



An Unusual Foreign Body in the Foot: Traumatic Implantation of a Human Tooth

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ABSTRACT

We report the case of a 29-year-old man who presented to the emergency department with persistent swelling and pain in his right foot, initially reported to be related to stepping on something while walking on the beach. When radiographs showed what appeared to be a human tooth embedded in the foot, the patient admitted to having been in a fight, during which he kicked his opponent in the jaw with his foot. The tooth was surgically removed and oral antibiotic therapy was administered for 1 week. The wound eventually healed by secondary intention without complications, and the patient returned to his regular activities 15 days after the operation.

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Puncture wounds in the foot are relatively common and have been reported to account for 0.81% of visits to the emergency room (1). When the foot is involved, the foreign body is often embedded, and surgical exploration and retrieval are often indicated. The most common foreign bodies associated with foot trauma are the toothpick (2) and sewing needle (3), and other materials such as glass (4), metal (3), cloth fibers, and sand or silica (4) have also been described. Organic matter can also puncture and become retained in the foot, including insect stingers, sticker-burrs from a variety of plants, sea urchin spines, and needlefish and stingray barbs (5). Almost anything that is hard enough to penetrate the skin can pose a threat when it is stepped on.

Interestingly, the prevalence of infection associated with foreign body puncture wounds varies from 0.6% to 14.8% (1). Infectious complications of punctures include cellulitis and soft tissue abscess, and serious deep infection, such as osteomyelitis or septic arthritis, occurs in 0.6% to 1.8% of cases (1). In this report, we describe the case of a puncture wound of the foot in a young man who had been in a fight with another person, during which he kicked his opponent in the mouth while barefoot, resulting in implantation of a tooth and subsequent development of foot infection.

Case Report

A 29-year-old man presented to the surgical emergency department with approximately 11 days of swelling and pain in his right

foot. He initially reported that while walking on the beach 14 days earlier, he had felt a violent thump in his right foot, and he stated that he thought he had stepped on a piece of glass. At first the foot did not bother him, but by the third day after the event, pain and swelling had developed. By 7 days after the injury, the wound had begun to drain serous fluid, and by the 10th day, the pain had become severe. The patient then sought help from a general practitioner, who cleansed the wound and prescribed oral antibiotic therapy in the form of amoxicillin and clavulanic acid, 1000 mg, twice daily by mouth. When the wound did not respond satisfactorily to therapy, the patient was referred to our emergency department for surgical evaluation.

At the time of presentation to our service, the initial clinical examination revealed a 1-cm puncture wound on the plantar aspect of the right foot. The patient's oral temperature was 37.6°C, and his right foot displayed tenderness, moderate swelling, and purulent drainage at the puncture wound, although a distinct foreign body was not palpable. Radiographs of the right foot revealed an opaque object, which resembled a human tooth, situated between the third and fourth metatarsophalangeal joints (Figure 1). Upon further questioning, the patient admitted that he had been involved in a fight with another individual on the beach, when he sustained the puncture wound. Clarification of the history of the injury revealed that, during the fight, our patient used his right foot to strike his opponent's jaw, which broke off one of his opponent's teeth. We did not obtain any further history regarding the other person involved in the fight with our patient.

In order to alleviate the abscess and remove the foreign body, the patient was taken to the operating room later on the same day that he had presented to our emergency department. The surgery consisted of surgical exploration of the plantar aspect of the right foot, with removal of the tooth and careful debridement (Figure 2). Based on the gross appearance of the removed foreign body, we suspected that it

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Fig. 1. Plain radiograph of the patient's right foot, anteroposterior (A) and oblique (B) views, with the foreign body tooth visible between the third and fourth metatarsophalangeal joints.

represented a human incisor from the victim of the kick to the face (our patient's opponent in the fight that had taken place 14 days earlier). An additional 7 days of oral antibiotic therapy, using amoxicillin and clavulanic acid, 1000 mg, twice daily, combined with metronidazole, 400 mg, twice daily. The wound was packed open and allowed to heal by secondary intention. Local wound care involved twice daily irrigation followed by application of povidone iodine-moistened gauze dressings. Microbiological specimens procured at the time of surgery subsequently revealed the presence of methicillin-sensitive *Staphylococcus aureus*. The patient was discharged from the hospital 2 days after the operation, and wound healing progressed without complications. By 15 days after the operation, the wound had fully closed and the patient had resumed his regular activities, after which he was lost to follow-up. However, because it is likely that no further follow-up was needed after the wound had healed, in this case we did not need longer follow-up.

Discussion

Human teeth as foreign bodies have been reported in the tongue (6), nasopharynx (7), maxillary sinus (8), bronchial tree (9) esophagus (10), and the external auditory canal (11). Basu et al (12) reported a case of appendicitis caused by a foreign-body tooth. To our knowledge, however, this is the first reported case of a foreign-body tooth traumatically implanted in the foot.

As with any foreign body, the goals of therapy are removal of the foreign material and prevention or treatment of secondary infection. We consider all foreign body puncture wounds to be "dirty," and the risk for infection requires careful wound care and post-injury surveillance. Moreover, human saliva contains as many as 10^7 organisms/mL, representing as many as 190 different species, so the inoculum of a human bite wound is rich in oral flora (including *Eikenella corrodens*, *Staphylococcus*, *Streptococcus*, and *Corynebacterium* species) and approximately 10% to 15% of these wounds become infected (13, 14). In the patient described in this report, it appeared to us that the foreign-body tooth, which was retained in the plantar soft tissue after traumatic implantation, led to the development of an abscess, which was relieved with surgical explantation and local wound care combined with antibiotic therapy. Because of the



Fig. 2. Photograph of tooth after surgical removal from the right foot.

unusual nature of the foreign body, namely the fact that it was a human tooth traumatically implanted in the foot as a result of an injury sustained while fighting another person, we felt that this case warranted publication.

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