietary factors that may be involved in modulating the risk of BCC. Results gathered from a prospective study done in men identified that a diet of monounsaturated fat was associated with a lower risk of BCC, saturated and polyunsaturated fat were not associated with BCC risk. Folate intake was associated with a slightly higher risk of BCC with (RR: 1.19), whereas α-carotene was associated with a slightly lower risk (RR: 0.88). Intakes of long-chain n-3 fatty acids, retinol, vitamin C, vitamin D or vitamin E were not materially related to BCC risk[18].

Conclusion

A recurrent tumor may require larger resections and if a tumor in this region invades the ocular muscles or post septal space, exenteration is usually the only option to prevent the tumor from invading the sinuses and brain[19]. Exenteration is the complete surgical removal of the contents of a bodily cavity, especially the eye socket, usually in cases of malignant cancer. Taking a comprehensive medical history is pertinent prior to these surgeries such as this case study where the patient has a complex cardiac history. Therefore, on consultation with the cardiology registrar, the patient was advised to have his cardiac pacemaker device fitted weeks prior to having his surgery for BCC removal. A collaborative multidisciplinary approach between the tertiary care physicians; oculoplastic surgeon, dermatologist and primary care physician increases greater chance of success in these surgeries.

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Conflicts of Interest

The authors declare no conflicts of interest.

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