Differential Diagnosis for Nail Psoriasis

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Contents

Key Features

- Several diseases can cause nail abnormalities similar to those in nail psoriasis. The most important differential diagnoses include alopecia areata, idiopathic onycholysis, and traumatic nail disorders.
- A diagnosis of onychomycosis does not exclude nail psoriasis as the two conditions are commonly associated.
- A good history is invaluable in determining the correct diagnosis.
- Exam of all 20 nails is always necessary.

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11.1 Introduction

Nail involvement occurs in up to 50 % of patients with psoriasis [1]. Although most patients experience concurrent skin involvement, 1–5 % of patients present with nail changes alone [2]. In these patients, it can be diagnostically challenging, as psoriatic nail disease can resemble several other nail dystrophies.

In this chapter, we describe the differential diagnoses for each classic sign of nail psoriasis including pitting, onycholysis, subungual hyperkeratosis, splinter hemorrhages, and oil spots [3].

11.2 Nail Plate Pitting

Common causes of nail pitting include psoriasis, alopecia areata, and eczema. A few pits can also be seen in normal nails. Uncommon causes include parakeratosis pustulosa, pemphigus vulgaris, sarcoidosis, dermatomyositis, drug-induced erythroderma, secondary syphilis, Reiter's disease, chronic renal failure/hemodialysis, and chronic paronychia [4] (Table 11.1).

Certain characteristics of nail pitting can help to identify its etiology (Table 11.2). Psoriatic pits are typically deep, indicating involvement of the intermediate and ventral nail plate [5]. Moreover, presence of more than 20 pits is suggestive of psoriatic nail disease [6]. Over 60 pits has been said to be diagnostic of psoriasis [7]. In contrast, pits in alopecia areata are small, superficial and usually arranged in a regularly distributed geometric pattern [8] (Fig. 11.1). They may demonstrate a "rippled" effect [9] and run along longitudinal or transverse lines [8]. Other nail signs of alopecia areata include mottled erythema of the lunula, onychomadesis, and trachyonychia [6, 10]. Pits in eczema are coarse, very irregular and associated with cross ridging [8] The term elkonyxis describes a very large irregular depression, which can be seen in syphilis, Reiter's disease, following a traumatic event, or after isotretinoin therapy [6, 11]. Small pitted craters on the middle and ring fingers, known as Rosenaus depressions, are characteristically seen in patients with diabetes mellitus [12]. It is important to remember that an isolated pit is not diagnostic and may be idiopathic in nature [9].

Table 11.1 Causes of nail pitting [4, 9]

Nail pitting	
Common causes	Uncommon causes
Psoriasis	Normal
Alopecia areata	Parakeratosis pustulosa
Eczema	Pityriasis rosea
Trauma	Hemodialysis
	Chronic renal failure
	Pemphigus vulgaris
	Sarcoidosis
	Dermatomyositis
	Drug-induced erythroderma
	Secondary syphilis

Table 11.2 Differential diagnosis for nail pitting

Pitting	
Cause	Pitting type
Psoriasis	Deep involving intermediate and ventral nail plate
	>20 pits
Alopecia areata	Small, superficial pits
	Regularly distributed, in geometric pattern
	"Rippled" effect, along longitudinal or transverse lines
	Also associated with punctate leukonychia, onychomadesis, or trachyonychia
Eczema	Coarse, irregular pitting, and cross ridging
Syphilis, Reiter's disease, trauma, isotretinoin therapy	Elkonyxis (very large pits)
Diabetes mellitus	Rosenaus depressions – small pits on middle and ring fingers
Idiopathic	Isolated pit

Fig. 11.1 Pitting in alopecia areata

11.3 Onycholysis

The differential diagnosis for onycholysis depends on its location (Table 11.3). The most common cause of onycholysis in fingernails is idiopathic onycholysis (Fig. 11.2). More common in women, idiopathic onycholysis has been speculated to arise secondary to the same environmental factors that result in chronic paronychia [4]. Frequent wetting, irritant contact, or aggressive manicure can damage the onychocorneal band, resulting in nail plate detachment [13]. The onycholytic space is frequently colonized by bacteria and yeast, including *Pseudomonas*, causing a typical green discoloration (Fig. 11.3). Irregularly sculpted onycholysis ("rollercoaster onycholysis") may be an indication of overzealous manicuring [9] and is often associated with striate leukonychia [14] (Fig. 11.4). Occupational onycholysis is seen in hairdressers and butchers.

Table 11.3 Causes of onycholysis [8, 9, 16]

Onycholysis	
Common causes	Uncommon causes
Manicuring ("rollercoaster onycholysis")	Photo-onycholysis
Idiopathic	Bullous disease
Psoriasis	Lichen planus
Onychomycosis	Lichen striatus
Drugs	Connective tissue disorders
Contact dermatitis	Metabolic disorders (e.g., thyrotoxicosis)
Subungual tumors (1 digit)	

Fig. 11.2 Idiopathic onycholysis

Psoriatic nail onycholysis may be distinguished by the presence of an erythematous rim surrounding the area of onycholysis [3], a finding almost exclusively seen in the fingernails. Moreover, Dawber et al. found that the rate of growth of normal fingernails can help discriminate psoriatic nail versus idiopathic onycholysis. While they described a faster growth rate in nails affected by both psoriatic and idiopathic onycholysis, they found a slightly slower than normal growth rate in the normal nails of idiopathic onycholysis as compared to the normal nails in psoriasis [15].

Other dermatologic conditions causing onycholysis, with a predilection for the fingernails, include eczematous dermatitis and lichen planus. In lichen planus, onycholysis is usually associated with onychorrhexis and other signs of nail matrix involvement (Fig. 11.5). Pompholyx can cause very distal onycholysis affecting most digits [14].

Fig. 11.3 Idiopathic onycholysis featuring green subungual discoloration secondary to pseudomonal infection

Fig. 11.4 Onycholysis and leukonychia due to manicuring

The two main causes of onycholysis in the toenails are trauma and onychomycosis [9]. Toe stubbing and ill-fitting shoes can lead to nail plate detachment [14]. Onycholysis of the great toe due to an overriding second toe is common and involves the lateral side of the nail [9] (Fig. 11.6). The presence of hemorrhage is a clue for a traumatic cause [16].

Differentiating distal subungual onychomycosis from psoriasis is especially challenging in the toenails. Onychomycosis can be distinguished by the presence of

Fig. 11.5 Lichen planus: onycholysis and onychorrhexis

Fig. 11.6 Great toe onycholysis due to overlapping second toe

Fig. 11.7 Onychomycosis with yellow patches and strikes

other nail findings, particularly yellow patches and strikes (Fig. 11.7). It is important to consider the possible coexistence of both diseases, which was reported to occur in 48 % of patients [3, 17]. The concomitant conditions are thought to

Fig. 11.8 Hemorrhagic onycholysis from taxane use

exacerbate each other, as well. While nail psoriasis itself has been deemed a risk factor for developing onychomycosis [18], Kacar et al. observed more severe nail changes in patients with onychomycosis and suggested the possibility of worsening nail psoriasis by fungal infection via Koebnerization [19]. Ultimately, a fungal and/or bacterial culture in addition to nail plate PAS should be obtained to rule out an infectious etiology [16].

Another cause of toenail onycholysis includes congenital malalignment of the big toenail in children [9].

Drugs can cause onycholysis and less frequently photo-onycholysis. Painful hemorrhagic onycholysis is a common side effect of treatment with taxanes, particularly docetaxel (Fig. 11.8). It is associated with subungual abscesses and usually involves several or all nails. The pathogenesis may be due to direct nail bed toxicity or disruption of nail bed angiogenesis. This complication can increase the risk of sepsis and may require treatment interruption [20].

Photo-onycholysis is rare and most commonly seen with psoralens and tetracycline use [16]. The onycholytic area demonstrates a characteristic hemorrhagic hue [14]. Most nails are affected but the thumbs are usually spared. There are four different subtypes of drug-induced photo-onycholysis: (1) the separation of the nail plate affects several nails and is concave distally with well-demarcated pigmentation proximally, (2) involving a single digit – well-demarcated, circular notch with the widest part distally and brownish pigmentation proximally, (3) round yellow staining (and later reddish) in the center of the nail bed with no lateral or distal margin involvement and affecting several digits, and (4) subungual bullae reported secondary to tetracycline hydrochloride use [9, 21].

Fig. 11.9 Subungual tumor

Tetracycline or psoralen-induced photo-onycholysis can be painful [4]. Photo-onycholysis may also be observed as part of Segal's triad – photosensitivity, onycholysis, and nail dyschromia [9, 22].

Metabolic disorders, particularly hyperthyroidism, have been reported to cause onycholysis. Plummer nail, a type of onycholysis in which the distal end of the nail curves upward and is undulated, is characteristic of thyrotoxicosis [23].

Onycholysis limited to one nail requires the exclusion of a subungual tumor as the cause. Tumors that can cause onycholysis include subungual exostoses, subungual fibromas, squamous cell carcinomas, and even melanoma [14] (Fig. 11.9). Radiography and/or biopsy is important for diagnosis [16].

Other uncommon causes of onycholysis include lichen striatus, sarcoidosis, and blistering diseases [16, 24].

11.4 Subungual Hyperkeratosis

Subungual hyperkeratosis is most commonly found in nail psoriasis or onychomycosis, although it may also be seen in eczema (Fig. 11.10), lichen planus, pityriasis rubra pilaris, and even cutaneous T cell lymphomas [9, 16]. Usually subungual hyperkeratosis is found in conjunction with onycholysis [9]. The nail bed hyperkeratosis seen in psoriasis is usually silvery white in colour. In onychomycosis, hyperkeratosis is usually seen with longitudinal streaks, indicating the pattern of fungal invasion [25]. Contact dermatitis of the nail bed may also result in subungual hyperkeratosis; however, this most frequently involves the first three digits in the dominant hand [25]. In pityriasis rubra pilaris and/or lichen planus, other cutaneous or nail findings may suggest the diagnosis [25] (Fig. 11.11).

Fig. 11.10 Subungual hyperkeratosis in eczema

Fig. 11.11 Nail findings in pityriasis rubra pilaris

11.5 Splinter Hemorrhages

Several conditions, other than psoriasis, may cause distal splinter hemorrhages. The most common is trauma (Fig. 11.12); other acute traumatic sequelae may include subungual hematomas and nail shedding [26]. Distal splinter hemorrhages can also be found in onychomycosis and eczema [16].

Proximal splinters are very rare and may be indicative of systemic disorders, including infective endocarditis, renal or pulmonary disease, diabetes mellitus, vasculitis, and antiphospholipid syndrome [27–30]. Pain can help distinguish a systemic etiology, but may not be consistently present [31]. Cholesterol crystal embolization has also been reported in a patient with splinter hemorrhages of multiple finger and toenails [32]. Hemodialysis and peritoneal dialysis have also been identified as causes of splinter haemorrhages, with peritoneal dialysis reported as the most frequent factor in a cohort of patients with splinter hemorrhages [29, 33, 34].

Fig. 11.12 Traumatic splinter hemorrhages

Drug-induced splinter hemorrhages in conjunction with onycholysis have also been reported after tetracycline use [35].

Splinter hemorrhages can also be found in healthy individuals, more frequently in males [27, 36]. When seen in females, they are often limited to a single digit [36–38]. Additionally, splinter hemorrhages are frequently seen in elderly patients who are more susceptible to nail damage.

11.6 Other Findings

Other nail findings, such as the "oil-drop sign" and red spots in the lunula, are more specific for psoriatic nail disease and can be used to help distinguish psoriasis from other dermatoses [39, 40]. This discoloration, along with pitting and nail plate crumbling, is virtually diagnostic of psoriasis [41].

Summary for the Clinician

The differential diagnosis of nail psoriasis includes nail abnormalities caused by traumatic, dermatological, and systemic disorders. Onychomycosis is more common in psoriatic nails and a diagnosis of onychomycosis does not exclude psoriasis.

References

1. Scher RK. Psoriasis of the nail. Dermatol Clin. 1985;3:387–94.
2. Lavaroni G, Kokelj F, Pauluzzi P, Trevisan G. The nails in psoriatic arthritis. Acta Derm Venereol Suppl (Stockh). 1994;186:113.
3. Tan ES, Chong WS, Tey HL. Nail psoriasis: a review. Am J Clin Dermatol. 2012;13:375–88. doi:10.2165/11597000-000000000-00000.
4. Jadhav VM, Mahajan PM, Mhaske CB. Nail pitting and onycholysis. Indian J Dermatol Venereol Leprol. 2009;75:631–3. doi:10.4103/0378-6323.57740.

5. Jiaravuthisan MM, Sasseville D, Vender RB, Murphy F, Muhn CY. Psoriasis of the nail: anatomy, pathology, clinical presentation, and a review of the literature on therapy. J Am Acad Dermatol. 2007;57:1–27. doi:10.1016/j.jaad.2005.07.073.
6. Baran R, Dawber RPR. The nail in dermatologic diseases. In: Baran R, RPR D, editors. Diseases of nail and their management. 2nd ed. Oxford: Blackwell Scientific Publications; 1994. p. 135–73.
7. Singh SK. Finger nail pitting in psoriasis and its relation with different variables. Indian J Dermatol. 2013;58:310–2. doi:10.4103/0019-5154.113955.
8. Tosti A, Piraccani B. Dermatologic diseases. In: Scher RK, editor. Nails diagnosis, therapy and surgery. 3rd ed. Philadelphia: Saunders; 2005. p. 116.
9. Baran R, Dawber RPR, Haneke E, Tosti A. Nail plate and soft tissue abnormalities. In: Baran R, Dawber RPR, Haneke E, Tosti A, Bristow I, Thomas L, et al., editors. A text atlas of nail disorders – techniques in investigation and diagnosis. London: Taylor & Francis; 2003.
10. Tosti A, Morelli R, Bardazzi F, Peluso AM. Prevalence of nail abnormalities in children with alopecia areata. Pediatr Dermatol. 1994;11:112–5.
11. Yung A, Johnson P, Goodfield MJ. Isotretinoin-induced elkonyxis. Br J Dermatol. 2005;153:671–2. doi:10.1111/j.1365-2133.2005.06782.x.
12. Greene RA, Scher RK. Nail changes associated with diabetes mellitus. J Am Acad Dermatol. 1987;16:1015–21.
13. Piraccani B, Iorizzo M. Diseases of the nails. In: Rakel R, Bope E, editors. Conn's current therapy 2008. Philadelphia: Saunders Elsevier; 2008.
14. Daniel 3rd CR, Iorizzo M, Piraccini BM, Tosti A. Simple onycholysis. Cutis. 2011;87:226–8.
15. Dawber RP, Samman PD, Bottoms E. Fingernail growth in idiopathic and psoriatic onycholysis. Br J Dermatol. 1971;85:558–60.
16. Tosti A, Piraccani BM. Nail disorders. In: Dermatology. Bolognia Jl, Jorizzo JL, Schaffer JV , (eds), Mosby Elsevier 2012. cap. 70:1019–36.
17. Natarajan V, Nath AK, Thappa DM, Singh R, Verma SK. Coexistence of onychomycosis in psoriatic nails: a descriptive study. Indian J Dermatol Venereol Leprol. 2010;76:723. doi:10.4103/0378-6323.72468.
18. Sigurgeirsson B, Steingrimsson O. Risk factors associated with onychomycosis. J Eur Acad Dermatol Venereol. 2004;18:48–51.
19. Kacar N, Ergin S, Ergin C, Erdogan BS, Kaleli I. The prevalence, aetiological agents and therapy of onychomycosis in patients with psoriasis: a prospective controlled trial. Clin Exp Dermatol. 2007;32:1–5. doi:10.1111/j.1365-2230.2006.02215.x.
20. Minisini AM, Tosti A, Sobrero AF, Mansutti M, Piraccini BM, Sacco C, et al. Taxane-induced nail changes: incidence, clinical presentation and outcome. Ann Oncol. 2003;14:333–7.
21. Baran R, Juhlin L. Drug-induced photo-onycholysis. Three subtypes identified in a study of 15 cases. J Am Acad Dermatol. 1987;17:1012–6.
22. Baran R, Juhlin L. Photoonycholysis. Photodermatol Photoimmunol Photomed. 2002;18:202–7.
23. Tosti A, Baran R, Dawber RPR. The nail in systemic diseases and drug induced changes. In: Baron R, Dawber RPR, editors. Diseases of the nail and their management. 2nd ed. Oxford: Blackwell Scientific Publications; 1994. p. 175–261.
24. Davies MG, McGavin CR. Onycholysis in sarcoidosis – a previously undescribed association. Br J Dermatol. 1996;135:340.
25. Tosti A, Daniel R, Piraccani B, Iorizzo M. Color atlas of nails. 1st ed. Berlin/Heidelberg/New York: Springer; 2009.
26. Mortimer PS, Dawber RP. Trauma to the nail unit including occupational sports injuries. Dermatol Clin. 1985;3:415–20.
27. Saladi RN, Persaud AN, Rudikoff D, Cohen SR. Idiopathic splinter hemorrhages. J Am Acad Dermatol. 2004;50:289–92. doi:10.1016/j.jaad.2003.07.012.
28. Frances C, Piette JC, Saada V, Papo T, Wechsler B, Chosidow O, et al. Multiple subungual splinter hemorrhages in the antiphospholipid syndrome: a report of five cases and review of the literature. Lupus. 1994;3:123–8.
29. Kilpatrick ZM, Greenberg PA, Sanford JP. Splinter hemorrhages – their clinical significance. Arch Intern Med. 1965;115:730–5.

30. Kimyai-Asadi A, Usman A, Milani F. Cutaneous manifestations of marantic endocarditis. Int J Dermatol. 2000;39:290–2.
31. Scher RK, Daniel R. Nails: therapy, diagnosis, surgery. Philadelphia: W.B. Sanders Company; 1990.
32. Turakhia AK, Khan MA. Splinter hemorrhages as a possible clinical manifestation of cholesterol crystal embolization. J Rheumatol. 1990;17:1083–6.
33. Blum M, Aviram A. Splinter hemorrhages in patients receiving regular hemodialysis. JAMA. 1978;239:47.
34. Kelly MP, Kight MA, Castillo S. Trophic implications of altered body composition observed in or near the nails of hemodialysis patients. Adv Ren Replace Ther. 1998;5:241–51.
35. Sanders CV, Saenz RE, Lopez M. Splinter hemorrhages and onycholysis: unusual reactions associated with tetracycline hydrochloride therapy. South Med J. 1976;69:1090–2.
36. Monk BE. The prevalence of splinter haemorrhages. Br J Dermatol. 1980;103:183–5.
37. Miller A, Vaziri ND. Recurrent atraumatic subungual splinter hemorrhages in healthy individuals. South Med J. 1979;72:1418–20.
38. Robertson JC, Braune ML. Splinter haemorrhages, pitting, and other findings in fingernails of healthy adults. Br Med J. 1974;4:279–81.
39. Kouskoukis CE, Scher RK, Ackerman AB. The “oil drop” sign of psoriatic nails. A clinical finding specific for psoriasis. Am J Dermatopathol. 1983;5:259–62.
40. van der Velden HM, Klaassen KM, van de Kerkhof PC, Pasch MC. Fingernail psoriasis reconsidered: a case-control study. J Am Acad Dermatol. 2013;69:245–52. doi:10.1016/j.jaad.2013.02.009.
41. Zaias N. Psoriasis of the nail. A clinical-pathologic study. Arch Dermatol. 1969;99:567–79.