Penile basal cell carcinoma in a black kidney transplant recipient

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Key words: cutaneous oncology; human papilloma virus; transplant dermatology.

INTRODUCTION

Basal cell carcinoma (BCC) is uncommon in the black population with a reported incidence of 9 cases per 100,000 persons per year. Penile BCC is rare with only 27 cases described in the literature. When compared with immunocompetent patients, BCC is 3 times less frequently diagnosed than squamous cell carcinoma (SCC) in organ transplant recipients (OTRs). The ratio of BCC to SCC in nonwhite OTRs is reported to be even lower at 1:4.5.[1] We present a case of BCC on the penile shaft in a black male kidney transplant recipient (KTR). To our knowledge, this is the second reported case of penile BCC in a black patient and the first in an immunosuppressed organ transplant patient.

Abbreviations used:

BCC:	basal cell carcinoma
HPV:	human papillomavirus
KTR:	kidney transplant recipient
NMSC:	nonmelanoma skin cancer
OTR:	organ transplant recipient
SCC:	squamous cell carcinoma

CASE PRESENTATION

A 62-year-old circumcised black male with a history of kidney transplantation in 2015 presented to our transplant dermatology center for routine posttransplant skin cancer screening. The patient's immunosuppressive regimen included tacrolimus and mycophenolic acid, which he had been taking continuously for 2 years. He reported a history significant for condyloma acuminata and an unspecified sexually transmitted infection during his youth, which was treated with tetracycline. The patient denied a personal or family history of skin cancer.

Physical examination found a 0.5- × 0.3-cm hyperpigmented, verrucous papule on the dorsal penile shaft (Fig 1) and a 0.4- × 0.3-cm hyperkeratotic, verrucous papule on the anterior scrotum. He reported Fitzpatrick type V skin, and his examination did not show signs of excessive sun damage. Skin biopsy findings from the 2 lesions of concern were consistent with pigmented superficial BCC on the penile shaft (Fig 2) and condyloma acuminatum on the anterior scrotum. Human papillomavirus (HPV) DNA testing for high- (16 of 18 and 31 of 33) and low-risk (6 of 11) subtypes were negative in both lesions.

DISCUSSION

BCC most commonly develops in sun-exposed areas, and known risk factors include ultraviolet light exposure, male gender, age, Caucasian descent, immunosuppression, and previous exposure to radiation.[2] Despite the strong association with ultraviolet light, BCC has been described in non–sun-exposed areas including the axilla and genitalia. Penile BCC, however, is a rare entity with fewer than 30 cases reported in the literature. Most cases have occurred in white individuals with 8 cases reported in skin of color.[3] Penile BCC most commonly presents in the fifth to seventh decades of life and arises on the penile shaft. Among all reported cases, only 2 patients exhibited signs of sun damage, and only one had direct sun exposure to the penis, suggesting other possible risk factors such as circumcision, phimosis, trauma, HPV infection, and chronic dermatitis.[4]

This case is unusual in that this penile BCC developed in an immunosuppressed black OTR. It

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Funding sources: None.
Conflicts of interest: None disclosed.

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JAAD Case Reports 2018;4:969-71.
2352-5126

https://doi.org/10.1016/j.jdcr.2018.05.019

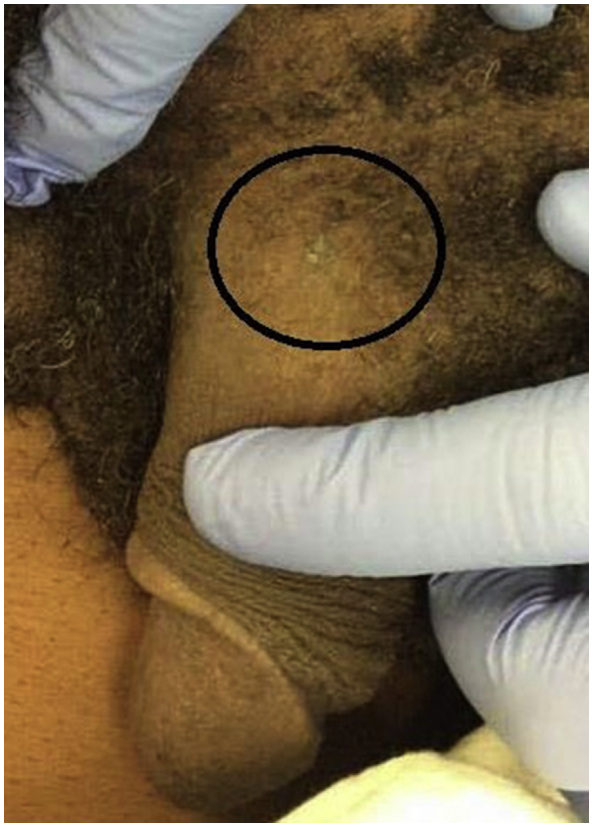

Fig 1. A 0.5- × 0.3-cm hyperpigmented, verrucous papule on the dorsal penile shaft.

is, in fact, well established that SCC is the most common skin cancer found in both the immunocompetent and immunosuppressed black population.[2] More than half of BCCs in blacks are pigmented, and this morphology can make it difficult to differentiate BCCs in nonwhite patients from seborrheic keratosis, Bowen disease, and malignant melanoma.[5] Our patient's lesion was both pigmented and verrucous in appearance, resembling either condyloma acuminatum or SCC in situ.

We hypothesize that immunosuppression secondary to kidney transplantation contributed significantly to the development of our patient's penile BCC. OTRs have a higher risk of nonmelanoma skin cancer (NMSC) development, and this risk increases with the duration of immunosuppression.[6] The relative risk of skin cancer in KTRs is reported to peak 6 years posttransplant in patients who underwent transplant at 50 years of age or older compared with 10 to 12 years in those patients who underwent transplant at a younger age.[7] Although the incidence of SCC is greater than that of BCC after transplantation, one report examining approximately 1000 KTRs over a 28-year period found that the relative risk of BCC increased linearly

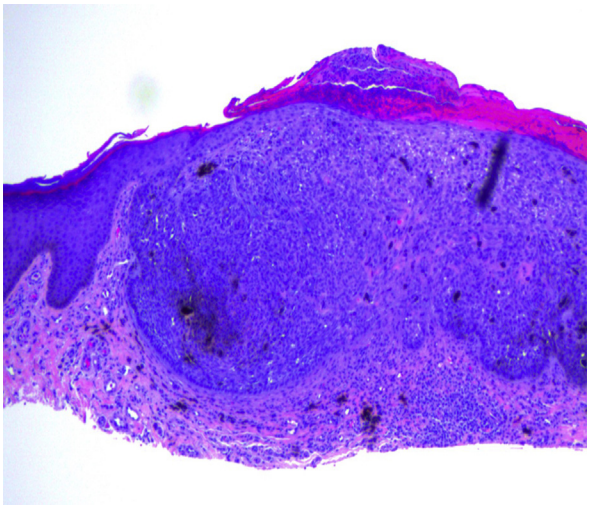

Fig 2. Islands and strands of atypical basaloid cells with a large amount of melanin pigment associated with the tumor. (Hematoxylin-eosin stain; original magnification: ×5.)

after transplantation compared with that of SCC, the relative risk of which increased exponentially.[8] This difference may explain the development of BCC as opposed to SCC in our patient, which is more common in both the black and immunosuppressed transplant populations.

Interestingly, our patient's penile BCC developed on a background of condyloma acuminatum, as he simultaneously had a biopsy-proven genital wart diagnosed on his scrotum. OTRs are at a higher risk of condyloma acuminatum due to immunosuppressive therapy, with the incidence ranging from 24% to 53% of patients. HPV infection has been associated with an increased risk of SCC development, especially in immunocompromised individuals. However, an association between HPV and BCC has not been clearly established. Although α-HPV strains are most often associated with cutaneous malignancy, a role for β-HPV subtypes in the development of NMSC has been studied. Zakrzewska et al[9] reported that 70% of BCCs in their cohort showed β-HPV positivity in lesional and perilesional skin but were negative for both high- and low-risk α-HPV strains and for genotype testing for the 28 most common mucosal and genital HPV subtypes. In their BCC samples, β-HPV 5, 8, 24, and 93 were most frequently identified and were found in 41% of lesions.[9] Furthermore, a recent study by Han et al[10] found the overall prevalence of genital HPV infection among 18- to 59-year old men in the United States to be 45.2% and the prevalence of infection with at least 1 high-risk subtype to be 25.1%. The investigators tested for 14 high-risk HPV subtypes and did not include testing for β-HPV subtypes. By contrast, laboratories in the United

States routinely screen for only the 4 most common high-risk HPV strains. As such, despite negative HPV DNA testing in our patient, we cannot fully exclude the involvement of HPV infection in the development of this case of penile BCC.

CONCLUSION

Penile BCC is a rare entity with an unclear etiology. The incidence of both NMSC and HPV is increased in OTRs, and cutaneous genital malignancy occurs at higher rates in nonwhite transplant patients. We suggest the possibility of HPV-associated oncogenesis of penile BCC. Further studies to elucidate the pathogenesis and risk factors for genital BCC are warranted. Skin cancer screenings in OTRs should include thorough genital examination, particularly in the nonwhite transplant population.

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