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A RARE PRESENTATION OF MIDDLE FINGERTIP TRICHILEMMAL CYST: A CASE REPORT

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ABSTRACT
Trichilemmal or pilar cysts (TCs) are common benign cutaneous lesions that arise from the outer root sheath of hair follicles and represent 5–10% of skin-related conditions in the general population. Characterized by a squamous epithelial lining and containing keratin, these cysts primarily appear in areas abundant in hair follicles, notably the scalp, which hosts about 90% of such cases. However, they have also been seen on the face, neck, arms, and legs. The rarity of TC occurrences in non-hair-bearing regions, such as the fingertips, presents an intriguing divergence from the norm, suggesting a wider spectrum of manifestation sites than previously acknowledged. We herein report a case of a 52-year-old male who sought medical attention for a lump on his middle finger that had been growing painlessly over two years but had recently become painful, ulcerated, and started discharging pus. Initially treated as a finger abscess, further investigation through biopsy revealed the true nature of the condition as a trichilemmal cyst. This case adds to the sparse literature on TCs manifesting in unusual, non-hair-bearing sites and underscores the necessity for healthcare professionals to consider a broader differential diagnosis for cystic lesions, even in unexpected locations

KEYWORDS: Abscess; benign; trichilemmal cyst; pilar cyst; keratin.

INTRODUCTION
Cystic lesions constitute a prevalent category of dermatological conditions, involving the skin and its adnexal tissues extensively. Traditionally encompassed under the term "sebaceous cyst," current nomenclature delineates two primary types of cysts: epidermal cysts, deriving from the epidermis, and pilar or trichilemmal cysts (TCs), originating from the pilary apparatus. Distinctively, pilar cysts account for approximately 20% of epithelial cysts, as opposed to the more common epidermal cysts, which represent about 80% of cases.[1] The term trichilemmal cyst was introduced by Pinkus to denote cysts emerging from the follicular isthmus of the external root sheath of hair follicles, signifying a pivotal advancement in dermatological classification.[2,3]

Trichilemmal cysts predominantly manifest in areas characterized by a high density of hair follicles, with the scalp being the foremost site of occurrence. However, the presence of TCs in areas devoid of hair follicles remains an exception, with recorded manifestations in various anatomical locations including the back, vulva, nose, mons pubis, buttocks, wrists, chest, elbows, and ocular regions. Such instances underscore the cysts' potential for diverse anatomical presentations.[4,5,6,7] TCs are recognized as autosomal dominant benign subcutaneous lesions, potentially triggered by trauma, inflammation, or unidentified factors, which lead to the loss of the inner root sheath and subsequent proliferative and keratinizing activities of the outer root sheath cells, resulting in cyst formation.[8] Although their development in hair-bearing regions is well-documented, the mechanisms facilitating their emergence in follicle-free areas are yet to be fully elucidated.[9]

Thus, in this paper, we represent a rare case of trichilemmal cyst occupying the third fingertip region and discuss the histopathological features and intraoperative findings.

CASE PRESENTATION
A 52-year-old ex-military smoker man, medically and surgically free, presented to emergency department complaining of a painful swelling on the volar side of the right middle fingertip of 1 month duration. The swelling is associated with ulceration and purulent whitish

discharge with no systematic or B symptoms. This condition dates back to 2 years when the patient noticed a slowly growing painless swelling on the fingertip and didn't seek any treatment during that period. The patient was initially diagnosed and treated as fingertip abscess by incision and drainage, betadine dressing and oral antibiotics for two weeks. After 2 weeks, the patient followed up at the clinic with no significant improvement and was discharged again on oral antibiotics with no improvement with residual swelling and signs of local infection. Ultimately, the patient was referred to us at the plastic surgery clinic.

Physical examination revealed a cystic, tender lesion approximately 2 × 1.5 cm in size with ulcerated overlying skin and scanty purulent discharge as shown in **Figure 1**. Given the lesion's characteristics and concerns for potential malignancy, we opted for an excisional biopsy with minimal margins, leaving the wound to heal by secondary intention. **Figure 2** shows intra-operative findings before and after excision.

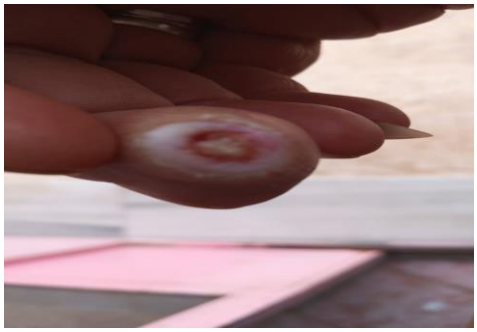

Figure 1: Cystic lesion with overlying skin ulceration and whitish purulent discharge.

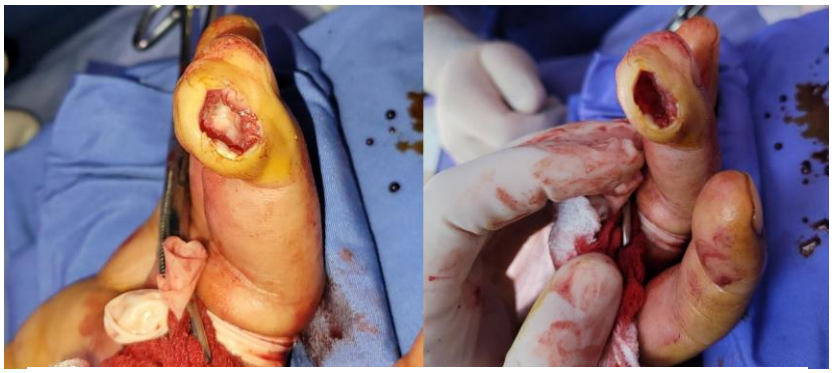

Figure 2: Intra-operative findings pre and post excision of the lesion.

Histopathological examination of biopsy material from the right middle finger identified two irregular white soft tissue fragments. Microscopically, the lesion was characterized as a squamous-lined cystic structure consistent with a trichilemmal cyst. Accompanying features included hyperkeratosis, parakeratosis with crust formation, and pseudoepitheliomatous hyperplasia in acral skin tissue. The dermis displayed dense mixed acute and chronic inflammation. PAS stain for fungal forms returned negative, and no signs of malignancy were observed. The final diagnosis confirmed a benign trichilemmal cyst without evidence of malignancy. **Figure 3** shows microscopic examination of the cyst.

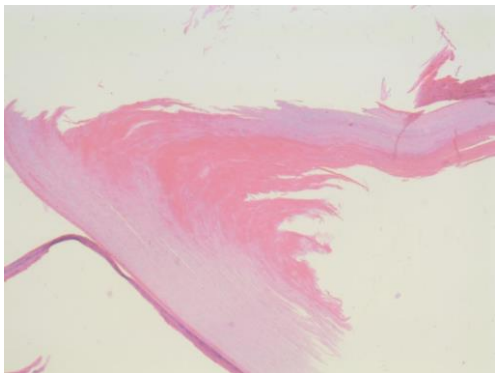

Figure 3: Microscopic examination of the lesion revealed a squamous-lined cystic structure consistent with a trichilemmal cyst. (hematoxylin and eosin, magnification x20).

Post-excision, the patient was given IV antibiotics for three days and was ultimately discharged on oral antibiotics. After a 2 week follow-up, the wound was clean showing no signs of infection and was fully healed. **Figure 4** illustrates the lesion's resolution and complete healing.

Figure 4: Complete healing and resolution of lesion.

DISCUSSION

Trichilemmal cysts, also known as pilar cysts, are benign lesions commonly located on the scalp. They are lined with a stratified squamous epithelium and filled with keratin, a protein from which hair and nails are derived.[10,11] Their content is typically smooth, cream-colored, and semi-solid, contrasting with the granular keratin found in epidermal cysts. Despite their commonality in hair-bearing regions, cases of TCs in non-hair-bearing areas such as the fingertips, ears, and even gluteal region have been documented, challenging previous assumptions about their exclusive scalp prevalence.[12]

The rarity of fingertip TCs, as highlighted in our case, underscores the diverse potential for TC manifestations. Fingertip TCs, such as the one presented, defy conventional expectations, and underscore the adaptability of trichilemmal keratinization processes. The evolution of TCs to inhabit non-hair-bearing areas, possibly due to metaplastic changes following trauma or other stimuli, expands the diagnostic considerations for cystic lesions in these regions. This adaptability is further evidenced by the occurrence of TCs in locations like the penile region and eyelids, postulated to result from metaplastic responses to surgical interventions or the removal of other lesions.[13]

The clinical management of TCs, as demonstrated in the reported case, often involves surgical excision, a definitive treatment that highlights the importance of accurate diagnosis. Despite the benign nature of most TCs, the differential diagnosis includes more aggressive entities such as proliferating trichilemmal tumors and malignant pilar tumors, which necessitate a different therapeutic approach. The potential for malignant transformation, albeit rare, underscores the importance of vigilance and comprehensive histopathological evaluation to guide appropriate management strategies.[13,14]

In conclusion, the rare presentation of a middle fingertip trichilemmal cyst in a patient previously misdiagnosed and treated for a finger abscess brings to light the critical nuances in the diagnosis and management of TCs. The case underscores the need for awareness of TCs' potential to manifest in atypical locations, challenging conventional diagnostic paradigms. It emphasizes the importance of considering a broad differential diagnosis for cystic lesions in non-hair-bearing areas, the role of surgical intervention in the management of TCs, and the necessity for histopathological confirmation to rule out malignancy. Through the lens of this rare presentation, the case report contributes to the expanding body of knowledge on TCs, highlighting the diversity of their manifestations and the importance of a meticulous approach to diagnosis and management.

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Ethical Considerations

In addition to the patient’s images and the clinical information, a written consent for the surgery and the study were obtained. The patient knows that his name will not be mentioned in the study.

Ethical Approval

Ethical approval was obtained from the local ethical committee of the Jordanian Royal Medical Services.The study was performed in accordance with the principles of the Declaration of Helsinki, 1975.

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