

## Photo Vignette

# Aquagenic wrinkling of the palms in a healthy adolescent

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### Abstract

Aquagenic wrinkling of the palms (AWP) is a rare dermatologic condition characterized by rapid wrinkling, edema, and papules on the palms after brief water exposure. It is commonly associated with cystic fibrosis (CF) or CF carrier status but can also occur in individuals without these conditions. We report a healthy 12-year-old girl who presented with AWP without a family history of CF or related symptoms. After 4 minutes of water immersion, she exhibited typical wrinkling and translucent papules on the palms, which resolved completely within 15 minutes. A sweat test for CF was negative. The patient was managed with moisturizers and advised to minimize prolonged water exposure. This case highlights AWP as a potential early marker for CF or carrier status, even in the absence of other symptoms. Recognition of AWP may guide genetic screening and early intervention, underscoring the role of dermatologists in identifying this condition and facilitating timely diagnosis and management of CF.

### Introduction

Aquagenic wrinkling of the palms (AWP) is an exceedingly rare dermatologic phenomenon characterized by rapid development of excessive wrinkling, edema, and transient whitish or yellowish papules on the palmar surfaces after brief water immersion. It was first described by pediatrician R.B. Elliot,<sup>1</sup> who observed this wrinkling pattern in children with cystic fibrosis (CF). This phenomenon predominantly affects women and may be accompanied by pain and/or pruritus.<sup>2</sup>

The pathophysiology of AWP is not fully understood, but abnormal electrolyte fluxes leading to sodium reten-

tion in epidermal keratinocytes, increased cell volume via osmosis, and aberrant expression of aquaporin 5 in sweat glands have been proposed.<sup>3</sup> Although initially considered a benign condition, AWP has a strong association with CF or CF carrier status.<sup>4,5</sup> It has also been observed in patients with hyperhidrosis, Raynaud disease, upper limb nerve injuries, marasmus, atopic dermatitis, and has been linked to aspirin and rofecoxib intake, supporting the need for basic clinical evaluation. Additionally, AWP can cause discomfort and affect hand aesthetics. We present the case of a healthy young girl who developed palmar wrinkling after brief contact with water.

### Case Synopsis

A healthy 12-year-old Caucasian girl presented with a 4-year history of excessive and rapid wrinkling of the palms after water exposure. She denied other predisposing factors or symptoms suggestive of CF, and there was no relevant family history. On examination, the palmar skin appeared normal (**Figure 1**). After immersion of the hands in room-temperature water for 4 minutes, numerous translucent white papules and marked wrinkling developed on the palms (**Figure 2**), with complete spontaneous resolution after 15 minutes. The patient did not report pruritus associated with these changes. The soles were not involved. These findings were consistent with aquagenic wrinkling of the palms.

A sweat test for CF was performed and yielded negative results. Specific *CFTR* (CF transmembrane conductance regulator) genetic testing was not conducted, as the patient had no other signs or symptoms of CF. As the patient's symptoms were limited to dermatologic complaints, management consisted of application of a fragrance-free moisturizer to maintain skin hydration and minimizing prolonged water exposure.

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**Figure 1.** Palmar skin before water immersion, showing no changes.



**Figure 2.** Palmar skin after 4 minutes of room-temperature water exposure, demonstrating numerous translucent white papules and marked wrinkling.

## Case Discussion

Given the high prevalence of aquagenic wrinkling of the hands in CF, AWP has been proposed as a potential

screening tool for CF. Immersing patients' hands in water for 3 to 7 minutes can be highly informative and should be incorporated into the routine clinical examination of patients with suspected CF, whether symptomatic (abdominal disease, reactive airway, nasal polyps, sinus drainage, clubbing, diarrhea, pancreatic insufficiency) or asymptomatic. The presence of AWP during examination serves as a significant marker for identifying not only CF, an autosomal recessive disorder caused by *CFTR* mutations, but also carrier status (heterozygosity for *CFTR* mutations), guiding appropriate genetic screening.<sup>6,7</sup> Approximately 80% of patients with CF and 25% of carriers exhibit AWP.<sup>6</sup> Recognition of AWP as an early clinical sign in individuals who may not present typical CF symptoms is therefore important.<sup>2</sup> Megna et al<sup>8</sup> reported a similar presentation of AWP in a healthy adult, highlighting the idiopathic nature of some cases and the potential for underdiagnosis in patients without CF or drug associations.

The *CFTR* gene, located on chromosome 7q, comprises 24 exons and encodes a membrane protein that regulates chloride transport in epithelial cells of the airways, pancreas, and sweat glands.<sup>9</sup> Nearly 2000 pathogenic variants have been identified in *CFTR*, with the most common worldwide being c.1521\_1523delCTT (p.Phe508del, ΔF508). Approximately 5% of patients present with non-classical CF, exhibiting milder symptoms and involvement of fewer organ systems.<sup>10,11</sup>

Prompt recognition of AWP can facilitate early initiation of CFTR modulator therapy, improving health outcomes, quality of life, and reducing morbidity and mortality associated with CF. Specific treatments for AWP include aluminum-based topicals and botulinum toxin-A, and each case should be evaluated individually.<sup>12</sup> Dermatologists play a pivotal role in the early identification of AWP, underscoring the importance of a multidisciplinary approach to ensure timely diagnosis and intervention.

## Conclusion

In the present case, there is no evidence that the patient has CF. However, AWP may serve as a clinical marker for CF or carrier status. Genetic analysis could therefore have implications for the patient and inform genetic counseling.

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## Potential conflicts of interest

The authors declare no conflicts of interest.

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