

Onychogryphosis in Elderly Persons: An Indicator of Long-standing Poor Nursing Care? Report of One Case and Review of the Literature

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A 92-year-old immobilized white woman under the daily nursing care of a private ambulatory nursing service displayed acquired deformities of the toenails resembling a ram's horn. In light of a rapidly growing elderly population, this case report illustrates the need for close monitoring of the quality of care that nursing services provide to older persons. In addition, it reviews the clinical aspects of onychogryphosis, as well as its pathomechanisms and treatment options.

Onychogryphosis is usually an acquired disorder of nail plate growth that is often encountered in toenails of elderly or infirm patients. Clinical features include an increase in nail plate length, hypertrophy with massive thickening, and growth in a coiled fashion that often resembles a ram's horn.¹ Among the various causes of this disorder, neglect by professional nursing services is a factor that must be considered.

Case Report

We report on an immobilized elderly woman who lived alone in her apartment. While under guardianship, she was provided with daily nursing care by a private ambulatory nursing service. Desperate faint cries from the woman alerted neighbors who found

her in a confused state lying undressed in her bed, soiled with excrement. Obviously, several days had passed since the nurse had last visited, and the last complete nail cutting appeared to have occurred about 2 years previously.

After admission to our hospital, clinical examination revealed a dehydrated, underweight 92-year-old woman (body mass index, 14.73 kg/m²) who was disoriented with respect to time and location. Further inspection revealed grossly thickened, elongated toenails, partly spiraled like a ram's horn, associated with bilateral hallux valgus (Figures 1 and 2). On the dorsal surface of the left second toe we found an ulcer caused by the penetrating distal nail plate of the left great toe. Wound swab cultures taken from the ulcer confirmed the colonization with *Corynebacterium* species. The findings from potassium hydroxide testing of scales of the feet and toenail debris were positive. Likewise, cultures tested positive for *Trichophyton rubrum*. We also detected an erythematous macule measuring 10 cm in diameter on the sacral region, representing a grade I pressure ulcer. Additional diagnostic procedures (including x-ray screenings, Doppler ultrasonography of peripheral vessels, and broad laboratory tests), especially in regard to vascular and metabolic impairments, yielded no further results.

Treatment for exsiccation and underweight in the patient consisted of oral rehydration and application of a low molecular weight, fully reabsorbable elementary diet. Sterile saline dressings with repositioning were used to handle the pressure ulcer; topical antiseptics (gentian violet 1% solution) were used to treat the second left toe;

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Figure 1. Bilateral onychogryphosis. On the second left toe, note the ulcer due to the penetrating distal nail plate of the left great toe, hallux valgus deformity, onychomycosis, and extensive tinea pedum.



Figure 2. Onychogryphosis of the left foot with bizarre deviations in nail plate growth especially in digits 1 to 3. Note also nail plate architecture with masses of crumbly horny material.

and systemic antifungal agents (itraconazole 400 mg/d for 7 consecutive days every 4 weeks for 3 months) were administered for the onychomycosis. Topical antifungal agents (bifonazole 1% cream once daily for 14 days) were applied to treat the tinea pedum, and repeated use of surgical pincers repaired the hypertrophic nail deformities.

Comment

Onychogryphosis can occur rarely as a congenital disorder, inherited in an autosomal-dominant fashion affecting mostly all the nails of the hands

and feet, sometimes in association with other ectodermal malformations.²⁻⁴

Usually onychogryphosis is an acquired impairment of nail plate growth. It often affects the toenail and is characterized by an opaque, yellow-brownish nail plate that is distorted, grossly thickened, elongated, and partly curved like a ram's horn. According to Heller⁴ and Zaias,⁵ the nail matrix produces the nail plate at uneven rates. The direction and amount of curvature of the nail is determined by whether the lateral or medial side grows more rapidly.

Possible causes of onychogryphosis include continuous pressure and friction on the toenails due to improper footwear, extreme cutting of the nail plate, a single isolated trauma (eg, the toes being trampled by a horse), ichthyosis, psoriasis, syphilis, pemphigus, uricemia, fungal infection, impairment of the vascular and neuronal system, as well as self-neglect or the inability to cut nails due to immobility and/or failing eyesight, especially in older persons.^{3,4,6-8} Mazeration by hyperhidrosis and a hallux valgus deformity are thought to be promoting factors in inducing onychogryphosis.^{3,4,6}

The medical status of the patient determines the therapeutic procedure of choice. Conservative methods are preferred in the elderly population, particularly in cases with vascular impairment or hyperglycemia due to diabetes. In most of these cases, the repeated use of electric drills, burs, and surgical pincers will help to establish and maintain a reduction of nail plate thickness and length. Ordinary scissors can be used after topical pretreatment of the nail plate with chemical agents such as 40% urea or 50% potassium iodine under occlusion.³ For relapsing onychogryphosis in the presence of good vascular supply, removal of the thickened nail plate is indicated, followed by total matrix ablation.⁹ Permanent removal of the nail plate can be achieved by topical application of phenol, whereby removal of the matrix, proximal nail fold, or nail bed can be accomplished with a 10% solution of sodium hydroxide.^{10,11} Surgical excision of the matrix generally results in an eradication of nail-producing tissue. Depending on the location and size of the matrix, the nail bed also may have to be excised.¹² Nevertheless, removal of the nail plate can result in an impaired sense of touch in the toe region owing to a loss of abutment for acral mechanoreceptors and pressure receptors, which may elicit problems with standing and walking.

The size of the elderly population is rapidly growing. In the European Union, 110 million people out of 348 million are older than 50 years.¹³ In the United States, 12.7% of the population was older than 65 years as of 1992, compared with 4% in 1900.¹⁴ This case report illustrates the need for close

monitoring of the quality of care that nursing services provide to elderly patients. The presence of onychogryphosis in a person receiving nursing care should raise suspicion of neglect.

REFERENCES

1. Baker H. Diseases of the scalp, hair and nails. In: Baker H, ed, *Clinical Dermatology*. 4th ed. London, England: Baillière Tindall; 1989:194.
2. Lubach D. Erbliche onychogryphosis. *Hautarzt*. 1982;33:331-334.
3. Baran R, Dawber RPR. Physical signs. In: Baran R, Dawber RPR, eds. *Diseases of the Nails and Their Management*. 2nd ed. Oxford, England: Blackwell Scientific Publications; 1994:47-48.
4. Heller J. Die krankheiten der nägel. In: Jadassohn J, ed. *Handbuch der Haut- und Geschlechtskrankheiten*. Vol 13/2. Berlin, Germany: Springer; 1927:89-110.
5. Zaias N. *The Nail in Health and Disease*. 2nd ed. Norwalk, Conn: Appleton & Lange; 1990:164.
6. Samman PD. Nail deformities due to trauma. In: Samman PD, Fenton DA, eds. *The Nails in Disease*. 5th ed. Oxford, England: Butterworth-Heinemann; 1995:164.
7. Horvath G, Vlcek F. Uricemia and onychogryphosis. *Cesk Dermatol*. 1986;81:388-390.
8. Tanaka T, Sohba S, Tanida Y. Onychogryphosis considered to be due to tinea unguium. *Hifuka no Rinsho*. 1986; 28:1333-1337.
9. Dawber RPR, Baran R. Nail surgery. In: Samman PD, Fenton DA, eds. *The Nails in Disease*. 5th ed. Oxford, England: Butterworth-Heinemann; 1995:221.
10. Dagnall JC. The history, development and current status of nail matrix phenolisation. *Chiropodist*. 1981;36:315-324.
11. Brown FC. Chemocautery for ingrown toenails. *J Dermatol Surg Oncol*. 1981;7:331-334.
12. Baran R, Dawber RPR. Nail surgery and traumatic abnormalities. In: Baran R, Dawber RPR, eds. *Diseases of the Nails and Their Management*. 2nd ed. Oxford, England: Blackwell Scientific Publications; 1994:393-394.
13. Watson R. Making the most of aging populations. *BMJ*. 1995;310:554.
14. Rowe JW. Aging and geriatric medicine. In: Wyngaarden JB, Smith LH Jr, Bennett C, eds. *Cecil Textbook of Medicine*. 19th ed. Philadelphia, Pa: WB Saunders Co; 1992:21.