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Case Reports and Series

A Case Report of Heel Pain Mimicking Plantar Fasciitis and Osteosarcoma: A Unique Presentation of a Nora's Lesion

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ABSTRACT

Bizarre parosteal osteochondromatous proliferation, otherwise known as "Nora's lesion," is a rare benign neoplasm first described by Nora in 1983. The exact etiology of this neoplasm remains unknown, and its presentation in the lower extremity presents a diagnostic challenge, as both clinical and radiologic features cannot fully differentiate it from other neoplasms. We present the case of a 48-year-old female with plantar heel pain secondary to Nora's lesion mimicking plantar fasciitis and periosteal osteosarcoma. Following bone biopsy for histopathologic analysis, the patient's symptoms spontaneously resolved, and she returned to activity with complete resolution of symptoms 18 months post biopsy. Bizarre parosteal osteochondromatous proliferation as an etiology for plantar heel pain has not been previously described in the literature. Although rare, it should be considered in the differential diagnosis for patients presenting with plantar heel pain, especially after failed conservative treatment. Following diagnostic confirmation by histopathology, complete surgical excision is the treatment of choice.

Bizarre parosteal osteochondromatous proliferation (BPOP), otherwise known as "Nora's lesion," is a rare benign neoplasm first described by Nora et al (1) in 1983. The lesion is characterized by an exophytic outgrowth classically affecting the metacarpals, metatarsals, and phalanges, with a predominance of 4:1 in the hand (2). Though uncommon, BPOP has demonstrated a propensity for recurrence as high as 55% (2), and a case report documenting malignancy in association with BPOP has been reported in the literature (3). The lesion's rapid growth, aggressive features on imaging studies, and histopathologic confusion can all lead to misdiagnosis and inappropriate treatment. Plantar fasciitis (PF) is the most common cause of plantar heel pain, with approximately 2 million people seeking treatment in the United States each year (4). We present the unique case of a 48-year-old female with a BPOP and plantar heel pain mimicking PF and periosteal osteosarcoma.

Case Report

A 48-year-old female with no significant medical history was referred to our office by her primary care physician in March 2015 with a sharp, stabbing pain in her right foot while walking and a dull ache while seated. The patient related a history of swelling to the right foot during the last month but denied any history of trauma. Her primary care physician had prescribed nonsteroidal anti-inflammatory drugs, supportive shoe wear, and stretching, all which had failed to alleviate her symptoms. The pain had steadily increased in severity, graded as 8 out of 10 at the time of initial evaluation.

Physical examination revealed diffuse swelling to the plantar aspect of the right calcaneal tuberosity near the origin of the plantar fascia. Tenderness was present during palpation of the plantar calcaneal tuberosity and was noted to be more central than medial. Compression of the heel medially and laterally with the palms (calcaneal squeeze test) also elicited tenderness, although less

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Fig. 1. Lateral radiograph showing cortical thickening of the plantar central calcaneus, possibly representing a plantar heel spur, neoplasm of the bone, or stress fracture.

Fig. 3. Repeat lateral radiograph showing increased cortical thickening and new periosteal reaction of the plantar central calcaneus.

than during direct palpation of the tuber. Active dorsiflexion of the great toe elicited pain plantarly at the calcaneus (windless test), with no limitation in the range of motion. Strength to all muscle groups of the foot and ankle was 5 of 5, and the results of the neurovascular examination were normal, without numbness or paresthesia. Conventional radiographs revealed cortical thickening of the plantar central calcaneus, possibly representing a plantar heel spur, neoplasm of the bone, or stress fracture (Fig. 1). A magnetic resonance imaging (MRI) study was ordered (T_1-weighted, short tau inversion recovery, proton density with fat saturation), and a controlled ankle motion boot was applied to the right lower extremity. The patient was instructed to perform Achilles tendon- and PF-specific stretching exercises with rest, ice, and protected weightbearing.

One month later, the patient returned. The MRI scan revealed moderate ill-defined edema within the mid-portion of the calcaneal body extending plantarly, with a 14-mm nodule in the soft tissues. Mild surrounding soft tissue edema with minimal tenosynovitis of the posterior tibial tendon was also noted (Fig. 2). Repeat radiographs revealed increased cortical thickening of the plantar central calcaneus compared to prior radiographic imaging (1 month earlier), with new periosteal reaction that appeared reactive rather than lytic (Fig. 3). Clinically, no improvement was observed, and increasing pain was reported, graded as 9 out of 10. Following an imaging review by an independent panel of radiologists, the possibility of osteosarcoma was expressed, and a stat order for computed tomography (CT) imaging of the right foot and ankle was obtained.

The CT imaging obtained of the right foot and ankle revealed a 16 × 15 × 6-mm, well-circumscribed osseous lesion extending from the plantar cortical surface of the mid-calcaneal body, with adjacent smooth cortical thickening (Fig. 4). These findings correlated with the growth of the lesion radiographically on prior imaging studies (March 17, 2015, April 13, 2015) and the surrounding marrow edema on the MRI scan (March 20, 2015) were concerning to the musculoskeletal radiologist interpreting the imaging. The differential diagnosis at this time included periosteal osteosarcoma, BPOP, and enthesopathic changes due to biomechanics or spondyloarthropathy. Because of our concern for the possibility of periosteal osteosarcoma, the patient was referred to an orthopedic oncologist for further evaluation and a bone biopsy.

CT-guided bone biopsy of the lesion performed at the University of Miami Health System (May 21, 2015) confirmed the diagnosis of BPOP (Fig. 5). During the first follow-up appointment post biopsy (July 30, 2015), the patient bizarrely reported complete resolution of her symptomatology and refused further surgical excision. Tenderness was no longer detected on palpation of the plantar calcaneal tuber, with the calcaneal squeeze test, or with the windless test. The patient was transitioned from controlled ankle motion boot-assisted ambulation to full weightbearing without assistive devices or restrictions. At 18 months post biopsy, the patient remained asymptomatic and had resumed all previous activities without limitation or pain.

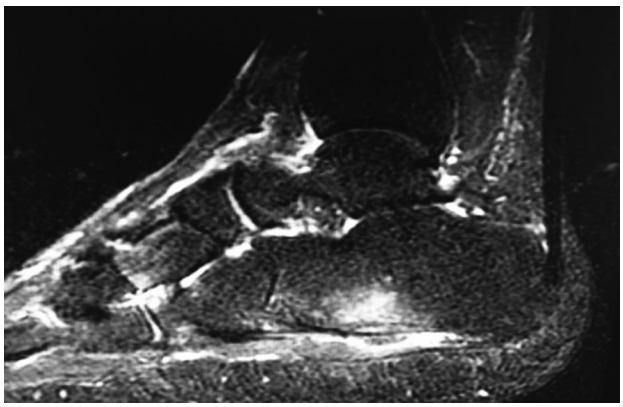

Fig. 2. Short tau inversion recovery magnetic resonance image demonstrating moderate ill-defined edema within the mid-portion of the calcaneal body extending plantarly, with a 14-mm nodule in the soft tissues.

Discussion

BPOP as a possible cause of plantar heel pain has not been previously reported in the literature. The purpose of this case presentation is to highlight BPOP as a potential etiology for plantar heel pain and the diagnostic dilemma associated with the lesion's presentation. BPOP is rare and <200 documented cases exist in the literature. Most presentations affect the metacarpals, metatarsals, and phalanges of adults in their 20s and 30s; hence, clinical suspicion in the calcaneus is low (5). To the best of our knowledge, this case report is unique, the first to document BPOP presenting clinically and radiographically as PF and periosteal osteosarcoma. Documented cases of BPOP have historically