

## [ Orthopaedic Surgery ]

# Watersport Hands

Jeremy B. Kent, MD,<sup>\*†</sup> Siobhan M. Statuta, MD, CAQSM,<sup>†‡</sup> Kenneth E. Greer, MD,<sup>§</sup> and John M. MacKnight, MD, FACSM<sup>||</sup>

Aquagenic syringeal acrokeratoderma is a newly described condition of the palms and soles characterized by hypopigmented papules and plaques, elicited after submersion in water. Symptoms include a burning pain and a tightening sensation in the palms, as well as hyperhidrosis. Initially thought to be rare, its frequent citation in the literature points to a more common entity. It is more often found in young women and has been linked to a number of medications and illnesses, including nonsteroidal anti-inflammatory drugs and cystic fibrosis. It is typically self-limiting, but certain medications such as topical aluminum chloride or salicylic acid ointment have been found to be an effective treatment option. This case details a collegiate-level coxswain who presented to the university athletic training room with a typical presentation of aquagenic syringeal acrokeratoderma. For an aquatic athlete, aquagenic syringeal acrokeratoderma can be a distressing condition that can limit training and athletic participation. As such, the sports medicine physician should be knowledgeable about aquagenic syringeal acrokeratoderma to provide effective counseling and treatment options for the athlete.

**Keywords:** aquagenic syringeal acrokeratoderma; aquagenic palmoplantar keratoderma; nonsteroidal anti-inflammatory medications; cystic fibrosis; athlete

## CASE PRESENTATION

A 19-year-old collegiate coxswain presented to the athletic training room after a 3-week history of a persistent white rash present on the palms of her hands. Initial presentation was of vesicles that transitioned to scaling and then skin sloughing. The rash worsened after exposure to water and was associated with mild burning of her hands. Weightlifting and grasping skills were irritating but did not worsen the rash. She denied any new topical products, exposures, dietary changes, sensitivities, or recent illnesses. She felt completely well otherwise. Her past medical history was unremarkable, with no prior dermatologic problems or diagnoses. Current medications consisted of a medroxyprogesterone intramuscular injection every 3 months. Family history was negative for significant skin disorders.

On physical exam, she demonstrated multiple 1- to 2-mm whitish papules and plaques on the palmar surface of her hands (Figure 1). There were no other skin manifestations.

Based on the patient's history and physical examination, the most likely diagnosis was aquagenic syringeal acrokeratoderma (ASA).

## DISCUSSION

Aquagenic syringeal acrokeratoderma, or “watersport hands” (authors' term), was first reported in 1996 in 2 sisters with a transient keratoderma on their palms after water exposure.<sup>6</sup> The disorder is characterized by 1- to 3-mm flat-topped hypopigmented papules coalescing into plaques on the palms and rarely on the soles. The rash is often accompanied by burning pain, pruritus, a tightening sensation of the palms, and hyperhidrosis. ASA is a rare entity but is probably underreported.<sup>7</sup> Two variants have been described. Most commonly, it is a transient and recurrent condition that manifests after submersion in water, known as the “hand in the bucket sign,” with resolution of lesions within minutes to hours of drying.<sup>18</sup> A less common variant demonstrates persistent lesions that are worsened after water submersion.<sup>14</sup>

Aquagenic syringeal acrokeratoderma is known by many names, including transient reactive papulotranslucent acrokeratoderma, aquagenic palmoplantar keratoderma, aquagenic keratoderma, and aquagenic wrinkling of the

From the <sup>†</sup>Department of Family Medicine, University of Virginia Health System, Charlottesville, Virginia, <sup>‡</sup>Physical Medicine & Rehabilitation, University of Virginia Health System, Charlottesville, Virginia, <sup>§</sup>Department of Dermatology, University of Virginia Health System, Charlottesville, Virginia, and <sup>||</sup>Internal Medicine and Orthopaedic Surgery, University of Virginia Health System, Charlottesville, Virginia

\*Address correspondence to Jeremy B. Kent, MD, Department of Family Medicine, University of Virginia Health System, PO Box 800729, Charlottesville, VA 22908-0729 (e-mail: Jbk7y@virginia.edu).

The authors report no potential conflicts of interest in the development and publication of this article.

DOI: 10.1177/1941738114529259

© 2014 The Author(s)



Figure 1. Papules and plaques were present on the palmar surface of the hand.

palms.<sup>13</sup> Case reports suggest a predilection for females in their teens and 20s.<sup>8,10,13,16</sup> The histopathology is variable and can be nonspecific, show hyperkeratosis, or present dilated eccrine ducts. The pathogenesis is unclear, with theories suggesting sweat duct dysfunction, hyperkeratosis, or barrier impairment of the stratum corneum.<sup>15,16</sup>

A number of medications and illnesses are associated with ASA. Cyclo-oxygenase (COX) inhibitors, rofecoxib, celecoxib, and aspirin have all been linked to ASA.<sup>3,9,17</sup> COX-1 and COX-2

receptors are found in keratinocytes, with COX-2 contributing to keratinocyte proliferation and differentiation. COX inhibition may cause sodium retention within the epidermal keratinocytes.<sup>2,12</sup> The atypical persistent form of ASA has a strong association with cystic fibrosis (CF). ASA is seen in 40% to 80% of CF patients, and 25% of CF carriers exhibit the condition.<sup>2</sup> It is thought that defective chloride channels in CF cause an osmotic gradient allowing hypertonic sweat to flow into the ducts, which dilates the eccrine ostia.<sup>2,4</sup> Asthma, allergic

rhinitis, urticaria, palmar erythema, and malignant melanoma have also been associated with ASA.<sup>15</sup>

Typically, the lesions resolve spontaneously, but case reports have found certain treatments to be effective. The most commonly cited remedies include topical aluminum chloride, 5% to 20% salicylic acid ointment, formalin 3% in alcohol, botulinum toxin, and iontophoresis.<sup>1,2,5,11,13</sup>

## CONCLUSION

Aquagenic syringeal acrokeratoderma, or “watersport hands,” is a rare but likely underreported condition that may be seen in any athlete with water exposure. As it characteristically presents after submersion in water, ASA can be a distressing condition in an aquatic athlete. Common medications such as nonsteroidal anti-inflammatory medications as well as conditions such as CF are associated with it. ASA is typically self-limited, but if it becomes an impediment to training or competition, a number of treatment options are available.

## REFERENCES

- Adisen E, Karaca F, Güler MA. Transient reactive papulotranslucent acrokeratoderma in a 50-year-old woman: case report and review of the literature. *Am J Clin Dermatol*. 2008;9:404-409.
- Baquerizo K, Elgart GW, Amini S, Badiavas EV, Keri JE. Atypical form of transient reactive papulotranslucent acrokeratoderma in a cystic fibrosis carrier. *J Cutan Patol*. 2013;40:413-418.
- Carder KR, Weston WL. Rofecoxib-induced instant aquagenic wrinkling of the palms. *Pediatr Dermatol*. 2002;19:353-355.
- Darlenki R, Tsankov N. Aquagenic syringeal acrokeratoderma. *J Dtsch Dermatol Ges*. 2012;10:198.
- Diba VC, Cormack GC, Burrows NP. Botulinum toxin is helpful in aquagenic palmoplantar keratoderma. *Br J Dermatol*. 2005;152:394-395.
- English JC 3rd, McCollough ML. Transient reactive papulotranslucent acrokeratoderma. *J Am Acad Dermatol*. 1996;34:686-687.
- Ertürk-Özdemir E, Özcan D, Seçkin D. Acquired aquagenic syringeal acrokeratoderma: a case series of 10 patients [published online November 28, 2013]. *Australas J Dermatol*. doi:10.1111/ajd.12122.
- Glid R, Clay CD. Aquagenic wrinkling of the palms in a cystic fibrosis carrier. *Australas J Dermatol*. 2008;49:19-20.
- Khuu PT, Duncan KO, Kwan A, Hoyme HE, Bruckner AL. Unilateral aquagenic wrinkling of the palms associated with aspirin intake. *Arch Dermatol*. 2006;142:1661-1662.
- Kocaturk E, Kavala M, Buyukbabani N, Turkoglu Z. Whitish papules on the palm. *Int J Dermatol*. 2007;46:736-737.
- Lee HC, Tsai TF. Aquagenic syringeal acrokeratoderma. *Dermatol Sinica*. 2008;26:145-150.
- Leong J, Hughes-Fulford M, Rakhlin N, Habib A, Maclouf J, Goldyne M. Cyclooxygenases in human and mouse skin and cultured keratinocytes: association of COX-2 expression with human keratinocyte differentiation. *Exp Cell Res*. 1996;224:79-87.
- Luo DQ, Li Y, Huang YB, Wu LC, He DY. Aquagenic syringeal acrokeratoderma in an adult man: case report and review of the literature. *Clin Exp Dermatol*. 2009;37:e907-e909.
- MacCormack MA, Wiss K, Malhotra R. Aquagenic syringeal acrokeratoderma: report of two teenage cases. *J Am Acad Dermatol*. 2001;45:124-126.
- Seitz CS, Gaigl Z, Brocker EB, Trautmann A. Painful wrinkles in the bathtub: association with hyperhidrosis and cystic fibrosis. *Dermatology*. 2008;216:222-226.
- Suchak R, Lawlor F. Water induced palmar tingling and swelling. *Clin Exp Dermatol*. 2006;32:119-120.
- Vildósola S, Ugalde A. Celecoxib-induced aquagenic keratoderma [in Spanish]. *Actas Dermosifilogr*. 2005;96:537-539.
- Yan AC, Asai SZ, Alms WJ, James WD, Heymann WR, Paller AS. Aquagenic palmoplantar keratoderma. *J Am Acad Dermatol*. 2001;44:696-699.

For reprints and permission queries, please visit SAGE's Web site at <http://www.sagepub.com/journalsPermissions.nav>.