A Nonsurgical Approach to Painful Piezogenic Pedal Papules

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For more than 3 decades, piezogenic pedal papules have been described in the literature. While many individuals with these papules are asymptomatic, patients with trauma or connective tissue diseases can experience pain. In our case study, we describe a unique, nonsurgical approach that abates the pain of painful piezogenic pedal papule (PPPP). Three injections of a solution of equal parts betamethasone (Celestone®) and bupivacaine (Marcaine®) were curative in a male patient with Ehlers-Danlos syndrome type III with PPPP. In addition, combination steroid/anesthetic injection provides another method of treatment in the management of PPPP.

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Piezogenic pedal papules, often seen as a normal variant in dermatology, have been described in the medical literature since 1968.[1,2] These papules, which have a prevalence ranging from 2.4% to 100%, are thought to represent herniations of adipose tissue through the plantar fascia retinaculum.[3,4] Although usually asymptomatic, repeated trauma or a preexisting collagen defect such as Ehlers-Danlos syndrome can be associated with symptoms of pain.[5] The etiology of the pain has been postulated as secondary to herniation of associated nerves and blood vessels with the adipose tissue.[1,2,4-7]

In the past, a variety of methodologies have been used to resolve this dermatologic and orthopedic pathology. Compression stockings and orthotic-based interventions, as well as electroacupuncture, have been used with variable success.[3,4,8,9] Our case study highlights another method of intervention that is of particular relevance in patients with painful piezogenic pedal papules (PPPPs). Our method offers another possible noninvasive intervention for what can be an extremely uncomfortable pathology. Although many people with these papules are asymptomatic, our case study and comments are relevant to the subpopulation who have these dermatologic signs concurrent with pain.

Case Report

A 40-year-old man with a known diagnosis of Ehlers-Danlos syndrome (hypermobile type or type III in the former nosology) presented with intractable pain from the medial aspect of his left heel 8 hours after spending an hour standing and walking on a concrete driveway wearing moccasins without orthotics. (He usually wore orthotics in his athletic shoes.) The pain was characterized as severe, lancinating, and focal. He sought the advice of a general orthopedic surgeon who diagnosed plantar fasciitis. The surgeon prescribed physical therapy (first, stretching, and later, taping of the heel), ibuprofen, and iontophoresis, and finally, night splints.

After 2 months of therapy and no resolution, the patient, who noted that direct compression alleviated the pain, sought the advice of a physiatrist. Findings from the physical examination revealed an external defect in the form of an external bulge, measuring 5×5 mm on the medial aspect of his left heel (Figure). The patient related that this defect had been noted 16 years earlier, when Ehlers-Danlos syndrome type III had been diagnosed. He was asymptomatic at the time.

The physiatrist decreased the patient's current pain by applying pressure on the defect. Furthermore, the physiatrist believed this defect was caused by a herniation of the plantar fat pad. While results of magnetic resonance imaging were nondiagnostic, a dynamic ultrasound (with weight bearing) showed a moveable 2- to 3-mm mass, corresponding to the location of the defect, which herniated toward the skin with increased plantar pressure. A temporizing remedy was to build up the patient's orthotic so as to

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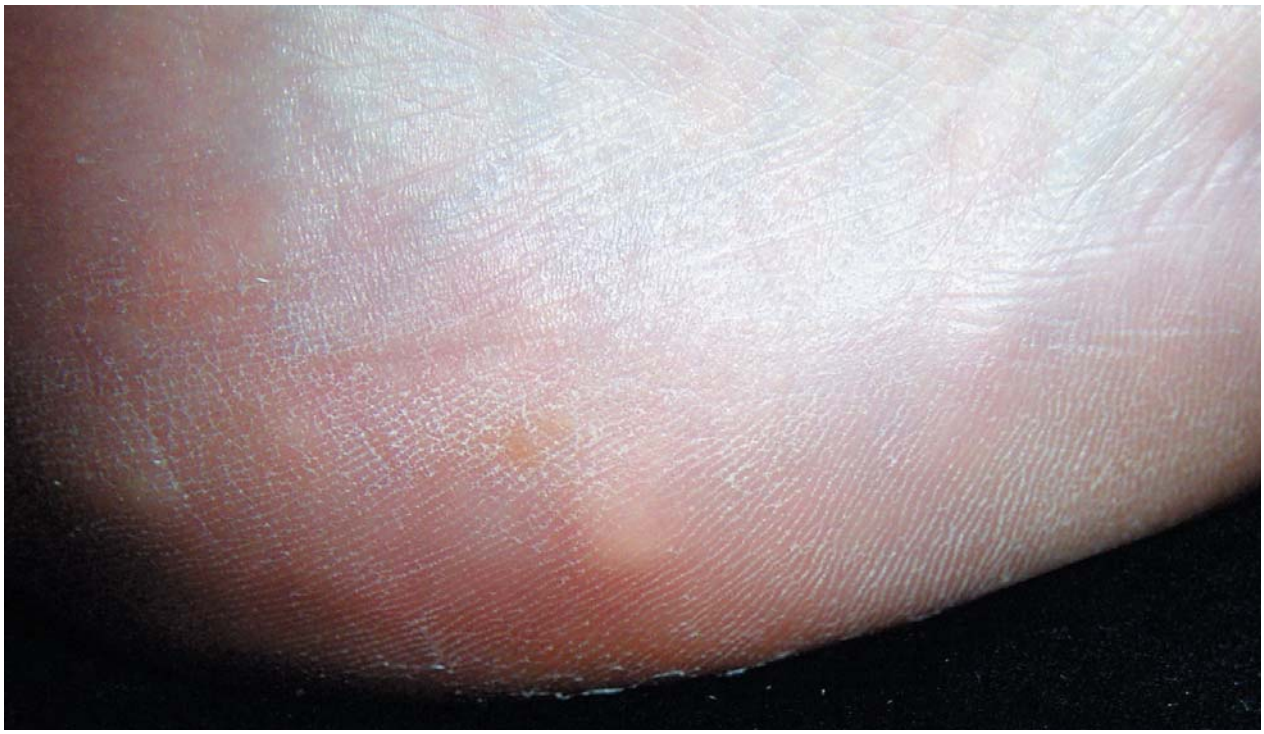

Blanching caused by a 5×5-mm painful piezogenic pedal papule on the medial aspect of the left heel.

apply pressure on the papule, which resulted in reduction of the herniation and some reduction in pain.

The patient then sought the counsel of another orthopedic surgeon subspecializing in foot and ankle surgery, who offered possible surgical correction of the defect. The patient requested an intermediate course of treatment, to which the surgeon agreed. This treatment consisted of injecting the herniation with equal parts of betamethasone and bupivacaine (a total of 1–2 cc per injection) to reduce the inflammation at the site. The risks (eg, infection, fat atrophy) and benefits of the intervention were discussed, and the patient consented. The first injection resulted in an immediate 50% reduction of pain. Two months later, a second injection reduced symptoms further to 20% of the original discomfort. A third injection 3 months later succeeded in eliminating the pain entirely. After completion of the 3-injection treatment, the external defect is still present, but the patient has been asymptomatic for 5 years.

Comment

The relevance of this case study's intervention is evident in patients with symptomatic PPPPs. It has been noted that patients with Ehlers-Danlos syndrome have PPPPs and concurrent tissue friability, making any surgical intervention problematic[5]; this intervention provides a new method of treatment. A nonsurgical intervention that will not cause new scar formation is preferred. The ability of a sequence of steroid injections to provide symptom relief makes this therapeutic approach potentially more desirable. It may be superior to surgery or repeated electroacupuncture sessions, with their needed regular maintenance therapy, because both treatments have had variable success in relieving pain. In our case study, symptoms of pain were eliminated following treatment with the series of injections; however, the defect in the plantar fascia remained and was presumably unaltered. Resolution of symptoms using an injection of local anesthetic and an anti-inflammatory medication adds weight to the hypothesis that pain associated with piezogenic pedal papules is caused by the involvement of cutaneous nerve end organs accompanying the herniated adipose tissue.

This case study allows for another intrusive but nonsurgical option in the treatment of PPPPs that falls into 3 broad categories. First, after a true PPPP is diagnosed by clinical examination, and, if need be, by dynamic ultrasound, the physician should first consider those modalities that will exert positive pressure to the papule to see if the pain is ameliorated. The restrictive solutions of taping, compression stockings, firm plastic heel cups, and padded

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orthotics are the first line of therapy to achieve symptomatic relief. Second, intrusive solutions (ie, use of a method that requires physician intervention entering the skin) should be used when the restrictive solutions fail to provide relief, or if they do not adequately allow function, taking into consideration the patient's occupation or physical activities. These intrusive solutions may include a trial of intervention of the proposed steroid injection used in this case study or electroacupuncture. Finally, only in the most extreme and recalcitrant circumstances of pain would a punch biopsy or limited surgical approach be considered,[3] as the friability of the tissue in a patient with Ehlers-Danlos syndrome may prove problematic in the formation of adequate healing at the site. Such an intervention warrants a careful discussion with the patient of the risks and benefits and a thorough informed consent.

Conclusion

Our study offers a new innovative method for treating the dermatologic signs of Ehlers-Danlos syndrome, which can be quite painful. The intervention proposed is safe, readily available using stock office medicines, and cost-effective, as it does not require weeks or months of repeated treatments. It is hoped that this method of treatment will be helpful for that segment of the population who unfortunately are symptomatic with PPPPs.

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