

contaminating his food with peanut dust for at least 5 years. Although he had at least 7 documented anaphylactic reactions that required epinephrine administration either by an autoinjector or emergency department staff, the exact number or frequency of contamination events is unknown and will likely remain unknown. It is possible that this individual may have resolved his peanut allergy from the repeated exposures^{7,8}; however, this phenomenon tends to occur most predominantly in children and young adolescents.^{9,10} Regardless, this pattern of repeated exposure seems to be associated with the amelioration of his immunologic response to peanut antigen. It would be ironic if his spouse's intentional contamination unintentionally mimicked the immunomodulatory effects of food desensitization.

Overall, the incongruence between subjective and objective findings led to the prolonged inability of attaining a cause for this individual's allergic reactions. This unusual case reinforces the importance of taking an accurate history, trusting the results of objective testing, and having a broad differential diagnosis for the cause of life-threatening anaphylactic reactions. Intentional poisoning with food allergens should be considered in recurrent and unexplained anaphylaxis.

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References

1. Simons FE, Ebisawa M, Sanchez-Borges M, et al. 2015 Update of the evidence base: World Allergy Organization anaphylaxis guidelines. *World Allergy Organ J*. 2015;8(1):32.
2. Lieberman P, Nicklas RA, Randolph C, et al. Anaphylaxis—a practice parameter update 2015. *Ann Allergy Asthma Immunol*. 2015;115(5):341–384.
3. O'Keefe A, Clarke A, St Pierre Y, et al. The risk of recurrent anaphylaxis. *J Pediatr*. 2017;180:217–221.
4. Wong HC. Factitious anaphylaxis and pre-varication anaphylaxis. *J Allergy Clin Immunol*. 2005;116(3):710.
5. Confino-Cohen R, Melamed S, Goldberg A. Debilitating beliefs, emotional distress and quality of life in patients given immunotherapy for insect sting allergy. *Clin Exp Allergy*. 1999;29(12):1626–1631.
6. Confino-Cohen R, Melamed S, Goldberg A. Debilitating beliefs and emotional distress in patients given immunotherapy for insect sting allergy: a prospective study. *Allergy Asthma Proc*. 2009;30(5):546–551.
7. Abrams EM, Sicherer SH. Diagnosis and management of food allergy. *CMAJ*. 2016;188(15):1087–1093.
8. Savage J, Sicherer S, Wood R. The natural history of food allergy. *J Allergy Clin Immunol Pract*. 2016;4(2):196–203.
9. Fleischer DM, Conover-Walker MK, Christie L, Burks AW, Wood RA. The natural progression of peanut allergy: resolution and the possibility of recurrence. *J Allergy Clin Immunol*. 2003;112(1):183–189.
10. Bégin P, Paradis L, Paradis J, Picard M, Des Roches A. Natural resolution of peanut allergy: a 12-year longitudinal follow-up study. *J Allergy Clin Immunol Pract*. 2013;1(5):528–530.e1–4.

Oral allergy syndrome due to a hidden allergen in Mojo sauce



Oral allergy syndrome (OAS) is a specific type of allergic reaction that mainly occurs after the consumption of raw fruit, vegetables, and nuts.¹ In adults, OAS represents the most common allergic reaction to food, affecting patients with pollen sensitization due to homology between plant proteins.² It is a complex syndrome with diagnostic and therapeutic challenges that require comprehensive history-taking and examination. We discuss a case of OAS after Mojo (a sauce used in Cuban food) ingestion including the diagnostic challenge and our approach for its management.

A 32-year-old man with a history of seasonal allergic rhinitis and sensitization to oak, cedar, and birch presented to the Allergy department for evaluation of a possible allergic reaction, with 3 episodes of intense pruritus of tongue, palate, cheeks, and lips. On all 3 occasions, the symptoms started 10 to 20 minutes after eating a pork sandwich with Mojo at a local restaurant. The patient did not take any medication for his symptoms because these would resolve within 10 to 15 minutes on its own. He recalled experiencing these symptoms only after eating the same type of sandwich from the same restaurant during spring and summer but presenting with no symptoms if he ate the sandwich during autumn and winter or with similar sandwiches from alternative restaurants. He denied any history of food allergies. The patient was unable to identify other possible causes of his symptoms apart from eating the sandwich.

Upon thorough history-taking, we determined that the Mojo used on the specific sandwich was the main difference between the specified restaurant's recipe and that of the other restaurants wherein the patient never had any symptoms. Mojo is

prepared with several ingredients (including garlic, cumin, black pepper, oregano, unripe orange, and olive oil) that were boiled for 10 to 20 minutes. There were no commercial extracts available for Mojo. We performed prick to prick testing to pork, whole Mojo (from the same restaurant) and each of its ingredients along with commercially available aeroallergens (Fig 1). The test result was positive for whole Mojo, ripe orange, cumin, cedar, and oak.

We then performed prick to prick tests with Mojo using undiluted Mojo and 10-fold dilutions (1:10; 1:100; 1:1000; 1:10,000; 1:100,000; and 1:1,000,000) on 5 healthy subjects and the patient. Healthy subjects had a negative reaction to all dilutions and undiluted Mojo, whereas the patient had a positive reaction to undiluted Mojo and 1:10 dilution.

We then performed an oral challenge where the patient ate the same type of sandwich at the clinic under close surveillance. Within 10 minutes of ingestion, the patient reported pruritus of the buccal mucosa, tongue, and lips. There was no urticaria, rashes, angioedema, or evidence of other systemic IgE-mediated reactions. Furthermore, oral challenges for an individual component of Mojo were done. Pruritus was noted with the ingestion of orange juice, but not with cumin. The patient was advised to avoid ingestion of foods containing Mojo during spring and summer to prevent worsening of symptoms with pollen peaks and to use oral antihistamines on experiencing these symptoms.

Spices, similar to the ones used in Mojo, are used in a wide array of foods and beverages and may act as hidden allergens. Citrus fruit allergy, as seen in our patient (orange) is often associated with cross-reactivity and sensitization to other plants such as birch or grass pollen.³ Symptoms of allergy to orange are mainly local, unlike other food allergies, which have more generalized symptoms such as vomiting, diarrhea, and abdominal pain.³ During an acute

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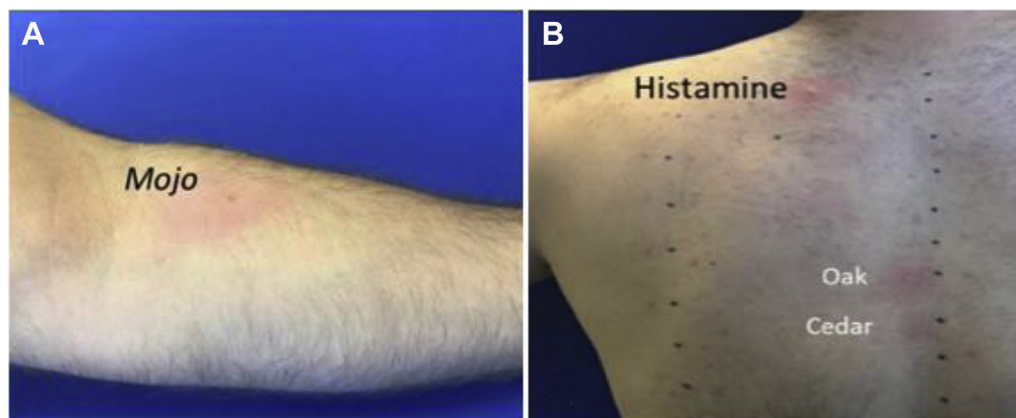


Figure 1. A, Prick to prick with Mojo. B, Aeroallergens and positive control.

episode, a physical examination may reveal angioedema as well as perioral urticarial eruptions.^{1,4}

There is no consensus on the recommended specific method for prick testing in patients with allergic reactions to spices. Testing for spices is a challenge, lacking reliable commercially available extracts, such that it becomes necessary to test these patients with fresh foods. For several years, the prick to prick testing for fresh produce has been shown to be a more reliable method than the commercial extracts.⁵ In contrast, skin prick test can be unreliable because the cross-reactive epitopes get denaturalized by the manufacturing process,⁶ and this also poses the risk of provoking clinical reactions.⁷ Prick to prick testing with freshly prepared extracts is more sensitive in detecting allergen-specific IgE antibody.⁸ Oral provocation tests can help confirm the presence of the disease. For an accurate diagnosis, patients should be advised to keep a diary of food consumption, based on which determination of food challenge tests should be performed.

Patient education is the most effective long-term management of this condition. Patients and their families should be made aware and instructed to read food and beverage labels, wherein all ingredients of the food are mentioned. In situations of hidden allergens, as in our case, patients with OAS can be treated with a combination of allergen avoidance and pharmacotherapy (antihistamines). Patients with a history of anaphylaxis should have an epinephrine auto-injector with them at all times.

Successful use of rifampin in a patient with Stevens-Johnson syndrome to rifabutin

Stevens-Johnson Syndrome (SJS) is a severe cutaneous adverse reaction that is generally considered an absolute contraindication to future use of the offending agent owing to the high risk of morbidity and mortality. Although large studies or validated assays that predict clinical cross-reactivity are lacking, potentially cross-reactive medications are often avoided. Restricting medication

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References

1. Sloane D, Sheffer A. Oral allergy syndrome. *Allergy Asthma Proc.* 2001;22(5):321–325.
2. Carlson G, Coop C. Pollen food allergy syndrome (PFAS): a review of current available literature. *Ann Allergy Asthma Immunol.* 2019;123(4):359–365.
3. Iorio RA, Del Duca S, Calamelli E, et al. Citrus allergy from pollen to clinical symptoms. *PLoS One.* 2013;8(1), e53680.
4. Chang YC, George SJ, Hsu S. Oral allergy syndrome and contact urticaria to apples. *J Am Acad Dermatol.* 2005;53(4):736–737.
5. Cantani A, Micera M. The prick by prick test is safe and reliable in 58 children with atopic dermatitis and food allergy. *Eur Rev Med Pharmacol Sci.* 2006;10(3):115–120.
6. Kashyap RR, Kashyap RS. Oral allergy syndrome: an update for stomatologists. *J Allergy (Cairo).* 2015;2015:543928.
7. Cantani A, Micera M. Can skin prick tests provoke severe allergic reactions? *Eur Rev Med Pharmacol Sci.* 2000;4(5–6):145–148.
8. Sussman G, Sussman A, Sussman D. Oral allergy syndrome. *CMAJ.* 2010;182(11):1210–1211.



use can, however, also pose health risks when efficacious therapies are limited. This is particularly true for mycobacterial infections, in which rifamycins can be integral to effective treatment¹ but have been associated with a significant risk of SJS.² In this report, we describe the successful use of a novel dose escalation protocol for rifampin in a patient with a history of SJS to rifabutin.

The patient was a 63-year-old man who had previously undergone renal transplant and was admitted to the hospital for disseminated *Mycobacterium avium complex* (MAC) with clavicular osteomyelitis. His medical history was notable for chronic kidney disease stage III, insulin-dependent diabetes mellitus, and seronegative rheumatoid arthritis. His immunosuppressive regimen included mycophenolate sodium, cyclosporine, and prednisone 10 mg daily.