

# Aquagenic Wrinkling of Palms: A Case Report

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## ABSTRACT

Aquagenic wrinkling of the palms is a rare skin condition characterised by rapid wrinkling of the palms after water exposure, occurring within 2-4 minutes, compared to the normal physiological response which takes about 11 minutes. This condition predominantly affects young adult females and involves the eccrine secretory coil and acrosyringium. Cystic fibrosis-associated forms, drug-induced cases, and idiopathic forms have been described. Initial assessment of aquagenic wrinkling of the palms can be performed in a primary care setting. A comprehensive medical history and physical examination should be conducted, with additional investigations as required based on the patient's presentation. The present case report presents a case of a 23-year-old male with aquagenic wrinkling of the palms, demonstrating wrinkling of the skin within two minutes of water immersion without any underlying systemic condition or drug-induced factors.

**Keywords:** Acrosyringium, Aquaporin, Cystic fibrosis, Keratoderma, Maceration

## CASE REPORT

A 23-year-old male IT professional presented to the dermatology outpatient department with complaints of excessive wrinkling of the hands upon exposure to water during daily activities for the past one week. There was a history of burning sensation on both hands, which subsided after drying. There was no history of itching, pain, trauma, drug intake prior to the onset of lesions, excessive palmar sweating, breathing difficulty, atopy, or colour changes on exposure to cold. There were no similar episodes in the past and no family history of similar lesions or cystic fibrosis.

The general and systemic examinations were normal. Cutaneous examination revealed an apparently normal palmar and dorsal surface of the hands with palmar hyperlinearity. When immersed in water, there was an immediate wrinkling reaction within two minutes [Table/Fig-1], along with multiple macerated plaques over the dorsum of all digits [Table/Fig-2], medial borders of both palms [Table/Fig-3], and the flexor aspect of both wrists.



**[Table/Fig-1]:** Clinical picture of both hands in a tub with water showing wrinkling of skin within 2 minutes.

Investigations were not performed as the patient was unwilling. Based on the history and clinical findings, a diagnosis of aquagenic wrinkling of the palms was made. The patient was reassured about the benign nature of the condition and prescribed 20% aluminium chloride; however, he was lost to follow-up.



**[Table/Fig-2]:** Clinical picture showing macerated plaques (black arrows) over dorsal aspect of all digits.



**[Table/Fig-3]:** Clinical picture showing macerated plaques (black arrow) over the medial aspect of the hand.

## DISCUSSION

Aquagenic wrinkling of the palms, also known as transient papulotranslucent acrokeratoderma, aquagenic syringeal acrokeratoderma, transient aquagenic keratoderma, and acquired aquagenic palmoplantar keratoderma, is a rare dermatological disorder characterised by thickening, white to translucent papules and pebbly plaques with prominent eccrine pores on the palmar and dorsal surfaces of the hands and soles immediately after water immersion [1].

It is typically characterised by rapid palmar wrinkling within a few minutes of water exposure, which resolves spontaneously within minutes to hours after drying [1,2]. This condition is most commonly observed in adolescents and young females and is often accompanied by oedema and a burning sensation [2].

The most common sites involved are the palmar and dorsal surfaces of both hands, but it can also affect the forehead, dorsum of the fingers, and heels. Some cases may present with unilateral involvement [3]. Normally, physiological wrinkling occurs after approximately 11 minutes of water exposure, whereas in aquagenic wrinkling of the palms it occurs within 2-3 minutes. This rapid onset is referred to as the "hand-in-the-bucket" sign [4].

Although the exact pathogenesis is unknown, it has been hypothesised that there is impaired skin homeostasis of water and electrolytes. Dysfunction of aquaporin-3 and Aquaporin-5 (AQP5) water channel proteins has been implicated, explaining increased water retention [5]. The condition has also been associated with cystic fibrosis, Raynaud's phenomenon, atopic dermatitis, hyperhidrosis, marasmus, and medications such as aspirin, rofecoxib, spironolactone, and tobramycin [6].

In cystic fibrosis, aquagenic wrinkling is linked to mutations in the CFTR (Cystic Fibrosis Transmembrane Conductance Regulator) gene, which is responsible for chloride and bicarbonate ion transport across cell membranes [7]. The CFTR protein is thought to functionally interact with aquaporin-3, triggering increased water influx [8].

Investigations such as dermoscopy, Wood's lamp examination, biopsy, sweat chloride testing, and CFTR gene analysis may be performed [9]. Histopathological findings may include orthokeratosis, acanthosis, spongiosis, dilated eccrine acrosyringia, increased perieccrine capillaries, and perivascular inflammatory infiltrates [9].

Differential diagnoses include hereditary papulotranslucent acrokeratoderma, Bothnia-type palmoplantar keratoderma, aquagenic urticaria, and aquagenic pruritus. Hereditary papulotranslucent acrokeratoderma is autosomal dominant and associated with atopic diathesis, usually beginning in adolescence [9,10]. Bothnia-type palmoplantar keratoderma presents with diffuse thickening of palms and soles starting in infancy and is caused by gain-of-function mutations in the AQP5 gene [10]. Aquagenic urticaria presents with wheals, pruritus, and burning sensation over the body, while aquagenic pruritus causes intense itching without visible skin changes [10,11].

Most cases are self-limiting and may not require treatment. However, management options include topical 20% aluminium chloride hexahydrate, botulinum toxin injections, antihistamines, salicylic acid, iontophoresis, and endoscopic thoracic sympathectomy [11].

## CONCLUSION(S)

The present case highlights aquagenic wrinkling of the palms in a healthy young male, a rare and frequently under-recognised dermatological condition. The rapid onset of palmar wrinkling within two minutes of water exposure, in the absence of systemic disease or drug-related triggers, makes this case particularly noteworthy. Although the condition is benign and self-limiting, clinicians should consider aquagenic wrinkling of the palms in patients presenting with transient post-immersion skin changes to avoid unnecessary anxiety and misdiagnosis. Further research into the pathophysiology and genetic predisposition may improve understanding of its occurrence in individuals without cystic fibrosis or hyperhidrosis.

## REFERENCES

- [1] Megna M, Cantelli M, Martellotta D, Calabrò G, Balato A, Ayala F, et al. Aquagenic wrinkling of the palms: A case report and literature review. *Dermatol Online J*. 2016;22(9):13030/qt29g4r1k4.
- [2] Yang K, Zhou C, Luke J. Aquagenic wrinkling of the palms: Review of the literature. *Clin Exp Dermatol*. 2022;47(11):1910-15.
- [3] Gironi LC, Colombo E, Zottarelli F, Guala A, Arduino C, Leutner M, et al. Aberrant expression of aquaporin-3 in hereditary papulotranslucent acrokeratoderma and aquagenic palmoplantar keratoderma. *Eur J Dermatol*. 2018;28(2):262-63.
- [4] Raynal C, Girodon E, Audrezet MP, Cabet F, Pagin A, Reboul M, et al. CFTR gene variants: A predisposition factor to aquagenic palmoplantar keratoderma. *Br J Dermatol*. 2019;181(5):1097-99.
- [5] Dev PP, Verma P. Unusual presentation of aquagenic palmoplantar keratoderma with overlapping clinical features with hereditary papulotranslucent acrokeratoderma in a young male. *Indian Dermatol Online J*. 2023;15(2):322-23.
- [6] Alsoweilem MK, Alsheikh RH. Aquagenic wrinkling of the palms: A report of two cases from a family medicine setting in Eastern Saudi Arabia and literature review. *J Fam Community Med*. 2025;32(1):74-77.
- [7] Manoh J, Kumar M, Mathai S, Varkki S. Aquagenic wrinkling of the palms—a good early screening tool for Cystic Fibrosis (CF) in malnourished young infants in resource limited setting. *Indian J Pediatr*. 2025;92(4):422.
- [8] Martins IA, Santos-Coelho M, Fernandes C. Aquagenic wrinkling of the palms in a patient with cystic fibrosis. *Acta Med Port*. 2025;38(2):117-18.
- [9] Alkhayal FA, AIMuqrin AM. Wood's light as a novel diagnostic tool in aquagenic keratoderma. *Skin Health Dis*. 2024;4(3):e361.
- [10] Lindsay J, Incristi AR, Arnett B, Costa M, Chong C. A case of aquagenic syringal acrokeratoderma in a male patient undergoing treatment with an angiotensin-converting enzyme inhibitor. *Cureus*. 2024;16(11):e74157.
- [11] Sezer E, Durmaz EÖ, Çetin E, Şahin S. Permanent treatment of aquagenic syringal acrokeratoderma with endoscopic thoracic sympathectomy. *Indian J Dermatol Venereol Leprol*. 2015;81(6):648-50.

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