

## Cactus thorn detection using bedside ultrasound

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### Patient presentation

A 30-year-old male presented to the emergency department (ED) complaining of unresolving swelling and pain to his right forearm. The patient stated that 2 weeks prior, while gardening, he was injured by a cactus spine. One week later, the patient was seen at an Urgent Care for pain and redness. Radiographs of the forearm were negative for foreign body, and he was treated with antibiotics for cellulitis. On the day of presentation, the physical examination was significant for intact nonerythematous skin with tenderness to palpation of the extensor muscles on the right mid forearm.

### Discussion

The greatest challenge in patients presenting with foreign body concerns is detection of the offending foreign body. Even small superficial wounds or injuries without obvious

site of penetration may harbor foreign bodies [1]. Clinical symptoms that suggest foreign material include sharp pain with palpation over the wound site, as well as a poorly or nonhealing wound [2]. Additionally, foreign bodies of vegetative nature such as a thorn, increase the risk of infection and may harbor or seed pathogens that produce localized infection [2].

Despite the previously negative radiographs, the patient's presentation was concerning for a foreign body. Bedside ultrasound revealed a well-defined foreign object within the extensor muscles of the right forearm (Fig. 1a). Although radiographic imaging has been shown to predict metallic foreign objects with up to 100 % accuracy, wooden foreign bodies are detected by X-ray study only 15 % of the time [1]. Ultrasound imaging has been shown to have superior diagnostic characteristics for detecting these radiolucent foreign bodies. One case series of 39 patients presenting with the clinical suggestion of a foreign body undetected on radiograph documents that ultrasound has a 95 % sensitivity and 89.5 % specificity in detecting foreign bodies in 19 out of 21 patients [3]. Further studies reaffirm the efficacy of using ultrasound to detect radiolucent foreign bodies, noting similar statistics given a high pre-test probability [4, 5].

The emergency physician was unsuccessful at removal of the foreign body, and the patient was referred to a hand specialist for operative exploration. A 2 cm cactus spine needle (Fig. 1b, c) was identified deep within the extensor muscles of the right forearm, which the surgeon felt would not have evacuated the body without intervention. Beside ultrasound is readily available in emergency departments, and has been demonstrated in numerous studies to be

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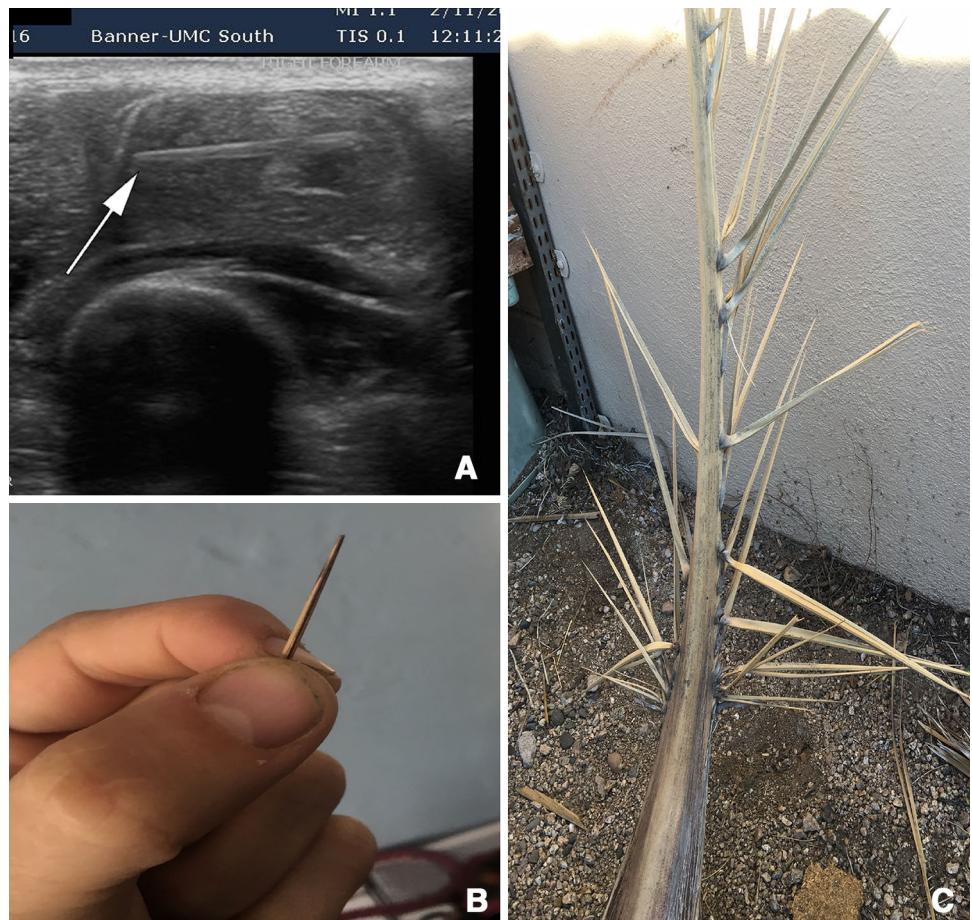
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**Fig. 1** **a** Ultrasound imaging of radiolucent foreign body (*arrow*). **b** 2 cm cactus spine needle post surgical removal. **c** Cactus resulting in initial injury



superior to radiographs in the detection of radiolucent objects. Physicians should be aware of this when managing patients with foreign body concerns.

#### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Statement of human and animal rights** In compliance with ethical standards set forth by our institutional research committee and in compliance with the 1964 Helsinki declaration.

**Informed consent** Patient provided written and verbal consent for this case presentation.

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