

A Case Presentation: Shiitake Flagellate Dermatitis

Simona Kogan¹, Joseph Dyer¹ D.O., Ashish Bhargava²

1. Philadelphia College of Osteopathic Medicine 2. Texas College of Osteopathic Medicine



Introduction

- Shiitake flagellate dermatitis is a rare toxicoderm triggered by ingestion of **raw or undercooked shiitake mushrooms**.
- Presents as **intensely pruritic, linear erythematous streaks** resembling whiplash marks, typically appearing **24–72 hours after ingestion**.
- The condition is most strongly associated with **lentinan**, a heat-labile β -glucan.
- Lentinan exhibits **dose-dependent immunomodulatory effects**, shifting from anti-inflammatory at low concentrations to **pro-inflammatory at higher exposures**, though the exact cellular mechanism remains incompletely understood.



Pathophysiology

- High-dose lentinan activates **TLR4 signaling**
- Produces **biased immune activation**:
 - ↓ MAPK signaling
 - ↑ NF- κ B activation
- Leads to increased transcription of **pro-inflammatory cytokines**
- Primes the **NLRP3 inflammasome** (↑ pro-IL-1 β , IL-18)

Second signal hypothesis:

- Minor skin trauma (scratching/friction) triggers inflammasome activation
- Results in **localized cytokine release and cutaneous inflammation**

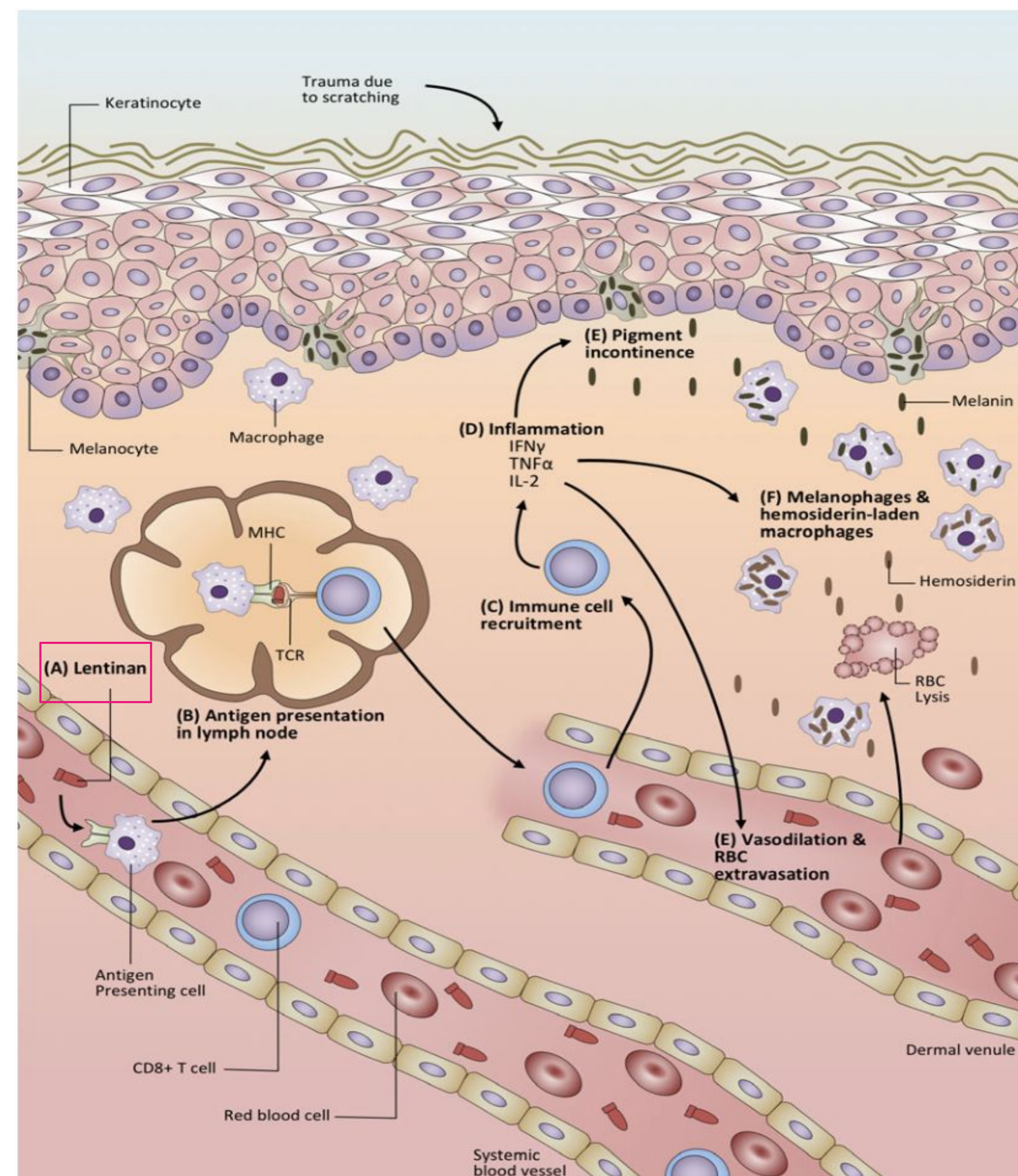


Figure 1: Pathophysiology of Lentinan

Case Presentation

A 72-year-old man presented with **intense pruritus** involving the trunk and periumbilical region. Examination revealed **erythematous, edematous linear plaques in a flagellate pattern** across the back and abdomen.

- History:** Recent ingestion of a large quantity of **raw shiitake mushrooms**
- Onset:** ~48 hours post ingestion
- Symptoms:** Progressive pruritus, no systemic involvement
- Exam:** Non-vesicular, non-scarring linear plaques; no mucosal involvement



Figure 2: Erythematous, edematous linear plaques on trunk



Figure 3: Linear flagellate plaques on abdomen and chest

Differential Diagnosis Treatment

- Bleomycin-induced flagellate dermatitis
- Dermatographism
- Phytophotodermatitis
- Intramuscular combination corticosteroid injection consisting of methylprednisolone acetate 40 mg and triamcinolone acetonide 10 mg.
- Topical triamcinolone acetonide 0.1% cream twice daily, to be applied two weeks per month until resolution.

Stepwise approach to Diagnosis



Patient Outcome

- Significant improvement within 3 days
- Near-complete resolution within 1 week

Histology

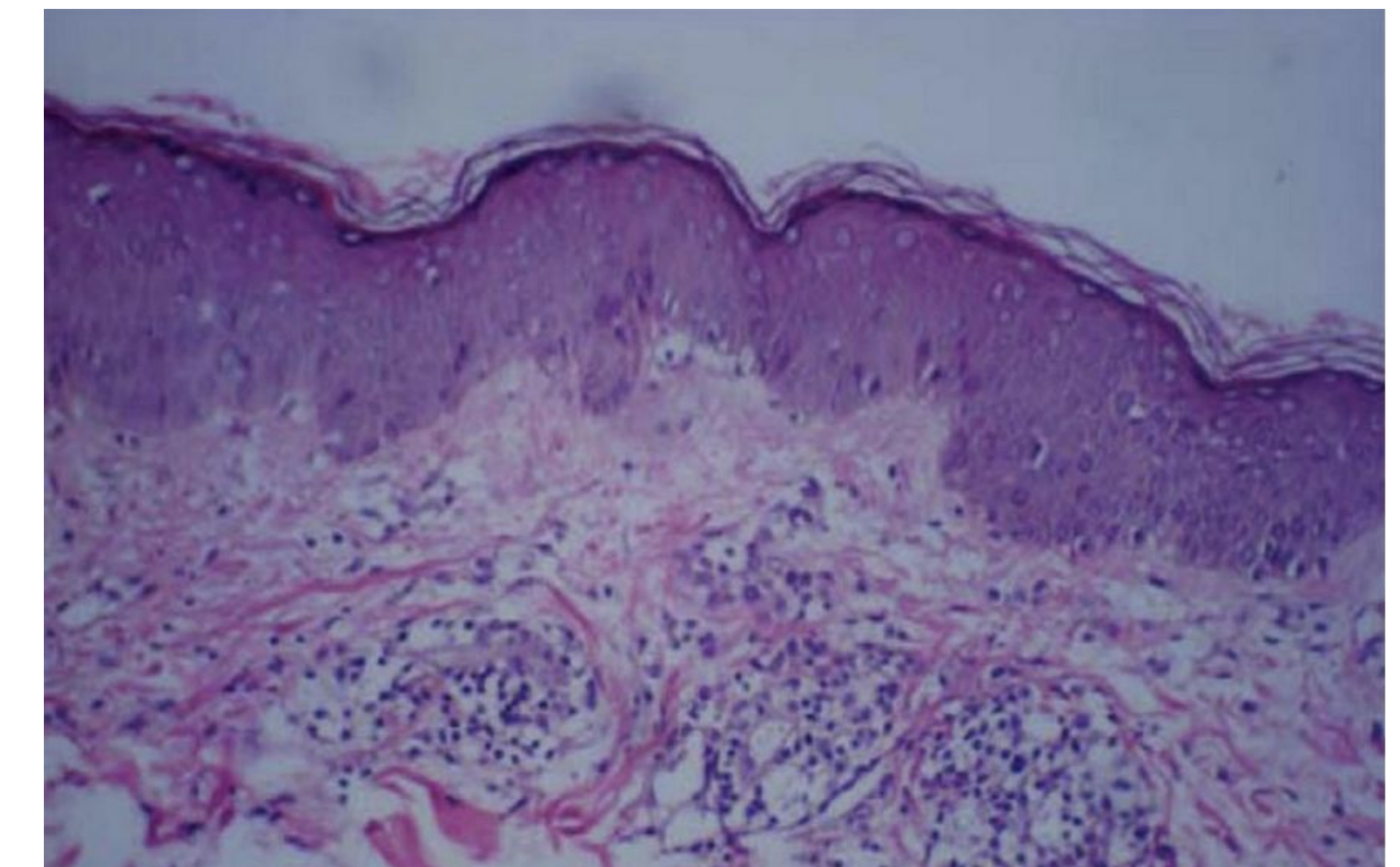


Figure 4: Shiitake dermatitis demonstrating spongiosis and lymphocytic infiltration of the dermis. The epidermis is intact with dermal papillary edema

Table 3 Histology and management of shiitake dermatitis

	n (%)
Biopsy findings (n = 19)	
Lymphoid infiltrate	17 (89.5%)
Eosinophils	12 (63.2%)
Epidermal spongiosis	11 (57.9%)
Dermal edema	11 (57.9%)
Hyper-/parakeratosis	6 (31.6%)
Lymphocyte exocytosis	5 (26.3%)
Neutrophils	3 (15.8%)
Keratinocyte necrosis	3 (15.8%)
Management (n = 47)	
No treatment given	12 (25.5%)
Worsening or no relief with treatment	14 (40.0%) ^a
Corticosteroid	31 (88.6%) ^a
Antihistamine	21 (60.0%) ^a

Future Direction

- Diagnosis is **clinical**, avoiding unnecessary testing
- Prevention: proper cooking + avoidance of re-exposure**
- Mechanism:** Better understand how lentinan triggers inflammation and why only some patients react
- Clinical:** Improve prevention (safe cooking) and create clearer treatment guidelines

