

# How Would You Diagnose These Nodules on an Older Woman's Feet?

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A 63-year-old woman presented for evaluation of painless nodules on her feet. With questioning, she was also found to have similar lesions on one of her palms.

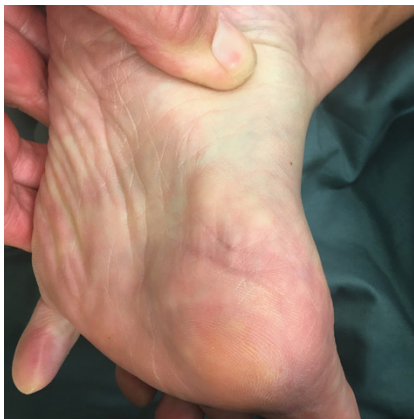
A physical examination revealed well-circumscribed subcutaneous nodules on the bilateral insteps (**Figure**) and right palm that appeared to be attached to the underlying tendon of the bilateral soles and palmar aspect of the 4th digit. They have been present for at least 3 years and have been slowly growing.

## What is the most likely diagnosis?

- A. Neuromas
- B. Ganglion cysts
- C. Plantar fasciitis
- D. Plantar fibromatoses
- E. Piezogenic pedal papules

## Correct answer: C. Plantar fibromatoses

Plantar fibromatoses (formerly Ledderhose disease) is a condition triggered by fibrous proliferation with subsequent nodule formation of the plantar aponeu-



**Figure.**

The patient's presentation of subcutaneous nodules and their location on the plantar aspects of the feet suggests this diagnosis. Sometimes these nodules can be tender and painful. This diagnosis is generally made based on physical examination alone, without the need for biopsy.

The differential diagnosis for this patient included neuromas, ganglion cysts, plantar fasciitis, and piezogenic pedal papules. Neuromas are cutaneous, benign hyperplastic growths of neural tissue

(Schwann cells and axons) underlying the epidermis that can occur in most parts of the body and can sometimes be associated with trauma (traumatic neuromas). However, traumatic neuromas are generally extremely painful, and asymptomatic palisading encapsulated neuromas tend to be localized on the face.

Ganglion cysts are benign, mobile, mucin-filled tumors that arise from the tendon sheath or joint space, most commonly located on the dorsum of the wrist or foot. These are generally fixed to the underlying tissue. They usually present as solitary nodules rather than multiple nodules.<sup>2</sup> However, our patient presented with multiple nodules that were not associated with a joint space, making a diagnosis of ganglion cysts less likely.

Piezogenic pedal papules are benign soft lesions that occur because of herniation of subcutaneous fat tissue through the dermis. These are generally located on the medial aspect of the foot and heel and are generally asymptomatic, but they occasionally can be painful.<sup>3</sup>

Plantar fasciitis presents with inflammation of the connective tissue in the instep. This is generally painful and tender. Rather than distinct nodules, it presents as a thickening of the whole fascia.<sup>4</sup>

Plantar fibromatosis is a benign disorder that results in the formation of firm nodules in the setting of fibrous tissue overgrowth. It is more common in middle-aged adults, but cases have been reported in children as well.<sup>1</sup> Men are more commonly affected than women. It often occurs in association with hyperproliferative fibromatosis of other appendages, like Dupuytren contracture of the hands. Patients present with a slow-growing

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lump generally localized to the medial longitudinal arch of the foot. While initially painless, these lesions can become tender with time as they grow and impinge on local structures, thus affecting daily activities and having a negative impact on patients' quality of life. Specifically, the presence of a well-defined nodule(s) along the plantar fascia supports a diagnosis of plantar fibromatosis. There are 3 phases to the disease: a proliferative phase in which there is increased activity of fibroblasts, an active phase in which the nodule is formed, and the residual phase that results in collagen and scar formation where the tissue contracts. Imaging, including ultrasonography scanning and magnetic resonance imaging, generally shows focal, lobulated lesions in the plantar fascia.<sup>1</sup>

Management of plantar fibromatosis includes steroid injections to shrink the nodule(s) and decrease pain; verapamil, which inhibits collagen function and is anti-inflammatory; surgical intervention; or radiation therapy to reduce the proliferation of these cells.<sup>1</sup> Generally, surgical management is reserved for when these nodules severely affect functioning. Our patient opted for surgery and was referred to an orthopedist for follow up.

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