Nail Alterations From Musical Instruments: Insights for Dermatologists Treating Musicians

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PRACTICE **POINTS**

- Long-term practice and performance with a musical instrument predispose musicians to several skin conditions and nail disorders.
- Nail alterations in musicians include onychodystrophy, callosities of the fingertips, paronychia, distal onycholysis, lamellar onychoschizia, striations, subungual hemorrhage, and occupational Raynaud phenomenon.
- Nail lesions in musicians may be caused by localized pressure, friction-induced mechanical forces, allergic or irritant contact dermatitis, or infections.

Long-term practice and performance with a musical instrument predispose musicians to several skin conditions and nail disorders. We conducted a comprehensive literature search of the PubMed, Scopus, and Google Scholar databases for articles on nail alterations in musicians. Complications were divided into modifications of the nail surface and nail plate, soft-tissue abnormalities, and periungual tissue and distal pulp disorders. Health care professionals should be aware of these various modifications related to the use of musical instruments and provide preventive measures.

A variety of skin problems can occur in musicians due to the repetitive movements of playing instruments.[1,2] Musicians' nails are continuously exposed to the mechanical forces and chemical substances characteristic of their instruments.[3] Occupational nail alterations in musicians caused by repetitive physical trauma, allergic contact dermatitis, and/or infection may lead to disability and compromise their professional career.[3]

We conducted a systematic review of the literature on the clinical features of musical instrument–related nail alterations to optimize the management and prevention of these conditions.

Methods

We conducted a systematic review of PubMed, Scopus, and Google Scholar databases for eligible publications on instrument-related nail alterations in musicians using the search terms *musicians* with *nail, onychopathy*, and *Raynaud*. No time or language criteria were applied. Reviews, editorials, and articles not related to the topic were excluded. Bibliographies/reference lists were checked to find any additional relevant publications. Relevant articles in English and French were screened by 2 independent reviewers (A.G. and N.L.), and the following data were extracted for qualitative synthesis: sex, age, musical instrument, clinical features, number of years practicing the instrument, laboratory investigations, and disease course.

Results

The literature search yielded 11 publications. Sixteen additional articles were identified by other methods (ie, references, related publications). Overall, 3 full-text articles described general nail alterations but did not describe the clinical data, and 11 publications were editorials, commentaries, reviews, or not relevant. Thirteen contributions

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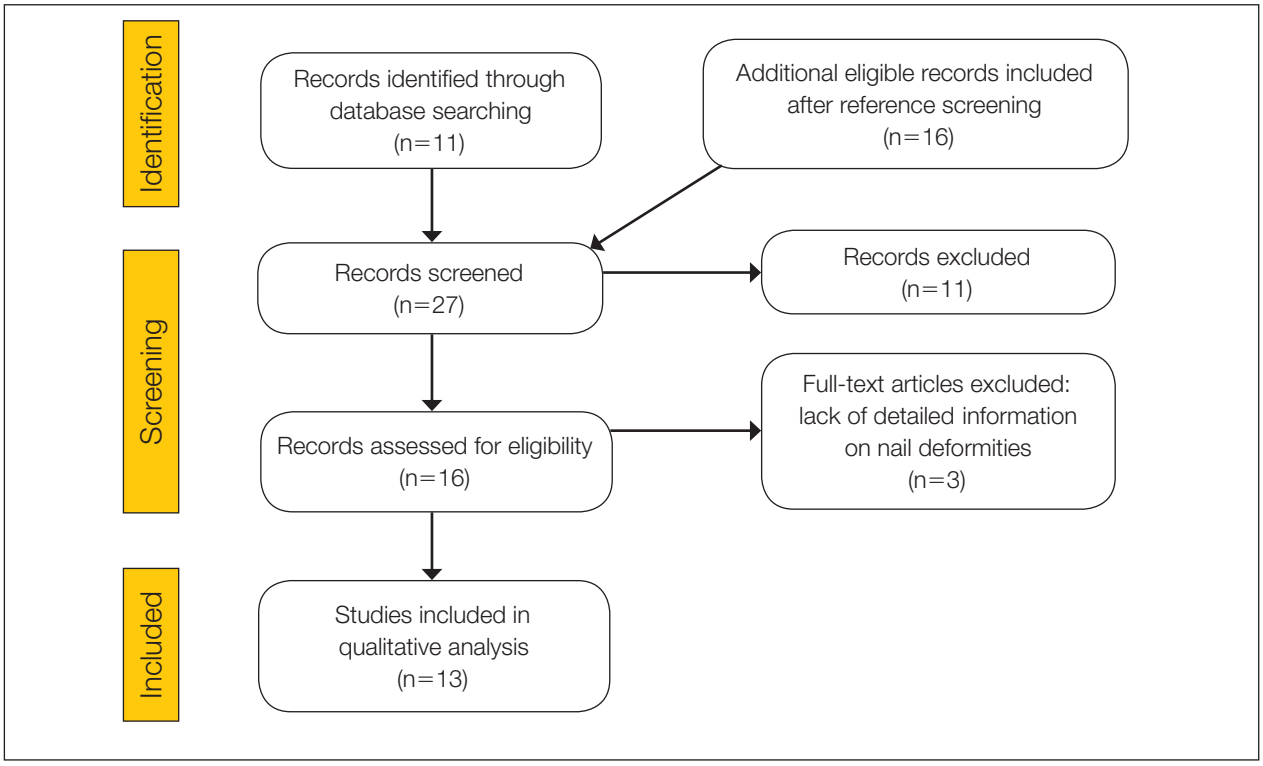

FIGURE 1. Flow diagram of studies included in a systematic review of the literature on instrument-related nail alterations in musicians.

fulfilled the inclusion criteria and were eligible for qualitative synthesis. The flow diagram illustrates the screening process (Figure 1).

Twenty-three patients were included. The instruments identified were divided into 2 groups: string instruments (ie, guitar, violin, harp) and percussion instruments (ie, drums, piano, slap bass). Nail alterations were clinically expressed as: (1) modifications of the nail surface; (2) nail bed, soft-tissue, and bone abnormalities; and (3) periungual tissue and distal pulp disorders. All cases are summarized in the Table.[4-16] Three articles described occupational Raynaud phenomenon.[12-14]

Comment

Modifications of the Nail Surface—Onychodystrophy, such as deformity or discoloration of the nail plate, was described in 6 patients among a cohort of 295 musicians and an additional 6 patients among 199 musicians with induced skin lesions. This condition was most common in string instrument players and pianists due to injury and irritation.[4,5]

One patient, who had been a professional violist for 27 years, presented with lamellar onychoschizia, which corresponds to a horizontal splitting of the nail toward its distal portion (Figure 2). The 3 fingernails of the dominant hand were involved with a *V*-shaped incision of the distal margin of the nail due to the repetitive friction of the nails with the strings.[6]

Striations of the nail plate were reported in a guitarist who played for 10 years.[7] Physical examination revealed linear transverse ridges alternating with depressions on the central aspect of the nail plate of the right thumbnail, as the patient was right-handed. This condition, attributed to sustained pressure on the string applied by the thumb, also has been called *habit tic deformity*.[7]

Nail Bed, Soft-Tissue, and Bone Lesions—Purpura (or hemorrhage) of the nail bed was associated with a percussion instrument (ie, piano) in 1 patient, affecting

FIGURE 2. Lamellar onychoschizia.

Nail Alterations in Musicians Due to Their Instrument

Reference	No. of patients	Age, y/sex	Musical instrument	Clinical features	No. of years practicing the instrument
Patruno et al[4] (2016)	6	N/A	N/A	Onychodystrophy (deformity, discoloration)	N/A
Baccouche et al[5] (2007)	6	N/A	N/A	Onychodystrophy	N/A
Piraccini et al[6] (2004)	1	40/F	Viola	V-shaped incision + lamellar onychoschizia + onycholysis	27
Wu[7] (2009)	1	29/M	Guitar	Linear ridges and depressions on the right thumbnail	10
Kluger[8] (2016)	1	Middle aged/F	Piano	Nail purpura	N/A
Alcántara-Nicolás et al[9] (2016)	1	40/M	Flamenco guitar	Allergic contact dermatitis, dystrophy, onycholysis, and paronychia	N/A
Baran and Tosti[10] (1993)	1	24/F	Guitar	Acro-osteolysis; nail tenderness: destructive changes to the distal phalangeal bones with associated nail dystrophy (onycholysis and/or pressure-induced tenderness) caused by mechanical stress on the affected fingers	N/A
Destouet and Murphy[11] (1981)	1	18/M	Guitar	Acro-osteolysis; nail bases were elevated with resultant loss of the normal nail angle	8
Jepsen and Simonsen[12] (2016)	1	67/M	Slap bass	Unilateral Raynaud phenomenon (third +/− second right fingers)	17
Sirufo et al[13] (2021)	1	19/M	Drums	Raynaud phenomenon; capillaroscopy: nonspecific pattern; dyshomogeneous capillary morphology, increased efferent/afferent loop ratio, enlarged capillaries, loss of alignment, and nonuniform distribution of capillaries	9
Sirufo et al[14] (2019)	1	30/M	Guitar	Unilateral Raynaud phenomenon (right-hand fingers); capillaroscopy: nonspecific pattern with lack of morphologic homogeneity, presence of enlarged capillaries, ectasia of the efferent tract of the loops, tortuous capillaries, local hemorrhages, and neoangiogenesis	20
Cohen[15] (2008)	1	6/F	Harp	Callosities (occasionally preceded by soreness and blisters) of the fingertips	N/A
De Vasconcelos[16]	1	60/M	Piano	Subungual keratoacanthoma: swelling, erythema and tenderness of the periungual area of the finger and hyperkeratosis of the lateral nailfold	50

Abbreviations: F, female; M, male; N/A, not available.

the second, third, and fourth fingernails of the right hand.[8] Especially when performing ascending glissando passages, the pianist applies pressure that may damage the finger and cause fingernail purpura. This condition improved after the patient stopping practicing glissandi.[8]

Three patients—2 guitarists and 1 violist—had onycholysis, defined by a loss of the attachment between the nail bed and the nail plate (Figure 3). It may result from repetitive trauma when strings are plucked.[6,9,10]

Acro-osteolysis associated with pain was reported in 2 guitarists.[10,11] This condition is defined as transverse lytic bands in the distal phalanges (Figure 4). Acro-osteolysis may be secondary to multiple causes, such as vinyl chloride exposure, connective tissue diseases, thermal injuries, neuropathic diseases, hyperparathyroidism, nutritional deficiencies, psoriasis, and biomechanical stress.[10] In musicians playing instruments, the mechanical stress to the guitar-playing fingers is the causative factor.[17]

Periungual Tissue and Distal Pulp Disorders—Paronychia is an important occupational hazard of harpists, violists, and pianists.[2] It represents an inflammatory condition involving the folds of tissue surrounding fingernails. Pizzicato paronychia is related to infection in the nail fold in string players and secondary to pizzicato playing, whereby the musician plucks the instrument strings with the nails and fingertips.[3]

Acrylates in artificial nails frequently are used among guitarists to strengthen their nails. A case of occupational allergic contact dermatitis induced by acrylic gel nails in a flamenco guitarist was described.[9] The patient developed dystrophy, onycholysis, and paronychia involving the nails of the right hand where acrylic materials were used, which resolved following the removal of the artificial nails. Patch tests were performed and were positive for 2-hydroxyethyl methacrylate, 2-hydroxyethyl acrylate, ethylene glycol dimethacrylate, and 2-hydroxypropyl methacrylate, supporting the diagnosis of allergic contact dermatitis to acrylates.[9] Therefore, musicians should be aware of the sensitizing potential of acrylates and adopt preventive measures.[9,18]

Unilateral Raynaud phenomenon of the dominant hand was noted in 3 cases of musicians who played string instruments due to the increased tendency to vasospasm in the digital capillaries from the direct transmission of vibrations of the strings (>100 Hz).[12-14] Consequently, the disruption of the digital blood circulation leads to an abnormal reaction to cold, which is called *vibration-induced white fingers* or *vasospastic white finger disease*.[19] In these 3 patients, capillaroscopy showed a nonspecific pattern with a lack of morphologic homogeneity of capillaries, the presence of enlarged capillaries, ectasia of the efferent tract of the loops, tortuous capillaries, local hemorrhages, and neoangiogenesis.[13,14]

FIGURE 3. Traumatic onycholysis.

FIGURE 4. Radiograph of the hand revealed acro-osteolysis with transverse lytic bands of the distal phalanges of the first, second, and third left fingers (arrows).

A middle-aged professional concert pianist presented with paronychia with hyperkeratosis of the lateral nail fold. Histopathology revealed a subungual keratoacanthoma eroding the distal phalanx tip, which was removed by surgical excision. The repeated fingertip trauma associated with pianistic activity was suspected to be the causative event.[16]

Callosities also are common on the fingertips of musicians, including 18.4% of patients in a cohort of 628 musicians, and involving fingers in 64.6% of these patients.[4] These callosities are explained by the chronic mechanical forces and characterize the way musicians grasp and hold their instruments. Callosities could be preceded by soreness and blisters of the fingertips in a harpist (harpist's finger).[1,15] Calluses were located on the lateral fourth fingertip of a drummer corresponding to the friction with the drumsticks (drummer's digit) and on the thumb of a bassoon player. Trumpet calluses generally overlie the proximal interphalangeal joint of the left index finger.[4]

Conclusion

Healthy nails are essential for playing a musical instrument. This review highlights the occurrence of fingertip callosities, paronychia, onycholysis, and subungual hemorrhages among musicians who play instruments. Additionally, the transmission of string-vibratory movements can produce microvascular damage and occupational Raynaud phenomenon in some musicians. These occupational nail disorders are underrecognized and may be underdiagnosed. Thus, musicians and clinicians must be aware of these alterations to adopt preventive measures and to provide adequate treatment.

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