

JAMA Dermatology Clinicopathological Challenge

Creamy Yellow Concretions in Axillary Hair

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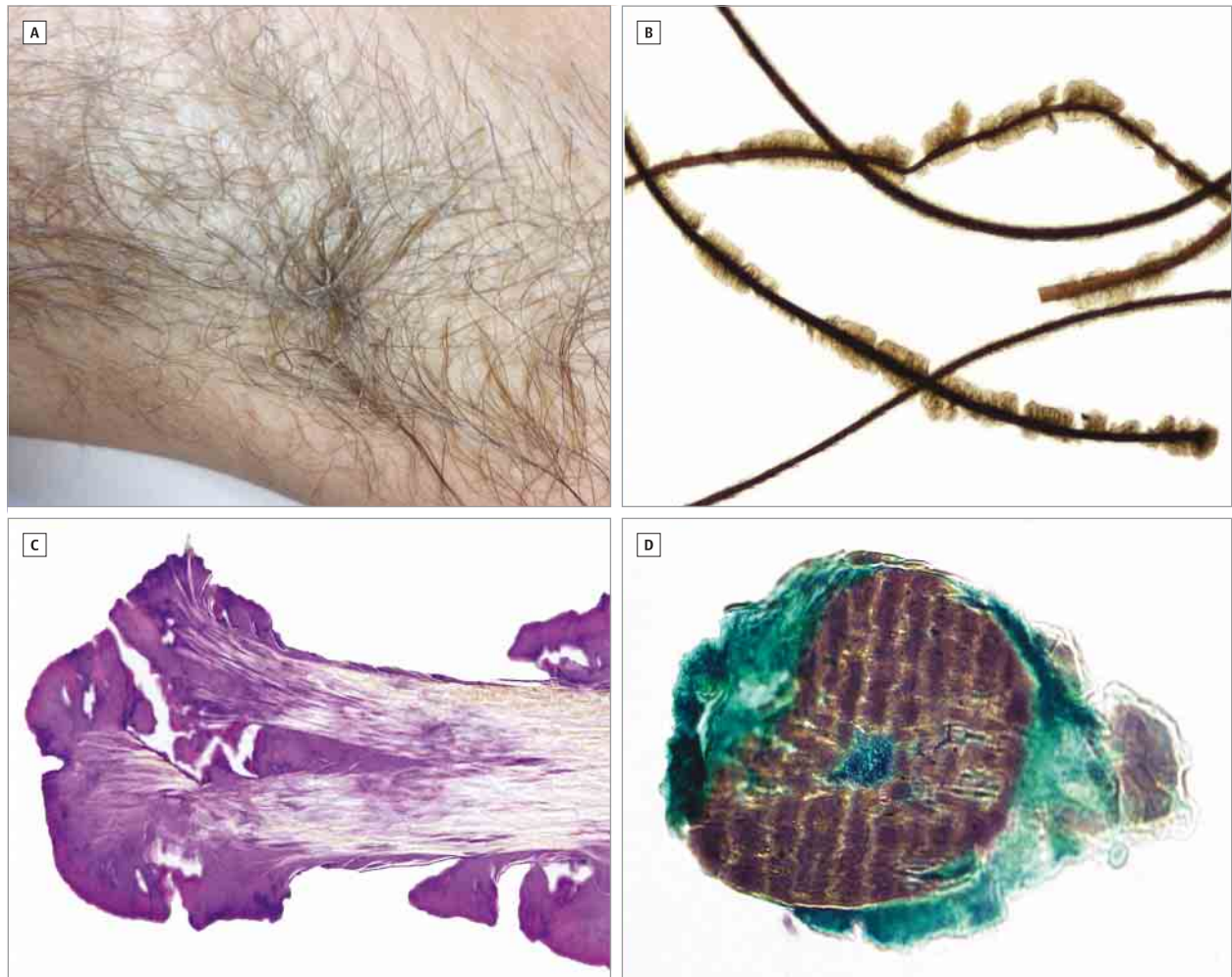


Figure. A, Clinical photograph of axillary hairs shows creamy yellow concretions along several axillary hairs. B, Direct microscopic examination of the hair shaft

(original magnification $\times 40$). C, Periodic acid-Schiff stain (original magnification $\times 400$). D, Grocott silver stain (original magnification $\times 400$).

A man in his 20s was referred to our department because of the presence of a sticky material around the underarm hair for approximately 1 year. The patient explained that he usually plays soccer and sweats abundantly. He did not apply deodorant or any other products in the underarm, and he ensured proper hygiene of the area. The lesions did not produce itching. Physical examination revealed creamy yellow concretions along several hair shafts, in both armpits, with strong axillary odor (Figure, A). These concretions did not disappear when cleansed with alcohol. Hair

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samples of the affected areas were sent for microscopy examination (Figure, B-D) and microbiologic culture. Treatment with antiseptic soap and a miconazole nitrate cream was initiated. After 2 weeks of treatment, the lesions had resolved and the patient had normal axillary hairs. Confirmation of the suspected diagnosis was made with the results of complementary tests.

WHAT IS YOUR DIAGNOSIS?

- A. Artifactual peripilar hair casts
- B. Trichomycosis axillaris
- C. Pediculosis axillaris
- D. White piedra

Diagnosis

B. Trichomycosis axillaris

Microscopic Findings and Clinical Course

Direct microscopic examination showed a discontinuous coating of hair shafts by a thick layer of adherent bacterial structures (Figure, B). These microorganisms were oriented perpendicularly to the main axis of the hair, showing autofluorescence. The bacteria stained on periodic acid-Schiff (Figure, C), Gram, and Grocott silver stains (Figure, D). The bacterial structures can be seen going into the hair cortex. Examination with 20% hydrogen peroxide showed structures with mucinous appearance. Microbiology studies in agar blood culture identified abundant colonies of *Corynebacterium* spp. The results of microbiological tests confirmed the clinical diagnosis of trichomycosis axillaris.

The patient came back after 2 weeks without relapse of the infectious process. He was informed of preventive measures to avoid recurrences and has been free of the condition for 6 months.

Discussion

Trichomycosis axillaris (TA) is a bacterial colonization of hairs commonly affecting the axillae, and sometimes the pubic area. It is characterized by the presence of concretions along the hair shafts, clinically observed as yellow, and rarely as red or black nodules.^{1,2} The pathogenic microorganism is a corynebacterium. In earlier reported cases of TA, *Corynebacterium tenuis* was identified as the pathogenic microorganism.^{1,3,4} In a recent publication by Bonifaz et al,⁵ the most common organism reported was *Corynebacterium* spp in 56 cases of TA, but different taxonomic species were identified. Kimura et al² described a recent case caused by *Corynebacterium propinquum*.

The diagnosis is clinical, by means of the identification of hair concretions. These concretions derive from bacterial colonization along the hair shaft containing dried apocrine sweat with a cementing substance generated by the bacteria.⁵ Microbiology laborato-

ries can confirm the diagnosis by examination of hairs with hydrogen peroxide 20% solution and by growing *Corynebacterium* in agar blood culture. The bacteria show positive autofluorescence, as well as positivity for periodic acid-Schiff, Gram, and Grocott silver stains. In our case, remarkable invasion of the hair cortex by bacterial structures was observed, in contrast with the majority of reported cases, which describe involvement of hair shafts with keratin damage but respecting the hair cortex.^{6,7}

The treatment is based on shaving the hair in the axillary area and maintaining appropriate daily hygiene. In some cases, the use of topical antibiotics can be useful.⁵ *Corynebacterium* infections are related to excessive sweating; for this reason, roll-on deodorants containing an aluminum chloride solution (15%-20%) may be used for treatment and prevention.^{6,8}

Infection by a corynebacterium can produce 2 other different diseases, erythrasma and pitted keratolysis (PK). Erythrasma is a chronic infection of underarm or inguinal skin, presenting with brown symmetric patches. Pitted keratolysis is a condition confined to the plantar stratum corneum that confers a punctate appearance and a "rotten" odor.⁸

Some patients with excessive sweating present the so-called corynebacterial triad, that is, the simultaneous presence of TA, erythrasma, and PK. Rho et al⁸ published a prospective study evaluating the prevalence of erythrasma and TA in Korean soldiers with PK during a period of 2 years. The most prevalent coexistence was with erythrasma, followed by simultaneous TA and PK; the coexistence of the 3 diseases was present in 13% of the patients.

We have herein reported a case of TA confirmed by microbiological and microscopy findings, with atypical involvement of the hair cortex. The prevalence of this condition is likely underestimated because it may be chronic and/or asymptomatic and not come to medical attention. The name "trichomycosis" is misleading because this is not a fungal infection; this entity should thus be called trichobacteriosis.^{1,5}

ARTICLE INFORMATION

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