

Cactus Skin Injuries

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Cactus spine injuries to the skin are usually treated by removing the visible spines and applying a topical corticosteroid. With this approach, granulomatous inflammation usually resolves in 2 to 4 months.

We describe a case of a 54-year-old Caucasian woman who presented for treatment of painful cactus spine granulomas on her right hand. Unroofing the granulomatous papules and removing the cactus spine fragments under a dissecting microscope, and subsequent soaking in an antibacterial solution, resulted in rapid resolution of the granulomatous lesions.

Cactus skin injuries are not limited to the natural habitat of cactus plants in the Southwestern United States. They can occur anywhere due to the abundance of ornamental cacti in homes and the existence of botanical gardens.

Treating patients with very fine cactus spines or thorn fragments embedded in the skin can be difficult. We present a case study, a discussion of various methods of cactus spine removal, and a brief literature review on cactus skin injuries.

Case Presentation

A 54-year-old woman presented for evaluation of painful red bumps on the dorsal aspects of the second and third fingers of her right hand (Figure 1). Three weeks earlier, while on vacation in Arizona, she accidentally hit her right hand against a tall outdoor cactus while throwing a tennis ball. The patient's husband removed approximately 16 to 18 4- to 5-cm brittle thorns from her hand with tweezers, then applied Neosporin® ointment. Two weeks later, the patient experienced pain and swelling of the affected fingers.



FIGURE 1. Cactus spine granulomas of the right second and third fingers.

Physical examination revealed 16 2- to 4-mm, erythematous, hard papules on the dorsa and sides of the right second and third fingers. The patient had no fever, chills, or lymphadenopathy. Routine X-rays of the hand were unremarkable. The patient was unable to obtain a detailed description of the cactus plant.

A mid-potency topical steroid was prescribed for twice-daily application, with little change in the granulomatous papules. Four days later, using digital nerve blocks, all papules were unroofed with a number 11 Bard-Parker® blade under a dissecting microscope (100× objective) (Aus Jena, Germany). Five clear spines, smaller than 1 mm in length, were identified and extracted. The patient was instructed to soak her hand in diluted Hibiclens Solution® for 10 minutes, twice a day for 3 days, followed by Polysporin® ointment application.

One week later, the swelling and pain had diminished greatly, with only three papules exhibiting minimal tenderness. An ultrasound of the hand performed

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at that time revealed no foreign bodies. Two weeks later, the granulomatous papules decreased further in size and there was no erythema, pain, or swelling.

Discussion

Granulomas produced by cactus glochids (small spines) entering the skin were described by Winer and Zeilenga.¹ The *Opuntia* genus of cactus, consisting of more than 31 species, is the only genus responsible for granulomas.² Although it was not possible to further identify the cactus plant in the present case, the injury occurred in a geographic area where *Opuntia* cacti are abundant.

The patient's clinical presentation was consistent with a delayed granulomatous skin response to cactus spines. Although the mechanism of the granulomatous inflammatory response to cactus spines has not been determined, mechanical irritation resulting in a foreign-body granuloma, or an allergic reaction to spine antigens, are the two main theories.^{2,3} Since granulomatous reactions are rare compared to the large number of cactus spine injuries, Schreiber and colleagues² proposed an allergic mechanism for the inflammatory response. This theory is supported by positive delayed hypersensitivity intradermal skin test reactions with *Opuntia* glochid extracts in 4 of 6 patients who developed cactus granulomas.

The report by Snyder and Schwartz³ suggested that cactus granulomas represent a non-specific, foreign-body reaction. They observed a case demonstrating a mixed cellular granulomatous infiltrate with foreign-body giant cells, as opposed to an organized epithelioid tubercle formation, which they expected in immunogenic granulomas. Additional studies are needed to clarify the nature of the granulomatous response to cactus injuries.

The first clinical sign after cactus spine penetration of the skin is a 2- to 5-mm, asymptomatic, domed, glistening papule, which appears within 24 to 72 hours.² This is inconsistent with our patient's lesions, which did not appear for 10 days. These lesions persist from 2 to 8 months and gradually resolve spontaneously. Postinflammatory hyperpigmentation is likely to occur after resolution of papules.³

Infection is rarely mentioned in association with cactus spine injuries. *Mycobacterium marinum* was reported as a cause of infection in cactus injury.⁴ *Alternaria* was found to contaminate cactus spines.⁵ A known plant pathogen, *Enterobacter agglomerans*, has been cultured from lesions produced by cactus thorns.^{6,7} Generally, the spine puncture sites are aseptic.⁸ Karpman *et al.*⁵ were unable to culture bacteria from cactus spines collected with sterile instruments. Levine (Norman Levine MD, Tucson, Arizona, oral communication, June 1997) has observed *Nocardia* and atypical

mycobacterial infections after cactus injuries. Additional reports of cactus injury complications include synovitis, tendinitis, and myositis (biceps) as a consequence of thorn tissue penetration.^{7,9-12}

In one case report, magnetic resonance imaging detected a 4-cm × 1-mm × 1-mm cactus thorn embedded in the cartilaginous proximal tibia.⁹ A study utilizing pieces of beef that contained different foreign bodies demonstrated that an emergency room physician with little formal training in ultrasound can detect 10 out of 10 cactus spines with a portable ultrasound transducer.¹³ The size of the spines used in the experiment was not specified. Our attempt to detect cactus spines with ultrasound utilized the expertise of a radiologist well trained in ultrasound techniques and an advanced ultrasound device (Siemens Elegra®). Our failure to detect spines was probably due to either the microscopic size of the spine fragments or our success in removing spines before ultrasonography. The ability of these radiologic techniques to differentiate between cactus spines and surrounding tissues diminishes with decreasing spine size.

Unlike some inert foreign bodies that can often be left alone (e.g., metal or glass),¹⁴ plant foreign bodies are best removed whenever possible.⁸ The magnitude of the problems caused by cactus spine injury inversely proportion to the size of the spines.⁸ Generally, it is easier to remove long and medium spines than to remove small spines and spine fragments embedded in the skin.

Martinez *et al.*¹⁵ found that the removal of small cactus spines can most effectively be accomplished by the combination of tweezers and glue. Tweezers are used to remove clumps of spines, followed by the application of a thin layer of non-toxic household glue covered with gauze, which is allowed to dry and then peeled off to remove individual spines. The use of adhesive tape and a commercial facial mask was less effective in removal of cactus spines, and produced inflammation 3 days after removal.¹⁵ Two reports suggested that the application of depilatory wax can also be a fast, effective method to remove cactus spines.^{16,17}

Glochids of *Opuntia* contain rearward angulated microscopic barbs.^{2,8} When the spines are removed, the barbs break off and may produce granulomatous inflammation in the skin. Treating a patient who has spine fragments that cannot be visualized above the skin surface can be challenging. Although skin lesions gradually resolve in 2 to 8 months,² they can be a source of pruritus, pain, and significant discomfort.

The usual treatment for cactus granulomas is the application of topical corticosteroids. Reports indicate that with this treatment, inflammation resolves in 2 to 4 months.^{3,18}

In managing our case, we initially unroofed the inflammatory papules and removed all visualized spine

fragments. Although the papules probably still contained microscopic amounts of spine material, the antigenic burden to the body was minimized by the unroofing procedure. We also believe that unroofing the granulomatous papules and subsequent soaking in an antiseptic solution expedited the process of spontaneous spine fragment extrusion¹ and prevented infection. Within one week after the unroofing procedure, our patient demonstrated significant clinical improvement. For patients with persistent, granulomatous papules due to cactus spines, we recommend punch excision.

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