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# The Foot Blog

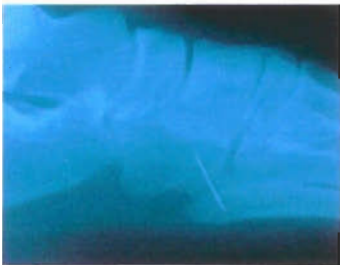
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## Foreign Bodies of the Foot

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### Introduction



Foreign bodies embedded in the foot are common to Podiatry. The patient may or may not recall the incident. There are a number of objects that can penetrate the skin of the foot causing an embedded foreign body. The most common foreign body penetration of the foot is the sewing needle. There are other materials that can cause foreign body injury to the foot. This includes toothpicks, glass shards, metal shavings, cloth fibers and sand or silica. Most anything that is hard and can penetrate skin can pose a threat when it is stepped on by the foot. Sea creatures such as sea urchin spines, fish scales and stingray

barbs can cause foreign body injury. Insect stings and sticker-burrs from various plants is also common.

Foreign bodies can remain in the foot indefinitely. There have been reports of wood penetration of the foot that remains encapsulated in the deep tissues of the foot for years. Usually, the body will see the foreign object, no matter how small, and encapsulate it through macrophage activity. Many times, it's not the foreign body, but the foreign body *tissue response* that causes pain and the need for removal.

### Infection

#### *Most Common Pathogens in Foreign Body Injuries*

**Staphylococcus aureus**  
**Staphylococcus epidermidis**  
**Pseudomonas aeruginosa**  
**Proteus mirabilis**  
**Mycobacterium marinum (marine)**

All foreign body penetrations are considered “dirty” and presents risk of infection. The most common organism found is Staphylococci. Other organisms common to foreign body penetration of the foot is pseudomas aeruginsa, proteus mirabilis, Escherichia coli and mycobacterium marinum (in

marine injuries).

Deep penetration injuries should be treated with the appropriate antibiotics including oral or IM antibiotics. Early removal of deep foreign bodies will lessen the degree of infection and abscesses.

### **Diagnostics**

Many times, superficial foreign bodies will cause a superficial abscess of the skin. In these cases, simple removal can be initiated without radiographic or other expensive tests. A complete history of the injury is important including when, where and how the injury occurred. Many times, patients will remove part of the foreign body material and leave remaining material behind. The type of injury and placement of the foreign body will usually dictate treatment. Joint penetrations are considered surgical emergencies requiring hospitalization and removal of foreign body material.

Radiographic evaluation of an injury remains the standard examination for localizing penetrating injuries of the foot. If surgery is required, many times, 3 needle localization is utilized to find the object. Keith needles can be used at 45 degree angles in the area of injury to localize the object using a xi-scan of mini-fluoroscopy unit.

### **Treatment**

Treatment is dictated by objective and subjective symptoms. If the patient presents with localized or systemic infection, more aggressive measures are needed in treatment. If pain is localized to the injury site, removal of the foreign body is indicated. Tetanus immunization must be up to date. If the tetanus toxoid booster was given in less than 10 years, no additional booster is required. Boosters of 0.5ml of tetanus toxoid should be given in patients who received the immunization over 10 years or if the penetrating injury is considered severe. The severity of a foreign body injury is directly equivalent to the depth of injury. Deep penetrating wounds need to be opened and treated aggressively to prevent abscessing and sepsis. Another factor that determines severity of injury is the 'cleanliness' of the foreign body material. Dirty needles or nails that penetrate through shoes or in dirty environments should also be treated aggressively. For persons who have an uncertain history of tetanus immunization, three doses are required. A single dose at presentation of injury, a second dose one month later and a third and final dose in 6-12 months.

After removing a foreign body, treatment is dictated by severity of injury. Deep penetrating wound may require hospitalization, open incision and drainage with packing and IV antibiotics. Secondary intention healing may be indicated in severe cases. Penetrating injuries into the joint requires prolonged IV antibiotic treatment to prevent osteomyelitis.

### **Case #1**



A 28 year old male presents to the emergency room with pain associated with stepping on a toothpick that morning. The toothpick penetrated the first interspace of the left foot. Initial treatment included antibiotic IM booster and radiographic evaluation of the foot. There was a consideration to perform an ultrasound. However, the toothpick was easily seen penetrating the outer layer of the epidermis. He was then sent to our office where a small incision was performed under local anesthesia. The entire toothpick was removed without breaking the toothpick. Care must be taken in removing such a large foreign body. Penetration is 4cm in this case, and adequate antibiotics and careful observation is needed. An understanding that infection can still occur even after removal of the foreign body must be discussed.

### Case #2



A 53 year old male presents to our office with pain and discomfort in the form of plantar keratosis of the left heel. Clinical evaluation reveals punctuate keratosis with a central core. Debridement reveals a hard, metallic object directly in the center of the lesion. The area was debrided thoroughly, tetanus prophylaxis was determined and the patient was placed on a local antibiotic with complete clearance of the keratotic lesion. This case study shows that even small keratotic lesions need to be investigated for possible foreign body material. In this case, a small metal shaving was found and removed without complication.

### Case #3



A 38 year old female presents with a small lesion or granuloma to the hallux. A small abscess is noted with removal of the granuloma and upon debridement a small plant thorn was removed. These types of foreign bodies almost always come to the surface. They can be easily removed without the need for extensive surgery or needle localization.

## **Conclusion**

Foreign bodies of the foot are common injuries that will be seen in both the office and emergency room. Proper identification of the penetrating body is key in preventing infection. The need to identify severity of penetration is important in initiating the proper treatment. The deeper the foreign body penetration, the more aggressive the treatment protocol. It is important to institute proper tetanus prophylaxis or if a booster is required. Foreign bodies case studies are discussed that mimic small keratotic lesions and granulomas. Special attention is recommended to rule out foreign body material in the presence of penetrating pain or discomfort.