

CASE REPORT

# Hunan hand syndrome: benign capsaicin-induced contact dermatitis presenting with alarming symptoms

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## ABSTRACT

**Background:** Hunan hand syndrome (HHS) is a painful, self-limited capsaicin-induced contact dermatitis that occurs after exposure to *Capsicum* species. Capsaicin activates transient receptor potential vanilloid-1 receptors on nociceptive fibers, producing intense burning pain that can mimic the sensation of burns or allergic reactions. Although benign, HHS can prompt emergency department (ED) visits and unnecessary investigations if not recognized promptly.

**Case Presentation:** A 44-year-old woman presented to the ED with severe burning pain in both palms after chopping a large quantity of red bell peppers without gloves. Vital signs were unremarkable (blood pressure 129/83 mm Hg, heart rate 73 beats per minute, temperature 36.8°C, respiratory rate 18 breaths per minute). Examination showed bilateral palmar erythema, mild swelling, and marked hyperesthesia without blistering. Initial treatment with diphenhydramine and a hydrogel burn shield containing tea tree oil provided minimal relief. Lidocaine gel was applied for 30 minutes, followed by 0.25%  $\beta$ -sitosterol, sesame oil, and beeswax (Mebo cream), and intravenous ketorolac and morphine. Her symptoms improved markedly, and she was discharged with Mebo cream and dermatology follow-up. Telephone follow-up confirmed complete resolution without recurrence.

**Conclusion:** This case highlights HHS as an important diagnostic consideration in patients with acute palmar pain and erythema after food preparation. Early recognition targeted symptomatic treatment with topical anesthetics and emollients, and patient education on chili pepper handling can reduce anxiety, prevent unnecessary investigations, and improve ED care.

**Keywords:** Hunan hand syndrome, contact dermatitis, capsaicin, chili pepper hands, emergency department.

## Introduction

Hunan hand syndrome (HHS), also known as capsaicin-induced contact dermatitis, “chili burn,” or “chili pepper hands,” is a painful, transient inflammatory reaction of the skin resulting from direct exposure to *Capsicum* species. These plants produce capsaicin, an active alkaloid responsible for their characteristic pungency and the burning sensation associated with exposure [1]. While often described in culinary or domestic contexts, this condition has important clinical implications for emergency physicians, particularly when patients present with unexplained acute hand pain, burning, or erythema.

The syndrome was named after Hunan Province, China, known for its heavy use of chili peppers, and was first reported in the *New England Journal of Medicine* in 1981 [2]. Capsaicin binds to transient receptor potential vanilloid-1 (TRPV1) receptors on sensory neurons,

triggering pain pathways independent of thermal or allergic mechanisms [3]. Although the clinical course is self-limited, the intensity of symptoms can lead to emergency department (ED) presentations, especially when the cause is not immediately recognized.

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Received: 13 April 2025 | Accepted: 06 November 2025

Emergency physicians must maintain a high index of suspicion for this condition when evaluating patients with sudden-onset hand pain and erythema after culinary exposure. Misdiagnosis may lead to unnecessary investigations or treatments for allergic reactions, burns, or neuropathic disorders. Understanding the pathophysiology, diagnosis, and management of HHS allows for rapid symptom control, appropriate reassurance, and prevention of recurrence.

### Case Presentation

A 44-year-old woman presented to the ED with severe burning pain in both palms after chopping a large amount of red bell peppers without gloves. She had no history of allergies. Her vital signs were stable: blood pressure 129/83 mm Hg, heart rate 73 beats per minute, temperature 36.8°C, and respiratory rate 18 breaths per minute. Examination revealed erythema and mild swelling over the palmar surfaces, with marked hyperesthesia but no blistering (Figure 1).

Initial management included diphenhydramine and application of a burn shield (hydrogel with tea tree oil). Because pain persisted, and after a brief bedside literature review that identified a case report in which lidocaine gel was used effectively [4], topical lidocaine gel was applied for 30 minutes. Then, 0.25%  $\beta$ -sitosterol, sesame oil, and beeswax (Mebo cream) were applied to the affected area, and intravenous ketorolac and morphine were administered.

The patient experienced significant relief and was discharged with instructions to continue Mebo cream and follow up with dermatology. A follow-up phone call confirmed complete symptom resolution without further medical intervention.

### Discussion

In the ED, clinicians typically evaluate patients who present with acute-onset palmar pain, burning, and erythema for thermal burns, allergic reactions, cellulitis, or contact dermatitis. However, in cases such as HHS, the etiology is purely neurogenic and chemical, often linked to recent culinary activity involving chili peppers. A detailed history of food preparation, especially without gloves, can lead directly to the diagnosis and avoid an extensive diagnostic workup.

The pathophysiological mechanism involves capsaicin binding to TRPV1 receptors, which are heat- and pH-sensitive ion channels found in nociceptive fibers. This interaction activates pain pathways and leads to the release of substance P and other pro-inflammatory neuropeptides [5]. The reaction is not immunoglobulin E mediated and therefore does not represent a true allergic response, although symptoms such as erythema, swelling, and paresthesia may mimic an allergic reaction [6].

From an emergency medicine perspective, differentiating HHS from other causes of hand pain is essential. The absence of vesicles, the lack of systemic symptoms,



**Figure 1.** Erythema and mild swelling over the palmar surfaces (A, B).

and preservation of skin integrity help distinguish it from second-degree burns and cellulitis. In addition, the symmetrical presentation, hyperesthesia without numbness or weakness, and sudden onset following a known exposure argue against peripheral neuropathy or carpal tunnel syndrome [5-7].

Treatment in the ED should focus on symptomatic relief. First-line interventions include thoroughly washing the affected area with soap and cool water or lipid-soluble agents (e.g., milk, oil) to dissolve residual capsaicin [6]. In more severe cases, topical anesthetics such as lidocaine gel can provide prompt relief and should be considered in the ED, particularly when pain is distressing or resistant to antihistamines or basic wound care [4,7]. Topical corticosteroids or emollients (such as Mebo cream) may help alleviate erythema and irritation. Oral antihistamines and systemic analgesics are often prescribed but are usually less effective because the underlying mechanism is nonallergic and neurogenic [5-7]. The condition is self-limited, and most patients recover fully within 24-48 hours with minimal intervention once capsaicin exposure ceases [5-7].

In this case involving HHS, pain management required a careful, graded approach due to the neuropathic nature of the condition and limited clinical precedent. The treating physician initiated therapy with topical emollients (Mebo cream) to restore the skin barrier, reduce friction, and provide a moist healing environment. As localized burning pain persisted, topical lidocaine was added to provide peripheral analgesia through transient nociceptor blockade while avoiding systemic adverse effects. Co-application of lidocaine with Mebo aimed to combine rapid symptomatic relief with epidermal support and repair. When pain remained significant, systemic analgesics were introduced sequentially – first nonsteroidal anti-inflammatory agents, then opioid analgesics – to achieve adequate pain control. This stepwise pain strategy was guided by clinical reasoning, a brief bedside literature review, and the treating physician's first encounter with this rare syndrome, balancing efficacy with patient safety.

From a preventive standpoint, patients should be advised to use gloves when handling hot or mild peppers, as individual sensitivity to capsaicin varies [6,7]. Emergency physicians should also educate patients on avoiding secondary contact with mucosal surfaces and to manage similar symptoms at home if they recur [6,7]. This case underscores the importance of pattern recognition and targeted history-taking in the ED. Although HHS is benign, it can cause significant anxiety and discomfort. Prompt identification, reassurance, and adequate symptom control can increase patient satisfaction and reduce unnecessary interventions.

## Conclusion

HHS is a distinct clinical entity that emergency physicians should recognize when evaluating patients with acute hand pain and erythema, particularly after food preparation. Diagnosis relies on a thorough clinical history and exclusion of more serious conditions. As illustrated in this case, targeted symptom management using topical anesthetics and emollients can provide rapid

relief. Educational efforts on proper handling of chili peppers should be emphasized to minimize recurrence. Greater awareness of HHS can prevent misdiagnosis, reduce unnecessary interventions, and enhance the overall patient experience in the emergency setting.

## List of Abbreviations

ED	Emergency department
HHS	Hunan hand syndrome
TRPV1	Transient receptor potential vanilloid-1

## Acknowledgment

None.

## Conflict of interest

The authors declare no conflicts of interest.

## Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## Consent to participate

Not applicable.

## Consent for publication

All authors consent to the publication of this manuscript. Verbal informed consent for publication of this case report was obtained from the patient via telephone by the second author and documented in the medical record. In addition, the general consent signed at registration in the emergency department authorizes the use of anonymized clinical data for research and educational purposes. All identifying details have been removed to ensure patient confidentiality.

## Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

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