Alpha-gal syndrome: potential for a hypersensitivity reaction after the use of dental products

Literature review and case report

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ABSTRACT

Background. Alpha-gal syndrome (AGS) is associated with a potentially severe delayed immunoglobulin E–based hypersensitivity reaction produced via transmission of a salivary oligosaccharide (galactose-α-1,3-galactose) predominately from the bite of the lone star tick (*Amblyomma americanum*). Sensitized people are at an increased risk of experiencing cross-reactivity reactions to numerous foods, pharmaceuticals, and medical and dental products that could result in a spectrum of pathophysiological responses, ranging from gastrointestinal and cutaneous disturbances to anaphylaxis. The authors have summarized the relevant literature and presented a case report describing an alpha-gal (AG) reaction associated with oral health care.

Types of Studies Reviewed. The authors provided an overview of clinical studies, review articles, case reports, and case series of AGS obtained from PubMed and Google Scholar electronic databases. In addition, various medical and dental pharmaceuticals and health care products were reviewed for the presence of AG epitopes.

Results. Factors implicated in an AGS-like event included consuming nonprimate red meat and dairy products, intake of pharmaceuticals with animal-based ingredients and excipients, and use of medical and dental products containing AG epitopes. The most common promoter of AGS-related dental events was the administration of animal-based hemostatic agents.

Practical Implications. Oral health care providers should be knowledgeable about the salient features of AGS and perform a thorough review of an affected patient's diagnosis, triggering events, associated adverse incidents, and therapeutic measures used. To gain greater insight into an affected patient's disorder, consultation with their attending allergist or immunologist is advised. To reduce the onset of a hypersensitivity reaction, attending clinicians must maintain strict avoidance of the use of pharmaceuticals and medical or dental products that express AG epitopes.

Key Words. Alpha-gal syndrome; case report; delayed hypersensitivity reaction; dental products; excipients; pharmaceuticals.

JADA 2025:156(7):538-546
https://doi.org/10.1016/j.adaj.2025.04.001

Alpha-gal syndrome (AGS) is an uncommon, potentially serious chronic disorder associated with an immunoglobulin E (IgE)–based delayed hypersensitivity reaction, typically caused by the bite of the lone star tick (*Amblyomma americanum*).[1,2] The transfer of the salivary oligosaccharide galactose-α-1,3-galactose from a tick bite into the host's bloodstream potentially sensitizes a person to subsequent epitopic exposure to a variety of foods, most notably from consumption of red meat, as well as pharmaceuticals and medical and dental products. Clinical outcomes range from a mild allergic event to anaphylaxis. With the climatic trend of global warming, tick populations have increased and are suspected to be a putative factor in the rapidly emerging number of antibody-positive cohorts with AGS worldwide.[2,3]

From January 2017 through December 2022, there were 90,018 cases of AGS with IgE-positive antibodies identified in the United States, which represented a 30.5% incidence rate among a cohort of 295,400 people, with most yearly case number totals increasing.[3] Demographically, AGS

had been distributed among all age groups (mean age at diagnosis, 48.2 years) and occurs with a near-equal sex predilection; biomes with elevated tick populations have been clustered in nearly contiguous southeastern and southcentral US states.[3,4] AGS has a near-global distribution, with the apparent exception of the Arctic Circle and Antarctica.[5]

Although there is an extensive number of AGS-related articles in the medical literature, there appears to be a lack of information on this disorder in the dental literature. Our objectives were to review the general and pathophysiological features of AGS, increase awareness of its potentially serious immunologic consequences, and provide a list of dental products that pose an increased risk of causing an allergic reaction from cross-reactivity. In addition, a summary of published accounts of cases of AGS associated with use of dental products, including a clinical narrative of an affected patient, are presented.

METHODS

An electronic search was conducted of PubMed and Google Scholar electronic databases for articles pertaining to AGS that appeared in the English-language literature from January 1, 1990, through November 30, 2024, including clinical investigations, review articles, case reports, and case series. Search terms included the term alpha-gal syndrome and each of the following terms: carrageenan, case report, dental, dental products, extraction, oral surgery, and pharmaceutical. Culled articles and their references were subsequently examined for AGS-related incidents associated with use of dental products. Data sought from pertinent articles included patient age and sex, procedural details, products containing an alpha-gal (AG) allergen, clinical reaction, clinical management, and patient outcome. Dental products with suspected AG epitopes were procured from product websites and safety data sheets. A case of AGS in association with oral health care is also provided.

The single case report did not require approval by the University of Maryland institutional review board. Written consent was obtained from our patient for publication of medical records.

RESULTS

The review of various dental products identified an assortment that contained excipients that expressed AG-like epitopes, particularly collagen, gelatin, glycerin, glycerol, hydrogels, and carrageenan. AG-like epitopes were listed in the ingredients of multiple products, such as artificial saliva substitutes, bone and gingival graft materials, chlorhexidine gluconate mouthrinse, collagen dermal fillers, fluoride supplements, gelatin capsules, lip balms, mouthrinses, prophylaxis paste, suture materials, toothpastes, and tooth-whitening gels. The literature search also identified 4 cases of AG-based reactions arising secondarily to use of dental products. With the addition of our case, 5 patients with AGS have been documented with sequelae associated with use of dental products. Four of the patients had been administered animal-based hemostatic agents, and 1 patient received doxycycline that was contained in animal-based gelatin capsules.

Case report

A 55-year-old woman sought comprehensive oral health care at the School of Dentistry, University of Maryland. The patient's medical history contained a complex allergy profile. Thirty-two years earlier, the patient experienced an almost-immediate "feeling of liquid fire in her body" and pruritus after multiple local anesthetic injections that contained paraben. Allergy testing at that time confirmed an allergy to paraben. She recounted being inoculated 7 years earlier with an influenza vaccine and began feeling "horrible" and developed widespread pruritus the next day. An allergist prescribed various regimens of oral antihistamines for 1 month due to persistent and fluctuating symptomatology. Laboratory testing at that time revealed an AG IgE level of 0.53 kU/L (reference, <0.10 kU/L) and total IgE was 185 IU/mL (reference, 0-100 IU/mL). However, the result for serum tryptase, a surrogate marker for anaphylaxis, was normal. The attending allergist diagnosed class I (low-level) AGS that was likely attributed to numerous episodes of tick bites received, as she had lived in a heavily wooded region. One year earlier, the patient developed severe dyspnea and coughing after exposure to a newly paved asphalt road. Her symptoms abated within approximately 30 minutes after sublingual administration of glycerin-free diphenhydramine. The patient also had a history of allergies to penicillin and oxycodone.

ABBREVIATION KEY

AG: Alpha-gal.
AGS: Alpha-gal syndrome.
IgE: Immunoglobulin E.

Figure. Female lone star tick with characteristic white macular patch on the dorsal shield. Photograph courtesy of URI TickEncounter Resource Center, The University of Rhode Island, Kingston, RI.

Although the patient's AG IgE levels remained decreased by 50% in several of the ensuing years, results of laboratory studies showed an increase to 1.05 kU/L, including an IgE level of 0.22 kU/L for beef and less than 0.10 kU/L for pork and lamb. These findings were deemed consistent with a diagnosis of class II (moderate-level) AGS. Additional comorbidities included allergies to dairy products, allergic rhinitis, genetically unconfirmed Ehlers-Danlos syndrome (featuring finger contractures, Raynaud phenomenon, hyperelastic skin, ease of bruising), osteoarthritis, and cigarette smoking (one-quarter pack/day for 20 years). The patient's medications were hydrochlorothiazide, fluticasone propionate, loratadine, tramadol, ibuprofen, and acetaminophen. The patient also detailed an account of an AGS event after oral health care. Five years earlier, the patient developed a dental abscess from a mandibular right first molar and a private practice clinician prescribed a course of doxycycline, which was contained in gelatin capsules. Shortly after taking the second dose ($\approx$ 12 hours after the first dose), the patient developed an "itchy" throat and swelling of the throat and tongue, and she was treated with glycerin-free diphenhydramine sublingual tablets. The patient telephoned the Robert Wood Johnson Research Foundation in Princeton, NJ, and received oral confirmation that the doxycycline gelatin capsules were composed of animal-based gelatin. As such, the temporal relationship of the intake of the animal-derived gelatin capsules containing doxycycline and the relevant symptomatology were likely indicative of an AG reaction. Around that time, the patient returned to the School of Dentistry, University of Maryland and underwent evaluation of her involved tooth. An attending faculty member determined that the tooth was nonrestorable due to a deep vertical crack. Six months later, the tooth was extracted without sequelae after receiving local anesthetic with 2% lidocaine. Our patient has continued experiencing occasional breakthrough episodes of AGS despite maintaining strict avoidance of foods and products that contain AG epitopes.

Etiology

AGS represents a potentially exuberant delayed hypersensitivity reaction that arises primarily from the transmission of saliva from the bite of the lone star tick (*A americanum)* and less frequently from *Hyalomma lusitanicum*, *Ixodes ricinus*, and *Haemaphysalis longicornis*.[1,6-8] These ticks are regarded as aggressive hematophagous ectoparasites, predominantly feeding on white-tailed deer and, to a lesser extent, domestic and wild animals, ground-nesting birds, and humans.[9,10] The female lone star tick owes its name to its readily distinguished, somewhat amorphic white macular patch along the center of the dorsal shield (Figure).[11]

The bite of the lone star tick can transfer various salivary antigens to the host's bloodstream, most particularly involving the oligosaccharide galactose-α-1,3-galactose, which leads to sensitization of the affected person.[12] A subsequent tick bite stimulates the recruitment of cluster of differentiation 4^+ T lymphocyte helper 2 cells, dendritic cells, basophils, eosinophils, and mast cells, which potentially result in a IgE-mediated delayed hypersensitivity reaction, ranging from a mild to a life-

Box 1. Chief diagnostic criteria for alpha-gal syndrome.[14]

- Adult onset after eating nonprimate mammalian meat and previous lack of clinical symptomatology
- Clinical manifestations ranging from pruritus, hives, or angioedema to anaphylaxis
- Isolated gastrointestinal disturbances, such as diarrhea, abdominal cramping, and emesis
- Reactions commence 3-8 h after consumption of nonprimate mammalian meat, dairy products, gelatin, or other mammalian-derived products
- Positive test results for alpha-gal immunoglobulin E (> 0.10 kU/L)
- Amelioration of symptoms after strict adherence to an avoidance diet and relevant antigenic-based products
- History of intense reaction to a tick bite, often with milder episodes from previous bites

threatening anaphylactic event.[5] The lone star tick can also serve as a vector to an array of viral and bacterial pathogens and result in ehrlichiosis, tularemia, Rocky Mountain spotted fever, and Southern tick-associated rash illness.[12,13]

Allergic reaction

At least 90% of patients with AGS have reported allergic reactions to the ingestion of nonprimate red meats (ie, beef, pork, sheep, deer, rabbit, horse, squirrel, buffalo, dolphin, and whale) and other animal part derivatives as well as dairy products that express AG oligosaccharide epitopes.[14-16] The development of AGS has also been correlated with increased age, living with a pet cat, and aeroallergen exposure (eg, house dust mites and birch and grass pollens).[17]

Sensitized patients with AGS generally have exhibited clinical symptoms from 3 through 8 hours after an antigenic challenge.[14] The incidences of clinical manifestations of AGS include 74.6% with skin reactions (predominately urticaria and pruritus), 30.1% with gastrointestinal disturbances (ie, nausea, emesis, diarrhea, cramping, and pain), 17.4% with respiratory distress, and a constellation of other consequences, such as hypotension, tachycardia, oral swelling (ie, lip or tongue), angioedema, isolated periorbital edema, and rhinitis.[18-21] Of clinical significance, 51.7% of patients who have developed an AG reaction have progressed to anaphylaxis.[20] A list of the main criteria for establishing the diagnosis of AGS is summarized in Box 1.[14] The differential diagnosis of AGS includes idiopathic anaphylaxis, pollen-food allergies, hereditary α-tryptasemia, and mast cell disorders.[22,23]

There has been some preliminary correlation of AGS with erythrocyte cell surface antigens. Brestoff and colleagues[24] found that blood types B and AB conferred some protection from the development of AGS. In contrast, Hamsten and colleagues[6] reported that 37 of 39 people with allergies to red meat consumption had a B-negative blood type. Leth-Møller and colleagues[17] reported an increased prevalence of AGS with the blood types A and B. The featured patient in our report has a B-positive blood type. To the best of our knowledge, we have described the first suspected AGS-like episode after inhalation of asphalt fumes from a newly paved road. To strengthen asphalt, some manufacturers will add collagen extracted from animal bones, leather, and meat waste.[25] It is plausible that the inhalation of asphalt fumes containing these animal-derived biomolecules could have evoked an acute AGS reaction in our sensitized patient. Alternatively, the patient's development of severe dyspnea and coughing shared phenotypic overlap with the symptoms of a chemically induced pulmonary irritation from asphalt organic compounds.[26]

Dental products and their excipients that could potentially trigger AGS

AG-Like Excipients

Although numerous medications and medical or dental products contain excipients bearing cross-reactivity to AG-based antigens, we have focused primarily on those used in dentistry (Box 2).[27-35] Excipients are inactive ingredients that provide preservation, stability, bioavailability, and appearance.[33] These substances principally include glycerin and gelatin as well as arachidyl propionate, carrageenan, milk proteins, lactic acid, lactose monohydrate, lanolin, magnesium stearate, oleic acid, stearate, and stearic acid.[32]

Box 2. Dental products and excipients that can potentially trigger alpha-gal syndrome.[27-35]

DENTAL PRODUCTS	EXCIPIENTS
Artificial saliva substitutes	Arachidyl propionate
Bone graft regenerative materials	Caesin phosphopeptide–amorphous calcium phosphate
Caesin phosphopeptide–amorphous calcium phosphate	Carrageenan
Chlorhexidine gluconate mouthrinses	Collagen
Collagen dermal fillers and plugs	Gelatin
Cough suppressants	Glycerin
Fluoride mouthrinses or gels	Glycerol
Gelatin capsules	Hydrogels
Gingival graft substitutes	Lactic acid
Hydrogels	Lactose monohydrate
Impression compounds	Lanolin
Intraarticular joint lubricating solutions	Magnesium stearate
Lip balms	Milk proteins
Mouthrinses	Oleic acid
Oral debriding agents	Stearate
Pharmaceutical patches	Stearic acid
Prophylaxis pastes	
Soft-tissue scaffolds	
Sore throat sprays	
Suture materials (eg, plain gut, chromic, and catgut)	
Toothpastes	
Tooth-whitening gels	
Vascular grafts, meshes, and patches	

Dental Products Potentially Containing AGS Epitopes

Gelatin is usually derived from hydrolyzed bovine and porcine collagen and is often included in a variety of dental products, such as hemostatic agents,[18,34-44] pharmaceutical capsules, cutaneous patches, vascular materials (eg, meshes, patches, and grafts), bone graft regenerative materials, soft-tissue scaffolds, sutures (eg, plain gut, chromic, and catgut), collagen dermal fillers and plugs, osteochondral grafts, and viscosupplementation agents (intraarticular joint lubricating solutions).[28-30,45-47]

Glycerin, also referred to as glycerol, is processed from beef, sheep, and plant oils or fats and may be an excipient in toothpastes, mouthrinses, prophylaxis pastes, oral moisturizer preparations, endodontic debriding agents, chlorhexidine gluconate oral rinse, fluoride rinse or gels, gel capsules, artificial saliva substitutes, sore throat sprays, topical anesthetics, tooth-whitening gels, povidone-iodine solution, cough syrups, and electronic cigarette vaping liquids.[48-50] Some antihistamine formulations contain animal-derived glycerin that could exacerbate an allergic reaction in susceptible people.

Hydrogels are a group of complex polymers derived from mammalian sources (eg, human, bovine, and porcine) that potentially could contain AG epitopes, such as collagen, glycerin, albumin, placental tissue, and gonadotropin-releasing hormone.[51] A broad range of dental products contain hydrogels that have been used in conjunction with tissue scaffolding, drug delivery devices, facial cosmetic fillers, wound healing materials, regenerative periodontal therapy, postoperative antimicrobial agents, antibiotic-coated titanium implants, caries preventive agents, orthodontic tooth movement materials, craniofacial defect repair materials, gingival grafts, and pulpal regenerative agents.[31,51-54] Likewise, some fibrous hydrogel variants contain animal collagen that could possibly trigger an AG reaction.[55]

Red seaweed contains carrageenan, a polysaccharide that possesses a somewhat comparable 1,3 galactosidic bond with AG oligosaccharides.[56,57] Carrageenan has been included as a thickening agent in toothpastes, cosmetics, shampoos, and some medications. Use of carrageenan has resulted in dermatopathic lesions, gastrointestinal symptoms, lip angioedema, joint disorders, hepatic disease, and anaphylaxis.[57-60] Alginate and agar are seaweed-based impression materials that contain complex polysaccharides that are chemically similar to carrageenan.[61] To date, there have not been any documented cases of AGS associated with use of dental alginate. However, in 1992, Rice and colleagues[62] reported a cohort of 47 dental students who developed mildly uncomfortable mucocutaneous vesicles within 1 through 2 days after undergoing dental impressions with a commercially available alginate material. Within 2 through 5 days, all lesions had resolved. Although the mechanism of the lesional outbreak was indeterminate, it is somewhat plausible that the observed reactions represented an attenuated AGS-like response to the alginate and its polysaccharide constituent. Accordingly, attending clinicians should carefully consider use of nonalginate and non–algae-based impression materials in patients with AGS.

Casein phosphopeptide–amorphous calcium phosphate is another bovine derivative that offers the potential to induce an AGS-like event.[25] It has been incorporated in topical dental pastes and mouthrinses to enhance enamel remineralization, salivary flow, and caries prevention,[63,64] and in a paste that is applied to the fitting side of dentures to improve the salivary flow rate.[65] Casein phosphopeptide–amorphous calcium phosphate has also been included in some brands of chewing gum to purportedly stimulate saliva. Although there are apparently no published reports of AGS with products containing casein phosphopeptide–amorphous calcium phosphate, their use in affected patients raises concern about the development of an oral mucosal contact sensitivity reaction or systemic involvement from inadvertent product ingestion. Other dental ingredients that could potentially lead to an AGS reaction include lanolin, which is derived from sheep and has been included as an ingredient in many lip balms. Lactoferrin, an antimicrobial agent derived from bovine milk and human bodily secretions, has been contained in several mouthrinse brands.

It is beyond the scope of this article to list all medications that contain AG-like epitopes. More common pharmaceuticals that could potentially precipitate an AG reaction include acetaminophen, antibiotics (ie, penicillin, amoxicillin, doxycycline, and clindamycin), anticoagulant agents (ie, apixaban, enoxaparin, heparin, rivaroxaban, and warfarin), antiplatelet agents (ie, aspirin, clopidogrel, prasurgrel, and ticagrelor), cetuximab, hydroxychloroquine, epoetin alfa, hydromorphone, infliximab, linezolid, lopinavir, milrinone, monoclonal antibodies, propofol, snake antivenom, thrombin, and vasopressin.[32,45,46,66-68]

Documented cases associated with AGS-like reactions from use of dental products

With the inclusion of our case, at least 5 patients have experienced an AGS-like episode associated with use of dental products[39,69-71] (Table). Although the small number of affected patients has precluded any rigorous statistical analysis, several trends were noted. All cases were associated with use of pharmaceutical products containing animal-derived epitopes, with 4 cases resulting from use of hemostatic agents. Our patient's AGS episode arose from the intake of doxycycline (contained in bovine-derived gelatin capsules) that was prescribed for a dental infection. This antibiotic was selected because our patient had an allergy to penicillin. As far as could be ascertained, our report has documented the first incident of an AG reaction after administration of a bovine-derived gelatin capsule prescribed for a dental infection. All 5 cases of hypersensitivity reactions were managed with various pharmaceuticals (eg, antihistamines, epinephrine, atropine, hydralazine, intravenous fluids, and albuterol), usually involving multiple agents. Complete recovery of all 5 patients took from 1 through 3 days.

Medical management of an AG reaction

The first step in managing anaphylaxis is recognition of the emerging pathophysiological alterations, namely urticaria, pruritus, angioedema, and signs and symptoms of systemic compromise that involves the respiratory system (eg, dyspnea, laryngeal edema, rhinitis, wheezing, and bronchospasm), cardiovascular system (eg, hypotension, arrhythmia, circulatory collapse, and cardiac arrest), and central nervous system (eg, increased anxiety and loss of consciousness).[72,73] Subsequently, the attending dentist should abruptly end any ongoing procedure, consider administration of pharmaceutical agents to reverse adverse sequelae, and activate the emergency medical system for

Table 1. Documented cases associated with alpha-gal reactions from use of dental products.

STUDY, YEAR	PATIENT		PROCEDURE	PRODUCT ALLERGEN	CLINICAL REACTION	CLINICAL MANAGEMENT	OUTCOME
	Age, Y	Sex					
Wüthrich and Colleagues, 1996[69]	54	Female	Tooth extraction	Bovine-derived hemostatic sponge	Rhinitis, rhinorrhea, widespread pruritus and urticaria, facial angioedema	Antihistamine	Recovery
Woodruff and Colleagues, 2014[70]	10	Male	Repair of alveolar cleft defect using iliac bone	Bovine-derived collagen sponge and microfibrillar hemostatic agents	Increased peak airway pressure, decreased end-tidal carbon dioxide, tachycardia, hypotension, facial and tongue swelling	Gelatin sponge removed, saline irrigation of surgical site, epinephrine, increase intravenous fluids, albuterol, and ventilation support	Recovery: 2 d
Ji and Barrett, 2015[39]	2	Female	Tooth restorations and extractions	Porcine-derived gelatin hemostatic sponge	Hypotension, hypoxia, decreased pulse, T-wave inversions, absent peripheral pulse, weak carotid pulse, periorbital and lip edema, puffy hands, back rash, and hypertension	Atropine, increase intravenous fluids, epinephrine, diphenhydramine, hydrocortisone, and hydralazine	Recovery: 1 d
Gehring and Colleagues, 2024[71]	10	Male	Alveolar bone graft using iliac bone	Porcine-derived gelatin hemostatic sponge	Hypotension, truncal rash, and facial edema	Intramuscular epinephrine, gelatin sponge removed, saline irrigation of surgical site	Recovery: 2 d
This study	50	Female	Intake of antibiotic for dental infection	Doxycycline in animal-derived gelatin capsules	Itchy throat, swollen throat and tongue	Diphenhydramine rapid-dissolving tablets (glycerin-free)	Recovery: 1 d

transportation of the patient to the hospital. Several pharmacologic agents can be used for an acute AG-based hypersensitivity reaction, principally with epinephrine, whereby adults should receive an intramuscular dose of 0.3 through 0.5 mL, 1:1,000 concentration, or be given a dose of 0.3 mg (0.3 mL, 1:1,000) with an autoejector pen for severe AGS episodes.[72] As a routine, affected patients should be advised to carry an epinephrine pen.[74] Non–life-threatening episodes of AGS have often been managed with vegan-derived diphenhydramine (50 mg for adults, 1 mg/kg for children), oral cromolyn, omalizumab, and corticosteroids.[14,73]

At a mean follow-up of 27 months, 55% (22/40) of AGS-affected patients disclosed resolution of their associated symptoms after eliminating red meat from their diet.[68] There have been isolated reports of successful reintroduction of small quantities of meat after strict avoidance for 6 years.[75] A limited number of other patients with repeated AGS-like events have elected to undergo desensitization measures and have successfully resumed eating red meat.[76] Many ingredients in dental products, prescription medications, and over-the-counter products could evoke an AGS event in at-risk patients. Potential resources to identify AG epitopes include pharmacists, allergists, and immunologists; manufacturers' lists of product ingredients and excipients; safety data sheets; and websites (eg, National Library of Medicine[77,78] and PillClarity.org[79]). Moreover, compounding pharmacies can dispense some alternative formulations with vegan-based gelatin capsules and other products without AG excipients.[80] A website has summarized various dental concerns associated with AGS.[81]

Key strategies for affected patients are to mitigate reexposure to AG-like epitopes that are contained in mammalian meat, dairy products, pharmaceuticals, medical or dental products, and body care products; reduce their residential proximity to endemic populations of deer ticks; and refrain from inhalation of red meats while cooking.[14]

To date, there has been only 1 reported fatal case of anaphylaxis attributed to AGS, occurring 2 hours after an initial infusion of the monoclonal antibody cetuximab for metastatic cancer.[82] To

reduce the risk of an adverse hypersensitivity reaction associated with AGS, practitioners should initially procure a detailed AGS-related medical history that includes triggers, clinical manifestations, management strategies, and patient outcome.[83] Before the initiation of oral health care, it is advised that providers seek consultation with the patient's attending allergist or immunologist to gain greater insight into the AGS status and to inquire whether it would be more prudent to conduct dental treatment in a facility that has emergency medical support readily available.

CONCLUSIONS AND PRACTICAL IMPLICATIONS

AGS is an uncommon chronic disorder associated with an IgE-based delayed hypersensitivity reaction, typically arising from the transfer of a salivary oligosaccharide from the lone star tick (*A americanum*). Sensitized patients exhibit an increased predilection for an AG reaction after epitopic reexposure. Oral health care providers should be familiar with the general features of an affected patient's medical history, triggering events, therapeutic strategies, and pathophysiological outcomes. Attending clinicians should gain a greater understanding of the patient's prevailing disorder via consultation with their allergist or immunologist. Preventive management of AGS is essential and involves strict avoidance of pharmaceuticals and dental products that could promote an AGS-like reaction. Dentists should be familiar with the manifestations of an AGS reaction and be prepared to manage an ensuing incident. ■

DISCLOSURE

None of the authors reported any disclosures.

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The authors express their heartfelt appreciation to the patient featured in this report for her generous expenditure of time to provide a thorough narrative of her alpha-gal syndrome experiences.

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