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Research Article

Lytic Lesion of the Cuboid in a 9-Year-Old; A Radiographic Diagnostic Clue

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Abstract

A 9 year old boy presented with a puncture wound on the plantar aspect of his right foot. He had stood on a nail in his garden, puncturing his shoe and foot. The nail had been removed prior to attending. Plain radiograph of the right foot demonstrated a cuboid fracture with a retained metallic foreign body. The wound was cleaned; he was given a tetanus booster and discharged on oral antibiotics for a fracture clinic follow up. The patient was reviewed in clinic with 2 more weeks of oral antibiotics. At a 6 weeks follow-up clinic, he struggled to weight bear due to pain along the lateral border of his right foot. Radiograph revealed a healed cuboid with a retained foreign body. Patient subsequently had an MRI and Brodie's abscess was suspected. He underwent surgical exploration of the wound, removal of the foreign body and drainage of the cavity.

This is a rare clinical scenario not frequently encountered in practice. Foot injuries are quite common reason for A and E attendances, and the presence of a foreign body should alert the treating physician to carefully decide the management plan, which might involve early orthopaedic referral. Patient should have regular follow up and surgical intervention must be taken if there are any evidence of Brodie's abscess.

Keywords: Brodie's Abscess; Foreign Body; Osteomyelitis; Debridement; Cuboid

Introduction

A 9-year-old boy presented to A and E with a puncture wound to the lateral plantar aspect of his right foot. He had jumped on a rusty nail in his garden, with it puncturing his shoe and foot. The nail had been removed prior to attending hospital and bleeding of wound site had stopped by the time of presentation. He had no significant medical or surgical history. The patient was unable to weight bear on his right foot. On examination there was a clean 5 mm laceration to the plantar aspect of the foot with no active bleeding. Dorsalis pedis and posterior tibial pulses were present, and the sensation and motor function of the foot was intact. The radiographs at presentation showed a retained metallic foreign body within the body of cuboid with an associated fracture of cuboid.

The patient was treated with tetanus booster of Revaxis 0.5 ml IM, and oral co-amoxiclav 250/62 mg suspension 5 ml TDS for one week and discharged for early fracture clinic follow up. The plan was to complete the oral antibiotics, non-weight bearing for 4-6 weeks, and further fracture clinic follow up in two weeks with X-ray on arrival. Unfortunately, the patient was not seen for four weeks, and had been struggling with pain. The radiograph at this fracture clinic follow up demonstrated that the bone had healed with the foreign body retained in the plantar aspect of the cuboid, and a well circumscribed lytic cavity within the bone walling off the retained foreign body.

Differentials as follow:

- Brodie abscess
- Open Fracture
- Osteoid Osteoma
- Non-ossifying fibroma

Materials and Methods

Listed below are the investigations carried out.

White cell count was 17.2, neutrophils 12.4, haemoglobin 136 and CRP < 5.

Plain radiograph of the right foot demonstrated a cuboid fracture with a 3 mm metallic foreign body retained in the bone (Figure 1).

Figure 1: AP Plain Radiograph of The Foot showing metal gragments within a well-defined cavitary osteolytic lesion.

Repeat radiograph at four weeks demonstrated a healed cuboid with retained foreign body and Brodie abscess.

MRI of the right foot (Figure 2, Figure 3).

Figure 2: MRI T1 Stir long axis showing the freagement with a thin layer of grandulation tissues lining the cavity.

Figure 3: MRI T1 Stir Sagittal.

Pus swabs from the abscess sent for culture and sensitivity (Figure 4, Figure 5).

Figure 4: Intraoperative image of the abscess site.

Figure 5: Successful removal of metal fragments.

The patient was admitted to hospital for exploration of the wound, removal of the foreign body and drainage of the Brodie abscess. Based on the history, imaging and clinical findings we found that the tract was plantar. The best way to access the cavity was decided to be plantar approach. On excising the entry tract part of the shoe retained within the soft tissue was excised with the tract. Two small metallic foreign bodies were retained within the bone we retrieved by opening the cavity and draining it. A large cavity was washed out and left in the cuboid. The pus swabs were sent for culture and sensitivity. The cavity was packed with Sorbsan and the wound edges were approximated with a single prolene suture. The patient was managed with elevation of the right foot and 48 hours of IV Clindamycin.

Results and Discussion

Pus swabs were positive for a moderate growth of Bacillus species and sensitive to Clindamycin. Patient was reviewed 1 week post operatively in the fracture clinic and was recovering well with no post-operative complications.

Brodie's abscess was first reported by Sir Benjamin Brodie in 1836 as a case of localized abscess in the tibia. It is a subacute osteomyelitis resulting in a localized purulent collection within a sclerotic wall. Brodie's abscess usually affects long bones such as humerus [1], radius [2], femur [3] but rarely quadrangular small bones such as cuboid. Non-specific symptoms such as pain lasting for several months and difficulty weight bearing are often experienced before the initial consultation with a physician. However, in our case there is a clear history of penetrating injury and patient became symptomatic on follow-up. Blood laboratory values are often normal and with no other characteristic signs, this makes Brodie's abscess a difficult differential. The diagnosis is based on clinical suspicion and aided by radiological investigations such as X-ray and MRI. The 'Penumbra sign' [4] shown on MRI can be useful in diagnosing Brodie's abscess over the other possible benign or malignant differentials such as osteoid osteoma. This sign is not pathognomonic but has a sensitivity of ~75% and specificity of ~90% in the diagnosis of Brodie's abscess [5].

There are three published cases of Brodie's abscess of Cuboid bone in the literature [6-8], two of which were due to penetrating trauma from a thorn prick and iron nail. However, there are no reports of retained foreign body in the bone unlike this case. All three cases presented with similar symptoms: chronic pain lasting for at least 3 months between presentation, progressive swelling and difficulty weight bearing. The demographics of these cases were of a young population, aged 10, 14 and 28. Surgical debridement and post-operative antibiotics were the choice of treatment for all three cases and resulted in full recovery.

Based on the available literature, Brodie's abscess to the cuboid bone is a rare presentation. Penetrating injuries to the foot is often a causative factor but hematogenous spread is possible as well. Patients with prolonged pain and complications will require surgical management. Clinicians should consider early aggressive surgical debridement in patients presenting with penetrating foot injuries with or without retained foreign body to prevent chronic disabilities to their daily living.

Conclusion

- Foreign body in the foot warrants careful assessment and decision making.
- MRI may be useful for differentiating subacute osteomy elitis and another non-infective lytic lesion.
- Brodie's abscess should be a differential for foot injuries with retained foreign bodies in bone.
- Surgical management is indicated for Brodies' abscess.
- This case report highlights a rare presentation of Bro die's abscess in cuboid and fourth such presentation in literature to the best of our knowledge.

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Conflict of Interest

None.

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