Acquired digital fibrokeratoma, a rare fibrous skin tumor: a case report and literature review

Jaspriya Sandhu, MD [1*]
Sunil Kumar Gupta, MD [1]
Navneet Kaur, MD [1]
Aditi Bansal, MBBS [1]
Bhavna Garg, MD [2]

1. Department of Dermatology, Venereology & Leprosy, DMCH, Ludhiana, Punjab, India
2. Department of Pathology, DMCH, Ludhiana, Punjab, India

**Corresponding author:*
Jaspriya Sandhu, MD
Department of Dermatology, Venereology & Leprosy, DMCH, Ludhiana, Punjab, India
Email: sandhu.jaspriya@gmail.com

Received: 23 September 2020
Accepted: 12 November 2020

Acquired digital fibrokeratoma (ADFK) is a rare benign fibrous tissue tumor that occurs over the extremities, predominantly in the periungual area. We report a case of ADFK over the digit of the right hand presenting as a finger-like growth; the base of the lesion showed a collarette of scales. The lesion was excised with ablative CO_2 laser. The histopathology was typical, showing hyperkeratosis and acanthosis. The core of the lesion had abundant collagen fibers perpendicular to the long axis of the epithelium. There was good healing with minimal scarring; the patient was followed up, and no recurrence was reported more than one year later. ADFK is a relatively rare tumor, with less than 150 cases reported worldwide; we present a concise review of the published ADFK cases with their clinical and histopathological characteristics. To the best of our knowledge, this is the seventh such case to be reported from India.

Keywords: acquired digital fibrokeratoma, skin tumor, fibrous skin tumors

Iran J Dermatol 2022; 25: 290-295

DOI: 10.22034/IJD.2020.249855.1224

INTRODUCTION

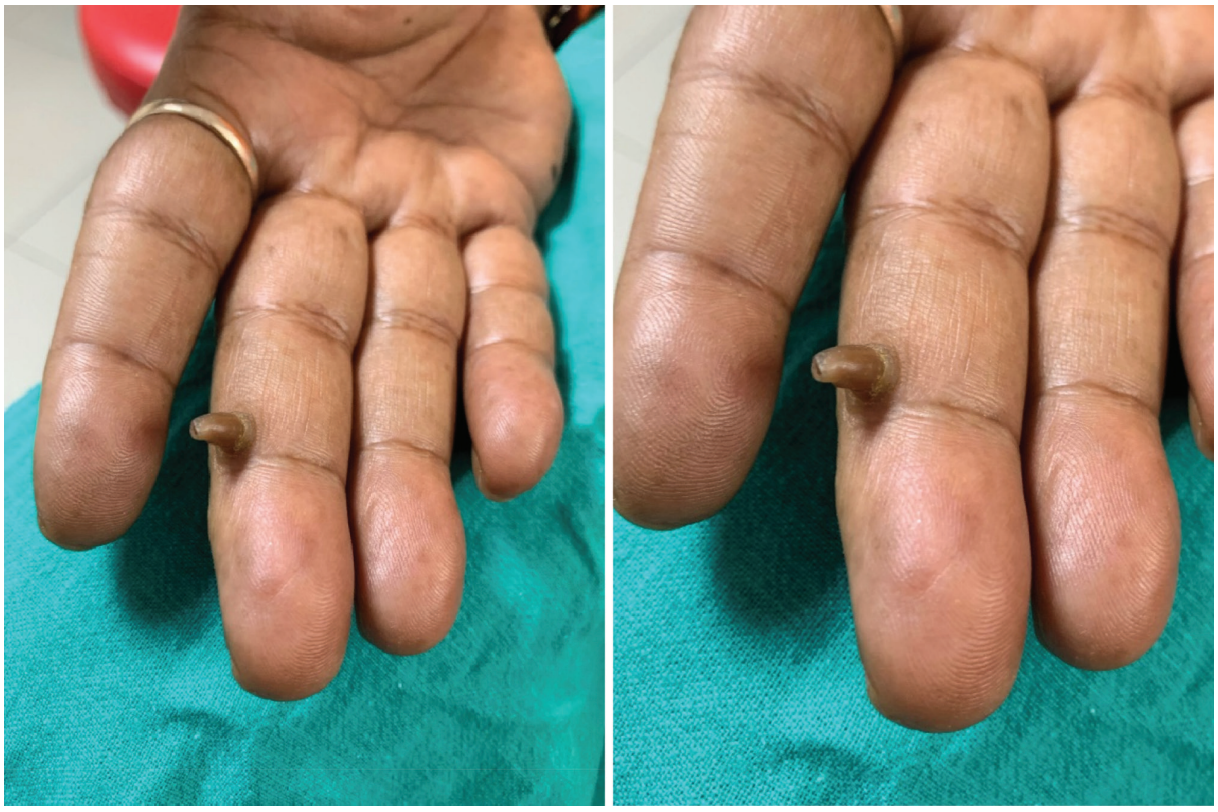
Acquired digital fibrokeratoma (ADFK) is an uncommon benign fibrous tumor first reported by Bart *et al.* in 1968 [1]. It is most commonly seen over the acral aspects of the fingers, nail bed, lips, nose, and heels, thus known as acral fibrokeratoma. This tumor occurs more often in middle-aged adults following trauma and affects males more than females [2]. ADFK usually presents as an asymptomatic, small, solitary nodule or finger-like growth with a collarette at the base. The treatment of choice is surgical excision of the tumor since ADFK does not show spontaneous involution. We report a case of fibrokeratoma of the finger presenting as a pedunculated nodule treated with excision with ablative CO_2 laser; we also provide a concise review of the literature.

CASE PRESENTATION

A 64-year-old male presented to our outpatient clinic with an asymptomatic, skin-colored lesion over the lateral aspect of the middle finger of the right hand. The lesion grew progressively over six years to achieve its present size; there was a preceding history of trauma to the digit. The lesion did not show any spontaneous regression, but the patient could painlessly cut the tip of the lesion, after which the lesion would regrow.

On examination, there was a firm to hard skin-colored finger-like projection, 3 by 1 cm in size. The surface of the lesion was smooth and convex (Figure 1a) The base of the lesion showed a hyperkeratotic rim with a collarette of scales (Figure 1b). We kept a provisional diagnosis of ADFK, cutaneous horn, or Koenen's tumor. An excision was planned.

An excision with ablative CO_2 laser was done; the specimen was sent for histopathology, which revealed marked hyperkeratosis and acanthosis with branching of the rete ridges. The core of the lesion showed prominent collagen bundles perpendicular to the long axis of the epidermis.



a b

Figure 1. (a) A firm to hard, skin-colored, 3×1 cm finger-like projection on the lateral aspect of the right middle finger. The surface of the lesion was smooth and convex. (b) A closer view shows a marked hyperkeratotic rim with a collarette at the base.

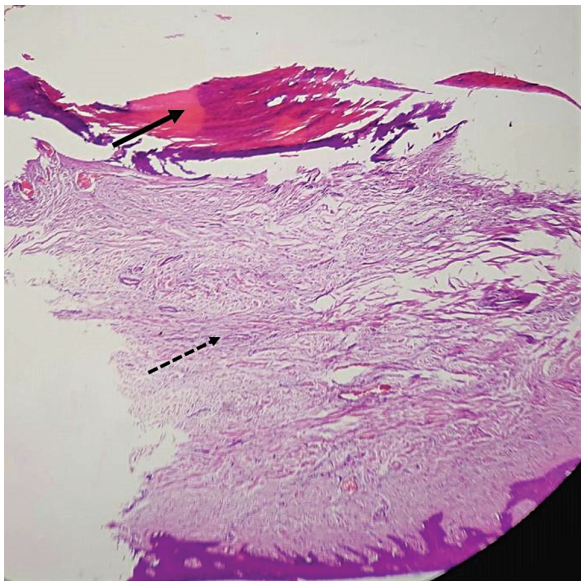


Figure 2. Marked hyperkeratosis and acanthosis with branching of the rete ridges. The core of the lesion showed prominent collagen bundles perpendicular to the long axis of the epidermis (H & E, 100×).

Numerous proliferating fibroblasts were seen between the collagen bundles (Figure 2).

On the clinical-pathological correlation, a final diagnosis of ADFK was made. The patient was followed up after over one year, showing minimal scarring and no recurrence (Figure 3).

DISCUSSION

Acquired digital fibrokeratoma (ADFK) is an

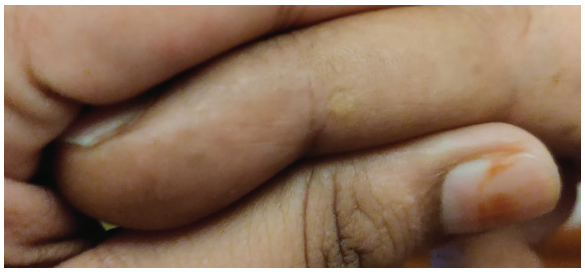


Figure 3. Minimal scarring at the tumor site over a year after excision with CO_2 laser.

acquired skin tumor. It may resemble a cutaneous horn or supernumerary digit clinically but differs histopathologically. Bart *et al.* reported 10 cases of fibrous tumors located on digits in 1968; these tumors were named 'acquired digital fibrokeratoma [1]. Subsequently, Verallo *et al.* reported 32 cases and suggested that the entity may be more appropriately named 'acral fibrokeratoma' since the majority of the lesions occurred over the acral areas [3]. We present a brief summary of the significant literature published on ADFK in Tables 1 and 2 [1,3-20].

ADFK seems to have a slight male predominance. However, very few cases have been described to adequately assess the significance of any sex predilection of this tumor. The reported ADFK cases were all asymptomatic. The age of patients varied from 12 to 70 years, with most cases occurring in middle-aged adults [9]. Though the exact etiopathogenesis of ADFK remains elusive, trauma may be a predisposing factor [21]. Clinically, ADFK presents as an asymptomatic protuberance that does not show spontaneous regression. The size can vary from small (< 1 cm) to giant forms [3,12]. The tumor morphology has been reported by various authors as finger-like projections, small plateau-like elevations, spherical mounds, or pedunculated, verrucous or dome-shaped papules with central depression [1,3,16,19]. An unusual case series of four cases with flat-pan nail-wide epiungual ADFK was described by Lencastre *et al* [13].

Various authors have reported ADFK mimicking other pathologies such as a supernumerary digit, verrucae vulgaris, cutaneous horn, Koenen's tumor, neurofibroma, or pyogenic granuloma [2].

An excisional biopsy alone can give a definitive ADFK diagnosis. Classically, the histopathological examination reveals a hyperkeratotic and acanthotic epidermis, with thick collagen bundles oriented along the vertical axis in the dermis. However, other histopathologic variants of ADFK have also been described (Tables 1 and 2) [3,6].

Destructive procedures to remove the lesion include shave excision, curettage, electrodesiccation, cryotherapy, and CO_2 ablation. However, surgical excision is the most commonly used method. The excision should be complete to prevent recurrences. We opted for removal with ablative CO_2 laser due to the advantages of a bloodless field, better healing, and minimal scarring.

Table 1. Review of literature on acquired digital fibrokeratoma (ADFK) cases reported worldwide, outside of India

Sr. No.	Author, Year	Country	No. of cases	Age/Sex	Site (No. of cases)	Morphology	Histopathology
1.	Bart *et al.*, 1968 [1]	USA	10	10–70 yrs M=8 F=2	Digits: index (4), middle (3), ring (1), thumb (2)	Smooth, firm, pinkish hyperkeratotic, horn-like projection with a slightly constricted base arising out of a collarette of elevated skin.	Hyperkeratosis and acanthosis; the cores of these tumors were formed by thick bundles of collagen, predominantly oriented along the vertical axis of the lesions.
2.	Verallo *et al.*, 1968 [3]	USA	32	17–66 yrs M=22 F=10	Digits (26) near the joints (dorsal, medial, lateral, or volar aspect); nails (6)	Firm, skin-colored lesions varying in height from 5 to 15 mm above a narrower base. The projections ranged from small plateau-like elevations to spherical mounds or long finger-like outgrowths. All patients except one had a single lesion.	Hyperkeratosis and acanthosis; core was made of mature, eosinophilic collagen bundles predominantly oriented in the vertical axis of the lesions and in continuity with the underlying dermal connective tissue.
3.	Pinkus *et al.*, 1968 [4]	USA	27	17–66 yrs M=18 F=9	Fingers (5), thumb (5), proximal hands (3), toe (6), sole (2), and prepatellar region (1)	Steep projections varying from hemispherical to slender, elongated shapes.	Hyperkeratosis and acanthosis; core of the lesion consisted of modified dermis including features of pars reticularis as well as pars papillaris.

Table 1. Continued

Sr. No.	Author, Year	Country	No. of cases	Age/Sex	Site (No. of cases)	Morphology	Histopathology
4.	Kint *et al.*, 1985 [5]	France	50	Mean: 40 yrs M=29 F=21	Fingers (39), palms (2), toes (6), dorsum of the hand (1), dorsal aspect of wrist (1), calf (1)	Tumors were small, firm, and often spherical, with a narrow base and a smooth to hyperkeratotic skin-colored surface. Some of them were only slightly raised above the surrounding skin, whereas others developed into tall finger-like projections. Alteration of nails was observed in one case.	1st variant (39 cases): Acanthosis and hyperkeratosis; the core of these tumors was made up of thick, dense, closely packed, irregularly arranged or vertically oriented collagen bundles. 2nd variant (8 cases): fibroblasts; spindle cells grouped into bundles and oriented vertically; ‾ elastin 3rd variant (3 cases): Edematous connective tissue; ‾ elastic tissue.
5.	Baykal *et al.*, 2007 [6]	Turkey	13	10–75 yrs/M	Fingers (9), dorsum of hand (1), palm (1), elbow (1), and foot (1)	Solitary, smooth, dome-shaped or finger-like, flesh-colored papule with a collarette of slightly raised skin at the base of the lesion.	Histopathological variants described similar to Kint *et al.* (see above).
6.	Lee *et al.*, 2009 [7]	Korea	1	35 yrs/M	Plantar aspect of left 2nd toe	Solitary, projecting, keratotic tumor with a reddish, polypoidal papule on the plantar aspect.	Hyperkeratosis, parakeratosis, acanthosis; proliferating fibroblasts in the dermis. Polypoid papule: proliferating vascular ectasia.
7.	Pegas *et al.*, 2012 [8]	Brazil	1	52 yrs/F	4th left finger and 2nd left finger (hyponychium)	Finger-like projection.	Hyperkeratosis and acanthosis; parallel collagen bundles observed in the stroma and an absence of nerve bundles with blood vessels.
8.	Ali *et al.*, 2015 [9]	UK	1	48 yrs/M	Plantar aspect of the distal phalanx of the left hallux	Well-demarcated, firm, non-pulsatile mass with a broad base attached to the plantar aspect.	Hyperkeratosis and acanthosis; hyalinized and irregularly arranged collagen bundles and variable numbers of fibroblasts and numerous thin-walled vessels.
9.	Moon *et al.*, 2016 [10]	Korea	1	79 yrs/M	Left great toe	Solitary, broad-based, firm, skin-colored mass.	Hyperkeratosis and acanthosis; collagen bundles with dilated capillaries oriented in the direction of the longitudinal axis.
10.	Mancuso *et al.*, 2019 [11]	USA	1	53 yrs/F	Right 5th fingernail	Firm, non-tender nodule on distal nail bed with onycholysis.	Hyperkeratosis and acanthosis; fibrotic with collagen bundles assuming a vertical orientation to the long axis of the epidermis.
11.	Al-Atif *et al.*, 2019 [12]	Saudi Arabia	1	17 yrs/M	Dorsal surface of the right middle toe	Round, skin-colored, exophytic nodule.	Hyperkeratosis and acanthosis; core of thick collagen bundles and vertically oriented small dermal blood vessels.
12.	Lencastre *et al.*, 2019 [13]	Portugal	4	13–24 yrs M=3 F=1	Proximal nail fold of left great toenail, right first toe	Flat, skin-colored epiungual nodule with a hyperkeratotic tip.	Orthohyperkeratosis and acanthosis; core of dense collagen fibers, mature fibroblasts, small blood vessels, and elastic fibers.
13.	Choi *et al.*, 2020 [14]	Korea	1	67 yrs/M	Left second toe	Pedunculated mass with multiple branches at its base and a smooth surface; color varied from violaceous hue to dark purple.	Hyperkeratosis, parakeratosis, and acanthosis; collagen bundles arranged parallel to the axis of the tumor and the proliferation of fibroblasts. Focal papillary dermal necrosis and hemorrhage.

Abbreviations: F = female; M = male; USA = united states of America; UK = United Kingdom

Table 2. Review of literature on acquired digital fibrokeratoma (ADFK) cases reported in India

Sr. No.	Author, Year	No. of cases	Age/Sex	Site	Morphology	Histopathology
1.	Pavithran *et al.*, 1986 [15]	1	38 yrs/M	Middle finger of right hand	Hyperkeratotic projection with progressive contracture of fingers of left hand.	Hyperkeratosis, acanthosis, elongation of rete ridges; core showed bundles of collagen oriented in the vertical axis of the lesion.
2.	Rathi *et al.*, 1998 [16]	1	25 yrs/M	Dorsal aspect of left index finger	Single skin-colored, dome-shaped papule with slight central depression.	Hyperkeratosis and acanthosis of the epidermis; core showed interwoven collagen bundles oriented along the long axis of the lesion.
3.	Salim *et al.*, 2001 [17]	1	56 yrs/M	Antero-medial aspect of proximal phalynx of right finger	Firm finger-like growth.	Marked hyperkeratosis and acanthosis; thick interwoven bundles of collagen with abundant fibroblasts forming a central core; collagen bundles arranged in the vertical axis of the lesion
4.	Jaiswal *et al.*, 2002 [18]	1	38 yrs/M	Inner aspect of left heel	Skin-colored, bullet-shaped, pedunculated, firm lesion.	Hyperkeratosis, hypergranulosis, acanthosis, and papillomatosis; interwoven bundles of collagen fibers in the center of the lesion, parallel to the vertical axis.
5.	Kumari *et al.*, 2009 [19]	1	35 yrs/F	Beneath proximal nail fold of 1st toe of right foot	Pedunculated, flesh-colored growth with multiple surface digitations and a surrounding collarette; a linear depressed groove was seen on the lateral margin of the nail plate.	Hyperkeratosis, acanthosis, branching of rete ridges; dermis (core of the lesion) showed thick collagen fibers and blood vessels arranged along the long axis of the lesion.
6.	Garg *et al.*, 2019 [20]	1	52 yrs/M	Tip of the right thumb	Skin-colored, dome-shaped, pedunculated, firm lesion with central depression and a hyperkeratotic edge.	Hyperkeratosis, acanthosis, branching of rete ridges; collagen bundles vertically oriented with minimal lymphomononuclear infiltrate and a few congested blood vessels.
7.	Present case	1	64 yrs/M	Lateral aspect of right middle finger	Skin-colored finger-like projection with smooth and convex surface; hyperkeratotic rim with a collarette of scales.	Hyperkeratosis, acanthosis, branching of rete ridges; core showed prominent collagen bundles perpendicular to the long axis of the epidermis.

Abbreviations: F = female; M = male

To the best of our knowledge, since Pavithran *et al.* reported the first Indian case of ADFK in 1982, only 5 other cases have been reported from India [1-20].

To conclude, we report a case of ADFK treated with CO_2 laser excision with minimal scarring and no recurrence over a year after excision. We also present a brief review of the published literature on ADFK, an uncommon fibrous skin tumor.

Conflict of interest: None declared.

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