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Retained Canine Tooth Following Dog Bite Injury to the Upper Extremity

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Abstract

In adults, dog bites to the upper extremity are common, but retention of the tooth after the bite is a rare occurrence. Foreign bodies can become embedded in the tissue after a penetrating injury and may not be evident upon the initial physical exam, potentially leading to infections and other local or systemic consequences. Various imaging modalities have been recommended for the localization and diagnosis of foreign bodies, depending on the nature of the foreign body and available facilities. We present a rare case of a retained tooth in the distal forearm after a stray dog bite. This case highlights the importance of radiographic evaluation in the context of penetrating animal bites.

Keywords

Dog Bite, Foreign Body, Canine, Tooth

1. Background

Animal bite injuries account for 1% - 2% of emergency room visits in the US [1]. Dog bite injuries are very common, accounting for 80% - 90% of all mammalian bites [2]. Furthermore, bites to the hand and forearm comprise 18% - 68% of all dog bites and are associated with an increased risk for abscess formation, tenosynovitis, and septic arthritis [3]. In examining a patient with a dog bite injury, the clinician should begin by obtaining an accurate history and physical exam, followed by exploration of the wounds and radiographic imaging to find possible retained foreign bodies [4].

There are very few case reports documenting foreign bodies as a result of a dog bite [4]-[6]. We report a rare case of a retained canine tooth in the distal forearm after a dog bite.

2. Case Presentation

A 26-year-old man with no past medical history presented to the emergency department (ED) for pain and lacerations in the left arm and hand, sustained from dog bite injuries. The patient was walking his dog down a street when a stray dog attacked him and ran away. On physical exam, there were approximately 1 - 2 cm wounds on the volar and dorsal left distal forearm and a larger 6 cm laceration on the ulnar aspect of the palm of the left hand without apparent tendon or neurovascular injuries. The patient was initially treated with antibiotics, pain medications, tetanus immunization, rabies vaccine, and immunoglobulin. Radiographs taken the same day showed a foreign body with the appearance of a tooth in the ulnar dorsal soft tissues of the distal forearm (Figure 1 and Figure 2). In the emergency department, an attempt was made to remove the foreign body from the distal forearm under fluoroscopic guidance without success, likely due to its depth and surrounding soft tissue structures.

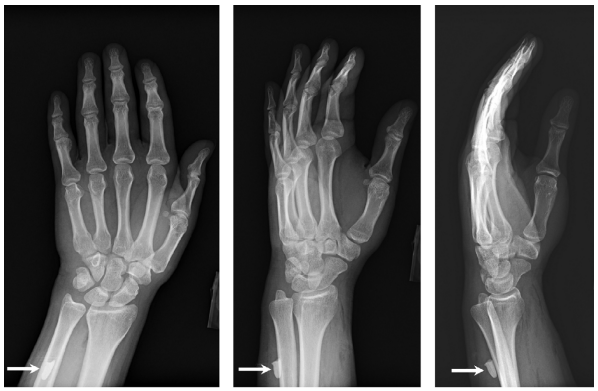

Figure 1. Radiographs of the left hand. (a) Frontal, (b) oblique, and (c) lateral views demonstrate a tooth-like radiodensity in the soft tissues at the ulnar dorsal aspect of the distal forearm (arrows). There is no osseous abnormality.

Figure 2. Radiographs of the left forearm. (a) Frontal and (b) lateral views demonstrate a tooth-like radiodensity in the soft tissues at the ulnar dorsal aspect of the distal forearm (arrows). There is no osseous abnormality. Gas is seen tracking in the soft tissues, predominantly at the volar aspect of the mid to distal forearm/wrist (arrowheads).

Orthopedic surgery was consulted. On the same day as the injury, the patient underwent the following procedures in the operating room: exploration and washout of the left forearm and hand, removal of the foreign body, and repair of lacerations in the left forearm and palm. The wound was irrigated with several liters of antibiotic solution including cefazolin and vancomycin, followed by Betadine solution. IV ampicillin-sulbactam was also given during surgery. There was no obvious tendon injury. The foreign body was confirmed to be a canine tooth by the surgeon and pathologist. The patient was given a single dose of amoxicillin-clavulanate 875 - 125 mg orally during the ED visit. The patient was discharged with a prescription for amoxicillin-clavulanate 875 - 125 mg orally twice daily for 10 days. The patient tolerated the procedures well, and no complications were noted on follow-up after 3 days. The patient was advised to return to the clinic in 2 weeks for a wound check but did not return for follow-up.

3. Discussion

Dog bite injuries are a common problem with approximately 4 million Americans being bitten by dogs every year [7]. Clinically, dog bite injuries can present with lacerations, bleeding, pain, and potential muscle or bone injuries [8]. Patients can also present with systemic signs of infection such as fever, lymphadenopathy, or malaise [8]. A physical exam is needed for the assessment of the wound's size, depth, degree of devitalized tissue, presence of vessel, nerve, or tendon damage, and involvement of bones or joints [9]. Any limitation to the range of motion in areas at or around the site should be noted [7]. The presence of a foreign body in the tissue can increase the risk of infection and neurovascular and tendinous injuries [10]. More specific complications associated with retained dental fragments of animals in human tissue include Pasteurella infections, abscess formation, and chronic granulomatous inflammation [1] [11].

After obtaining an accurate history and physical exam, radiographs should be considered to assess for fractures or retained foreign bodies, and to provide details about the dimensions and position of radiopaque foreign bodies if present [4] [10] [12]. Radiographs can assess soft tissue swelling in the setting of an animal bite but are not particularly sensitive in detecting infection. MRI is a more sensitive modality for detecting signs of infection in soft tissue. In cases of suspected vascular injury, CT, MRI, and ultrasound imaging can be used to evaluate the vasculature [12]. In addition, ultrasound is commonly used to assess for radiolucent foreign bodies [4]. The radiographic studies in the presented case were critical in the diagnosis and clinical management of the patient as they showed significant soft tissue defects and injuries in the left forearm with a tooth-shaped foreign body in the soft tissues of the distal forearm.

Wounds from animal bites are considered grossly contaminated, requiring proper care to prevent infection [13]. The wound should be irrigated copiously with tap water or normal saline and then inspected for the presence of foreign bodies or injuries to the bone or tendon. Foreign bodies should be removed and thorough

irrigation and debridement of the wound should be performed using general or local anesthesia if necessary [9] [14]. In addition, prophylactic antibiotics and vaccines should be given depending on individual risk factors [14]. Current practices suggest that a tetanus vaccine should be administered on presentation in mammalian bite injuries if there is no record of tetanus vaccination in the last 5 years. Rabies postexposure prophylaxis is indicated in patients who were possibly exposed to a rabid animal [14]. In cases that involve systemic infection, copious bleeding, retention of a foreign body, involvement of the bone, joints, or tendons, cranial bites, or bites that require reconstructive surgery, referral to a specialist or surgeon may be indicated [9]. Fluoroscopy or ultrasound may be used to help facilitate the removal of foreign bodies [12]. For the patient in this case report, the foreign body could not be removed under fluoroscopic guidance in the emergency department, necessitating an orthopedic surgery consult and subsequent surgical removal.

4. Conclusion

In conclusion, a retained foreign body in the forearm after a dog bite is a rare finding. This requires a thorough assessment and evaluation in combination with appropriate wound care, imaging studies, and consideration for surgical consultation. Imaging is critical to optimize patient outcomes and prevent complications that may result from a missed retained foreign body.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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