

ACQUIRED (DIGITAL) FIBROKERATOMAS

Complication of Ingrown Toenail

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Abstract. An unusual case of duplicated soft tissue lesions protruding from beneath a great toenail is presented. A clinical and histologic diagnosis of acquired (digital) fibrokeratoma was made. The literature on this subject is reviewed and special emphasis is placed on the role of trauma and perhaps granulation tissue in the induction of lesions.

Duplicated and adjacent acquired (digital) fibrokeratomas have not been described previously. We report here a case where such lesions apparently were the direct result of trauma to granulation tissue accompanying an ingrown toenail.

CASE REPORT

A 32-year-old medical student presented to the Dermatology Clinic with two peculiar "horns" protruding from beneath his left great toenail. Circa nine years previously the patient developed an ingrown left great toenail with granulation tissue at the lateral nail fold. With budding surgical intent, the student excised the entire lateral fold and nail from the distal end to the junction with the proximal nail fold. Considerable, but temporary bleeding resulted. Gradually, the lateral edge of the nail grew back, but seemed somewhat elevated and split into two layers.

One year later, the nail became fissured 4 mm from the lateral edge, revealing a firm, slender, sausage-shaped soft tissue outgrowth circa 1.5 cm in length. Again displaying his surgical talent, the patient cut off the distal half of the "horn", with resultant mild bleeding. Regrowth of this abnormal structure to its previous length took 1 month. Six months later, the patient noted an identical but narrower outgrowth fully developed, adjacent and medial to the pre-existing lesion. This too, protruded from beneath the raised edge of the lateral nail plate. The lesions were totally asymptomatic and required only an occasional "nip" of the end with scissors to maintain them at constant length. There were no other cutaneous problems apart from a histologically-confirmed irritated benign compound nevus. Wood's light examination of the

body surface revealed no hypopigmented macular areas. The patient denied any family history of tuberous sclerosis and his own medical history was otherwise unremarkable.

Examination revealed two sausage-shaped lesions both 1.7 cm in length and 2-3 mm in width protruding in angular fashion from beneath the elevated lateral edge of the left great toenail (Fig. 1). The lesions were pink except for the distal 1 mm which was somewhat whitish. Both lesions had a firm consistency and were anchored firmly by a somewhat narrowed base in the angle between the lateral and proximal nail folds. No basal cutaneous collarette was noted.

A clinical diagnosis of duplicated acquired (digital) fibrokeratoma was made and the lesions were excised *in toto* by wedge resection of the lateral and proximal nail folds and lateral nail plate. The resultant defect was closed by stitches which, when removed, revealed a well-healed site. There has been no recrudescence of lesions 6 months post-operatively, nor is any expected. Skull X-ray, E.E.G., and Echoencephalogram were all normal, as was a full general medical exam.

Histology revealed both outgrowths to have a similar appearance. The cores of these tumors were formed of thick bundles of collagen which were interwoven and oriented predominantly in the direction of the vertical axis of the lesion. There was in addition a rich vascular supply which was also oriented parallel to the vertical axis (Fig. 2). The bundles of collagen became less dense in the proximity of the dermal-epidermal junction. Elastic tissue stains revealed a moderate amount of elastic tissue within the core, represented as thin irregular fibers. No neural tissue could be demonstrated by Bodian stain in the central core of these tumors. The epidermis had a normal appearance, was flat, and there was an absence of rete ridges and dermal papillae. The granular layer was thickened and there was marked orthohyperkeratosis. The keratinocytes maintained their normal morphology. Sections stained with alcian blue showed the presence of small amounts of acid mucopolysaccharide between the collagen bundles forming the core of the fibrokeratoma. It was interesting to note that in both tumors no inflammatory cells were found either in the core or in the epidermis.

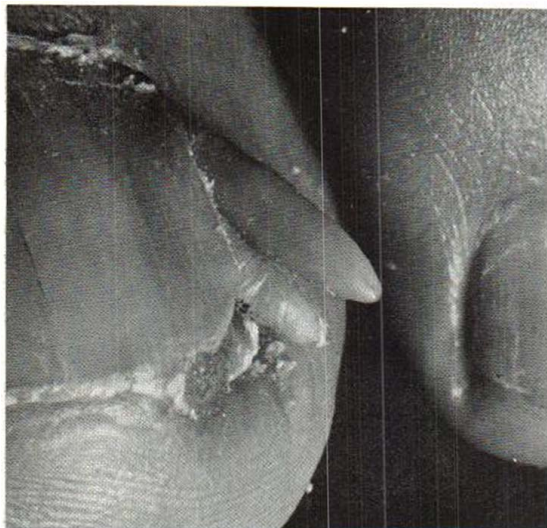


Fig. 1. Duplicated, almost identical, but separate, firm soft tissue lesions protruding from beneath lateral edge of left great toenail.

DISCUSSION

Since the original paper by Bart et al. in 1968 entitled *Acquired Digital Fibrokeratomas* (1) a number of articles (2, 4, 5, 7) have appeared in the English language dealing with this subject. Altogether 77 cases have been described, assuming the identity of the Pinkus (3) and Verallo (7) material. In view of the fact that not all histologically-confirmed lesions are digital, successive authors have preferred the terms *acquired* or *acral fibrokeratomas* with the actual site defined as an adjective.

Acral fibrokeratomas are benign acquired outgrowths of the digits or, less frequently, of elsewhere on the hands and feet, ankles or prepatellar regions. Their clinical characteristics suggest a differential diagnosis of rudimentary supernumerary digit, fibroma, acrochordon, cutaneous horn, granuloma telangiectaticum, wart, hypertrophic lichen simplex chronicus, and eccrine poroma. Clinically, the lesions in this case most closely resembled those of the multiple subungual and periungual fibromas (known as Koenen's tumors) which form part of the well-known genodermatosis-tuberous sclerosis. There were certain similarities to "Steel's nails"—the "garlic-clove fibromas" (6).

However, general medical examination eliminated tuberous sclerosis as a diagnosis, and unlike

the garlic-clove fibromas, the lesions did not project from the dorsal surface of the nail.

An extensive discussion of the classification of acral fibrous nodules and of the histogenesis of acral fibrokeratomas has been published by Reed & Elmer (4). These authors have summarized the findings of previous workers and added their own interpretation of the development of the characteristic outgrowths as being primarily derived from the papillary dermis. Our case was different from some of those previously described in that there was an absence of increased amount of mucopolysaccharide in the histologic sections. Otherwise, the histology can be considered as typical.

The role of trauma in the induction of fibrokeratomas has never been clearly established. Certainly, trauma has been suspected by previous authors as being an initiating factor even though lesions have not usually arisen at sites of recollected injury. In our case, similar to only one of the cases described by Bart (1), a definite history of trauma was obtained. Further regarding pathogenesis, Hare & Smith (2) did not believe that fibrokeratomas originate as granuloma pyogenicum (telangiectaticum) even though a closely similar clinical and histologic picture is sometimes described between the two conditions. Certainly, foreign body induced granulation tissue can resemble spontaneous granuloma pyogenicum. Whether the granulation tissue at the site of the original ingrown toenail in our case was a stimulus to subsequent production of the more well-

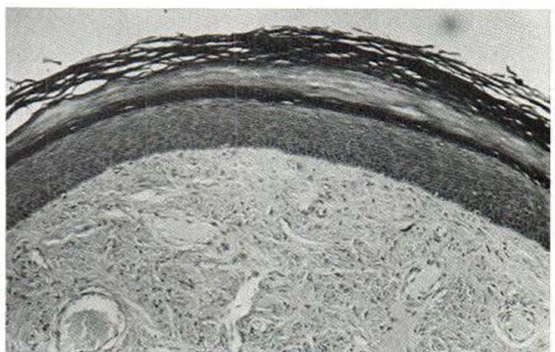


Fig. 2. Transverse section through fibrokeratoma reveals interlacing bundles of collagen predominantly oriented in the direction of the vertical axis of the lesion. In addition, a rich vascular supply also oriented parallel to the vertical axis is noted. Note also acanthotic flat epidermis with orthohyperkeratosis. (H. & E. $\times 70$.)

defined fibrokeratomatous protrusions is unknown.

The presence of duplicated, almost identical, adjacent but separated fibrokeratomas is unusual. Among all of the previously described cases of acral fibrokeratoma, Pinkus and Verallo mention only one case where two fibrokeratomas occurred on the same digit. One lesion presented on the volar aspect. Two years after its removal, a similar lesion developed and was removed from the dorsal aspect. All other previously-reported cases have been solitary.

Regarding therapy, it appears that simple surgical excision or ablation, perhaps followed by electrodesiccation of the base, is almost universally successful. Only two recurrences after previous removal have been described.

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Received April 18, 1973

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