We present a case of verrucous carcinoma of the foot in a 34-year-old man. This is a rare, locally invasive, well-differentiated, low-grade squamous cell carcinoma, with human papilloma virus as a possible causative agent. It follows a chronic course and mimics a variety of skin lesions, delaying diagnosis by up to 15 years. The definitive diagnosis is made histologically, and treatment by wide local excision is recommended. Our patient underwent wide local excision and partial 5th metatarsal amputation because of invasive disease, local infection, and peripheral vascular disease. There were no postoperative complications. At the 10-year follow-up, there were no signs of tumour recurrence.

Key words: carcinoma, verrucous; foot

INTRODUCTION

Verrucous carcinoma (VC) is a rare, locally invasive, well-differentiated, low-grade squamous cell carcinoma (SCC), with low metastatic potential. It has a variety of different names; each is distinguished by its differing location but represents the same pathological condition.¹ These terms include: epithelioma cuculatum plantare, giant condylomata acuminate of the anorectal region (Buschke-Loewenstein tumour), verrucous carcinoma of the oropharynx, papilloma cutis carcinoids, epithelioid tumour, and cutaneous squamous carcinoma.²–⁴

CASE REPORT

In October 1996, a 34-year-old man presented with a large ulcerating, fungating lesion on the sole of his right foot between the 4th and 5th metatarsals (Fig. 1). The exophytic tumour measured 3x4 cm, was tender to touch and appeared to have invaded deeply. It had an erythematous border and exuded foul-smelling material. The lesion had been present for 2.5 years and the patient had undergone various local treatments at other institutions. Blood chemistry and other standard laboratory tests were normal. The patient had no underlying diabetes or neuropathic skin changes, and radiographs showed no bony

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erosions. A deep incisional biopsy was performed, and histological examination confirmed a VC (Fig. 2). Regional lymph nodes were not enlarged; abdominal ultrasonographs and chest radiographs excluded metastatic spread. Human papilloma virus (HPV) viral typing was not performed.

The patient underwent a wide local excision with a partial 5th metatarsal amputation, as the tumour had expanded beneath the plantar fascia, and the skin condition was compromised by local infection and peripheral vascular disease from smoking. There were no postoperative complications. At the 10-year follow-up, there were no signs of tumour recurrence.

**DISCUSSION**

Verrucous carcinoma is a subtype of a low-grade SCC, not an SCC with a verrucous presentation. The pathogenesis of VC (epithelioma cuniculatum plantare) is unclear, but all arise *de novo* in the weight-bearing areas of the foot. VC has histological similarities to plantar warts, and HPV may be a causative agent. Indeed, the deoxyribonucleic acid of HPV types 6, 11, 16, and 18 have been identified in VC specimens.

VC typically occurs in men in their 4th to 6th decades, although it has been seen in patients as young as 16 years. It follows a chronic course, evolving from a discrete focal lesion to a large fungating deeply penetrating mass. The slow growth and confusing early-stage appearances can lead to delays in diagnosis of 8 to 15 years, and hence under-treatment. Differential diagnoses include viral warts, pseudocarcinomatous hyperplasia, and deep mycosis.

Although the clinical and macroscopic findings can be marked (the formation of a bulky, exophytic mass, which may be ulcerated with numerous sinuses from which foul-smelling purulent keratinous debris is expressed), the definitive diagnosis is made pathohistologically. Specimens exhibit both endophytic and exophytic growth patterns. Proliferations are usually composed of large pale-staining well-differentiated keratinocytes, with the presence of pronounced hyperkeratosis and papillomatosis. Unlike SCC, keratin pearl formation is uncommon. Tumour strands may extend deep into...
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the dermis and subcutis, forming keratin-filled intraepidermal abscesses and sinuses connecting with the surface. These sinus tracts are the ‘rabbit burrow’-like spaces from which epithelioma cuniculatum derives its name. The surrounding stroma may demonstrate an infiltration of lymphocytes, histiocytes, eosinophils, and plasma cells.

VC is a low-grade, locally invasive tumour, which almost never metastasises, and thus has a favourable prognosis. The recommended treatment is wide local excision, rather than marginal excision, as VC often causes a structural distortion of adjacent tissues, and the margins are not always apparent intraoperatively. The residual defect can then be covered with a full thickness skin graft or radial forearm free flap. Other therapeutic modalities include topical chemotherapy, electrocautery, cryotherapy, and laser therapy, but all have high recurrence rates. Mohs microscopically controlled surgery has reported good results for the less invasive VC. Radiotherapy is not recommended, despite being curative in some reports, because of the possibility of malignant change.

Partial (ray or 5th metatarsal) or radical (foot or below-knee) amputations are occasionally required for aggressively invasive disease, and in the presence of poor vascular status, massive skin defects, postoperative deep infections, or in tumour recurrence secondary to incomplete excision.

The long-term prognosis for definitively treated VC is good, with cure rates of up to 99%. Nonetheless, patients should be reviewed annually as recurrence and metastasis remain a possibility.

REFERENCES