



CASE REPORT

## Acquired digital fibrokeratoma: A case report and review of the literature

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**Abstract:** Acquired digital fibrokeratoma (ADFK) has typical characteristics and occurs most frequently on the fingers. The size of the tumor is usually less than 1 cm in diameter. We report a case of a typical ADFK, along with a review of the literature. A 76-year-old man presented with a two-year history of a slow-growing keratotic tumor on the edge aspect of his right hand ring finger. A literature search was conducted to identify published case reports of ADFK. Data on patient demographics, size and location of the lump, treatment, and follow-up were collected from each case report. This case is of interest because of the rarity of ADFK. Additionally, we have emphasized the importance of ruling out other causes of abnormal growths and considering fibrokeratoma during differential diagnoses.

**Keywords:** Acquired digital fibrokeratoma; case; review of the literature

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### Introduction

Acquired digital fibrokeratoma (ADFK) is an uncommon, benign tumor that usually occurs in adults as a solitary nodule on fingers and toes. Herein, we report a typical acquired digital fibrokeratoma, along with a review of the literature.

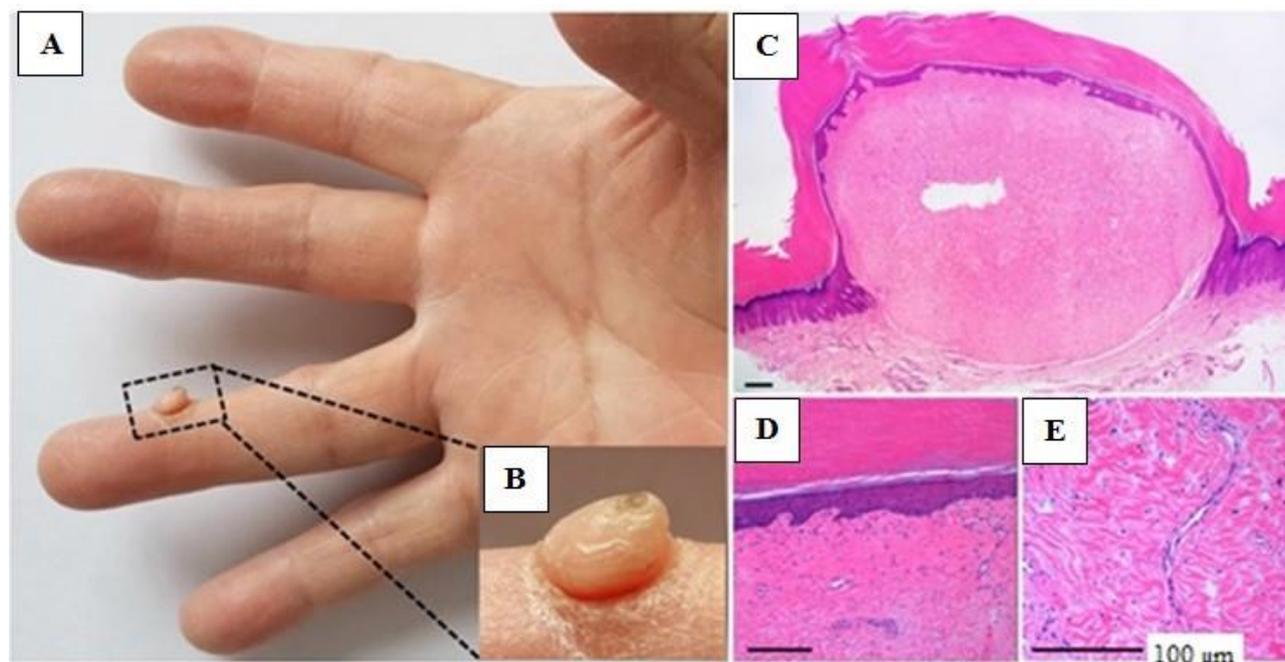
### Case report

A 76-year-old man presented with an asymptomatic, slow-growing tumor which had been present for the past two years on the edge aspect of his right hand ring finger. There was no history of trauma prior to the onset of the lesion. It was not painful and did not itch or bleed, even after trauma. Over the two-year period, the benign projecting tumor had grown to 0.5 × 0.4 × 0.3 cm, with occasional pain when squeezed (**Figure 1A**). The lesion

surface was smooth, and basal epidermal ridges surrounded the nodule (**Figure 1B**). The patient was scheduled for excision. Histopathology revealed hyperkeratohyperkeratosis, parakeratosis, and acanthosis (**Figure 1C**), with thick interwoven bundles of collagen forming a central core (**Figures 1D** and **1E**). On the basis of these clinical and histopathologic signs, the tumor was diagnosed as ADFK. There has been no recurrence for six months since the surgical excision.

### Discussion

ADFK is a rare skin tumor of an acquired nature. It was first reported by Bart *et al.* as a separate clinical entity in 1968<sup>[1]</sup>. They named this growth ADFK after describing 10 cases of an uncommonly acquired growth located on the fingers. Although it clinically resembles a cutaneous horn or rudimentary supernumerary digit, it has distinct



**Figure 1.** (A) Skin-colored,  $0.5 \times 0.4 \times 0.3$ -cm solitary nodule on the edge aspect of the right hand ring finger. (B) Inset panel showing an enlarged image of the dotted rectangular area. (C–E) Histology showed a dome-shaped tumor with interwoven collagen

histopathological findings<sup>[2]</sup>. Subsequently, Pinkus reported 28 more cases of ADFK<sup>[3]</sup>. However, these lesions occurred not only on the fingers but also on the proximal hand, toes, sole, and one in the prepatellar region. For this reason, Verallo suggested that the entity might more appropriately be called an acral fibrokeratoma<sup>[4]</sup>. We have collected some case information about the disease from articles published over the past 15 years (Table 1).

The pathophysiology of ADFK is unknown. Some scholars believe that minor trauma is one of the most important pathogenic factors<sup>[5]</sup>. However, case histories have not supported this hypothesis. Kint *et al.* suggested that ADFK resulted from neoformation of collagen by fibroblasts in 1985<sup>[6]</sup>. Subsequently, Nemeth and Penneys reported that factor XIIIa, which is found in fibrovascular tumors, is also found in ADFK<sup>[7]</sup>. Therefore, this factor might play an important role in the pathogenesis of these tumors. Suh *et al.*<sup>[8]</sup> observed that factor XIIIa-positive dermal dendrocytes were increased in ADFK by immunohistochemical staining and suggested that these cells were associated with collagen synthesis regulation. Repetitive irritation has been suggested as another predisposing factor of ADFK<sup>[9]</sup>.

Acquired digital fibrokeratomas seem to have a slight male predominance<sup>[10]</sup>. However, very few cases have been described to adequately assess the significance of any sex predilection of this tumor type. Reported

acquired digital fibrokeratoma cases have occurred in patients from 12 to 70 years of age, with most cases occurring in middle-aged adults<sup>[11]</sup>. Most patients with acquired digital fibrokeratoma present with an asymptomatic protuberance that gradually increases in size over time<sup>[12]</sup>.

Typically, ADFKs are small and less than 1 cm in diameter. Ali *et al.* and Choi *et al.* reported  $3.0 \times 1.6 \times 1.2$ -cm and  $2.5 \times 1.6 \times 1.4$ -cm ADFKs on the toe, respectively, and designated them as giant ADFKs<sup>[11,13]</sup>. Frydman *et al.* reported a  $4.0 \times 1.5$ -cm ADFK on a left foot<sup>[12]</sup>. de Freitas *et al.* reported a  $3.0 \times 2.2 \times 1.0$ -cm pedunculated firm nodule that protruded from the heel<sup>[14]</sup>. Additionally, Jaiswal and Chatterjee reported  $1.5 \times 1.2$ -cm ADFKs that protruded from the heel<sup>[15]</sup>. ADFKs are predominantly, although not exclusively, located on the fingers and toes near the phalangeal joints<sup>[16]</sup>. Occasionally, they occur on the elbow, wrist, calf, and prepatellar<sup>[11]</sup>.

ADFKs are almost always solitary, and only two case reports have described ADFK being accompanied by another tumor<sup>[11]</sup>: one report described a renal transplant patient on cyclosporine who developed an ADFK on a toe simultaneously with a gingival overgrowth, and the authors suggested that there may have been a causal association between these two growths<sup>[12]</sup>; another report described an ADFK accompanied by a pyogenic granuloma<sup>[17]</sup>.

**Table 1.** Review of the literature

Case	Age and sex*	Site and size	Duration	History of trauma
Salim T <sup>[19]</sup>	56M	The proximal phalanx of right finger 18 × 7 mm	10 years	No
Yu D <sup>[27]</sup>	51M	Right thumb 0.2 × 0.4 × < 0.1 cm	6 months	No
Choi JH <sup>[13]</sup>	18F	Left great toe 2.5 × 1.6 × 1.4 cm	2 years	No
Hayashi K <sup>[28]</sup>	53M	The dorsum of the fourth left toe 25 × 15 × 10 mm	3 years	No
Rubegni P <sup>[29]</sup>	46F	Second finger Size not mentioned	Several weeks	No
Kumari R <sup>[16]</sup>	35F	First toe of the right foot 2-cm pedunculated	6 years	No
Ali M <sup>[11]</sup>	48M	The distal phalanx of the left great toe 3.0 × 1.6 × 1.2 cm	17 years	No
Frydman AF <sup>[12]</sup>	15F	On the sole of his left foot 4 × 1.5 cm	3 years	No
Lee DR <sup>[30]</sup>	35M	On the plantar of his left second toe 7 × 18 mm	10 years	No
de Freitas PM <sup>[14]</sup>	50M	On the right heel region 30 × 22 × 10 mm	12 years	Not mentioned
Jaiswal AK <sup>[15]</sup>	38M	Inner aspect of left heel 1.5 × 2 cm	1 year	No

\*M: Male; F: Female

Histopathological examination shows epidermal hyperkeratosis and acanthosis of the epidermis and the core of the lesion is formed of interwoven bundles of collagen predominantly oriented along the long axis of the lesion<sup>[18]</sup>. Numerous proliferating fibroblasts are seen between the collagen bundles<sup>[19]</sup>.

Kint *et al.* described three types of ADFKs, classified by clinical and histopathologic features<sup>[6]</sup>. Type I is a dome-shaped lesion that contains fibroblasts between collagen bundles, fine elastic fibers, and numerous capillaries in the dermis. Type II is typically tall and is a hyperkeratotic lesion that contains many more fibroblasts and less elastic fiber than type I. Type III is a flat to dome-shaped lesion that is characterized by poor cellular and edematous structure and no elastic fibers. The tumor in our case had the typical

histopathologic findings of Type I ADFK.

ADFK can have the appearance of a rudimentary supernumerary digit and it can be misdiagnosed as pyogenic granuloma, verruca vulgaris, or a supernumerary digit<sup>[17,20]</sup>. However, it is easy to differentiate acquired digital fibrokeratoma from the above-mentioned diseases. For example, pyogenic granuloma usually presents as a solitary, red, rapidly growing papule or a nodule<sup>[21]</sup>. Verruca vulgaris frequently exhibits a mammillated surface texture<sup>[22]</sup>. Supernumerary digits is a common hereditary condition with additional digits on the hands and/or feet<sup>[23]</sup>. Superficial acral fibromyxoma and angiofibroma can also be included in the differential diagnosis for ADFK<sup>[24,25]</sup>; however, they have different histological characteristics. The treatment of this disease is relatively simple. The optimal treatment of an ADFK is

a complete excision<sup>[26]</sup>.

## Conclusion

ADFK is an uncommon, benign fibrous tumor that usually arises in the fingers and toes as a solitary lesion. Surgical excision is the treatment of choice and the patient usually has a good outcome.

## Author contributions

S Li and X Li are equal contributors. They contributed to the study concept and design, data collection, data analysis, and writing of the paper. F Li prepared the case report and contributed to the histology description. B Li contributed to the management and follow-up of the patient.

## Conflict of interest

The authors declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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