CLINICAL VIGNETTE

Transient Reactive Papulotranslucent Acrokeratoderma During the COVID-19 Pandemic

Sogol Stephanie Javadi, BS, Gregory Gates, MD and Yang Yu, MD

Case

A 19-year-old patient presented to dermatology with a two-month history of palmar lesions that were associated with irritation and sensation of tightness. The patient reported that the lesions were more prominent after handwashing, showering, or sweating. Exam findings revealed translucent white, flat-topped papules and plaques with eccrine duct prominence of the palms bilaterally with associated dampness (Figure 1). The patient was previously prescribed mupirocin and antifungal cream by their primary care provider with no relief. A clinical diagnosis of acquired transient reactive papulotranslucent acrokeratoderma, also known as aquagenic palmoplantar keratoderma, was made and supported with histopathologic findings (Figure 2).

Discussion

Transient reactive papulotranslucent acrokeratoderma is a condition characterized by round translucent-white palmoplantar papules and plaques.[1] Though lesions may be present at baseline, findings are markedly accentuated after exposure to water or sweat.[2] According to Yan et al., the "hand in bucket" sign could be used as an additional diagnostic tool given that the skin lesions become more conspicuous following water exposure.[2] Treatment options, which include iontophoresis, 20% aluminum chloride hexahydrate, and glycopyrrolate to minimize hyperhidrosis, aid in prompt remission.[2]

Hereditary Aquagenic Acrokeratoderma

Existing literature has documented both the acquired and hereditary forms of similar conditions.[2,3] According to Onwukwe, Mihm, and Toda, those with the hereditary form of papulotranslucent acrokeratoderma become symptomatic at the time of puberty and experience associated thinning of scalp hair.[3] The condition may be inherited in an autosomal dominant pattern.[3] Patients with the hereditary form of the condition, may have associated aquagenic wrinkling of the palms. Some studies have suggested that patients with palmar wrinkling may have a mutation in the gene encoding cystic fibrosis transmembrane regulator (CFTR) and should consider genetic testing for cystic fibrosis (CF).[4,5] However, patients with CFTR mutations, do not necessarily have CF, as there is tremendous variability in penetrance as well as the types of mutations and phenotypes.[6] In terms of the pathophysiology, it has been postulated that abnormal electrolyte fluxes or aberrant aquaporin functioning due to mutations in the CFTR gene may account for wrinkling of the skin.[4,5] Conducting a careful history and exam can help clinicians determine which patients are likely to have the hereditary aquagenic acrokeratoderma, and should be referred for genetic testing.

Acquired Aquagenic Acrokeratoderma

In our patient, a genetic predisposition was not suspected as the patient became symptomatic in their early adulthood, had no family history of cystic fibrosis, and did not have wrinkling of the palms following exposure to water. Much like the hereditary form of the condition, diagnosis of the acquired type of acrokeratoderma is made by history and clinical findings, though histological investigation confirms discrete hyperkeratosis and dilated eccrine ostia.[2] While the pathophysiology is still unclear, some have hypothesized pathology within the stratum corneum which results in a defective skin barrier and increased water absorbance.[7] Other hypotheses include a keratin-10 deficiency or mutations in epithelial proteins, such as transglutaminase and involucrin, resulting in impaired functioning of the skin barrier.[7]

Implications of the COVID-19 Pandemic

Since March 2020, there have been additional reports of patients presenting with aquagenic palmoplantar keratoderma, suggesting that incidence may be on the rise.[8,9] Given the strong association between this condition and water exposure, the rise in cases over the past year may be related to an increase in handwashing during the COVID-19 pandemic.[8,9] Therefore, we strongly urge clinicians to consider transient reactive papulotranslucent acrokeratoderma among their differentials in patients presenting with a hand "rash," thereby avoiding a common misdiagnosis and promoting steadfast treatment and relief of symptoms.

Figure 1. Edematous white macerated papules coalescing in plaques on the left palm pre-handwashing (A)(B); accentuated post-handwashing (C)(D).

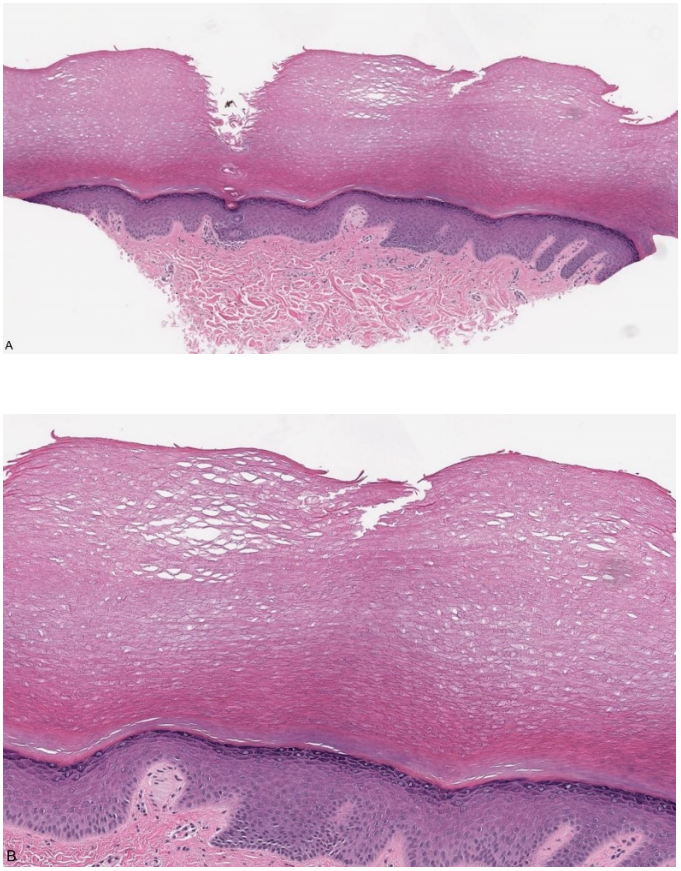

Figure 2. Histology from the left palm showed mildly acanthotic epidermis with overlying compact hyperkeratosis showing palor and a widened acrosyringeal ostium. (Hematoxylin and eosin stain [A] 4x original magnification, [B] 10x original magnification).

REFERENCES

1. **English JC 3rd, McCollough ML**. Transient reactive papulotranslucent acrokeratoderma. *J Am Acad Dermatol*. 1996 Apr;34(4):686-7. doi: 10.1016/s0190-9622(96) 80087-9. PMID: 8601664.
2. **Yan AC, Aasi SZ, Alms WJ, James WD, Heymann WR, Paller AS, Honig PJ**. Aquagenic palmoplantar keratoderma. *J Am Acad Dermatol*. 2001 Apr;44(4):696-9. doi: 10.1067/mjd.2001.113479. PMID: 11260552.
3. **Onwukwe MF, Mihm MC Jr, Toda K**. Hereditary papulotranslucent acrokeratoderma. A new variant of familial punctate keratoderma? *Arch Dermatol*. 1973 Jul;108(1):108-10. doi: 10.1001/archderm.108.1.108. PMID: 4716729.
4. **Tolland JP, Boyle J, Hall V, McKenna KE, Elborn JS**. Aquagenic wrinkling of the palms in an adult cystic fibrosis population. *Dermatology*. 2010;221(4):326-30. doi: 10.1159/000319754. Epub 2010 Sep 25. PMID: 20881360.
5. **Katz KA, Yan AC, Turner ML**. Aquagenic wrinkling of the palms in patients with cystic fibrosis homozygous for the delta F508 CFTR mutation. *Arch Dermatol*. 2005 May;141(5):621-4. doi: 10.1001/archderm.141.5.621. PMID: 15897385.
6. **Ferec C, Cutting GR**. Assessing the Disease-Liability of Mutations in CFTR. *Cold Spring Harb Perspect Med*. 2012 Dec 1;2(12):a009480. doi: 10.1101/cshperspect.a009480. PMID: 23209179; PMCID: PMC3543074.
7. **Itin PH, Lautenschlager S**. Aquagenic syringeal acrokeratoderma (transient reactive papulotranslucent acrokeratoderma). *Dermatology*. 2002;204(1):8-11. doi: 10.1159/000051802. PMID: 11834842.
8. **Karagün E**. Aquagenic acrokeratoderma due to frequent handwashing during the COVID-19 pandemic outbreak. *Dermatol Ther*. 2021 Mar;34(2):e14796. doi: 10.1111/dth.14796. Epub 2021 Feb 10. PMID: 33484064; PMCID: PMC7995083.
9. **Ayhan E, Yıldırım C, Aksoy M, Ebik B, Öztürk M, Akelma H**. Ten cases of aquagenic syringeal acrokeratoderma revealed during the COVID-19 outbreak. *Int J Clin Pract*. 2021;75(3):e13914. doi: https://doi.org/10.1111/ijcp.13914