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Case Report

Verrucous Squamous Cell Carcinoma of the Finger: A Diagnostic and Therapeutic Challenge in a Young Patient

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Abstract

We report the case of a 39-year-old female patient with no significant medical history who presented with a verrucous lesion on the right index finger, initially diagnosed as a viral wart. Following multiple local recurrences, a biopsy confirmed a well-differentiated squamous cell carcinoma. Due to the high risk of recurrence and the critical location, treatment options were discussed in an interdisciplinary tumor board. Although Mohs micrographic surgery was considered, it was unavailable at the time, leading to amputation of the affected finger. Pathological analysis confirmed an invasive acanthotic verrucous carcinoma of Ackerman, without perineural or lymphovascular invasion, and with clear surgical margins. Despite the favorable prognosis, the tumor's size and location increase the risk of local recurrence, emphasizing the need for close follow-up and adjuvant radiotherapy. Nicotinamide is also recommended to reduce the risk of new lesions, along with sun protection, self-examination, and regular dermatological evaluations.

Keywords: case report; verrucous squamous cell carcinoma; surgery; adjuvant therapy in squamous carcinoma

Introduction

Verrucous carcinoma is an uncommon, low-grade variant of squamous cell carcinoma that typically occurs in the oropharynx, genitalia, or feet, although it can also develop in other areas of the skin or mucosa. Depending on its anatomical location, it is referred to by different names, such as Ackerman tumor (in the oropharynx), Buschke-Loewenstein tumor (in the genitalia), epithelioma cuniculatum (in the feet), and papillomatosis cutis (or cutaneous papilloma) [1,2].

In 1941, Friedell and Rosenthal reported eight cases of squamous cell carcinoma (SCC) in the buccal mucosa and alveolar ridge of men around 60 years old, all with a history of tobacco chewing. These papillary lesions with a verrucous appearance were considered pathognomonic. In 1948, Lauren Ackerman coined the term "verrucous carcinoma" and defined this entity as a specific variant of squamous cell carcinoma after studying 31 cases affecting the oral cavity. Later, in 1954, Aird et al. described epithelioma cuniculatum on the plantar surface. Outside these anatomical locations—palmoplantar, oral mucosa, and anogenital mucosa—verrucous carcinoma is rare, with facial involvement being particularly exceptional [1].

Verrucous carcinoma is considered a rare form of well-differentiated squamous cell carcinoma, characterized by a low mitotic index, a tendency for recurrence, and local invasion capacity, but with a low potential for metastasis [3].

The pathogenesis of verrucous carcinoma is still not fully understood. However, repeated microtrauma, chronic inflammatory processes (osteomyelitis, fistulas, ulcers, scars, necrobiosis lipoidica), and viruses (especially HPV-6 and HPV-11) are involved in the development of this type of cancer. Advances in molecular biology have suggested that human papillomavirus (HPV) may play a role in its development. Several types of HPV have been associated with both warts and squamous cell carcinomas, including "low-risk" types 1-4, 6, and 11, and "high-risk" types 16 and 18 [4,5]. Several risk factors for oropharyngeal verrucous carcinoma are known, including smoking and alcohol consumption [6].

This low-grade squamous cell carcinoma predominantly affects men and can occur across a wide age range, from 18 to 86 years, being most common in the sixth or seventh decade of life [2].

The histological diagnosis of verrucous carcinoma is challenging due to its benign cellular appearance. Differential diagnoses include viral warts, condyloma acuminatum, keratoacanthoma, and pseudocarcinomatous hyperplasia. The final diagnosis relies more on clinical and architectural features rather than cytological details. This tumor of keratinocytes presents with blunt projections of well-differentiated epithelium, supported by an edematous stroma with chronic inflammation, and forms keratin-filled cysts. The cells show minimal dysplasia and a benign cytological appearance [4,7].

In this report, we will describe a clinical case that presents exceptional characteristics, highlighting distinguishing factors such as its unusual location, clinical progression, and treatment. This case not only exemplifies the initial diagnostic challenges but also underscores the importance of a multidisciplinary approach and appropriate follow-up to prevent recurrences.

Case Presentation

A 39-year-old female patient, with no significant personal or family medical history, presented to the clinic with a lesion on the right index finger, initially diagnosed as a viral wart. Electrocoagulation treatment was performed, and the patient was placed under follow-up.

In the following months, the patient experienced multiple local recurrences, leading to a decision to perform a biopsy of the lesion, which measured 30 x 40 mm at that time. Histopathological examination revealed a well-differentiated squamous cell carcinoma. The case was discussed in a multidisciplinary tumor board, where Mohs micrographic surgery was proposed. However, this option was unavailable at the center, prompting consideration of alternative strategies.

Due to disease progression and the unavailability of Mohs surgery, a new surgical intervention was performed, resulting in the amputation of the affected index finger. Postoperative histopathological analysis confirmed the presence of invasive acanthotic verrucous carcinoma, characterized by well-differentiated epithelial proliferation, acanthosis, hyperkeratosis, and exophytic verrucous growths measuring 28 x 39 mm. Surgical margins were reported to be tumor-free, with the closest margin being 10 mm.

Further analysis showed no perineural or lymphovascular invasion, although a stromal inflammatory reaction composed of lymphocytes and plasma cells was observed. The low mitotic index suggested slow tumor growth.

Given the risk of local recurrence, adjuvant radiotherapy was recommended to maximize local disease control.

Discussion:

Aging is well known to be one of the main risk factors associated with most neoplasms. However, in this case, the patient was only 39 years old at the time of diagnosis, which is notable, as the incidence of non-melanoma skin cancers typically increases progressively with age. Furthermore, the patient lacked common predisposing factors such as prolonged ultraviolet radiation exposure, a history of immunosuppression, or a family history of skin cancer, making this case particularly unusual in a young person without these typical risk factors [2,8].

The location of the lesion on the right index finger is a notable aspect of this case, given that verrucous carcinoma most frequently appears in areas with high sun exposure, such as the head, neck, lower extremities, or in mucosal areas like the oral cavity or the anogenital region [2,8]. The location on the hand, a functionally important area, presents both diagnostic and therapeutic challenges. In fact, only 16 cases of verrucous carcinoma on the hands have been reported in the world literature, highlighting the importance of considering this diagnosis in lesions that do not respond to conventional treatments, as occurred in this case [9].

Similarly, the location on the finger led to a delayed diagnosis. As in the case reported by Narayana and Sandhya, in which a 62-year-old patient presented with a chronic lesion on the finger, our case was also characterized by a delay in diagnosis due to the initial confusion with a viral wart. Both cases highlight the need for early biopsy in verrucous lesions that persist or recur after treatment, to avoid a delayed diagnosis of verrucous carcinoma [9]. Verrucous lesions in this area are often interpreted as benign, as was initially the case with this patient, who was mistakenly diagnosed with a viral wart. This underscores the importance of considering an early biopsy in recurrent or treatment-resistant skin lesions, especially when they do not respond to usual interventions [8,10].

Given that this was a well-differentiated squamous cell carcinoma, larger than 20 mm, and located on the hand, the lesion was classified as high-risk. The primary goals of treatment were to ensure complete tumor excision, preserve aesthetics, and prevent metastasis. The case was discussed in a multidisciplinary tumor board, where several surgical options were considered. Alternatives such as Mohs micrographic surgery or wide local excision with peripheral and deep margin evaluation were recommended. Since Mohs surgery was not available, conventional surgery was performed [10-12].

Postoperative histopathological analysis confirmed the presence of invasive acanthotic verrucous carcinoma, with acanthosis, hyperkeratosis, and verrucous exophytic growths. Fortunately, no perineural or lymphovascular invasion was observed, which reduces the risk of distant metastasis, although the low mitotic index suggests relatively slow tumor growth. Tumor-free surgical margins were reported, with the closest margin being 10 mm, a positive prognostic factor. In cases such as this, adjuvant radiotherapy is recommended to maximize local disease control and minimize the risk of recurrence [2,13,14].

Among the limitations of the study is the fact that it involves a single case, which limits the generalization of the findings. Although this case provides a valuable example of the diagnostic and therapeutic challenges in an unusual location of verrucous carcinoma, the results and therapeutic decisions may not be representative of all patients with similar lesions.

Despite the generally favorable prognosis of squamous cell carcinoma, this patient presents several factors that increase the risk of recurrence, such as the location on the hand, the tumor size greater than 20 mm, and the acanthotic verrucous histological subtype. Although the tumor was well-differentiated and no perineural or lymphovascular invasion was observed, the combination of these factors—particularly the location and size—confers a high risk of local recurrence. This underscores the importance of close and prolonged follow-up [2,15].

Conclusion:

Squamous cell carcinoma is common in areas with high sun exposure, but its occurrence on the hands, as in this case, is less frequent. Risk factors such as tumor size and location increase the likelihood of recurrence, emphasizing the need for close follow-up. Adequate surgical treatment and the administration of nicotinamide may help reduce the risk of new lesions. Sun protection, self-examination, and regular dermatological check-ups are essential to prevent recurrences.

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