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CLINICAL REASONING: CASE REPORT

Whip-like rash in the emergency room: shiitake-induced flagellate dermatitis, a case report

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Summary

Shiitake-induced flagellate dermatitis is a rare cutaneous reaction characterised by linear, erythematous, itchy lesions that appear after the consumption of raw or undercooked shiitake mushrooms. Shiitake mushrooms are traditionally consumed in Asian countries such as Japan, where the first case of flagellate dermatitis was documented. As shiitake mushrooms have become increasingly popular in Western countries, the incidence of this reaction has increased.

We present the case of a 54-year-old man who presented to the emergency room with widespread linear erythematous skin lesions and was diagnosed with shiitake-induced flagellate dermatitis, a condition that is rarely reported in Western emergency settings. The case was triggered by undercooked rather than raw shiitake mushrooms.

The dermatologist's pattern recognition skills and detailed enquiry into the patient's dietary history enabled the diagnosis. His symptoms resolved completely within one week following treatment with oral antihistamines and topical corticosteroids.

When considering the differential diagnosis of flagellate dermatitis, clinicians should include adverse drug reactions, particularly those related to chemotherapeutic agents, as well as systemic diseases such as dermatomyositis, adult-onset Still's disease, systemic-onset juvenile idiopathic arthritis, and, less commonly, phytophotodermatitis or infectious exanthems. In cases presenting with atypical linear skin eruptions, clinicians should also inquire about the patient's dietary history.

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Introduction

The shiitake mushroom (*Lentinula edodes*) is the second most consumed mushroom in the world, after the cultivated mushroom (*Agaricus bisporus*) [1]. The name "shiitake" comes from the Japanese words "shii", which refers to the Castanopsis tree, and "take", which means mushroom. A potential complication of consuming shiitake mushrooms, particularly when eaten raw, is shiitake-induced flagellate dermatitis. This condition is more prevalent in countries where shiitake mushrooms form part of the traditional diet [2, 3]. However, because of globalisation, this dermatitis has increasingly been reported worldwide, extending beyond its traditional geographic bounds [4]. Shiitake dermatitis was first described in Japan in 1977 [2]. The first European case was reported in the UK in 2006 [5], and the first case in Switzerland was documented in 2023 [6]. The increased consumption of these mushrooms in Europe and other continents suggests that such cases may become more frequent [4, 7].

This case is unusual because it occurred in a Western emergency setting, where shiitake dermatitis remains rarely recognised. Diagnosis relied on identifying the distinctive rash and linking it to the patient's recent dietary intake.

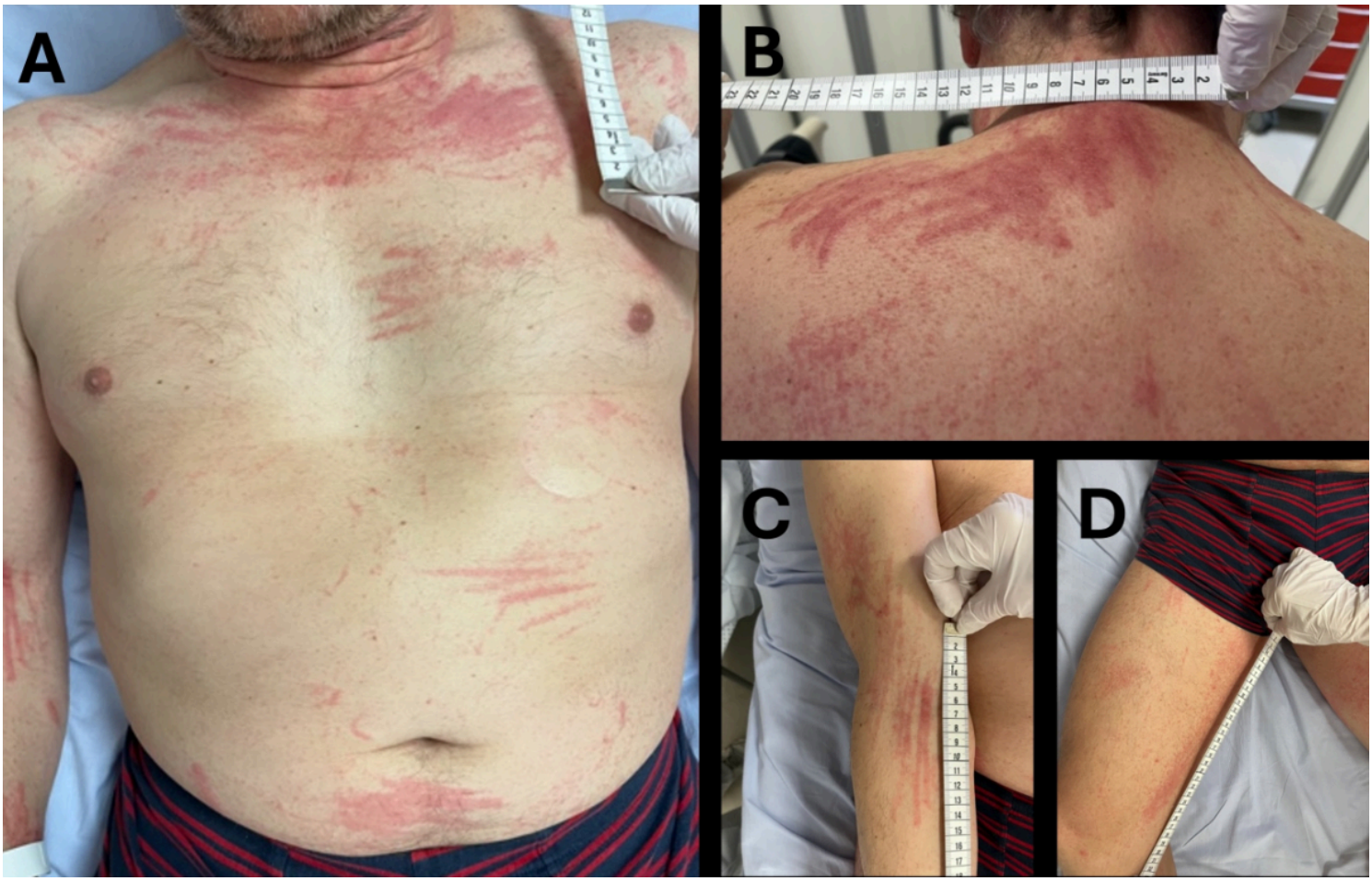
Notably, the reaction followed the consumption of *undercooked* rather than raw shiitake mushrooms, demonstrating that partial cooking may not prevent the condition. This underscores the need for clinician awareness and appropriate food preparation advice.

Case description

Presentation

A 54-year-old man with a history of ischaemic stroke due to a patent foramen ovale was admitted to the emergency room following the onset of unusual and widespread linear erythematous skin lesions. The skin eruption began 24 hours before presentation as small red papules on his hands and forearms. It progressed to blisters on his left shoulder and then developed into whip-like linear papules across his trunk and back. The rash also affected his neck, scalp, and face. The patient reported no itching and denied scratching the affected areas. There was no mucosal involvement, and scratching his back produced no signs of dermographism.

Figure 1: Whip-like erythematous papules and plaques pathognomonic of flagellate dermatitis. A: Chest and abdomen; B: neck; C: forearm; D: lateral aspect of the thigh.



Assessment

The patient had not travelled recently, reported no recent infections, and had not changed his medication. However, he disclosed that he had consumed undercooked shiitake mushrooms four days before the onset of his symptoms. The remainder of the physical examination was unremarkable. Blood tests revealed mild eosinophilia (0.57 g/l) with a normal leukocyte count (9.8 g/l) and normal renal and liver function.

Diagnosis

Due to the whip-like appearance of the lesions, our senior dermatologist diagnosed the condition as flagellate dermatitis. This condition remains underrecognised in Europe, likely due to limited clinician familiarity with shiitake dermatitis, which can delay diagnosis.

Management

The treatment focuses on symptom management and the avoidance of shiitake. The patient was prescribed antihistamines (desloratadine 5 mg, once daily) and a topical dermocorticoid (mometasone furoate 0.1%, once daily). Complete resolution of symptoms was achieved after one week.

From the patient's perspective, providing reassurance and a clear explanation of the benign nature of the condition was just as important, if not more so, than the pharmacological management.

Discussion

This case report presents a typical instance of flagellate dermatitis, a rare but recognisable condition that general practitioners may encounter. Importantly, it does not require specialised dermatological treatment and can often be effectively managed in primary care settings. Enhanced awareness of this condition can help prevent unnecessary investigations and provide earlier reassurance to patients. Case reports such as this one provide a foundation for future epidemiological studies and systematic reviews. As the number of cases increases in Europe, such research can enhance diagnostic accuracy, guide clinician questioning, and reduce unnecessary investigations. Ultimately, this will enable healthcare providers to reassure patients and avoid medical overuse and delays in diagnosis.

Flagellate dermatitis is marked by a distinctive rash consisting of linear, red papules and plaques resembling whip-like streaks. The term "flagellate" derives from the Latin word "*flagellare*", meaning "to whip". This rash primarily affects the trunk but can spread to the extremities and, in some cases, to the scalp and face. Other reported skin lesions include petechiae, purpura, pustules, and oedema of the face or hands. Patients frequently report pruritus and may also experience a burning sensation, which may be accompanied by gastrointestinal symptoms such as nausea, vomiting, or diarrhoea [8].

Symptoms typically emerge within 48 hours of consuming raw or undercooked shiitake mushrooms, though they can manifest as early as one hour or as late as seven days after ingestion. This variability can be attributed to the pharmacokinetics of lentinan, a polysaccharide found in shiitake mushrooms [8].

Typically, the symptoms resolve spontaneously within days to weeks [8]. However, the condition may recur with repeated consumption; therefore, patients should be advised to avoid shiitake mushrooms altogether. The importance of this measure was demonstrated by the case of an individual who experienced intermittent symptoms for 16 years due to continued exposure [9].

The skin reaction is likely a response to lentinan, which is heat-labile and requires high temperatures of over 150°C to be inactivated [8]. Lentinan is believed to induce inflammation and trigger a T-cell-mediated late reaction, though its exact pathogenesis remains unclear. Some researchers categorise it as a hypersensitivity reaction [10], whereas others suggest that it may be a more predictable, dose-dependent toxic mechanism [11]. The characteristic whip-like pattern of the rash is attributed to the Koebner phenomenon, which is caused by scratching, resulting in the lentinan being deposited into the skin [8]. Factors such as medication use and UV exposure may also contribute to this reaction. Histological examination of affected skin typically reveals non-specific features resembling acute eczema, including spongiosis, interface inflammation, and dermal lymphohistiocytic infiltrate [9]. Since the lesions are self-limited, treatment is generally symptomatic. In more severe cases, antihistamines and topical or oral corticosteroids may be prescribed, although there is limited evidence regarding their effectiveness in alleviating itching or the rash itself [11]. The condition generally improves without complications within two weeks [12, 13], and the recovery time may depend on the amount of mushroom consumed [8].

Flagellate dermatitis has also been described in association with bleomycin and other chemotherapeutic agents, such as peplomycin, docetaxel, trastuzumab, cisplatin, bendamustine, and doxorubicin [14–16]. Additionally, it has been associated with systemic diseases such as dermatomyositis, adult-onset Still's disease, and systemic-onset juvenile idiopathic arthritis [17, 18]. Less commonly, flagellate-like eruptions have also been reported in association with Chikungunya fever and phytophotodermatitis [19, 20]. Bleomycin-induced flagellated dermatitis may lead to hyperpigmentation [21]. For patients, understanding the cause of the rash helps alleviate anxiety and reduces the need for unnecessary medical consultations. This illustrates the therapeutic value of patient education in managing benign, self-limiting dermatological conditions, where addressing uncertainty can greatly improve patient comfort and reduce the burden on healthcare resources.

This case highlights the importance of obtaining a detailed dietary history rather than simply asking, “Have you changed anything in your eating habits?” The value of asking the right questions was emphasised by Dr Lisa Sanders, the medical doctor and author who inspired the television series "House M.D." In one of her columns titled "Diagnosis", for *The New York Times Magazine*, she recounts how a doctor unexpectedly asked a patient with a mysterious streaky rash, "Have you eaten any shiitake mushrooms recently?" [22].

Strengths and limitations

A strength of this report is the typical clinical presentation, accompanied by a clear history of shiitake ingestion. However, no histopathological examination was performed, and the exact degree of mushroom cooking could not be verified. In addition, the precise duration of symptoms or any relapse was not systematically documented.

Patient perspective

The patient expressed considerable concern about the persistence of his rash, particularly given that symptoms persisted despite an initial visit to the emergency department and that the prescribed treatment was ineffective. He was also surprised by the unexpected nature of the reaction, having consumed shiitake mushrooms previously with no prior awareness of this potential adverse effect. Moreover, receiving clear reassurance and a comprehensive explanation of the benign and self-limiting nature of the condition was extremely important.

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Potential competing interests

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