



A Case Report of Collagenous Fibroma of the Fingernail

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Abstract

Background: Collagenous Fibroma (CF) of the nail, particularly the finger, is exceedingly uncommon. Although uncommon, they should be included in the differential diagnosis of nail abnormalities. Early diagnosis and complete surgical excision lead to an excellent prognosis with a minimal risk of recurrence. **Objective:** To raise awareness of the rarity of this condition to improve its early diagnosis and management. **Case Report:** A 72-year-old woman presented with a painless, slowly enlarging subcutaneous mass for 2 years at the base of the right middle fingernail. She was treated surgically under digital block anesthesia and followed up for 12 months. **Results:** The patient recovered without complications, and follow-up visits showed no recurrence at 12 months post operative upon complete regrowth, clinical examination revealed well defined longitudinal groove. **Conclusion:** This case highlights the delayed presentation and the importance of complete excision of collagenous fibroma of the nail matrix, which can lead to a favorable prognosis when effectively managed.

Subject Areas

Dermatology

Keywords

Collagenous Fibroma, Nail

1. Introduction

Collagenous fibroma (CF) of the nail is a rare benign soft-tissue tumor that predominantly affects the nail matrix, bed and surrounding structures. This condi-

tion is classified as fibroma, characterized by overgrowth of collagenous connective tissue. Fibromas are slow-growing tumors composed mainly of fibrous tissue, and when they occur in the nail region, they can cause significant cosmetic and functional disturbances [1]. Although CF has been reported in various anatomical locations, their occurrence in the nail apparatus is uncommon [2].

The pathogenesis of CF remains uncertain. Some cases may be related to trauma or irritation, while many have unknown causes. Clinically, these tumors are often present as well-defined, firm, and painless masses or nodules in the nail bed or Matrix [3]. Slow enlarging tumors can cause nail distortion, deformity, or loss over time.

Histologically, CF is composed of dense collagen fibers arranged in an irregular pattern. Tumors are typically non-invasive and lack features of malignancy. This makes it distinct from other lesions, such as squamous cell carcinomas or other more aggressive tumors which may involve the nail bed [4].

The diagnosis of CF is based on clinical presentation and histopathology. Surgical excision is the only effective treatment. However, complete excision is essential to minimize the risk of recurrences [5].

Although benign, the rarity of CF of nails poses challenges in diagnosis and management. Case reports are essential for both understanding the clinical courses, treatment options, outcomes and contributing to a broader knowledge of tumors in the nail unit [2].

2. Case Report

A 72-year-old woman presented with a two-year history of painless, slowly enlarging mass beneath the skin of proximal nail fold of right middle fingernail (**Figure 1**). CF of the Fingernail is a rare benign soft tissue neoplasm that typically involves the nail matrix, nail bed, or periungual fold. It is infrequently encountered and presents a diagnostic challenge that requires careful clinical examination and histopathological confirmation [6]. Although the exact incidence is difficult to determine due to its rarity, it is generally seen in adults, predominantly in individuals between the ages of 50 and 60 [2]. However, this condition may occur across a wide age range, as seen in this case. The female-to-male ratio for CF is balanced, although a slight predilection for female has been noted in some studies. The clinical characteristics are not exclusive to CF, as similar presentations may be seen in other benign conditions like glomus tumors, subungual exostosis [3], or even squamous cell carcinoma, all of which must be considered differential diagnosis [7].

The importance of distinguishing CF from other conditions lies in their distinct biological behaviors and therapeutic approaches. Unlike glomus tumors, which are typically more painful and may present with bluish discoloration, or subungual exostosis, which is usually associated with underlying bone involvement, CF presents as a firm, mobile mass without the marked tenderness seen in glomus tumors [8]. Additionally, squamous cell carcinoma, a malignant condition that

can present similarly, requires a different treatment approach, highlighting the critical role of a correct diagnosis.

The patient did not report any trauma or prior injury to the affected area. No pain or functional limitations was complained. The patient's medical history was uneventful, and there was no notable family history of skin disorders. On clinical examination, a firm, well-circumscribed nodule was noted at the proximal nail fold of right middle finger, associated with mild longitudinal groove of the nail plate (**Figure 1**). Grooves are seen on the nail plate using the dermoscopy (**Figure 2**). The lesion did not show signs of inflammation or infection, and there were no lymphadenopathies neither in the ipsilateral epitrochlear lymph nodes nor axillary area. The surrounding skin appeared to be normal. Magnetic resonance imaging (MRI) was performed and reported multiple circular T2 signals on the dorsal side largest measuring about 6 * 5 * 5 mm, a well-circumscribed, with no evidence of invasion into the surrounding soft tissues or bone (**Figure 3**). No contraindications was revealed and surgical excision was performed under digital



Figure 1. Before surgery.



Figure 2. Shows dermoscopy with dermlite 5 (DL5).

block anesthesia with tourniquet placed at root of right middle finger. The nail plate was gently detached and removed from the nail bed by dissector. Incisions were made at both corners of the perionychium and the entire proximal nail folds (PNF) was retracted using sutures to expose the nail matrix (Figure 4). A high-resolution electronic microscope (CARL ZEISS-LUMERA300) enhanced intraoperative visualization. The mass was carefully dissected and excised at its very base using micro-scissors and micro-forceps. The defect was closed using 6/0 absorbable sutures, followed by closure of the retracted PNF with 5/0 non-absorbable suture. A sterile dressing consisting of antibiotic ointment, sterile paraffin gauze, and protective gauze bandage wrap was used. The excised mass was subjected to histopathological examination which later confirmed the diagnosis of CF. Postoperative instructions included keeping the surgical site clean, dry, and avoiding trauma. Follow-up appointment was scheduled after 24 hours to remove the dressing and an antiseptic soaking were performed, repeated wound dressing was subjected until complete healing. The patient was instructed to come after ten days for removal of stitches of the PNF. According to a review of the existing literature, recurrence of CF is rare but can occur if the lesion is not entirely excised [4]. However, close monitoring is advisable in the early postoperative period to ensure that no residual tumor remained [9].

During the follow-up period, the surgical site healed well and there were no signs of infection. At the 12-month follow-up, the patient showed no complications or recurrence of the lesion.



Figure 3. MRI shows the dorsal side of the middle finger.



Figure 4. During surgery.

3. Discussion

This case highlights the delayed presentation and the importance of complete excision of collagenous fibroma of the nail matrix, which can lead to a favorable prognosis when effectively managed.

This case underscores the necessity for histopathological assessment in all suspected cases of soft tissue tumors of the nail, as clinical examination alone is insufficient to definitively identify the lesion.

In this case the lesion showed hallmark features of CF, an abundant dense collagenous matrix with a relatively uniform arrangement of fibroblasts [4]. This fibrous tissue was not infiltrative, which helped rule out more aggressive malignancies, such as fibrosarcoma. The overproduction of collagen fibers and relatively benign cellular architecture distinguishes this tumor from another fibroblastic lesion [4] [5].

The etiology of CF stays idiopathic, although some studies have suggested that chronic mechanical irritation or minor trauma may contribute [4]. In this case, no history of significant trauma or repetitive injury to the affected finger was reported by the patient. This aligns with the variable presentation of CF in which many cases arise without an identifiable precipitating factor [8]. This lack of a clear etiology is consistent with other reports in the literature, which suggest that these tumors may occur sporadically. However, a history of trauma, as seen in some cases, may trigger abnormal fibroblastic activity, leading to excessive collagen deposition [9].

Its pathogenesis involves the proliferation of fibroblasts, which synthesize and deposit collagen fibers in response to either genetic or environmental factors [5]. These tumors are generally non-invasive and well-circumscribed, distinguishing them from more aggressive tumors. The histopathologic features of dense, irregularly arranged collagen fibers, with minimal cellular atypia, are diagnostic. Fibroblast proliferation is thought to be a response to an underlying or a consequence of an intrinsic proliferative disorder.

4. Conclusion

Herein, to our knowledge this is the first rare, reported case of CF occurring at the fingernail. Prior reports describe CF at the fingertip without the nail unit involvement. Surgery remains the treatment of choice. It is non-invasive and has an excellent prognosis.

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Author Contributions

Every author played a role in composing and critically evaluating the manuscript and offered input on its readiness for publication.

Availability of Data and Materials

The corresponding author can provide the data examined in this case report upon request.

Ethics Approval and Consent to Participate

This case report was approved by Hangzhou First People's Hospital. Prior to this, the patient provided written informed consent. Stringent protocols were implemented to safeguard patient privacy and ensure confidentiality, with no disclosure of personal information. The case report was written and conducted in full compliance with established ethical guidelines and regulations for clinical practice and the protection of human subjects.

Consent for Publication

The person featured in this case study provided written consent for the release of medical details and related images. The journal's editor-in-chief had the opportunity to examine the patient's signed consent form.

Conflicts of Interest

The authors declare no conflicts of interest.

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Abbreviations

CF	Collagenous Fibroma
PNF	Proximal Nail Fold
MRI	Magnetic Resonance Imaging