

Shiitake dermatitis: Two clinical forms of cutaneous presentation in the same patient

Emilio Sudy¹, Francisco Urbina¹

¹Dermatologists in private practice, Santiago de Chile.

The authors declare no funding was received for this work. The authors declare there is no conflict of interest.

Received: December 23, 2020
Accepted: June 09, 2022

Corresponding author:
Emilio Sudy
Email: emiliosudy@gmail.com

RESUMEN

La dermatitis por hongos Shiitake ocurre en un pequeño porcentaje de casos luego de la ingesta de este hongo en forma cruda o semi-cruda. Se manifiesta usualmente como una dermatosis flagelada localizada principalmente en la espalda y en forma más ocasional con otro tipo de lesiones incluyendo la urticaria, petequias y una dermatitis de contacto entre otras.

Este estudio describe un paciente sano de 46 años con dos tipos diferentes de reacciones al hongo, espaciadas en el tiempo. Primero está la típica dermatosis flagelada luego de la ingesta del hongo Shiitake y un tiempo después luego de que se había mejorado completamente, un segundo rash en la forma de dermatitis de contacto con descamación y prurito de las manos y dedos luego de la manipulación del hongo.

Según nuestro conocimiento, este es el primer caso con dos diferentes formas de presentación clínica de reacción alérgica al hongo Shiitake en el mismo paciente

Palabras claves: Dermatitis shiitake; Dermatosis flagelada; dermatitis de contacto por hongo shiitake.

ABSTRACT

Shiitake fungal dermatitis occurs in a small percentage of cases after ingestion of this raw or semi-raw mushroom. It usually manifests as flagellated dermatosis located mainly on the back and more rarely with other types of lesions, including urticaria, petechiae, and contact dermatitis, among others.

This study described a healthy 46-year-old male patient who presented two different forms of reaction to mushrooms, spaced over time. First is the typical form of flagellated dermatosis after the Shiitake mushrooms ingestion, and shortly after, when fully recovered, with a second rash in the form of contact dermatitis with desquamation and itching of hands and fingers after the mushroom manipulation. To the best of our knowledge, this is the first case reported with two different cutaneous clinical forms of allergic reaction to Shiitake mushrooms in the same patient.

Key words: Shiitake dermatitis; Flagellate dermatoses; contact dermatitis to shiitake mushroom.

Shiitake dermatitis after ingestion of this mushroom is well known in the literature after the initial descriptions made in Japan by Nakamura.¹ The typical case is characterized by the sudden appearance of papules, papulovesicles, or plaques with a linear distribution pattern that mimics lashing, with lesions especially located on the trunk; that is why it is also known as flagellated dermatosis.^{2,3,4} Other unusual skin manifestations produced by Shiitake mushrooms include its presentation with petechiae^{1,5,6} as well as contact dermatitis in the hands^{7,8,9} or on the face and forearms,⁹ contact urticaria,⁷ skin pustules, and oral ulcers,¹⁰ and also as a DRESS-like syndrome.¹¹

In most publications, a single variety of skin presentations has been described in each case reported. The case of a patient who had two forms of cutaneous presentation produced by Shiitake mushrooms was presented at different times spaced out in time: the first in the form of flagellated dermatosis after ingestion of the mushroom and on another occasion in the form of contact dermatitis of the hands after its manipulation.

CASE REPORT

A healthy 46-year-old patient with no significant medical history presented with an acute and very itchy

eruption in the back, characterized by linear erythematous lesions, composed of papules with a bulging or pseudovesicular appearance with a whiplash-shaped configuration (Figure 1).

The patient did not report taking any type of medication or in contact with plants. He attended an emergency department twice, where he was initially treated with chlorphenamine and intramuscular betamethasone, and later with an indication to continue with antihistamines and oral corticosteroids for a few days. The lesions disappeared completely after two weeks.

Three weeks later, after having been completely healthy, he developed a new condition, also very itchy, this time with scaling of the palms and fingers after handling a kitchen product (Figure 2). At that moment the patient suspected the cause of the problem: he was setting up a company to export Shiitake mushrooms and the day before he had been handling the mushrooms with his hands without any protection, also recalling that the flagellated dermatitis he had presented previously occurred after the intake of raw Shiitake mushrooms.

He was successfully treated with topical clobetasol and oral levocetirizine. The possibility of performing a patch test was raised, but due to the evident nature of both episodes and their clear relationship with the mushroom, he decided not to carry out any tests and only avoid ingesting and handling Shiitake mushrooms in the future.

DISCUSSION

Shiitake mushrooms are widely used in Asian cuisine. Furthermore, they are also used in traditional medicine in this region for their anticancer, antihypertensive, and lipid-lowering properties (serum cholesterol reduction properties).^{12,13} The first cases were observed in Japan by Nakamura in 1977,¹ and in later years this same author collected more cases and presented them in new articles.¹

Since Asian food became more popular in the West, different publications on this process appeared both in Europe¹², North America¹⁴, and South America.^{6,15} There are large series of patients described in Japan (51 cases), a review of 50 cases of publications in English¹³ and a French review of 15 other cases.¹²



Figure 1

Linear erythematous lesions, some cross-linked and very itchy, after ingestion of raw Shiitake mushrooms. Some of the lesions examined more closely showed an appearance of pseudovesicles, the most striking being their appearance in the form of lashing.



Figure 2

Desquamation of the palms and mainly of the palmar aspect of the fingers after manipulating Shiitake mushrooms.

The main clinical features are the appearance of a characteristic flagellated pattern that universally affects the trunk,² very itchy, consisting of linear erythematous lesions - sometimes intertwined - some of which may have a pseudovesicular appearance. The most affected areas are the back and extremities. Other more infrequent lesions are petechiae. Some patients may have digestive complaints, such as nausea, abdominal pain, vomiting, and diarrhea, without showing dermatological signs.¹²

Skin lesions usually appear two days (ranging from 2 to 120 hours) after ingestion of the mushroom.¹³ The ingestion of the mushroom must be in its raw or semi-raw form so that it produces the eruption because once it has been cooked it does not originate dermatitis. This is because a polysaccharide of the mushroom cell wall - called lentinan (a molecule attributed to the cause of dermatitis) - is heat-labile and decomposes with heat. Even the same patients, who had Shiitake dermatitis when consuming the raw or semi-raw mushroom, did not develop it when they ingest the cooked mushroom. The condition occurs in about 2% of persons who ingest the raw mushroom.¹²

General laboratory tests are nonspecific and only some patients may present with mild eosinophilia, neutrophilia, leukocytosis, and mild elevation of C-reactive protein, IgE, or lactic dehydrogenase. Regarding allergological studies, skin tests (patch tests and prick-by-prick tests) are unpredictable. There are cases with a positive patch test,^{7,8} while in other cases it has been negative.^{5,9} A patient with a positive patch test for the Shiitake mushroom and another negative case has been described in the same article.⁷ The prick test in some publications has been positive for the mushroom.^{5,7,9}

Histopathological study shows spongiosis, dermal edema, and a perivascular lymphocytic infiltrate with some occasional eosinophils, features that are not diagnostic. A biopsy is generally not necessary since the medical history and appearance of the flagellated rash are sufficient for the diagnosis.

The pathophysiological mechanism is not clear. Some authors support a toxic mechanism and others a hypersensitivity mechanism.¹³ It has been proposed that the origin of the flagellated lesions would be produced by the Koebner phenomenon.^{1,16}

Other conditions that manifest with flagellated dermatosis should be included in the differential diagnosis: the use of bleomycin - which is an extract of the *Streptomyces verticillus*- fungus,³ phytophotodermatitis, contact with jellyfish, and some autoimmune diseases such as dermatomyositis or Still's disease in the adult. In most of these cases, the clinical history will guide the diagnosis.

The eruption produced by Shiitake mushrooms is self-limiting and lasts for around two weeks. In its treatment, topical or oral antihistamines and corticosteroids are used depending on the intensity of the episode, which shortens the duration of the disease in some days.

Apart from flagellated dermatitis - which is the typical presentation due to the ingestion of Shiitake mushrooms - there are many other occasional skin manifestations after contact with it, and among them is contact dermatitis. Allergic contact dermatitis of the back of the fingers and hands,^{7,8} contact dermatitis of the back of the hands, forearms, and face,^{8,9} and contact urticaria⁷ have been described especially in workers who cultivate these mushrooms. And finally, systemic allergic contact dermatitis has also been described due to the consumption of raw Shiitake mushrooms.⁵

CONCLUSION

To our knowledge, this would be the first patient described to present two different cutaneous manifestations in time after contact with the Shiitake mushrooms: the first in the form of a flagellated dermatitis produced by the ingestion of the raw mushroom and the second, sometime later, as an allergic contact dermatitis after the contact of the mushroom with the hands and fingers when handling it.

REFERENCES

1. Nakamura T. Shiitake (*Lentinus edodes*) dermatitis. *Contact Dermatitis* 1992; 27: 65-70.
2. Stephany MP, Chung S, Handler MZ, Handler NS, Handler GA, Schwartz RA. Shiitake Mushroom Dermatitis: A Review. *Am J Clin Dermatol* 2016; 17(5): 485-489.
3. Czarnecka AB, Kreft B, Marsch W Ch. Flagellate dermatitis after consumption of Shiitake mushrooms. *Postepy Dermatol Alergol* 2014; 31(3): 187-90.
4. Bhushan P, Manjul P, Baliyan V. Flagellate dermatoses. *Indian J Dermatol Venereol Leprol* 2014; 80(2): 149-52.
5. Kopp T, Mastan P, Mothes N, Tzaneva S, Stingl G, Tanew A. Systemic allergic contact dermatitis due to consumption of raw mushroom. *Clin Exp Dermatol* 2009; 34(8): e910-3.
6. Mendonça CN, Silva PM, Avelleira JC, Nishimori FS, Cassia F de F. Shiitake dermatitis. *An Bras Dermatol* 2015; 90(2): 276-8.
7. Tarvainen K, Salonen J-P, Kanerva L, Estlander T, Keskinen H, Rantanen T. Allergy and toxicodermia from shiitake mushrooms. *J Am Acad Dermatol* 1991; 24: 64-6.
8. Ueda A, Obama K, Aoyama K, Ueda T, Xu B-H, Li Q, Huang J, Kitano T, Inaoka T. Allergic contact dermatitis in shiitake (*Lentinus edodes* (Berk) Sing) growers. *Contact Dermatitis* 1992; 26: 228-233.
9. Curnow P, Tam M. Contact dermatitis to Shiitake mushroom. *Australas J Dermatol* 2003; 44(2): 155-7.
10. Hamer SE, Kulkarni K, Cohen SN. Shiitake dermatitis with oral ulceration and pustules. *Clin Exp Dermatol* 2015; 40(3): 332-3.
11. Talour K, Abasq C, Sassolas B, Le Ru Y, Jannou V, Misery L. DRESS-like syndrome induced by shiitake mushroom. *Eur J Dermatol* 2011; 21(4): 640-1.
12. Boels D, Landreau A, Bruneau C, Garnier R, Pulce C, Labadie M, De Haro L, Harry P. Shiitake dermatitis recorded by French Poison Control Centers-new series with clinical observations. *Clin Toxicol (Phila)* 2014; 52(6): 625-8.
13. Nguyen AH, Gonzaga MI, Lim VM, Adler MJ, Mitkov MV, Cappel MA. Clinical features of shiitake dermatitis: a systematic review. *Int J Dermatol* 2017; 56(6): 610-6.
14. Adler MJ, Larsen WG. Clinical variability of shiitake dermatitis. *J Am Acad Dermatol* 2012; 67(4): e140-1.
15. Droppelmann K, Majluf P, Madison A. Eritema flagelado por ingesta de hongos shiitake: Reporte de caso. *Rev Chil Dermatol* 2017; 33(3): 97-99.
16. Ade R, Sukut Ch, Wiser HJ, Shockman S, Buescher L. Shiitake dermatitis demonstrating K  bner phenomenon. *Int J Dermatol* 2015; 54 (5): e179-81.