Squamous Cell Carcinoma with Co-infection of Microsphaeropsis arundinis and Geotrichum candidum: A Rare Case Report

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Introduction

Squamous cell carcinoma (SCC) is a cancer arising from the proliferation of epidermal keratinocytes. It is the second most common skin cancer after basal cell carcinoma (BCC); however, its incidence is relatively rare on the feet, heels, and other areas that are not exposed to sunlight [1]. SCC accounts for approximately 20% of skin malignancies and 75% of all skin cancer deaths, excluding melanoma [2]. Verrucous carcinoma is a variant of SCC with deep invasion of the underlying local structures [3]. Verrucous carcinoma rarely metastasizes but can be locally invasive and destructive. If left untreated, Lesions can significantly enlarge. This carcinoma in the plantar area can be irregular, well-defined, verrucous, and is also known as epithelioma cuniculatum. Management is usually palliative and includes extensive and aggressive tumor resection [4].

Microsphaeropsis arundinis is a dematiaceous anamorphic fungus found in soil and freshwater. M. arundinis (fungi imperfecti) is a coelomycete that includes a new group of pathogens capable of causing soft tissue infections, mostly in immunocompromised human patients. The fungus usually penetrates the subcutis through trauma. The first reports of these organisms occurred more than 10 years ago [5]. Geotrichum candidum (teleomorph: Galactomyces candidus) is a dimorphic, ascomycetous species of the class Saccharomycetes. G. candidum is a commensal organism that can colonize one of them on the skin [6]. We report a case of a 46-year-old female patient with verrucous SCC with co-infection of M. arundinis and G. candidum that can lead to misdiagnosis and was treated with excision and subsequent referral to the orthopedic department.

Case Report

A 46-year-old female patient went to a dermatologist with complaints of mass and wound on the second and third fingers of the right foot for the past year. Initially, the patient had a history of moist feet that was covered by a white membrane. An enlarging mass that easily bled then appeared along with intermittent pruritus. The patient experienced pain especially if the lesion experienced friction. There is no history of fever and trauma.
On physical examination, vital signs were within normal limits, and no enlarged lymphadenopathy was observed. On the 2nd, 3rd, and 4th digits of the right foot, we found hyperpigmented verrucous nodule with the approximate size of 2.5 cm × 3 cm. Hyperpigmented plaque with thickness at around 2 cm was also found along with ulcers and crust (Figure 1). Dermoscopy found keratin/squama, blood spots, white structureless areas, and ulcerations (Figure 2).

The patient was suspected with a diagnosis of SCC accompanied by a fungal infection, so histopathological examination and fungal cultures were performed. On histopathological examination, the conclusion that SCC is well differentiated (Figure 3). Fungal culture found M. arundinis and G. candidum (Figure 4). The patient was then referred to the orthopedic surgery department because of suspicion of bone invasion and surgical excision, as well as amputation, were performed.

Discussion

SCC is the second most common skin cancer after BCC. The incidence of SCC continues to increase worldwide, with a reported increase of 50–200% over the past 3 decades. The incidence of SCC increases with age and is more likely to develop in chronically injured skin, including chronic ulcers, burn scars, and radiation dermatitis. Chronic inflammatory disorders of the skin and mucosal tissue can also predispose to SCC [7].

Around 1% of skin cancers arise in chronically inflamed skin (e.g., burn scars, chronic ulcers, sinuses,
Verrucous carcinoma is a rare variant of SCC. Locations in the intertriginous region of the foot and bone invasion are rare. The etiology of verrucous carcinoma remains unclear, but as it can develop in areas of chronic inflammation, we suspect the lesion in our case is due to continuous maceration [8]. Macerated white membrane occurred one year prior that resulted in wound formation and possibly lead to SCC development.

The clinical manifestation of SCC varies and depends on the histologic subtype and the location of the tumor. Typical locations of verrucous SCC include the oral cavity, the genitoanal area, the plantar area, commonly referred to as the epithelioma cuniculatum [7]. The location of verrucous carcinoma in the interdigital is still very rare [8]. Dermoscopy examination was typical for invasive SCC, where we found keratin/scale, blood spots, white circles, white structureless areas, hairpin, and linear-irregular vessels, perivascular white halos, ulceration. Keratin/squamata is a strong predictor of well-differentiated and moderately differentiated SCC, whereas the presence of blood vessels in more than half of the tumor surface with a diffuse distribution of blood vessels and bleeding was a predictor of poorly differentiated SCC [2].

The diagnosis of SCC was confirmed histologically. The superficial verrucous resembles a verruca with parakeratosis, acanthosis, and prominent stratum granulosum [7]. Histopathology of epithelioma cuniculatum showed hyperkeratosis, acanthosis with undulations, keratinization, well-differentiated squamous epithelium [2].

Interestingly, in our case, there was also the presence of fungal growth in culture that can lead to misdiagnosis. This was mentioned in a case report that found Candida parapsilosis in a SCC patient [9]. In addition, another case report mentioned seven patients. With SCC due to chronic chromoblastomycosis. The malignant lesions occurred independent of the antifungal therapy and all patients underwent curative amputation [10]. M. arundinis is a rare fungal infection in humans, and there have only been eight cases previously described in the literature. The clinical manifestations of M. arundinis are described in the literature as crusted indurated plaques that can be mistaken for other conditions such as SCC. Management of M. arundinis infection includes surgical excision, thermotherapy, and antifungal drugs including terbinafine, amphotericin, and azole antifungal treatment, such as itraconazole, posaconazole, and voriconazole [11]. There is still limited references regarding M. arundinis colonization in SCC lesions.

Geotrichum is a species of fungus that can be found in the environment and is abundant in soil, water, and in the air. In addition, it is also found in plants and dairy products, it has also been shown to be found in normal human flora (mucus and feces). G. candidum is mostly a saprophyte that can cause a disease called Geotrichosis [12]. G. candidum is a commensal organism that can colonize human skin, tracheobronchial tree, and digestive tract. It is rare to be pathogenic in human and is of low virulence. These organisms are usually acquired through ingestion or inhalation [6]. We have not obtained literature describing the presence of G. candidum in SCC lesions.

The management of SCC is either surgical or non-surgical [7]. This patient was consulted to the orthopedic department because of suspicion of bone invasion. In cases with difficult to distinguish borders, amputation may be performed, where complete excision of the tumor rarely results in recurrence [4]. The prognosis for verrucous carcinoma is generally good but local invasiveness and metastatic potential can occur [1].

**Conclusion**

The co-infection of M. arundinis and G. candidum in a patient diagnosed with SCC is a rare case and can lead to misdiagnosis. We hypothesize that the SCC lesion arose due to chronic inflammation caused by maceration. Treatment in this patient includes surgical excision and subsequent amputation.

**References**


