

A Rare Squamous Cell Carcinoma Lesion In The Plantar Foot

Kyle Durfey, DPM, PGY-3*, Brian Hiapo, DPM, PGY-3*, Timothy Short, DPM, FACFAS**, John Powers, DPM, FACFAS**



Introduction

Cutaneous squamous cell carcinoma (SCC) is a proliferation of keratinocytes of the epidermis that invades into dermis or beyond. The treatment of SCC is important to prevent progression or local tissue metastasis and destruction. Early treatment is the best opportunity for possible cure.

A 76 year old African American female presented to the clinic with the chief complaint of excruciating 9/10 pain to the left foot due to a large growth. The patient reported pain with weight bearing to the left foot secondary to that growth. She reports that the lesion has steadily increased in size and she began treating it with over the counter ointment for the past 4 months. The patient thought the lesion was a wart and that it would go away with home care but it continued to grow and her pain worsened. The patient had been seen 5 years early for an injury to the area with a previous scar. Physical exam showed palpable 2/4 pulses, diminished protective sensation to her toes and a large cauliflower/verrucous mass with hemorrhagic changes to the plantar foot sub 5th metatarsal area. The mass was painful upon palpation. The patient elected and consented for surgical excision for further diagnosis.



Figure 1: Initial clinical exam



Figure 2: Hyperkeratosis, cauliflower lesion plantar 5th metatarsal base

Histological differences between low-grade and high-grade SCC.

Low-Grade SCC

Well to moderately differentiated: intercellular bridges and keratin pearls
Tumor cells arranged in solid or sheet-like patterns
Association with solar damage and precursor actinic keratosis
Diameter less than 2 cm
Depth less than 2 mm

High-Grade SCC

Poorly differentiated: clear-cell, sarcomatoid, or single cell features
Presence of infiltrating individual tumor cells
Arising *de novo* or in site of prior injury (ulcer, burn scar, or osteomyelitis)
Perineural and/or perivascular invasion
Diameter greater than 2 cm
Depth greater than 2 mm

Figure 3: Histological comparison of Low grade and High grade SCC

Surgical Excision

The primary treatment is complete removal of the primary tumor to prevent further progression. Removal can be obtained from surgical excision, curettage, cryotherapy, photodynamic therapy, or radiation therapy if the patient is a non-surgical candidate. It's recommended to surgically excise all primary tumors as first line of treatment. A prospective study of 111 patients with 141 primary invasive SCCs excised using Mohs surgery found that a margin of 4 mm cleared 95 percent of low-risk tumors, whereas a margin ≥ 6 mm was required to clear 95 percent of tumors with high-risk features

Using sharp dissection the entire lesion was excised of all superficial and protruding tissue and collected in specimen container for pathology. After all superficial borders were removed attempt was made to excise all margins extending deep into the musculature and boney level of the foot. The lesion was excised and attempts were made to keep the lesion intact but due to the nature of the lesion many parts broke apart. The underlying mass extended through the subcutaneous and muscle layers of the foot and was found to extend to the 4th and 5th metatarsals. The entire wound was further sharply debrided of all tissue in resemblance of the tan appearance and fibrotic changes and collected for pathology. The 4th and 5th metatarsals that were exposed were evaluated and a bone biopsy was deemed necessary to ensure clean margins. It is prudent to utilize a primary or delayed closure to allow for further excision pending pathology results. The wound was left open and packed until further pathology reports returned.

Pathology

After 2 days a pathology report indicated Invasive Keratinizing Squamous Cell Carcinoma (IKSCC) and was immediately reported to the surgeon. The full report indicated: "Left foot lesion of hyperkeratotic verrucous skin measuring 4.5 cm x 4.0 cm x 2.0 cm with ill defined margins due to the amount of disruption. The fragmented nature of the specimen does not allow for assessment of the margin or depth of invasion." Invasive SCCs have dysplastic keratinocytes involving the full thickness of the epidermis that can penetrate the epidermal basement membrane, the dermis or deeper tissues. Cutaneous SCCs contain atypical keratinocytes that are enlarged with abundant amounts of cytoplasm.

Discussion

SCC can develop on any cutaneous surface, including the head, neck, trunk, extremities or oral mucosa but 55% of all lesions are found in the head and neck. In a cohort of 145 patients with SCC in Australia, the distribution was less than 4% found in the lower extremity. Many lesions are found on areas exposed to sunlight or UV light. The plantar midfoot is a very uncommon location. Lesions that develop in relation to chronic scarring processes account for 20 to 40 percent of SCCs in black patients. Blacks, dark-skinned Asians, and other people with skin of color have low reported rates of cutaneous SCC. Individuals with a family history of SCC may have an increased risk for developing the disorder. In a cohort study of more than 11 million individuals in Sweden that included 3867 cases of invasive SCCs, subjects with a sibling or parent who had a history of invasive SCC were two to three times as likely to develop the same diagnosis. The clinical appearance of invasive SCC often correlates with the level of tumor differentiation. It's important to remember the TNM staging criteria including: depth, size, node involvement and metastasis in order to properly determine prognosis. SCC in the skin has a metastatic rate of 3% to 4%.

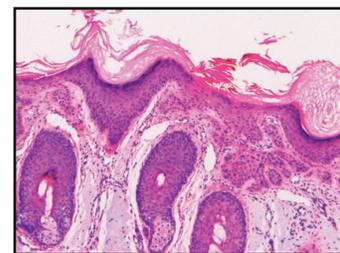


Figure 4: Superficially invasive squamous cell carcinoma (SCC). These lesions often do not show the marked pleomorphism and atypical nuclei of in situ squamous cell carcinoma, but demonstrate early keratinocyte invasion of the dermis (150x).

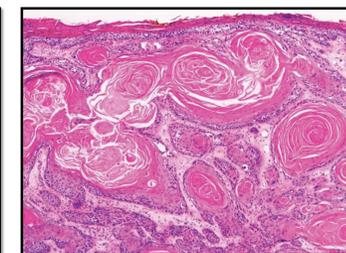


Figure 5: Invasive squamous cell carcinoma (SCC). Well-differentiated lesions show prominent keratinization and may form "pearl-like" structures where dermal nests of keratinocytes attempt to mature in a layered fashion (40x).

Conclusion

Certain features of a lesion are higher risk for spreading including: Greater than 2mm thickness, Invasion into dermis, Invasion into nerves and location. After the TNM components and risk factors have been established the SCC lesion is assigned to one of five SCC stages. In this report our lesion was a Stage II because it was greater than 2cm but had no lymph node involvement.

The margins of the the tumor were completely excised and the patient healed the tumor site within 8 weeks post operatively. The patient was referred to oncology for appropriate work up after SCC diagnosis but no further oncological treatment was needed.

This patient was followed for over 13 months without any additional complications. SCC is an uncommon foot and ankle lesion but it may present when family history, previous scar site or ethnicity may increase the likelihood of a diagnosis in the foot an ankle. Skin lesions are common ailments treated by the foot and ankle surgeon. Most skin lesions are benign and are treated in an office setting. Occasionally a rare skin lesion is found and proper treatment is needed to ensure healing without complications or morbidity.

- **Stage 0 squamous cell carcinoma:** Also called carcinoma in situ, cancer discovered in this stage is only present in the epidermis (upper layer of the skin) and has not spread deeper to the dermis.
- **Stage I squamous cell carcinoma:** The cancer is less than 2 centimeters, about 4/5 of an inch across, has not spread to nearby lymph nodes or organs, and has one or fewer high-risk features.
- **Stage II squamous cell carcinoma:** The cancer is larger than 2 centimeters across, and has not spread to nearby organs or lymph nodes, or a tumor of any size with 2 or more high risk features.
- **Stage III squamous cell carcinoma:** The cancer has spread into facial bones or 1 nearby lymph node, but not to other organs.
- **Stage IV squamous cell carcinoma:** The cancer can be any size and has spread (metastasized) to 1 or more lymph nodes which are larger than 3 cm and may have spread to bones or other organs in the body.

Figure 6: Squamous Cell Carcinoma Staging

References

- Yanofsky, V. R., Mercer, S. E., & Phelps, R. G. (2011). Histopathological Variants of Cutaneous Squamous Cell Carcinoma: A Review. *Journal of Skin Cancer*, 2011, 1-13. doi:10.1155/2011/210813
- Mantovani, A., Teobaldi, I., Stoico, V., Perrone, F., Zamoni, M., Cima, L., ... Borrona, E. (2018). Cutaneous squamous carcinoma in a patient with diabetic foot: An unusual evolution of a frequent complication. *Endocrinology, Diabetes & Metabolism Case Reports*, 2018. doi:10.1530/edm-18-0065
- Kogawa, T., Ohe, S., Yamazaki, F., Okamoto, H., & Kiyohara, T. (2017). Extracutaneous squamous carcinoma accompanied by invasive squamous cell carcinoma: The first case report and consideration of histogenesis. *The Journal of Dermatology*, 45(4), 501-504. doi:10.1111/1346-8138.14196
- Sedberry, S., Gazea, M., Zeline, E., & Vyas, S. (2018). Rare presentation of squamous cell carcinoma of the Foot in a noncompliant HIV patient. *Wounds*, 30(7), July 2018, E68-E70. Retrieved November 5, 2018.
- Stralagos, A., Garbe, C., Lebbe, C., Malvehy, J., Marmol, V. D., Pehamberger, H., ... Grob, J. (2015). Diagnosis and treatment of invasive squamous cell carcinoma of the skin: European consensus-based interdisciplinary guideline. *European Journal of Cancer*, 51(14), 1969-2007. doi:10.1016/j.ejca.2015.06.110
- Yanofsky, V. R., Mercer, S. E., & Phelps, R. G. (2011). Histopathological Variants of Cutaneous Squamous Cell Carcinoma: A Review. *Journal of Skin Cancer*, 2011, 1-13. doi:10.1155/2011/210813
- Jackson, B. A. (2009). Skin Cancer in Skin of Color. *Skin Cancer Management*, 217-223. doi:10.1007/978-0-387-88495-0_16
- Mora, R. G., & Pernicaro, C. (1981). Cancer of the skin in blacks. I. A review of 163 black patients with cutaneous squamous cell carcinoma. *Journal of the American Academy of Dermatology*, 5(5), 535-543. doi:10.1016/0190-9622(81)70113-0
- Asgari, M. M., Warton, E. M., & Whittimore, A. S. (2015). Family History of Skin Cancer Is Associated With Increased Risk of Cutaneous Squamous Cell Carcinoma. *Dermatologic Surgery*, 41(4), 481-486. doi:10.1097/dss.0000000000000292
- Bernstein SC, Lim KK, Brodland DG, Heidelberg KA. The many faces of squamous cell carcinoma. *Dermatologic Surgery*. 1996;22(3):243-254.
- Lohmann CM, Solomon AR. Clinicopathologic variants of cutaneous squamous cell carcinoma. *Advances in Anatomic Pathology*. 2001;8(1):27-36.
- Squamous Cell Carcinoma Stages | CTCA. (0001, January 01). Retrieved from <https://www.cancercenter.com/skin-cancer/stages/tab/squamous-cell-carcinoma-stages>

Acknowledgements

This material is the result of work supported with the resources or facilities at the Southern Arizona VA Health Care System
*3rd year Resident at the Southern Arizona VA Health Care System
**Attending at Northwest Allied Foot and ankle
The Authors have no conflicts of interest to declare