

Beware the Manchineel: A Case of Irritant Contact Dermatitis

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PRACTICE POINTS

- Sap from the manchineel tree—found on the coasts of Caribbean islands, the Atlantic coastline of Central and northern South America, and parts of southernmost Florida—can cause severe dermatologic and ophthalmologic injuries. Eating its fruit can lead to oropharyngeal pain and diarrhea.
- Histopathology of manchineel dermatitis reveals a subcorneal acantholytic blister and epidermal spongiosis overlying a mixed perivascular infiltrate and follicular necrosis, which is consistent with irritant contact dermatitis.
- There is no specific treatment for manchineel dermatitis. Case reports advocate a thorough cleansing, application of wet compresses, and observation.

The manchineel tree (*Hippomane mancinella*) grows along the sand-vegetation boundary of Caribbean beaches. The tree also can be found in Florida and the US Virgin Islands. All parts of the tree are toxic. Contact with the sap can cause severe irritant dermatitis and keratoconjunctivitis; eating the fruit can be fatal. Indigenous people were well aware of these properties, and early European explorers of the Caribbean coastlines mentioned the dangers of the plant in their writings. However, the medical literature provides scant information on the clinical evaluation and histopathology of manchineel

dermatitis. This case report describes a physician (S.A.N.) who developed manchineel dermatitis while traveling in the US Virgin Islands. The dermatitis manifested as folliculocentric pustules. The patient subsequently underwent a skin biopsy, and histopathology showed a subcorneal acantholytic blister and epidermal spongiosis overlying a mixed perivascular infiltrate and follicular necrosis. The area was treated with hot compresses. Complete resolution took 6 weeks. There is no uniformly recommended treatment for manchineel dermatitis; prevention depends on avoiding contact with the tree.

What is the world's most dangerous tree? According to *Guinness World Records*¹ (and one unlucky contestant on the wilderness survival reality show *Naked and Afraid*,² who got its sap in his eyes and needed to be evacuated for treatment), the manchineel tree (*Hippomane mancinella*) has earned this designation.¹⁻³ Manchineel trees are part of the strand vegetation of islands in the West Indies and along the Caribbean coasts of South and Central America, where their copious root systems help reduce coastal erosion. In the United States, this poisonous tree grows along the southern edge of Florida's Everglades National Park; the Florida Keys; and the US Virgin Islands, especially Virgin Islands National Park. Although the manchineel tree appears on several endangered species lists,⁴⁻⁶ there are places within

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its distribution where it is locally abundant and thus poses a risk to residents and visitors.

The first European description of manchineel toxicity was by Peter Martyr d'Anghiera, a court historian and geographer of Christopher Columbus's patroness, Isabella I, Queen of Castile and León. In the early 1500s, Peter Martyr wrote that on Columbus's second New World voyage in 1493, the crew encountered a mysterious tree that burned the skin and eyes of anyone who had contact with it.⁷ Columbus called the tree's fruit *manzanilla de la muerte* ("little apple of death") after several sailors became severely ill from eating the fruit.^{8,9}



FIGURE 1. Manchineel leaves with their characteristic shiny green upper surface and subtly serrated margins. Leaves have distinctive yellow-green mid ribs that are roughly as long as the petiole (stalk). An unripe manchineel fruit also is present.



FIGURE 2. Thick milky white sap drips copiously when a manchineel leaf, twig, or branch is disrupted. The sap is caustic to the skin and mucosae, thereby causing a severe irritant contact dermatitis. Minute pores (lenticels) used in gaseous exchange are scattered along woody twigs, branches, and stems.

Manchineel lore is rife with tales of agonizing death after eating the applelike fruit, and several contemporaneous accounts describe indigenous Caribbean islanders using manchineel's toxic sap as an arrow poison.¹⁰

Eating manchineel fruit is known to cause abdominal pain, burning sensations in the oropharynx, and esophageal spasms.¹¹ Several case reports mention that consuming the fruit can create an exaggerated parasympathomimetic syndrome due to suspected anticholinesteraselike compounds.^{3,11,12} Ophthalmologic injuries include severe conjunctivitis—sometimes extensive enough to cause superficial punctate epithelial keratitis.⁵ Dermatologic injuries have been described, but reports on its histopathologic features are limited. We present a case of manchineel dermatitis in a patient who subsequently underwent a skin biopsy.

Case Report

A 64-year-old physician (S.A.N.) came across a stand of manchineel trees while camping in the Virgin Islands National Park on St. John in the US Virgin Islands (Figure 1). The patient—who was knowledgeable about tropical ecology and was familiar with the tree—was curious about its purported cutaneous toxicity and applied the viscous white sap of a broken branchlet (Figure 2) to a patch of skin measuring 4 cm in diameter on the medial left calf. He took serial photographs of the site on days 2, 4 (Figure 3), 6, and 10 (Figure 4), showing the onset of erythema and the subsequent development of follicular pustules. On day 6, a 4-mm punch biopsy specimen was taken of the most prominent pustule. Histopathology showed a subcorneal acantholytic blister and epidermal spongiosis overlying a mixed perivascular infiltrate and follicular necrosis, which was consistent with irritant contact dermatitis (Figure 5). On day 8, the region became indurated and tender to pressure; however, there was no warmth, edema, purulent



FIGURE 3. An ill-defined red patch studded with follicular papules and pustules was visible 4 days after manchineel sap was applied to the leg.

drainage, lymphangitic streaks, or other signs of infection. The region was never itchy; it was uncomfortable only with firm direct pressure. The patient applied hot compresses to the site for 10 minutes 1 to 2 times daily for roughly 2 weeks, and the affected area healed fully (without any additional intervention) in approximately 6 weeks.

Comment

Manchineel is a member of the Euphorbiaceae (also known as the euphorb or spurge) family, a mainly tropical or subtropical plant family that includes many useful as well as many toxic species. Examples of useful plants include cassava (*Manihot esculenta*) and the rubber tree (*Hevea brasiliensis*). Many euphorbs have well-described toxicities, and many (eg, castor bean, *Ricinus communis*) are useful in some circumstances and toxic in others.^{6,12-14} Many euphorbs are known to cause skin reactions, usually due to toxins in the milky sap that directly irritate the skin or to latex compounds that can induce IgE-mediated contact dermatitis.^{9,14}

Manchineel contains a complex mix of toxins, though no specific one has been identified as the main cause of the associated irritant contact dermatitis. Manchineel sap (and sap of many other euphorbs) contains phorbol esters that may cause direct pH-induced cytotoxicity leading to keratinocyte necrosis. Diterpenes may augment this cytotoxic effect via induction of proinflammatory cytokines.¹² Pitts et al⁵ pointed to a mixture of oxygenated diterpene esters as the primary cause of toxicity and suggested that their water solubility explained occurrences of keratoconjunctivitis after contact with rainwater or dew from the manchineel tree.



FIGURE 4. An ill-defined red plaque with coalesced pustules and a near-confluent grayish hue to the epidermis was visible 10 days after manchineel sap was applied to the leg.

All parts of the manchineel tree—fruit, leaves, wood, and sap—are poisonous. In a retrospective series of 97 cases of manchineel fruit ingestion, the most common symptoms were oropharyngeal pain (68% [66/97]), abdominal pain (42% [41/97]), and diarrhea (37% [36/97]). The same series identified 1 (1%) case of bradycardia and hypotension.³ Contact with the wood, exposure to sawdust, and inhalation of smoke from burning the wood can irritate the skin, conjunctivae, or nasopharynx. Rainwater or dew dripping from the leaves onto the skin can cause dermatitis and ophthalmitis, even without direct contact with the tree.^{4,5}

Management—There is no specific treatment for manchineel dermatitis. Because it is an irritant reaction and not a type IV hypersensitivity reaction, topical corticosteroids have minimal benefit. A regimen consisting of a thorough cleansing, wet compresses, and observation, as most symptoms resolve spontaneously within a few days,

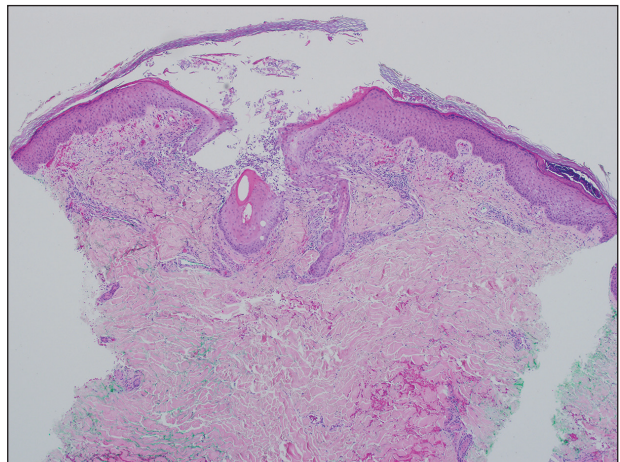


FIGURE 5. A punch biopsy from the left medial calf showed spongiosis and a subcorneal split; epidermal and follicular necrosis; a superficial mixed lymphocytic-neutrophilic infiltrate; and hemorrhage, consistent with an irritant contact dermatitis (H&E, original magnification ×4).



FIGURE 6. Sign from Virgin Islands National Park on St John, US Virgin Islands, warning visitors about manchineel trees and their hazards.

has been recommended.⁴ Our patient used hot compresses, which he believes helped heal the site, although his symptoms lasted for several weeks.

Given that there is no specific treatment for manchineel dermatitis, the wisest approach is strict avoidance. On many Caribbean islands, visitors are warned about the manchineel tree, advised to avoid direct contact, and reminded to avoid standing beneath it during a rainstorm (Figure 6).

Conclusion

This article begins with a question: “What is the world’s most dangerous tree?” Many sources from the indexed medical literature as well as the popular press and social media state that it is the manchineel. Although all parts of the manchineel tree are highly toxic, human exposures are uncommon, and deaths are more apocryphal than actual.

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