STATEMENT OF PURPOSE

Foreign bodies can be difficult to diagnose and should be considered in a differential diagnosis related to pain of unknown origin, even if there is no known history of trauma. We present a case of a foreign body that lacked a known traumatic incident, had no dermatologic signs of infection or foreign body reaction, and was not identified on plain radiographs or CT. The patient was only diagnosed after a postoperative pathologic evaluation of bone biopsy obtained.

LITERATURE REVIEW

Foreign bodies are common in the foot and ankle (1). Although common, they can be missed up to 38% of the time, leading to further complications (2). Wood can be particularly difficult to detect with standard imaging techniques. Sensitivity in detecting wooden foreign bodies is reported to be 15-29% for standard radiographs and 67-76% for computed tomography (CT) (3). Retained viable plant material in the calcaneus is rare, and there have been few studies evaluating that potential (4). Organic foreign bodies are a great medium for bacterial growth due to their protein nature and organic characteristics. Failure to diagnose and treat them can lead to abscesses, pain, drainage, and osteomyelitis (6). Typically, wooden foreign bodies cause osteitis when in or near bone (7). Our literature review was unable to find any reports of bone actually integrating into an organic foreign body, as was seen in our case. The reports we reviewed also noted that with organic intraosseous foreign bodies, there was always either clinical or microscopic signs of inflammation, infection, or a foreign body reaction (7, 8, 9, 10), which was not seen in our case. Most organic foreign bodies in the foot and ankle are found in the soft tissues rather than penetrating bone (11). Viable plant material retained as a foreign body for a significant period of time is also rare. The one report we found described a patient with known eye trauma and a foreign body that was initially isolated. Later, the foreign body was removed and identified as a decalcified leaf with cells still containing cytoplasm (8).

CASE REPORT

A 22 year old otherwise healthy active duty male Soldier initially presented to our clinic with an 11 month history of left heel pain rated at 3/10, with onset while he was deployed in Afghanistan. He denied any previous surgery or trauma to the left foot and had been diagnosed by his primary care manager (PCM) with planar fasciitis. Our initial evaluation was consistent with the diagnosis of plantar fasciitis/fasciitis, with a history that was (-) for trauma/surgery on the left foot, (+) post-traumatic dyskinesia, (-) dermatologic changes (swelling/redness/wounds/bleeding or drainage). His physical examination included no obvious soft tissue defects, but did find a mass that was later determined to be a devitalized foreign body in the calcaneus. The mass had been present for at least 10 months, was described as being “deep within the bone”, and evolved into increased pain with high impact activities as well as night pain that would wake him from sleep. He became frustrated with the continued pain and lack of progress, and returned to his PCM who ordered an MRI that revealed a hypointense mass in the calcaneus on T1. This was read by the radiologist as a non-displaced calcaneal fracture versus prior surgical pinning. At his next appointment in our clinic we obtained calcaneal axial films that revealed a linear lucency in the medial aspect of the posterior calcaneus. Considering the MRI and new radiographic findings we were favoring an infectious etiology to our working diagnosis, so a CBC, ESR, and CRP were ordered, which all came back within normal limits. A Technetium bone scan was ordered at the same time to evaluate the rate of bone turnover to assist us in correlating the bone scan activity level with the MRI and calcaneal axial radiograph results. With the bone scan revealing increased uptake in the posterior portion of the calcaneus coupled with the negative lab results, the primary working diagnosis became “atypical calcaneal fracture” and the he was treated with a non-weight bearing cast for 2 months and then transitioned to weight bearing as tolerated in a removable walking boot for another 6 weeks. As pain was unimproving following this course of treatment, it was decided to order a CT scan to provide a thorough evaluation of the osseous defect in the calcaneus, which revealed a well-defined linear lucency with sclerotic margins. Due to continued long-term pain (at least 20 months) and no radiographic evidence of osseous healing, coupled with the exhaustion of both conservative treatment options and other diagnostic lab or radiographic studies, the decision was made to perform exploratory surgery/biopsy. We planned to use a guide-wire to assist in drilling out the osseous tract and obtain a biopsy of the bone, while also allowing us to cultivate the soft tissue at the lesion site, and possibly stimulate bone healing at the site of pathology with the drilling. Surgical technique consisted of percutaneous insertion of a 0.062 inch Kirschner wire within the calcaneal defect. Using fluoroscopy and a soft tissue protector/drill guide, a 2mm drill was used to “drill-out” the tract. Larger drill bits were sequentially increased to a maximum diameter of 3.5mm to overdrill the osseous tract both in depth and circumference. With each drilling of the calcaneus, the bone was removed from the flutes and sent to pathology for culture and analysis. On gross appearance the bone was of healthy appearance and texture without signs of infection or evidence of a foreign body; however, on histology the drill tract was packed with devitalized bone matrix. The postoperative recovery was uneventful apart from mild superficial discharge of the wound, which resolved with a short course of local wound care. There was complete resolution of his pain and he was able to perform all the physical requirements of his Army soldier, deploying overseas 9 months post operatively. Now 18 months status post surgery, he successfully completed his deployment and continues to remain pain free.

REFERENCES