Acquired anhidrosis in a patient with Sjogren syndrome and silicone breast implants

Mary Beth Gadarowski, BS,[a] Tatsiana Pukhalskaya, MD,[b] Ramsay Farah, MD,[a] and Bruce R. Smoller, MD[b]
Rochester, New York

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INTRODUCTION

Primary Sjogren syndrome is an autoimmune disease with broad clinical manifestations, characterized by disruption of epithelial cells and lymphoplasmocytic infiltration of exocrine glands, mainly the salivary and lacrimal glands.[1] Cutaneous manifestations of Sjogren syndrome (SS) include vasculitis, angular cheilitis, eyelid dermatitis, and annular erythema. Xerosis and anhidrosis are also seen, and the pathogenesis remains unclear.[2] Chronic inflammatory atrophy of sweat glands or biochemical alterations in eccrine epithelium may result in decreased eccrine sweating.[3]

One possible source for subsequent inflammatory atrophy is autoimmune/inflammatory syndrome associated with silicone breast implants (SBIs).[4] Much of the literature to date claims no association between SBIs and autoimmune development; however, silicone adjuvants may induce cytokine dysfunction and subsequent fibrosis. Patients with SBIs have a diverse presentation of symptoms that may mimic SS, including dry eyes, dry mouth, and fatigue along with cutaneous complaints and pruritus. Salivary gland biopsies in patients with SBIs disclose mononuclear cell infiltrates that differ from the classic lymphocytoplasmic infiltrations seen in primary SS, suggesting further overlap and confusion with regard to the 2 entities.[5] We propose an inflammatory mechanism for eccrine apparatus impairment in a case of focal anhidrosis in a patient with SS complicated by chronic exposure to silicone in SBIs.

Abbreviations used:

SBI: silicone breast implant
SS: Sjogren syndrome

CASE REPORT

An obese 73-year-old woman with bilateral SBIs and a 3-year history of SS presented to an outpatient dermatology clinic for localized anhidrosis and xerosis. The patient reported an abrupt inability to sweat from her axilla, palms, and soles that had been present for several months. It was not aggravated by any measures to induce perspiration. No disturbances in thermoregulation elsewhere on the body were reported. She denied any prior difficulties with perspiration or any other active cutaneous complaints, aside from nummular dermatitis and a long-standing history of venous stasis dermatitis.

A primary diagnosis of SS was made 3 years prior, with clinical and serologic evidence. Her autoimmune history was also accompanied by fibromyalgia, hypothyroidism (status postthyroidectomy), and psychiatric comorbidities entailing anxiety and depression. Social and family history were noncontributory. Pertinent medications include hydroxychloroquine, folic acid, tizanidine, and pregabalin, with the latter 2 possibly contributing to xerostomia.

Medical history is significant for multiple severe comorbidities, including poorly controlled type II diabetes mellitus, chronic venous stasis dermatitis of bilateral lower extremities, and diabetic neuropathy. Prior autoimmune workup found a positive antinuclear antibody, speckled pattern (250; reference

From the State University of New York Upstate Medical University[a] and University of Rochester Medical Center.[b]
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Correspondence to: Bruce R. Smoller, MD, Professor and Chair, Department of Pathology and Laboratory Medicine, Department of Dermatology, 601 Elmwood Ave, Box 626, Rochester, NY 14642. E-mail: Bruce_Smoller@urmc.rochester.edu.

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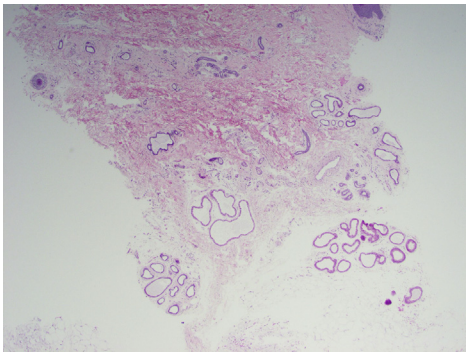

Fig 1. SS. A 6-mm punch biopsy of the right axilla. There is a significant reduction in sweat glands, ducts, and pilosebaceous units. (Hematoxylin-eosin stain; original magnification: ×20.)

range, 0-49 L/dL), and SSA autoantibody (191, reference range, 0-99 [AU]/mL). Rheumatoid factor, CCP antibody, and all other antinuclear antibody specificity panel results were negative.

Physical examination found generalized xerosis on both upper and lower extremities. Clusters of round erythematous scaly patches and diffuse erythema of bilateral lower extremities was present, consistent with nummular dermatitis and stasis dermatitis, respectively. Given the unclear etiology for the source of this patient's newly acquired anhidrosis, a skin biopsy was scheduled. Pathology findings of the right axilla found marked reduction in sweat glands, ducts, and pilosebaceous units. Rare residual eccrine structures did not show any transmural inflammation or architectural disarray. Moderate fibrosis and scarring were present (Fig 1).

DISCUSSION

Skin involvement in SS can be seen in at least half of patients, with dryness and angular cheilitis appearing most frequently.[2] Sweat dysfunction leading to hypohidrosis is a lesser-known exocrinopathy reported in patients with SS, alongside more commonly known symptoms of xerostomia and xeropthalmia.[3] Xerosis is more likely to occur in those younger than 50 years,[3] and although is it possible to consider asteatotic eczema given the patient's older age, we speculate that in the setting of acquired anhidrosis, the patient's subsequent loss of skin moisture may be caused by sweat gland destruction.[6] Although there is no consensus treatment for acquired generalized anhidrosis associated with SS (or localized), oral corticosteroid treatments, cyclosporine and intravenous immunoglobulin have successfully treated sweat gland dysfunction.[7,8]

The pathophysiology of the eccrine apparatus in SS remains poorly understood. Proposed theories support an acquired dysfunction of the sweat glands that could be caused by sympathetic nerve disturbances, inflammatory-mediated destruction, or by specific autoantibodies directly impairing the action of acetylcholine and the axon reflex.[9] Diabetes may cause abnormal sweat patterns but would not explain the absence of sweat glands seen in this patient. It would be interesting to know whether biopsies from alternative sites would demonstrate decreased eccrine glands. We speculate that chronic inflammation that was subsequently replaced by fibrosis resulted in focal deficiency of sweat production and gland atrophy, as noted by absence of glandular structures. In contrast to other findings, we did not observe the heavy inflammatory infiltrate around the eccrine glands but rather noted glands in a postaction state, with significant fibrosis.[9]

Of particular interest in this patient is her history of bilateral SBIs. Despite a 40-year window from the time of implants to SS diagnosis, it is still plausible to consider the patient's fibromyalgia and SS in the setting of autoimmunity triggered by SBI. The evidence is inconclusive with regard to the role of SBI and its association with autoimmune conditions, with insufficient study data to demonstrate increased risk for rheumatic disease.[10] In this case, silicone adjuvant may have bled into the tissue, mediating an inflammatory cascade of fibroblast stimulation, illustrated by the scarring of the patient's eccrine glands.

The controversial association of SBIs with autoimmune conditions makes this case unusual. Chronic exposure to silicone adjuvant may have been an inciting factor in the inflammatory etiology for the eccrine gland dysfunction. In anhidrotic skin in patients with SS, prominent lymphocytic infiltration around the vessels and eccrine glands suggest an acquired anomaly of the glands.[8] No inflammatory infiltrate was present in our patient's biopsy, but rather absence of the eccrine glands and marked fibrosis were seen. The significant reduction of glandular structures is in contrast to other reports in which structural abnormalities in sweat glands and appendages are not seen. Our case highlights inflammation mediated by silicone breast implants as a proposed mechanism for sudden-onset localized anhidrosis in a patient with SS.

REFERENCES

1. Kassan SS, Moutsopoulos HM. Clinical manifestations and early diagnosis of Sjögren syndrome. *Arch Intern Med*. 2004;164(12):1275-1284.
2. Bernacchi E, Amato L, Parodi A, et al. Sjogren's syndrome: a retrospective review of the cutaneous features of 93 patients by the Italian Group of Immunodermatology. *Clin Exp Rheumatol*. 2004;22:55-62.

3. Katayama I, Yokozeki H, Nishioka K. Impaired sweating as an exocrine manifestation in Sjogren's syndrome. *Br J Dermatol*. 1995;133:716-720.
4. Vera-Lastra O, Cruz-DomAnguez MP, Medrado Ramirez G, et al. Autoimmune/inflammatory syndrome induced by silicone breast implant and risk factors associated to autoimmune disease. *Rheumatology (Sunnyvale)*. 2019;9:248.
5. Tervaert C, Willem J, Colaris, Maartje J, Van Der Hulst R. Silicone breast implants and autoimmune rheumatic diseases: myth or reality. *Curr Opin Rheumatol*. 2017;29(4): 348-354.
6. Shiohara T, Sato Y, Komatsu Y, Ushigome Y, Mizukawa Y. Sweat as an efficient natural moisturizer. *Curr Probl Dermatol*. 2016;51:30-41.
7. Maeda A, Yamanouchi H, Lee JB, Katayama I. Oral prednisolone improved acetylcholine-induced sweating in Sjogren's syndrome related anhidrosis. *Clin Rheumatol*. 2000;19:396-397.
8. Fujita K, Hatta K. Acquired generalized anhidrosis: review of the literature and report of a case with lymphocytic hidradenitis and sialadenitis successfully treated with cyclosporine. *Dermatology*. 2013;227:270-277.
9. Huang YJ, Chih PL, Huang TH, Yu HS, Hsieh YL, Yu S. Skin ultrastructural findings in acquired generalized hypohidrosis/anhidrosis in a patient with subclinical Sjögren syndrome. *Acta Derm Venereol*. 2017;97(8):981-983.
10. Balk EM, Earley A, Avendano EA, Raman G. Long-term health outcomes in women with silicone gel breast implants. A systematic review. *Ann Intern Med*. 2016;164:164-175.