

# Food Allergy due to Olive

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## ■ Abstract

We report the case of a 28-year-old man who presented palatal itching and generalized urticaria following ingestion of olive 3 years after being diagnosed with olive pollinosis. The patient did not have a history of food allergy or urticaria. The results of skin prick tests with aeroallergens including latex were positive for house dust mite and olive pollen. The results of prick tests and prick-to-prick tests for olive fruit were positive, as were those of specific immunoglobulin E tests to olive pollen and fruit. The results of prick tests to peach, pear, kiwi, melon, and nut were negative. Nasal provocation with olive pollen gave positive results. An open oral provocation test with olive oil did not cause symptoms. This case is unique in that the patient developed olive fruit allergy in the presence of olive pollinosis, and he did not experience allergic symptoms to fruits other than olive, thus enabling us to define a new pollen-food (olive-olive) syndrome.

**Key words:** Olive pollinosis. Olive allergy. Pollen-food syndrome.

## ■ Resumen

Comunicamos el caso de un hombre de 28 años de edad que presentó prurito palatino y urticaria generalizada tras la ingestión de aceituna 3 años después de ser diagnosticado de polinosis a olivo.

El paciente no tenía historia de alergia alimentaria o urticaria. Las pruebas cutáneas con aeroalérgenos incluyendo el látex resultaron positivas a ácaros del polvo y polen de olivo. Los resultados de las pruebas cutáneas y el prick-prick para la aceituna fueron positivas, así como la IgE específica frente a polen de olivo y aceituna. Los resultados de las pruebas cutáneas a melocotón, pera, kiwi, melón y nuez fueron negativas. La provocación nasal con polen de olivo resultó positiva. La provocación oral abierta con aceite de oliva no causó síntomas. Este caso es el único en el que un paciente desarrolla alergia a la aceituna en presencia de polinosis al olivo, y que no experimentó síntomas alérgicos a frutos distintos de la aceituna, permitiéndonos de esta forma definir un nuevo síndrome polen-alimento (olivo.-aceituna).

**Palabras clave:** Polinosis a olivo. Alergia a olivo. Síndrome polen-alimento.

## Introduction

Food allergy is less prevalent in adults than in children. In adults, it is usually associated with the cross-reactivity stemming from sensitivity to aeroallergens such as latex and pollens, and is defined as latex-fruit or pollen-food syndrome. The widespread cultivation of olive in Mediterranean countries, including Turkey, means that olive pollinosis is one of the leading causes of allergic rhinitis and asthma in the area [1-3]. However, olive fruit has not been recognized as a major allergen in food allergy, despite its common consumption in this region. To our knowledge, there is only 1 report of olive fruit allergy in the absence of pollinosis. We report for the first time a patient who developed olive fruit allergy 3 years after being diagnosed with olive pollinosis.

## Case Description

A 28-year-old man with a 3-year history of persistent rhinitis and seasonal exacerbation was referred to our clinic. He reported palatal itching beginning minutes after ingestion of olive fruit followed by generalized urticaria about 1 hour later. These symptoms subsided spontaneously within hours. He had experienced these symptoms several times following ingestion of olive fruit. In an attempt to ensure that they were related to olive, he had ingested olive with no other food and developed the same reaction. The patient considered that these reactions might be associated with olive pollinosis and stopped eating olive. The patient did not have a history of food allergy and was able to tolerate other foods.

The patient underwent skin prick testing (SPT) (Say,

Paris, France) and the results were assessed after 15 minutes. Presence of an induration  $\geq 3$  mm wider than the negative control accompanied by erythema was considered positive. SPT results were positive to house dust mites and olive pollen (Table). Prick test results for other aeroallergens (grass, weed, tree pollen, molds, animal epithelia, cockroach, and latex) were negative. The prick test with a commercial olive-fruit extract was positive, as was the prick-to-prick test with fresh green and black olive (Table, Figure). The food prick tests to peach, pear, kiwi, melon, and nut were negative. Specific IgE (CAP system, Pharmacia, Uppsala, Sweden) was positive for olive fruit and olive pollen (Table).

A nasal provocation test (NPT) with olive pollen (Say, Paris, France) was performed. First, the NPT was started with placebo. The patient did not develop symptoms and the nasal flow rate did not decrease by more than 20% within 15 minutes of administration of the placebo. The patient was then exposed to the allergen challenge. The NPT was performed with 100 IR/mL

of the allergen extract. Fifteen minutes after administration, the patient developed rhinitis and a 40% decrease over baseline in nasal flow rate was observed [4].

The open oral provocation test with olive oil (2 mL) did not produce symptoms. The prick-to-prick result with fresh olive was negative in the control group (50 healthy individuals with no history of olive pollen sensitivity).

## Discussion

Several cross-reacting proteins are responsible for plant-derived food allergy, which presents with oral allergy syndrome or anaphylaxis in patients with pollen allergy [5-8]. Among these, profilins and lipid transfer proteins (LTPs) are responsible for co-occurrence of pollinosis and plant-derived food allergy [9-11].

To date, 10 allergens have been characterized from *Olea europaea* pollen extract (Ole e 1-Ole e 10) [12]. Ole e 2 has been identified as profilin [3], and Ole e 7 as an LTP associated with anaphylaxis after food ingestion [11]. Allergy to peach, pear, kiwi, melon, and nut has been reported in patients suffering from olive pollen sensitivity [11]. Our patient had no history of anaphylaxis or oral allergy syndrome following ingestion of these fruits. Furthermore, we did not observe positive prick test results to any of these fruits (Table).

There is only 1 report of olive fruit allergy in the literature [12]. The patient, who presented angioedema and generalized itching following ingestion of olive, was not allergic to aeroallergens and could tolerate olive oil, as could our patient. However, our case was different because of the presence of olive pollen sensitivity confirmed by a positive result in the skin prick test and NPT to olive pollen. The initiation of olive pollinosis symptoms 3 years before the development of food allergy and the absence of a history of food allergy point to a new pollen-food (olive-olive) syndrome that has yet to be elucidated.

Table. Summary of the Analysis

	Prick, mm	Prick-to-Prick, mm	sIgE, kU <sub>A</sub> /L	NPT	OPT
<b>Allergens Inhaled</b>					
Dust Mite	4		ND	ND	
Olive	12		74.8 (+5)	Positive	
<b>Foods</b>					
Olive	3	4 (g) and 5 (b)	4.73 (+3)		ND
Pear	0	ND	ND		ND
Kiwi	0	ND	ND		ND
Melon	0	ND	ND		ND
Nut	0	ND	ND		ND
Peach	0	ND	ND		ND
Olive oil					Negative
<b>Negative control</b>					
	0	0			
<b>Positive control</b>					
	5	5			

Abbreviations: b, black olive; g, green olive; ND, not done; NPT, nasal provocation test; OPT, oral provocation test; sIgE, allergen-specific immunoglobulin E.



Figure. Prick and prick-to-prick tests with olive fruit. O1 shows the prick-to-prick test with black olive; O2 shows the prick-to-prick test with green olive; and OF shows the prick test with commercial olive extract.

## References

- Guneser S, Atici A, Cengizler I, Alparslan N. Inhalant allergens: as a cause of respiratory allergy in east Mediterranean area, Turkey. *Allergol Immunopathol*. 1996;24:116-9.
- Kırmaz C, Yuksel H, Bayrak P, Yılmaz Ö. Symptoms of the olive pollen allergy: Do they really occur only in the pollination season? *J Investig Allergol Clin Immunol*. 2005;15:140-5.
- Quiralte J, Palacios L, Rodriguez R, Cardaba B, Arias de Saavedra JM, Villalba M, Florido JF, Lahoz C. Modelling diseases: the allergens of *Olea europaea* pollen. *J Investig Allergol Clin Immunol*. 2007;17 Suppl 1:24-30.
- Bachert C, Berdel D, Enzmann H, Fuchs E, Gonsior E, Hofmann D, Keller H, Nitz U, Rudolph R, Rudiger W, Schlenker WW. Richtlinien für die Durchführung von nasalen Provokationstests mit Allergenen Bei Erkrankungen der oberen Luftwege. *Allergologie*. 1990;13:53-5.
- Ebner C, Birkner T, Valenta R, Rumpold H, Breitenbach M, Scheiner O, Kraft D. Common epitopes of birch pollen and apples-Studies by Western and Northern blot. *Allergy Clin Immunol*. 1991;88:588-94.

6. Ebner C, Hirschwehr R, Bauer L, Breiteneder H, Valenta R, Ebner H, Kraft D, Scheiner O. Identification of allergens in fruits and vegetables: IgE cross-reactivities with the important birch pollen allergens Bet v 1 and Bet v 2 (birch profilin). *J Allergy Clin Immunol.* 1995;95:962-9.
7. Rodriguez-Perez R, Fernandez-Rivas M, Gonzalez-Mancebo E, Sanchez-Monge R, Diaz-Peralez A, Salcedo G. Peach profilin:cloning, heterologous expression and cross-reactivity with Bet v 2. *Allergy.* 2003;58:635-40.
8. Egger M, Mutschlechner S, Wopfner N, Gadermaier G, Briza P, Ferreira F. Pollen-food syndromes associated with weed pollinosis: an update from the molecular point of view. *Allergy.* 2006;61:461-76.
9. Valenta R, Duchene M, Pettenburger K, Sillaber C, Valent P, Bettelheim P, Breitenbach M, Rumpold H, Kraft D, Scheiner O. Identification of profilin as a novel allergen; IgE autoreactivity in sensitized individuals. *Science.* 1991;253:557-60.
10. Pastorello EA, Pravettoni V, Farioli L, Ispano M, Fortunato D, Monza M, Giuffrida MG, Rivolta F, Scibola E, Ansaloni R, Incorvaia C, Conti A, Ortolani C. Clinical role of a lipid transfer protein that acts as a new apple-specific allergen. *J Allergy Clin Immunol.* 1999;104:1099-106.
11. Florido Lopez JF, Quiralte Enriquez J, Arias de Saavedra Alias JM, Saenz de San Pedro B, Martin Casanez E. An allergen from *Olea europaea* pollen (Ole e 7) is associated with plant-derived food anaphylaxis. *Allergy.* 2002;57:53-9.
12. Azofra J. Olive allergy. *Allergy.* 2004;59(5):559.

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