CASE REPORT

Alpha-gal Syndrome Presenting as Isolated Diarrhea Following Exposure to Red Meat: A Case Report

Joseph Moschella, OMS-III/BS[1]; Alison Mancuso, DO, FACOFP[1]; Susannah Ruzbarsky, DO PGY-1[2]

[1] Rowan-Virtua School of Osteopathic Medicine
[2] Virtua Health Family Medicine Residency

KEYWORDS

Alpha-gal

AGS

IgE-mediated food allergy

Alpha-gal syndrome

Food allergy

ABSTRACT

Alpha-gal syndrome (AGS) is an emerging immunoglobulin E (IgE)-mediated food allergy linked to tick bites, typically presenting as delayed anaphylactic reactions following consumption of mammalian meat products. We present the case of a patient with AGS (elevated alpha-gal IgE) who displayed an atypical clinical presentation of isolated gastrointestinal symptoms without systemic allergic manifestations, including urticaria. The patient's symptoms completely resolved after eliminating red meat from her diet. This case highlights the variable presentations of AGS and the importance of considering this diagnosis in the absence of typical urticarial and anaphylactic symptoms.

INTRODUCTION

Alpha-gal syndrome (AGS) is an emerging food allergy defined by an immunoglobulin E (IgE)-mediated hypersensitivity reaction in response to galactose-alpha-1,3-galactose (alpha-gal), an oligosaccharide present in the cells of nonhuman mammals. Prevalence and incidence of AGS have substantially increased in recent years. Sensitization to alpha-gal occurs through tick bites, primarily through the lone star tick in the United States, though Ixodes ticks have also been implicated in AGS.[1]

Clinical presentation of AGS is characteristically delayed, occurring 3 to 7 hours following consumption of red meat.[2] While the clinical symptoms of AGS can vary, the most commonly reported symptoms include urticaria and diarrhea. Additional clinical features may include angioedema, respiratory symptoms, emesis, reflux, and abdominal pain, with rare cases progressing to anaphylaxis.[3] Although most patients present with cutaneous symptoms, isolated gastrointestinal (GI) symptoms without concurrent urticaria or systemic allergic reactions represent an atypical variant that can lead to delayed diagnosis.

CASE PRESENTATION

Chief Complaint: Diarrhea

History of Present Illness: A 44-year-old female with a past medical history of anxiety, irritable bowel syndrome (IBS), and depression presented with complaints of worsening anxiety and diarrhea.

The patient states that for the last 2 weeks she has been having increasing episodes of diarrhea, with about three loose stools per day. In the past, the patient experienced constipation-predominant IBS, with bowel movements every 3 to 7 days. Within the past year she has been experiencing more of these diarrhea episodes with nausea. She also reports daily episodes of tenesmus that include abdominal cramping before and after defecation.

She notes a potential sensitivity to red meat in particular. Specifically, she recalls episodes of diarrhea in the hours following consumption of foods such as steak and meatballs. Associated symptoms include diffuse abdominal pain, abdominal cramping, nausea, and occasional heartburn. She denied rash, angioedema, or respiratory symptoms.

CORRESPONDENCE:
Joseph Moschella | mosche37@rowan.edu

Copyright© 2026 by the American College of Osteopathic Family Physicians. All rights reserved. Print ISSN: 1877-573X; Electronic ISSN 1877-5748 doi: 10.33181/18307

The authors have no relevant financial relationships or conflicts of interest to disclose.

When questioned about possible tick exposure, the patient recalled a tick bite about 2 years ago, which she believed may coincide with the onset of her diarrhea episodes. She has a history of IBS that used to be more constipation-predominant before her exposure to the tick bite.

The patient's GI symptoms have negatively impacted her quality of life. Notably, she experiences "debilitating" anxiety surrounding bowel movements, particularly in social settings. Consequently, she has been avoiding meals and has lost 4 pounds over the past months.

Medications

- Sertraline 25 mg daily
- Buspirone 5 mg as needed
- Dicyclomine 10 mg as needed (ineffective for current symptoms)

Physical exam

Vital signs were within normal limits. The patient appeared to have a thin body habitus, with a body mass index (BMI) of 16.9 kg/m^2. Abdominal exam revealed a soft, nondistended, nontender abdomen with bowel sounds present and normal. Skin showed no rashes or swelling. Heart and lung exams were unremarkable.

Labs

Laboratory tests including comprehensive metabolic panel (CMP), thyroid function tests, and complete blood count (CBC) were all within normal limits.

Due to the association between red meat consumption and symptom onset, as well as the exposure to tick bite, the differential diagnosis of AGS was explored and an IgE titer was ordered.

TABLE 1: Key

Class	IgE level (kU/L)	Degree Sensitivity
0	0-0.34	Insignificant
1	0.35-0.69	Low level
2	0.70-3.49	Moderate level
3	3.50-17.4	High level
4	17.5-49.9	Very high level
5	50-100	Very high level
6	>100	Very high level

TABLE 1: Patient results

	IgE level (kU/L)	Reference Level and Sensitivity
Beef IgE	0.54	Class 1 – Low level
Pork IgE	0.18	Class 0 – Insignificant
Lamb IgE	0.52	Class 1 – Low level
Galactose-alpha-1,3-galactose	0.85	Class 2 – Moderate level

Results displayed elevated IgE levels signifying a moderate sensitivity to galactose-alpha-1,3-galactose, confirming the diagnosis of AGS.

Additionally tick-borne illness serology was ordered, and results were negative for Borrelia, Babesia, Ehrlichia, and Rickettsia.

Management and follow-up

The patient was informed of her diagnosis and advised to avoid red meat, including steak, beef, and lamb.

Follow-up at 3 weeks revealed complete resolution of her GI symptoms, noting improvements within 1 week of adhering to strict avoidance of red meat. Her bowel movements have become more firm and regular. Furthermore, she reported that her anxiety surrounding bowel movements has greatly improved. The patient also noted an unexpected improvement of menstrual cycle cramps since eliminating red meat from her diet. The patient will continue to avoid mammalian meat products and will be monitored by the office for any recurrence or evolution of symptoms.

DISCUSSION

This case illustrates a unique presentation of AGS characterized by isolated GI symptoms without systemic allergic manifestations. While cutaneous manifestations occur in 93% of cases, isolated GI symptoms can occur.[3] The absence of dermatologic manifestations pose diagnostic challenges, as many providers may not associate diarrhea with an IgE-mediated allergic response. A recent review implicated that patients with a history of IBS and AGS may have more GI-predominant symptoms.[4] IBS is a diagnosis based on recurrent abdominal pain with abnormal stool form or frequency, requiring one to rule out other underlying causes. A patient's IBS history may further blind the physician to the differential diagnosis of AGS, as the digestive manifestations may be attributed to the underlying diagnosis. Patients should be questioned about red-meat sensitivity and tick exposure when IBS symptoms change. IBS patients typically are categorized into subtypes of diarrhea-predominant or constipation-

predominant. It is common for IBS patients to switch from their IBS subtype to a mixed IBS over the course of 1 year. However, it is rare for a patient to change directly from constipation-predominant to diarrhea-predominant.[5,6] The change in our patient's IBS presentation from constipation-predominant to diarrhea-predominant was crucial for raising physician suspicion on an alternative diagnosis.

The delayed onset of symptoms further complicates the diagnosis, with most patients failing to identify red meat as a trigger. Thus, food diaries are an essential tool that should be used when patients struggle with consistent episodes of diarrhea and abdominal pain. It is important to note that the level of alpha-gal–specific IgE does not necessarily correlate with the severity of symptoms.[7] This disconnect between antibody levels and clinical presentation further highlights the complexity of AGS and emphasizes that diagnosis and management should be based on clinical history and response to dietary avoidance rather than relying solely on IgE antibody titers.

Diagnostic delay remains a significant challenge for AGS. A study in 2017 showed that the mean time between onset of symptoms and AGS diagnosis was 7.1 years, with a more recent study in 2025 showing the median time to diagnosis has improved to 21 months.[8,9] While the mean time to diagnosis has improved, there is still significant delay, emphasizing the need for further awareness of the various clinical manifestations of AGS in order to decrease diagnostic latency.

The patient showed dramatic improvement following avoidance of red meat, confirming the diagnosis of AGS. First-line management is avoidance of mammalian meat products (80% effective), with resolution increasing to 95% when avoiding dairy and gelatin.[10] Furthermore, patient education on skin products and medications containing gelatin and animal derivatives is important. For example, heparin is commonly derived from porcine or pig intestines and can cause reactions in patients with AGS.[11]

Additionally, studies have linked IgE antibodies to alpha-gal with accelerated atherosclerosis and coronary artery disease. The mechanism of accelerated atherosclerosis may be linked to alpha-gal being absorbed via lipids and chylomicrons, hence, once entering the bloodstream, there is greater potential for inflammatory response from the antibodies.[12] It will be worthwhile to monitor the patient closely for any early development of coronary artery disease or peripheral atherosclerosis.

A key takeaway is that AGS should be considered as a differential diagnosis in the setting of new-onset or worsening GI symptoms, especially for patients with possible tick exposure. Clinical suspicion of AGS warrants specific IgE testing for an earlier diagnosis, which may reduce future risk of cardiac manifestations, prevent progression of symptoms, and reduce long-term complications.

CONCLUSION

This case demonstrated an atypical presentation of AGS characterized by isolated GI symptoms without cutaneous or systemic allergic manifestations. Through thorough history taking, there was some clinical suspicion leading to IgE testing for an alpha-gal allergy. The positive titer, along with complete resolution of symptoms following dietary avoidance of mammalian meat products confirmed the diagnosis.

As the incidence of AGS continues to rise, clinicians must maintain a high level of suspicion for this diagnosis, particularly in regions endemic to lone star and Ixodes ticks. Moving forward, increased awareness leading to quicker recognition of AGS will improve patient outcomes and quality of life.

REFERENCES

1. Román-Carrasco P, Hemmer W, Cabezas-Cruz A, Hodžić A, de la Fuente J, Swoboda I. The α-gal syndrome and potential mechanisms. *Front Allergy*. 2021;2:783279. doi: 10.3389/falgy.2021.783279
2. Ross M, Daley G, Burnard ML, et al. Alpha-gal on the rise: the alarming growth of alpha-gal syndrome in high-risk regions. *Cureus*. 2025;17(7):e88415. doi: 10.7759/cureus.88415
3. Macdougall JD, Thomas KO, Iweala OI. The meat of the matter: understanding and managing alpha-gal syndrome. *Immunotargets Ther*. 2022;11:37-54. doi: 10.2147/itt.S276872
4. Commins SP. Diagnosis & management of alpha-gal syndrome: lessons from 2,500 patients. *Expert Rev Clin Immunol*. 2020;16(7):667-677. doi: 10.1080/1744666x.2020.1782745
5. Yadav YS, Eslick GD, Talley NJ. Review article: irritable bowel syndrome: natural history, bowel habit stability and overlap with other gastrointestinal disorders. *Aliment Pharmacol Ther*. 2021;(54 suppl 1):s24-s32. doi: 10.1111/apt.16624
6. Garrigues V, Mearin F, Badía X, et al. Change over time of bowel habit in irritable bowel syndrome: a prospective, observational, 1-year follow-up study (RITMO study). *Aliment Pharmacol Ther*. 2007;25(3):323-332. doi: 10.1111/j.1365-2036.2006.03197.x
7. Choudhary SK, Karim S, Iweala OI, et al. Tick salivary gland extract induces alpha-gal syndrome in alpha-gal deficient mice. I*mmun Inflamm Dis*. 2021;9(3):984-990. doi: 10.1002/iid3.457
8. Flaherty MG, Kaplan SJ, Jerath MR. Diagnosis of life-threatening alpha-gal food allergy appears to be patient driven. J *Prim Care Community Health*. 2017;8(4):345-348. doi: 10.1177/2150131917705714
9. Propst SBH, Thompson DK. Alpha-gal syndrome and the gastrointestinal reaction: a narrative review. *Front Allergy*. 2025;6:1535103. doi: 10.3389/falgy.2025.1535103
10. Patel C, Iweala OI. 'Doc, will I ever eat steak again?': diagnosis and management of alpha-gal syndrome. *Curr Opin Pediatr*. 2020;32(6):816-824. doi: 10.1097/mop.0000000000000955

11. Commins SP. Invited commentary: alpha-gal allergy: tip of the iceberg to a pivotal immune response. *Curr Allergy Asthma Rep*. 2016;16(9):61. doi: 10.1007/s11882-016-0641-6

12. Wilson JM, McNamara CA, Platts-Mills TAE. IgE, α-gal and atherosclerosis. *Aging* (Albany NY). 2019;11(7):1900-1902. doi: 10.18632/aging.101894