

Pitted Keratolysis

Pitted keratolysis is a superficial, non-inflammatory bacterial infection that predominantly affects the palms and soles, with the latter being more commonly involved. This condition is characterized by the presence of small, well-defined depressions or pits in the outermost layer of the skin. While these pits are often asymptomatic, they can occasionally cause itching or tenderness. Pitted keratolysis is primarily associated with excessive sweating and certain environmental factors. Bacterial species, particularly *Corynebacterium* and *Actinomyces*, are identified as the main causative agents. This condition is relatively common in individuals who engage in activities that increase sweat production, such as athletes or those in hot, humid environments.

Etiology and Pathogenesis

The primary causative organisms of pitted keratolysis are *Corynebacterium* species, including *Corynebacterium minutissimum*, and *Actinomyces* species. These gram-positive bacteria thrive in the moist, occluded environments created by sweating and tight clothing, such as shoes and socks. The infection is facilitated by a combination of factors: excessive sweating, poor ventilation of the feet, and prolonged wear of tight, non-breathable footwear. These conditions create an ideal environment for the growth of the bacteria, which then produce enzymes that degrade the superficial layers of the skin, leading to the characteristic pitting.

While the condition is most commonly observed on the soles of the feet, it can also occur on the palms and, less frequently, in other regions of the body that experience high moisture levels. *Corynebacterium* species are involved in the production of a characteristic odor due to the metabolic byproducts they release.

Clinical Presentation

Pitted keratolysis presents with small, shallow depressions or pits in the outermost skin layers, usually on the weight-bearing areas of the soles. The lesions are typically well-circumscribed and can range in size from small pinpoint depressions to larger, coalescing pits. The affected skin may have a characteristic odor, often described as foul-smelling, which is caused by the bacterial fermentation of sweat and skin debris. While the pits themselves are generally painless, they may become itchy or tender, particularly if secondary irritation or infection occurs. In more severe cases, the skin can appear macerated or moist, and there may be a risk of bacterial superinfection.

Diagnosis

The diagnosis of pitted keratolysis is primarily clinical, based on the characteristic appearance of the pitted lesions and associated symptoms, such as odor. A thorough history and examination of the patient's lifestyle, including factors such as occupation, footwear habits, and sweating patterns, are essential in establishing the diagnosis. Laboratory testing, including skin scraping and microbial culture, can help confirm the diagnosis and identify the responsible bacteria, although it is not always necessary in uncomplicated cases. In some cases, a Wood's lamp examination can assist in identifying infections caused by *Corynebacterium* species, which typically fluoresce under UV light.

Treatment and Management

The management of pitted keratolysis focuses on reducing the environmental factors that promote bacterial growth and addressing the bacterial infection. Key components of treatment include:

- **Lifestyle Modifications:** Avoidance of tight-fitting shoes and socks that contribute to excessive sweating is crucial. Wearing breathable, moisture-wicking footwear and socks can help reduce sweat accumulation and improve air circulation.
- **Topical Antibacterial Therapy:** Prescription-strength topical antibacterial agents are the mainstay of treatment. Commonly used medications include:
 - **Clindamycin:** This topical antibiotic is effective against *Corynebacterium* species and is often prescribed in gel or lotion form.
 - **Erythromycin:** Another antibiotic option that is effective against gram-positive bacteria, including *Corynebacterium*.
 - **Mupirocin:** This topical antibiotic is also used to treat bacterial infections of the skin, including pitted keratolysis.
- **Drying Agents:** In cases of persistent sweating, a topical drying agent such as **Drysol** (aluminum chloride hexahydrate) may be recommended. This agent reduces sweat production by blocking sweat glands, thereby creating an environment less conducive to bacterial proliferation.
- **Oral Antibiotics:** In severe or refractory cases, oral antibiotics may be required. Typically, a 1- to 2-week course of oral antibiotics such as tetracyclines or trimethoprim-sulfamethoxazole may be prescribed, particularly if there is extensive involvement or secondary infection.
- **Prevention:** Once the infection is treated, preventive measures include good foot hygiene, regular washing and drying of the feet, and the use of antifungal powders to help absorb excess moisture. In cases of recurrent pitted keratolysis, preventive use of topical antibacterial agents may be considered.

Prognosis and Complications

The prognosis for pitted keratolysis is generally good with appropriate treatment, and most patients respond well to topical antibacterial therapy. However, if left untreated, the condition can cause discomfort due to tenderness and persistent odor. In rare cases, prolonged or untreated infections may lead to secondary bacterial infections or complications such as cellulitis or fungal superinfection. Additionally, if the condition is recurrent, it may have a psychological impact due to its appearance and odor.

Conclusion

Pitted keratolysis is a superficial bacterial infection primarily affecting the soles of the feet, characterized by small, pitted lesions and an unpleasant odor. It is commonly caused by *Corynebacterium* and *Actinomyces* species and is associated with environmental factors such as excessive sweating and occlusive footwear. Treatment focuses on lifestyle modifications, topical antibacterial agents, and the use of drying agents to reduce sweating.

References

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