Squamous cell carcinoma of the nail apparatus: a tumor with uncommon clinical presentations

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To the editor,

The nail apparatus is an intricate structure of substantial practical and cosmetic significance.

Owing to its composite anatomy, morphologic presentation of tumors involving this framework differs considerably as opposed to other dermatologic locations.

Often, clinical diagnosis of benign lesions could masquerade an underlying malignancy. A high index of suspicion along with a mandatory biopsy therefore becomes indispensable to avoid the likelihood of a diagnostic lapse.

Clinical and diagnostic data (including histopathology) of both our patients have been represented in Table 1.

Squamous cell carcinoma (SCC) of the nail apparatus accounts for 0.028% of patients attending dermatologic outpatient clinics [1]. As it is a slow growing tumor, often the diagnosis is delayed. In one study, the mean delay index was found to be 76 months [2].

Despite the identification of many predisposing factors (chronic inflammation, arsenic exposure, chronic actinic damage, human papilloma virus, and trauma) for subungual SCC, they may not be evident in a number of cases. Although the thumb is the commonest site involved, other fingers can also elaborate this tumor. An exceptional presentation of this tumor involving multiple digits has also been described and is termed as synchronous SCC [3].

Interestingly, the polymorphous disposition of nail unit SCC is striking, making it closely resemble a number of other benign lesions and inflammatory processes of the nail apparatus. Differentials include pyogenic granuloma [4], subungual exostoses [2], onychomatricoma [2], onychopapilloma [5], subungual wart [6], fibrokeratoma [2], superficial acral fibromyxoma [2], digital keratoacanthoma, and longitudinal melanonychia [7].

Both our cases demonstrated different clinical phenotypes. In patient 1 (as mentioned in Table 1 and Fig. 1), diagnostic possibilities considered included pyogenic granuloma, superficial acral fibromyxoma, onychomatricoma, and subungual SCC [8,9]. Clinical and microscopic features availed for evaluating this patient have been lucidly elaborated in Table 2. After studying the components outlined in Table 2, we realized that clinical findings alone were deceiving in substantiating a final diagnostic conclusion. A cutaneous biopsy along with immunohistochemical markers was essential for this. Routine hematoxylin and eosin-stained biopsy illustrated findings in consonance with in-situ carcinoma. Immunohistochemistry, on the contrary, with Ki67 portrayed a high proliferation/labeling index and P40 immunohistochemistry elucidated nuclear positivity in squamous cells, thereby pointing more toward invasive SCC.

Patient 2 (as mentioned in Table 1 and Fig. 2) displayed lesional morphology closely simulating

Table 1 Clinical and demographic profiles of both our patients

Patient characteristics	Patient 1	Patient 2
Age (years)/sex	60/male	70/female
Duration of the lesion (years)	2	1
Location of the lesion	Right hand	Right hand
	Middle finger	Little finger
	Distal nail bed	Involving the entire nail bed and extending to involve the finger up to the distal interphalangeal joint
Clinical morphology	Moist, pinkish plaque with pinpoint hemorrhagic crusts involving the distal subungual region	A keratotic plaque involving the entire nail bed with irregular margins and almost complete absence of the nail plate (Fig. 2a)
	Longitudinal melanonychia and a central zone of black discoloration over the nail plate	
	Lateral detachment of the nail plate distally (Fig. 1a)	
Evidence of immunosuppression	No	No
Evidence of lymph node involvement	No	No
Past treatment	Indigenous treatment (unsuccessful)	Topical tazarotene (0.05%) cream and clobetasol propionate (0.05%) cream
Differentials considered	Granuloma pyogenicum	Acrodermatitis continua of Hallopeau
	Superficial acral fibromyxoma	Squamous cell carcinoma
	Onychomatricoma	
	Squamous cell carcinoma	
Radiograph findings	No evidence of bone involvement	No evidence of bone involvement
USG findings	Heterogenous hypoechoic focal mass with irregular margins	Heterogenous hypoechoic focal mass with irregular margins
Histopathology	Sections demonstrated islands of squamous epithelial cells with nuclear pleomorphism with some of them elaborating moderate amount of eosinophilic cytoplasm with individual cell keratinization (Fig. 1b and c)	Sections revealed moderately differentiated SCC with infiltrating islands of tumor cells along with keratin pearls, surrounded by lymphocytes (Fig. 2b)
	An impression of in-situ carcinoma was made along with suspicion of invasive SCC for which IHC (P40 and Ki67) was advised for confirmation	
IHC	Ki67 labeling index delineated a high proliferation index of ~60% (Fig. 1d)	As histopathology was clearly demonstrating invasive SCC, IHC was not done
	P40 IHC elucidated nuclear positivity in squamous cells (Fig. 1e), thereby pointing more toward invasive SCC	
Treatment suggested	Distal amputation	Distal amputation

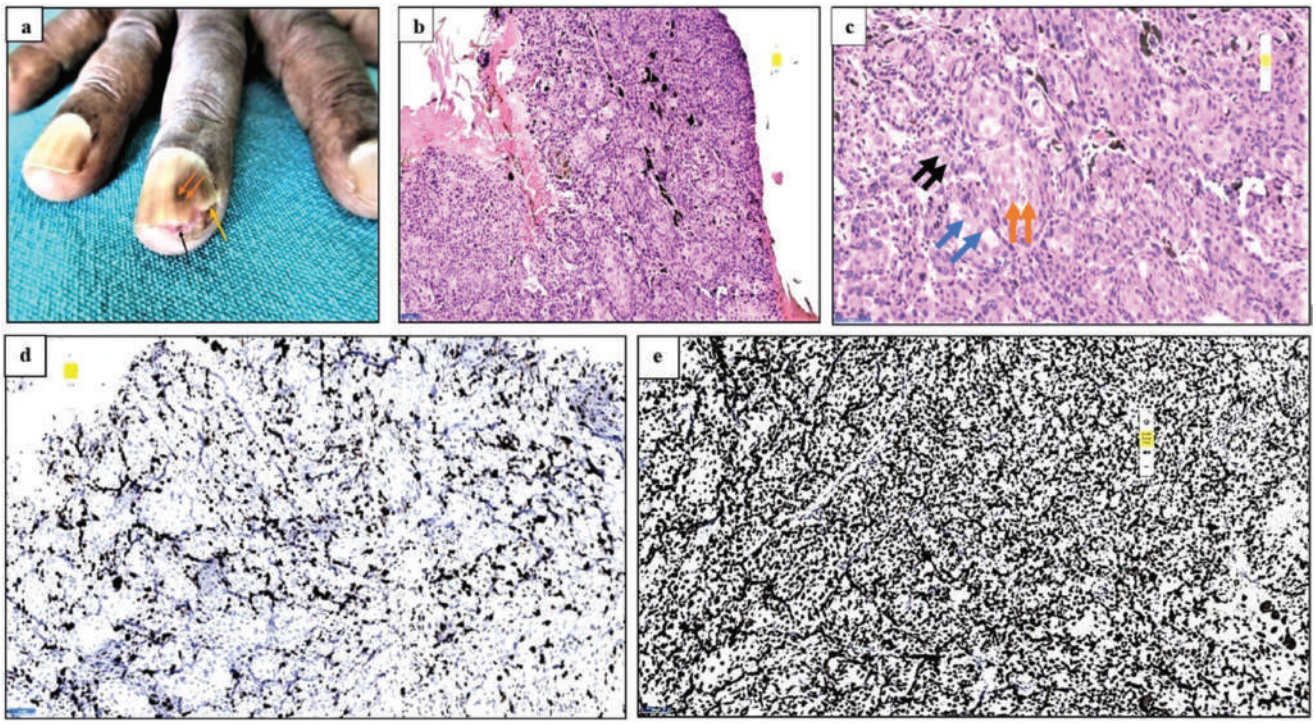
IHC, immunohistochemistry.

acrodermatitis continua of Hallopeau. History of initial pustulation, involving the distal phalanx of the right little finger, followed by desiccation with eventual destruction of the nail plate and formation of a thickened keratotic overlying scale, pointed more toward a diagnosis of acrodermatitis continua of Hallopeau. However, as the lesion was highly recalcitrant to antipsoriatic therapy, possibility of an ungual growth could not be negated. Skin biopsy finally confirmed the diagnosis of invasive SCC. We believe that this morphologic pattern of subungual SCC has not been described earlier and would therefore like to highlight this unusual clinical presentation.

Bone invasion with nail apparatus SCC has been documented in 18–60% of patients, and its presence/absence permits determination of an appropriate therapeutic strategy [10]. Furthermore, it has been recommended that if less than 50% of nail surface is involved, Mohs micrographic surgery should be the treatment of choice. Other therapeutic adjuncts that can be used include cryotherapy, photodynamic therapy, imiquimod, and 5-fluorouracil.

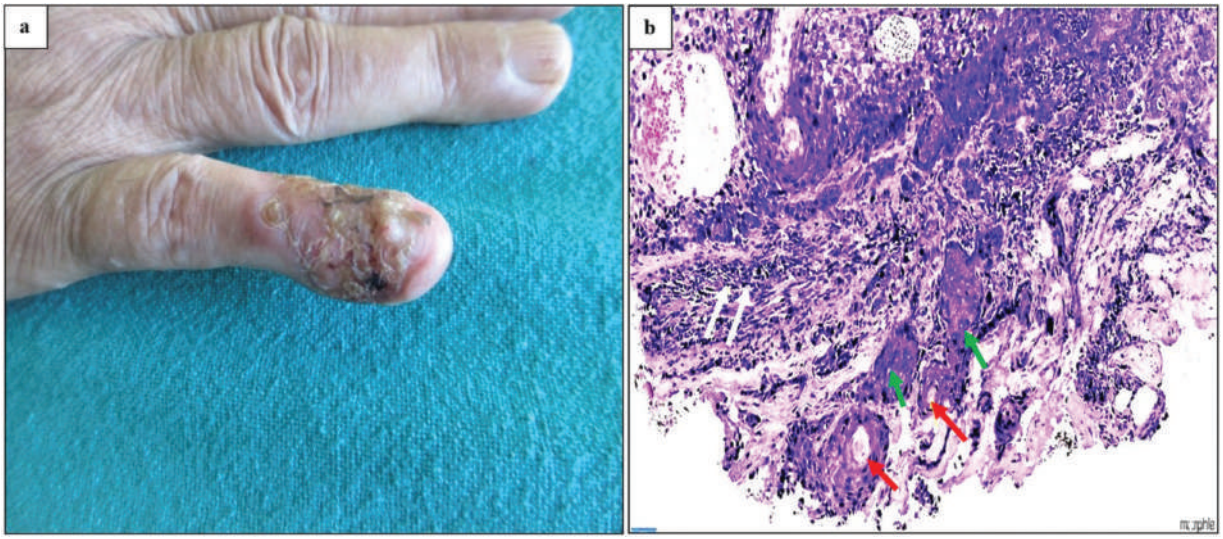
In view of unavailability of Mohs micrographic surgery in our institute, uncertainty regarding proper follow-up, and high likelihood of further tumor

Figure 1



(a) A moist pinkish plaque with pinpoint hemorrhagic crusts (black arrow) involving the distal subungual region of the right middle finger. The overlying nail plate demonstrates longitudinal melanonychia and a central zone of black discoloration (orange arrows). Moreover, lateral detachment of the distal part of the nail plate can be appreciated (yellow arrow) (patient 1). (b) Section illustrating islands of atypical squamous epithelial cells, suggestive of in-situ carcinoma (hematoxylin and eosin ×40). (c) Section demonstrating islands of squamous epithelial cells with nuclear pleomorphism (black arrows), with some of them elaborating eosinophilic cytoplasm (blue arrows), along with individual cell keratinization (orange arrows) [H & E 80X]. (d) IHC with Ki67 labeling index delineating a high proliferation index of ~60% (×40). (e) IHC with P40 demonstrating nuclear positivity in squamous cells (×40). IHC, immunohistochemistry.

Figure 2



(a) A keratotic plaque involving the entire nail bed with irregular margins and almost complete absence of the nail plate (patient 2). (b) Section demonstrating moderately differentiated SCC (green arrows) with infiltrating islands surrounded by lymphocytes (white arrows), and keratin pearls (red arrows) [H & E 40X].

Table 2 Various parameters used to evaluate patient 1

Parameters	Pyogenic granuloma	Superficial acral fibromyxoma	Onychomatricoma	Squamous cell carcinoma (features pertaining to our patient)
History of trauma	Generally forthcoming	Absent	Absent	Absent
Symptoms	Bleeds easily on minimal manipulation	Asymptomatic	Asymptomatic	Bleeding on minimal manipulation was seen
Lesional morphology	Vascular, friable lesion involving the nail bed	Solitary, pink to flesh colored nodular mass with a gelatinous to firm consistency, along with white, pink, and red components	Villous matrix tumor with sea anemone-like projections penetrating the nail plate that can be seen after nail avulsion	Moist pinkish plaque with pinpoint hemorrhagic crusts involving the distal subungual region
				Longitudinal melanonychia
			Yellowish discoloration of the nail	
				Central zone of black discoloration over the nail plate
		Surface may be dome shaped, verrucous, or polypoidal		
Nail plate thickening	Absent	Absent	Present	Absent
Nail plate curvature	No changes	Nail plate may be lifted up by the underlying tumor	Both transverse and longitudinal curvatures of the nail plate are increased	Slightly increased transverse curvature of the nail plate
Nail plate splinter hemorrhages	Absent	Absent	Present	Absent
Wood worm cavities over the distal margin of nail plate	Absent	Absent	Present	Absent
Histopathology	Well-circumscribed lesions	Well-circumscribed polypoidal tumor associated with hyperkeratosis	A fibroepithelial tumor with two distinct zones	Atypical squamous epithelial cells with nuclear pleomorphism and loss of polarity that was limited to the epidermis, giving an impression of in-situ carcinoma
	Proliferation of small capillaries often arranged in a lobular pattern			
			A proximal zone characterized by deep epithelial invaginations occupied by overlying ungual protrusions	
		Stellate and spindle shaped fibroblasts are arranged in loose storiform or less frequently fascicular growth patterns		
	These capillaries are lined by slightly plump endothelial cells, rimmed by pericytes and surrounded by a variably edematous fibromyxoid interstitial stroma containing fibroblasts			
			A distal zone comprising epithelial digitations originating from nail matrix epithelium	
		Surrounding stroma is myxoid, myxocollagenous, or predominantly collagenous		

(*Continued*)

Table 2 (*Continued*)

Parameters	Pyogenic granuloma	Superficial acral fibromyxoma	Onychomatricoma	Squamous cell carcinoma (features pertaining to our patient)
Immunohistochemistry	–	Immunoreactivity to CD34, epithelial membrane antigen (EMA), and CD99 is present	Immunoreactivity to CD10 is present	Ki67 demonstrated a high proliferation index revealing a high mitotic activity of these atypical cells and pointing more in favor of moderately to poorly differentiated invasive SCC P40 IHC demonstrated nuclear positivity in squamous cells, thereby pointing more toward invasive SCC

IHC, immunohistochemistry.

spread, distal finger amputation of the involved finger was suggested.

To conclude, owing to myriad clinical phenotypes of subungual SCC, in any long-standing, benign-appearing, treatment-recalcitrant lesion involving the nail apparatus, the possibility of SCC should never be discounted.

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Conflicts of interest

There are no conflicts of interest.

References

1 High WA, Tyring SK, Taylor RS. Rapidly enlarging growth of the proximal nail fold. Dermatol Surg 2003; 29:984–986.

2 Lecerf P, Richert B, Theunis A, Andre J. A retrospective study of sqamous cell carcinoma of the nail unit diagnosed in a Belgian general hospital over a 15 year period. J Am Acad Dermatol 2003; 69:253–261.

3 Abner S, Redstone J, Chowdhry S, Kasdan ML, Wilhelmi BJ. Synchronous squamous cell carcinoma in multiple digits. Eplasty 2011; 11:e9.

4 Arumugan M. Sqamous cell carcinoma of the thumb nail bed. Indian J Dermatol Venereal Leprol 2007; 445:59–60.

5 Jellinek NJ, Lipner SR. Longitudinal erythronychia: retrospective single centre study evaluating differential diagnosis and the likelihood of malignancy. Dermatol Surg 2016; 42:310–319.

6 Batalla A, Feal C, Roson E, Posada C. subungual squamous cell carcinoma. A case series. Indian J Dermatol 2014; 59:352–354.

7 Gatica-Torres M, Arguello-Guerra L, Manuel Ruiz-Matta J, Dominguez-Cherit J. Subungual pigmented squamous cell carcinoma presenting as a grey longitudinal melanonychia in a young patient. BMJ 2016; 2016:2016.

8 Sawaya JL, Khachemoune A. Superficial acral fibromyxoma. Int J Dermatol 2015; 54:499–508.

9 Joo HJ, Kim MR, Park HJ. Onychomatricoma: a rare tumor of nail matrix. Ann Dermatol 2016; 28:237–241.

10 Zabawski EJ, Washak RV, Cohen TB, Cockerell CJ, Brown SM. Squamous cell carcinoma of the nail bed: Is finger predominance another clue to etiology?. A report of 5 cases. Cutis 2001; 67:59–64.