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## Visual Case Discussion

# Ultrasound-guided ulnar nerve block and radiolucent foreign body retrieval from the hand

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A 28 year old male construction worker with no past medical history presented to the emergency department with a concern that a piece of wood may be stuck in his hand after an accident at work the day before. Physical exam was significant for diffuse swelling of the volar aspect of his left hand, decreased sensation of the volar aspect of the left fourth digit, and inability to fully flex the left third digit. There was a pinpoint wound on the medial edge of the volar aspect of the left hand. X-ray of the affected hand showed no acute pathology and no foreign body. Orthopedic surgery was consulted and they recommended no further action. Ultrasound of the hand with a linear probe was indicative of a retained foreign body, with a discrete 3.0 cm linear hyperechoic foreign body with posterior acoustic shadowing extending from the medial aspect of the distal palmar crease to the area proximal to the third digit (Video 1). An ultrasound guided forearm ulnar nerve block was performed, after which a <1 cm incision was made at the presumed point of entry of the foreign body. Under ultrasound guidance, tissue forceps were advanced toward the presumed foreign body (Video 2). A 3.5 cm wooden splinter was then extracted from the patient's hand (Fig. 1). The patient reported no pain from the procedure. After a short period of observation the patient regained full sensation and function of the affected hand. Ultrasound is approximately seven times more sensitive (US 30% sensitive, 100% specific; DDR 4.17% sensitive, 100% specific) in the detection of radiolucent foreign bodies than conventional direct digital radiography.<sup>1</sup> Forearm ultrasound guided blocks of the nerves of the hand can be performed safely and quickly by ED practitioners.<sup>2</sup> Ultrasound guided nerve blocks are less painful and more effective than anatomic landmark based wrist nerve blocks.<sup>3</sup>

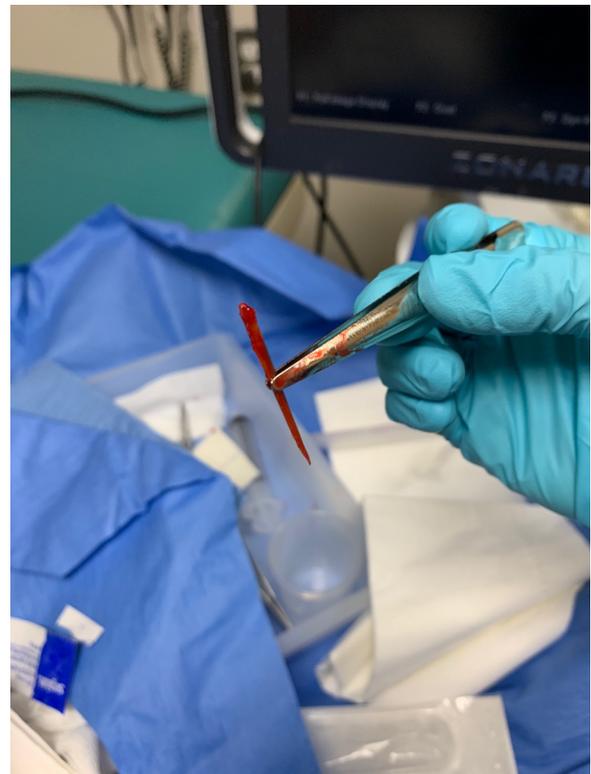


Fig. 1. Extracted wooden shard.

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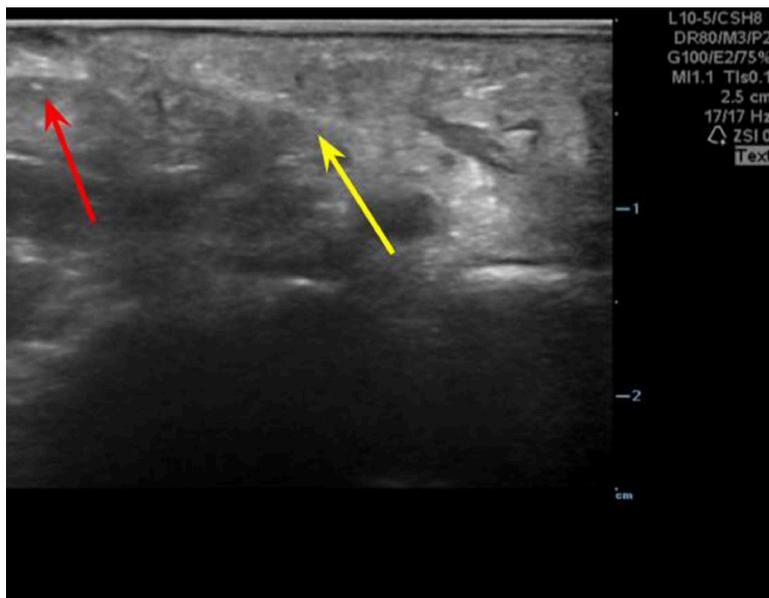
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### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.visj.2019.100600](https://doi.org/10.1016/j.visj.2019.100600).



**Video 1.** Red arrow indicating presence of hyperechoic foreign body with posterior acoustic shadowing.



**Video 2.** Red arrow indicating tissue forceps; yellow arrow indicating foreign body.

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**Questions**

1. Ultrasound is not a useful tool at evaluating for the presence of a possible radiolucent foreign body if X-rays are negative for the presence of one.
  - a. True
  - b. False
  
2. Which of the following best describes the practicality of forearm ultrasound guided nerve blocks in the emergency department?
  - a. High complication rate, time consuming, painful, not effective
  - b. High complication rate, time consuming, not painful, effective
  - c. Low complication rate, time consuming, painful, effective
  - d. Low complication rate, not time consuming, not painful, effective
  - e. Low complication rate, not time consuming, painful, effective

**Answers**

1. False. Explanation: Though highly specific, x-ray has extremely poor sensitivity in the detection of a possible radiolucent foreign body. Ultrasound is approximately seven times more sensitive.
  
2. Low complication rate, not time consuming, not painful, effective. Explanation: Forearm ultrasound guided nerve blocks can be performed easily and effectively by the Emergency Department physician. They have a low complication rate, are not time consuming, and are not painful to perform.