

# A Center's Callosities

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*We present a case report of a 14-year-old white male who developed hyperkeratotic plaques on the distal aspects of 2 toes. He was referred by his primary care physician for the treatment of onychomycosis. With questioning, the patient stated that he played center for his high school basketball team. After physical examination, he was diagnosed with callosities caused by his basketball activities. Proper nail hygiene and wearing of larger footwear resulted in improvement of his callosities. Sports-related cutaneous injuries should be included in the differential diagnosis of nail and toe abnormalities.*

**A**thletes are prone to develop many skin disorders. There have been multiple reports of toenail disorders in runners<sup>1,2</sup>; dancers<sup>3</sup>; gymnasts<sup>4</sup>; and tennis<sup>4,9</sup>, football<sup>2,10</sup>, and soccer players.<sup>2,10</sup> While one article suggested that basketball participants were at increased risk for toenail problems, no case report exists in the literature describing specific nail changes in basketball players.

## Case Report

A 14-year-old white male presented with 2 keratotic plaques on both distal second toenails. These plaques had been present for approximately one year. He also complained of discoloration of those 2 nails. His primary care physician believed that he had onychomycosis and referred him for treatment. His past medical history was significant only for tinea pedis, and he was on no medications. There was no family history of a similar eruption.

On physical examination, the patient had thick, scaling, flesh-colored plaques extending from his hyponychium to the distal portions of his second toes (Figure 1). Interestingly, his second toes were the longest and extended nearly 0.5 cm more than the



**FIGURE 1.** Two well-defined, 1-cm, thick, scaling plaques extended from the hyponychium to the distal portions of both second toes. Note that the second toes are the longest of all toes.

next most distal digit. Additionally, the distal aspects of both nail plates revealed multiple splinter hemorrhages (Figure 2). There was no subungual hyperkeratosis or yellow discoloration of the nail plate. There was no evidence of tinea pedis.

On further inquiry, the patient admitted that these plaques began soon after he started playing center for his high school basketball team. A diagnosis of trauma-induced callosities was made. He was instructed to obtain larger shoes. The scaling plaques reduced and nearly cleared after his basketball season ended.

## Comment

Although many athletes in various sports have developed nail disorders, this patient, to the best of our knowledge, represents the first case of callosities in a basketball player. All sports-related nail abnormalities are the result of trauma to the nail plate, bed, and matrix during vigorous athletic activity.<sup>1-10</sup> The diverse motions of athletes during competition leads to variable disease presentation. Jogger's toe typically occurs on the lateral aspects of the third, fourth, and fifth toes. Constant slamming of these toes can lead to erythema, subungual hemorrhage, pain, and onycholysis.<sup>1</sup> Vesicles and bullae also may occur

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**FIGURE 2.** On closer inspection, multiple splinter hemorrhages are seen on the distal portions of his nail plate.

periungually.<sup>2</sup> Proper fitting shoes are of paramount importance as ill-fitting footwear may exacerbate trauma to these nails.<sup>1,2</sup> Onychomycosis also should be considered in the differential diagnosis of nail changes in a runner; however, tinea unguium most often presents with subungual hyperkeratosis and yellow discoloration.

Soccer players' nails can experience a great deal of force during the act of kicking the ball and the playing surface. These pressures may cause onycholysis or frank nail avulsions.<sup>2</sup> The nail plate, when extending beyond the hyponychium, bears the brunt of soccer kicks. This force can damage the nail matrix leading to transverse ridging.<sup>10</sup> In football players, onychoptosis defluxion or complete nail shedding can occur.<sup>10</sup> Multiple nail disorders also have been noted in dancers including onychogryphosis (ingrown nails), distal toe callosities, and subungual exostosis.<sup>3</sup> One author reported a gymnast who received trauma to her hallucal nail who developed a periungual *Staphylococcus aureus* infection with subsequent osteomyelitis that required nail avulsion and intravenous antibiotics.<sup>4</sup>

One of the most documented sports-related nail abnormalities is tennis toe.<sup>4,9</sup> This condition likely represents subungual hemorrhage and most commonly affects the hallucal nail. Hard stops after quick accelerations on the tennis court cause a player's most distal digit to collide with the end of the sneaker.

Gibbs<sup>7</sup> suggested that the strong force generated compresses the subungual space thereby rupturing capillaries leading to hemorrhage. In addition, myxoid cysts, although not caused directly by playing tennis, have been reported as a nail abnormality impeding tennis play.<sup>4</sup>

Rzonca and Lupo<sup>2</sup> describe that basketball players are at increased risk for developing nail disorders. Like tennis players, basketball players' toes experience many forces as the result of abrupt stops coupled with short bursts of speed. Because the shoe soles do not freely slide on most basketball surfaces, the toes are constantly squeezed into the sneakers' front edge.<sup>2</sup> Our case illustrates their observation. Our patient not only demonstrated the subungual hemorrhages possible in athletes but also revealed that chronic pounding of the most distal digit can result in callosities. To avoid developing nail abnormalities, athletes must ensure that they utilize properly fitted footwear. Furthermore, careful nail hygiene will ameliorate abnormal forces placed on the nail. Finally, any orthotic device that prevents the foot from freely moving forward within the sneaker should be investigated.

## REFERENCES

1. Scher RK. Jogger's toe. *Int Soc Trop Dermatol.* 1978;17:719-720.
2. Rzonca EC, Lupo PJ. Pedal nail pathology: biomechanical implications. *Clin Podiatr Med Surg.* 1989;6:327-337.
3. Howse J. Disorders of the great toe in dancers. *Clin Sports Med.* 1983;2:499-505.
4. Eisele SA. Conditions of the toenails. *Ortho Clin North Am.* 1994;25:183-188.
5. Roth HV. "Tennis Toe" [letter]. *J Am Podiatr Assoc.* 1973;63:76.
6. Gibbs RC. "Tennis Toe" [letter]. *Arch Dermatol.* 1973;107:918.
7. Gibbs RC. Tennis toe [letter]. *JAMA.* 1974;228:24.
8. Hutchinson MR, Laprade RF, Burnett QM, et al. Injury surveillance at the USTA boys' tennis championships: a 6-yr study. *Med Sci Sports Exerc.* 1995;27:826-830.
9. Basler RSW, Garcia MA. Acing common skin problems in tennis players. *Phys Sports Med.* 1998;26:37-44.
10. Mortimer PS, Dawber RPR. Trauma of the nail unit including occupational sports injuries. *Dermatol Clin.* 1985;3:415-420.