Splinters, Thorns, and Other Foreign Bodies in the Hand

A foreign body is an object that ends up in the body. Although a joint replacement to treat arthritis or a screw to treat a fracture is put into a person's body, that object was intentionally put there for medical reasons. Therefore, it is called a medical device rather than a foreign body.

There are different types of foreign bodies, and two common main groups stand out: biological and non-biological. Biological foreign bodies come from living things such as plants, animals, or insects. They can include wood, thorns, teeth (from humans, land animals, and marine creatures), insect stingers, sea urchins, sea cucumbers, starfish, coral, and stingray spines. Common non-biological examples include glass, metal, gravel, bullets, BBs, shrapnel, fishhooks, pencil graphite, plastic, and fiberglass threads.

Causes

Foreign bodies can end up inside someone, intentionally or unintentionally. They often happen accidentally during an injury. Any puncture or laceration can cause a foreign body injury.

A home activity example is when the tip of a pencil breaks off and the graphite gets lodged in the hand or finger. Even when the piece of lead can be removed and the pain goes away, the skin may still have a gray color like a tattoo. If a glass or dish breaks during washing, a small piece might get stuck in the hand. Gardening activities can result in many types of accidental foreign bodies getting stuck in hands or fingers, and these can include wood splinters, bark slivers, thorns from a rose bush, or cactus spines.

Exercise and recreational hobbies can result in foreign bodies. If someone falls while running or cycling, they may land on their hands. The force and impact can drive gravel, road debris, or trail hazards into the palms and fingers. At the beach, someone can get pieces of broken seashells in their feet or hands. While diving or snorkeling, spines from sea urchins can get embedded in the hands. Barbs from fish or fishhooks can get stuck in the hands or fingers while fishing. During war, hunting activities, or recreational battle games, projectiles (shrapnel, bullets, or BBs) can become imbedded in people.

Sometimes, people's jobs put them at risk for foreign bodies. Carpenters, roofers, and manufacturing jobs may result in injuries from a nail or staple gun. Wood, plastic, or metal shards can get stuck in the hands or fingers.

Symptoms

How do you tell if you have a foreign body? Sometimes, it is clear to the patient based on how the injury happened and how the finger or hand feels. It can be like when you have a stone in your shoe: You know when your foot hurts in a localized area, it feels like something sharp keeps poking it, and you get the sense that you need to remove your shoe and dump it out.

Figure 1 - A wood splinter in the finger is a kind of biological foreign body, and can cause inflammation, which makes the area red, swollen, warm, and painful.

The same feelings can happen when you press over the area of the foreign body. It might just feel like there is something there that doesn't belong. When the foreign body is close to the skin surface, you might be able to see it. If it gets pushed in deeper, it can be hard to confirm when your doctor examines the area. When there is a visible puncture wound, a laceration, or blood after an injury, you or your doctor may suspect a foreign body. It is important to speak up and explain to the health care provider that you think there may be a foreign body present.

A common finding or symptom is a very narrow zone of tenderness that happens each time the area is pressed. Sometimes, there will be a sharp pain if there is pressure on the skin. Clear, colorless, or very fine materials may be difficult to find. Gentle rubbing over the area may locate the foreign body. The doctor or patient might feel it moving one direction, but not another. You may feel a firm lump under the skin. If you can't see it, you could always try a magnifying glass or the magnifier on your smartphone.

Other early symptoms can include bruising. Movement of the joint may cause pain. Numbness can occur if the foreign body is in or near a nerve. There might be increased redness or swelling as the foreign body can cause irritation and inflammation. Sometimes, these symptoms mean an infection has occurred.

Diagnosis and Treatment

If you or your doctor cannot confirm the location of a foreign body in your hand, medical technology is another method of finding a foreign body. X-rays are often the first test ordered. Some types of metal that can be seen on x-ray include copper, iron, aluminum, steel, or tin. Materials such as teeth, tooth fragments, and some fish spines include calcium and can be visible on x-rays. Also, most gravel, plastics, coral spicules, and some types of glass may be visible on x-rays. Keep

in mind that though x-rays can show some materials, they don't show all objects, so a normal x-ray does not mean you are in the clear.

Other tests can be ordered if x-rays do not clearly show a foreign body. Performed by an experienced technician, an ultrasound is a very effective, low-cost, and comfortable test that bounces sound waves off the foreign body to create a brighter area on the screen. Wood, thorns, and other materials can be detected with ultrasound. Ultrasound can demonstrate if you are dealing with one or multiple foreign bodies, and this test can also determine their size, shape, location, direction, and depth. Ultrasound can also detect changes in the surrounding soft tissues and whether fluid is present to suggest an abscess.

Computerized tomography (CT) scans and magnetic resonance imaging (MRI) can also show foreign bodies. If the foreign body is deeper or near a bone, a CT may be required. CTs and MRIs are more expensive and may be considered based on the injury location and other patient-specific characteristics.

Many factors determine the treatment of foreign bodies. These include the kind of foreign material, the location, the patient's symptoms, and the likelihood of infection.

Foreign bodies from plants, bite wounds, and marine creatures are more likely to cause reactions or infections. Bite wounds involve the crushing of tissue and other injury. This lowers the body's ability to fight bacteria from the wound. Spines and spicules from marine animals can carry poisonous material. Some infections are caused by bacteria, which divide quickly and cause more severe symptoms early. Fungal and atypical mycobacterial infections often are slower-growing organisms, so those might not cause symptoms for weeks or months. These types of infections are much harder to grow in a laboratory to identify the cause of infection, and they are also harder to cure and may require medication for weeks or months, including one or more surgeries.

Wood slivers and thorns may cause inflammation, which makes the area swollen, red, warm, and painful. These symptoms mimic infection, so it can be difficult to separate inflammation from infection. Glass, metal, and plastic are synthetic products, not biologic structures, so they are less likely to cause inflammation and/or infection.

The location of the foreign body can dictate the need for removal. If it is deep, without symptoms, and non-reactive, no invasive treatment may be needed. It may only be followed with occasional office exams to monitor for developing problems. Examples are small pieces of metal or glass. Those close to the skin, tendons, nerves, or joints may be more painful with light pressure and will require removal. This could be due to symptoms or concern about further injury. Sharp glass and metal foreign bodies have caused injuries to vital structures.

Pain or suspected infection are the most common reasons for foreign body removal. Most foreign bodies that cause symptoms do not go away without a procedure. It is rare for the body to be able to break down the foreign body and get rid of it.

During a foreign body removal, the doctor may swab the wound to obtain a specimen and then send it to the lab to determine if an infection is present. Sometimes, the presence of an infection is obvious, and other times, it can be hard to tell just by looking at the wound. When infection is suspected, the doctor may prescribe the patient one or two antibiotics to start based on common organisms in your geographic location. If the wound culture grows bacteria in the lab, this can make picking an effective antibiotic easier

Bacteria from human, dog, or cat bites often require different antibiotics than a thorn puncture. Microorganisms from marine animals are also very different from land animals. Deeper fluid collections or abscesses need surgical drainage and antibiotics. Infected joints, tendons, and bones require more involved surgeries and sometimes intravenous antibiotics for several weeks. Infected joints are opened and cleansed. Infected tendons and bones require the removal of very infected tissue, as well as pills or intravenous antibiotic medication.

Nerve injuries require exploration and repair because they do not usually heal without surgery. However, when nerve fibers are cut, residual numbness or weakness can be expected, even if the nerve could be repaired. Partial tendon tears can heal without surgery but may develop scarring that can limit motion. Sometimes, therapy alone can improve motion. Other times, a surgery called a tenolysis may be worth trying. Many completely severed tendons have an immediate loss of motion. Early wound exploration can help determine if there is an infection. If no infection is suspected, an early tendon repair can be performed. If an infection is present or suspected, the tendon repair would need to be delayed. When the infection is cured, a late repair can be performed.

Finally, after a puncture wound, a lump can form. This may take months or years to develop. The patient may not remember the puncture. The lump or mass can be tender. The most common post-traumatic mass is an epidermal inclusion cyst. It is thought that some skin cells get driven under the surface and survive. They continue to grow and secrete normal oils and protein, which gradually form a mass. Another post-traumatic mass is a pyogenic granuloma, which is a raised, red lump that easily bleeds. It usually requires removal and cauterization with silver nitrate or another electrocautery.