Ungual Horn

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Question

A 62-year-old African American male presented to our clinic for evaluation of an exophytic tumor on the right third finger that had been growing for more than 2 years. He denied prior trauma to this finger. Review of systems was negative and he reported feeling well. His only reported past medical history was hypertension.

Physical examination revealed a so-called “ungual horn,” a yellow-brown, hard, exophytic tumor apparent-

ly originating from the nail bed (Fig. 1, 2). The surface of the dorsum of the nail plate was laterally everted, leading to a longitudinal canal akin to an atypical koilonychia. There was minimal tenderness to palpation over the lateral nail fold and hyponychium. The other nails were found to be unremarkable other than longitudinal melanonychia on two of the other fingernails.

What is your diagnosis?

Fig. 1. Frontal view of the yellow-brown, hard, exophytic mass originating from the nail bed, with an overlying yellow-brown dystrophic nail plate.

Fig. 2. Lateral view of the yellow-brown, hard, exophytic mass originating from the nail bed, with an overlying yellow-brown dystrophic nail plate.

Fig. 3. Lateral hand radiograph showing prominent soft tissue density with underlying erosion and chronic deformity of the distal phalanx.

Answer

Subungual Verrucous Carcinoma

We sent the patient for X-ray of the hand, which revealed a prominent soft tissue density with underlying erosion and chronic deformity of the distal phalanx (Fig. 3). Due to the bone erosion, the digit was amputated at the middle phalanx. Histopathology revealed keratinocyte cellular atypia and epidermal hyperplasia with pushing – but not overly infiltrative – borders that extended to but did not involve the underlying distal phalanx (Fig. 4). No koilocytic changes were appreciated, thus no human papillomavirus (HPV) staining was performed.

Fig. 4. Photomicrograph showing keratinocyte cellular atypia and epidermal hyperplasia with pushing borders that extend to and abut the underlying distal phalanx.

Verrucous carcinoma is considered a well-differentiated variant of squamous cell carcinoma. The three most common locations are the foot (epithelioma cuniculatum), genitals (giant condyloma of Buschke-Lowenstein), and oral mucosa (oral florid papillomatosis). It is considered a low-grade malignancy but tends to be locally aggressive, in many cases penetrating deep into underlying tissue. Clinically, verrucous carcinoma often manifests as a large – sometimes huge – exophytic tumor. Histologically, characteristic features include minimal cytologic atypia with “pushing” borders due to massive epidermal hyperplasia. Metastasis is exceedingly rare. It is commonly, but not always, associated with HPV. The treatment of choice is excision.

Our differential diagnosis for this patient included mostly tumors. In particular, we considered keratoacanthoma and onychomatricoma, which can occasionally present as an ungual horn. We also considered infectious and inflammatory entities such as verruca, onychomycosis, or psoriasis. Once imaging was performed, we suspected a neoplastic process. Subungual keratoacanthomas tend to grow rapidly and have been reported to spontaneously resolve, as they do in other locations [1]. They also tend to cause significant nail plate destruction [1], so our exclusion of this diagnosis was based on clinical presentation. Onychomatricomas can feature impressive nail plate thickening, but they only involve the nail plate and are not reported to cause underlying bone erosion [2].

We found only seven cases of primary subungual verrucous carcinoma reported in the English language literature, although this number may be an underestimation due to the possibility that some cases of verrucous carcinoma have been classified as squamous cell carcinoma or keratoacanthoma. These seven cases presented with hyperkeratotic verrucous papules and plaques with variable nail plate destruction, but none presented as an ungual horn. Among these cases, three were treated with excision [3–5] (of which one recurred and was then treated with amputation) [5], two were treated with amputation as primary treatment [6, 7], one was treated with Mohs surgery [8], and one was treated with intra-arterial methotrexate [9]. Follow-up varied from several months to five years. Of note, only three cases were stained for HPV on biopsy and all were negative. While subungual squamous cell carcinoma and verrucous carcinoma in other locations are commonly associated with HPV, the association with subungual verrucous carcinoma may not be as strong.

Bone involvement was quite common, occurring in 4 of the 7 cases (57%). In a review of subungual verrucous carcinoma with either primary or secondary nail unit involvement, Matoso et al. [3] reported bone involvement in 4 of 11 cases (36%) and compared this to verrucous carcinoma of the foot not involving the nail unit, which involved underlying bone in 4 of 43 cases (9%). In our patient, the tumor abutted the underlying phalanx but did not invade it. Presumably, the bone erosion and remodeling was due to chronic pressure from the soft tissue density. It has been reported that this is the mechanism of bone erosion in subungual keratoacanthoma, whereas bone involvement in subungual squamous cell carcinoma is often due to direct tumoral invasion [10]. Shapiro and Baraf [11] reported a patient with subungual keratoacanthoma with underlying bone erosion who was treated with electrodesiccation and curettage; subsequent X-ray two years later showed resolution of the bone erosion. Similar improvement in the case of direct tumoral invasion (squamous cell carcinoma) would not be expected.

Likely causes for the high incidence of bone involvement include anatomic proximity, the locally aggressive nature of the tumor, and delay in diagnosis due to initial misdiagnosis as a benign entity. Two main considerations stem from the high incidence of bone involvement. First, imaging – beginning with a plain film – should be performed if a subungual tumor is on the differential. Second, bone involvement warrants a more aggressive approach to management, often amputation. Because bone

erosion was noted in our patient, we sent him directly to a hand surgeon for evaluation for amputation rather than for treatment with Mohs surgery. Bone abnormalities on imaging may not distinguish between pressure-induced erosion and tumoral invasion. Moreover, it is important to consider that obtaining adequate margins is difficult if the tumor abuts the phalanx, yielding a high risk of recurrence, and thus amputation should be considered even in the case of pressure-induced erosion.

Subungual tumors are often misdiagnosed as benign entities. A solitary dystrophic nail which fails to respond to conservative management should raise suspicion for a subungual tumor. Certain subungual tumors, including verrucous carcinoma, commonly involve the underlying bone, making imaging an important diagnostic tool. If bone involvement is suggested on imaging, more aggressive treatment is warranted.

Statement of Ethics

The patient provided informed consent allowing for the publication of this case.

Disclosure Statement

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Author Contributions

All authors contributed to drafting the manuscript.

Keywords

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