Migration of a toothpick along the flexor tendon sheath in a lower extremity

Cem ALBAY*, Oktay ADANIR, Sever ÇAĞLAR, Ozan BEYTEMÜR

Bağcılar Training and Research Hospital, Department of Orthopaedics and Traumatology, İstanbul, Turkey

The most common foreign bodies seen in the foot are sewing needles, toothpicks, glass, and materials such as sand or silica. Foreign bodies in the foot are usually embedded, and surgical exploration and removal is usually necessary. Penetrating foreign bodies in the foot—particularly of organic origin, like wood—can cause cellulitis, osteomyelitis, abscess formation, and pseudotumor formation. Identification of foreign bodies in the foot can be challenging because they are often not radiopaque. However, foreign bodies in the foot do not migrate, in contrast to upper extremities, where foreign bodies are known to migrate. We report a case of a toothpick penetrating a child's foot and moving proximally along the tendon sheath.

Keywords: Foot; foreign body; foreign body migration; lower extremity; migration.

Sewing needle,[1] toothpick,[2] and glass[3] are the most common materials causing lower extremity penetration. Penetration by materials such as sand[3] and silica[3] has been described, though with less frequency. Foreign bodies in the foot are usually embedded, and surgical exploration and removal is usually necessary. Penetrating foreign bodies in the foot—particularly of organic origin, like wood—can cause cellulitis, osteomyelitis, abscess formation, and pseudotumor formation.[4–6] Their identification can be challenging because they are not radiopaque.[7,8] Foreign bodies in the foot do not migrate, in contrast to those in upper extremities, where foreign bodies are known to migrate.[9] We report a case of a toothpick penetrating a child's foot and migrating proximally along the tendon sheath. The patient's family was informed that data of the child would be used for publication, and their consent was obtained.

Case report
An 11-year-old girl was seen in the emergency department after she stepped barefoot on a toothpick in the carpet of her room 2 weeks prior. While walking barefoot on the carpet, she suddenly felt a pain in her left foot. When she looked at the plantar surface of the foot, she saw a puncture at the first intermetatarsal area between the first and second metatarsal heads. Her mother cleaned the wound and dressed it using sterile gauzes. The family did not seek for professional medical care, as the girl was able to walk despite discomfort in the forefoot area. After 1 week, the pain increased, and the family sought professional medical care. She was initially seen by a general practitioner, and radiographs of the foot were performed. No foreign body was visualized on the radiographs, and the patient was discharged and prescribed an oral analgesic. She took the medication, but
the pain did not subside. Thus, the family attended our hospital 2 weeks after the injury.

On general examination, she walked on her heel. Local examination of the foot revealed a puncture wound in the intermetatarsal area between the first and second metatarsal heads on the plantar surface of the foot. The patient had generalized tenderness over the plantar surface of the foot, especially during passive dorsiflexion of the toes. Palpation of the midfoot area of the plantar surface caused pain. Radiographs of the foot were normal. Her white blood cell count, erythrocyte sedimentation rate, and C-reactive protein levels were normal. Despite these results, magnetic resonance imaging (MRI) of the foot was ordered to evaluate soft tissues and the presence of a radiolucent foreign body. MRI revealed the foreign body and tenosynovitis around the flexor digitorum longus tendon. The patient was taken to the operating room for surgical removal of the foreign body. Before operation, ultrasound examination of the foot was performed, and the exact location of the foreign body was determined (Figure 1). The incision was made longitudinally over the foreign body, (Figure 2) and it was removed from the flexor digitum longus tendon sheath approximately 6 cm proximal to the entry site (Figure 3 and 4). Bacterial cultures from the site were negative. The patient was discharged from the hospital 1 day after the operation, and the wound healed without complication.

Discussion

Wooden foreign bodies in feet are common and can lead to complications such as cellulitis, osteomyelitis and pseudotumor.[5,6] Although migration of foreign bodies in the upper extremities is well described, migration of a foreign body along a tendon sheath in a lower extremity has been described only once in the English literature.

To our knowledge, our case is the second case described.

The mechanism of migration in our case is similar to that in the case described by Firth et al. In their case, the toothpick migrated along the flexor tendon sheath from the medial side of the heel to the medial side of the ankle from distal to proximal direction due to its sharp proximal and irregular distal orientation.[10] In our case, the sharp end of the toothpick was also oriented proximally. As a result, there was little resistance to migration, allowing it to move proximally within the flexor tendon sheath approximately 6 cm within 2 weeks. The angle that the toothpick entered the foot is also important in the explanation of the mechanism. We think that it en-

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**Fig. 1.** Before operation, ultrasound examination of the foot was performed, and exact location of the foreign body was determined.

**Fig. 2.** The incision line is far from the puncture site. [Color figures can be viewed in the online issue, which is available at www.aott.org.tr]

**Fig. 3.** Removal of the foreign body from the tendon sheath. [Color figures can be viewed in the online issue, which is available at www.aott.org.tr]

**Fig. 4.** The foreign body. [Color figures can be viewed in the online issue, which is available at www.aott.org.tr]
tered the foot nearly parallel to the flexor digitorum longus tendon sheath. The inflammatory exudate produced by the foreign body in the tendon sheath expanded the tendon sheath and facilitated movement of the toothpick.

Appropriate investigation to detect foreign bodies, especially radiolucent ones, is very important. Traditionally, direct radiographs have been the first modality of choice, but Anderson et al. reported that direct radiographs were able to identify only 15% of wooden foreign bodies.[11] Other radiological modalities like computed tomography, ultrasound, and MRI can be used to detect wooden foreign bodies.[6,12–15]

Conflicts of Interest: No conflicts declared.

References