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Management of Psoriatic Nail Disease

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Nail involvement is common at some point in the life of the patient with psoriasis. Simple hand care, keeping nails cut short and avoiding nail trauma, will all help in management. Medical interventions include topical therapies used for psoriasis at other body sites, directed at the location of the disease within the nail unit. Individual digits may require focused intensive treatment, such as steroid injections. Systemic therapy for psoriatic nail disease can be justified when the disease presents in tandem with severe skin disease or where function and quality of life are sufficiently diminished by nail involvement. Biological therapy usually is indicated for widespread psoriasis, but studies show that therapy directed at nail symptoms can be effective in the treatment of coincident nail disease.
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Nail involvement is estimated to affect 80% to 90% of patients with psoriasis at some point in their lives.[1] De Jong and colleagues[2] reported that 93% of those with psoriatic changes of the nail considered it a significant cosmetic handicap, 58% found that it interfered with their job, and 52% described pain as a symptom. Psoriasis of the toe nail area can alter mobility and assessment should always include mycology samples to exclude coincident onychomycosis, which may be present in up to 27%.[3]

The main features of nail psoriasis can be differentiated as those manifested in the nail plate and those affecting the surrounding soft tissues. Many of the latter will affect the nail. Nail changes reflect disease of the matrix. The nail may be pitted, have transverse ridges, be thickened, or be lost. Loss may be the result of active shedding related to nail bed disease, such as onycholysis (Fig. 1), or to subungual hyperkeratosis (Fig. 2). Alternatively, absence of nail may result when inflammation within the nail matrix is sufficient to halt nail plate production. Active scaling psoriasis may affect the nail folds and nail bed. In the nail bed, the compacted form represents subungual hyperkeratosis. Sterile pustules can be found in a similar distribution (Fig. 3). They may be few and scattered or multiple and coalescing as in the aggressive variant of pustular psoriasis known as acrodermatitis continua of Hallopeau. The severity can be scored using the Nail Psoriasis Severity Index and subsequent modified variants.[4,5]

Nail Care

Psoriatic changes of the nail unit are exacerbated by trauma. Functional and cosmetic manipulation of the nail unit are common sources of trauma. An important part of management is to ensure that the patient is avoiding all factors that will make their psoriasis worse. In functional terms, this means wearing gloves during wet work or during exposure to chemically or physically harsh materials. The nail must be kept short to minimize the leverage sustained at the free edge when using the nail as a tool in normal activities. Such leverage can be a significant factor in onycholysis. Where there is dry skin and scaling, frequent application of emollient to the nail fold and beneath the free edge will keep this to a minimum and reduce the risk of frank psoriasis.

Most physical cosmetic manipulations of the nail risk exacerbating the disease and represent a short-term gain with the likelihood of causing eventual deterioration. The most damaging of these is trimming the cuticle and clearing subungual debris. Both provoke the isomorphic reaction and make psoriasis worse, contributing to a positive feedback loop and increasing cosmetic disability. However, there is still a place for careful cosmetic management.[6] Nail varnish may be very helpful in concealing a range of nail plate and subungual changes, but the solvents used to remove these agents can present risks. Nail plate buffing may diminish surface imperfections and even out deeper transverse ridges. Any cosmetic benefit must be weighed against the potential harm of these agents.

Topical Therapies

The main treatment for psoriasis of the nail unit is topical steroids and vitamin D analogs.[7] Opinions vary concerning preferred sites of application and the base for the active agent. The site can be determined according to the patterns of disease. Gloves can be useful to enhance penetration and reduce rubbing off the preparations on bedding.

Pitting, Thickening, and Surface Ridging

Pitting and surface ridging reflect matrix disease. Pitting represents psoriatic pathology with parakeratosis and loss of loose scale from the nail plate surface as it emerges from the proximal nail fold. This leaves a punctuate depression, known as a pit. Surface ridging is a secondary phenomenon connected with the transmission of inflammation from psoriasis in adjacent tissues, such as the proximal nail fold. Potent topical steroids can be effective in managing both signs,

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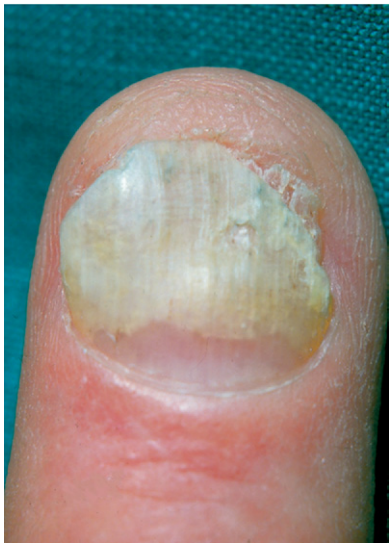

Figure 1 Onycholysis.

although they respond at different thresholds. Topical steroids are limited in their ability to penetrate deep nail matrix to address pitting. However, topical steroids usually elicits a clear response in psoriatic changes of the nail fold, which then halts secondary matrix inflammation and the consequent ridging. Treatment may require a highly potent steroid, such as clobetasol propionate. Use of such a steroid for more than 3 to 4 months can lead to local skin atrophy. The length of treatment needs to be balanced against the intensity. Although occlusion will enhance the latter, this is not desirable in a slow-growing appendage like the nail. Occlusion is occasionally justified when used for short periods. In extreme cases in which a strong topical steroid has been used continuously for years, the digits become tapered with changes to the underlying bone, such as in the case of the "disappearing digit."[8,9] Tazarotene 0.1% gel has been demonstrated to provide some benefit when used under occlusion, which may help overcome the barrier provided by the proximal nail fold.[10] The limited access of topical therapy to the focus of pitting pathology can require steroid injected into the proximal nail fold which may produce benefit.

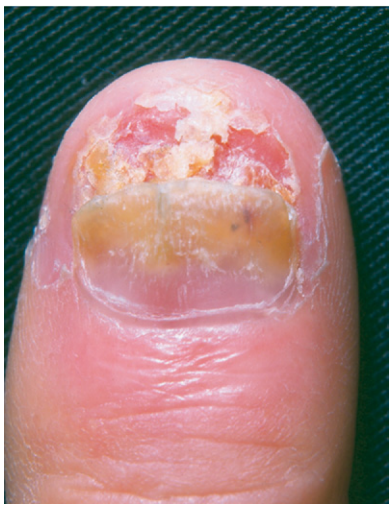

Figure 2 Subungual hyperkeratosis with onycholysis.

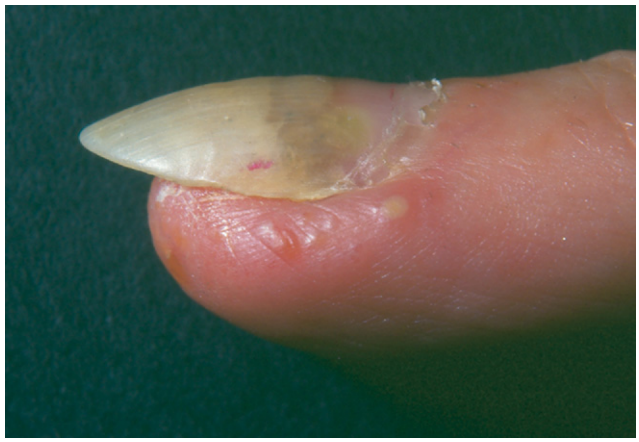

Figure 3 Pustular psoriasis of the nail unit.

Onycholysis and Nail Bed Hyperkeratosis

Psoriatic changes of the nail bed interfere with the adherence of the nail. Involvement may be multifocal with limited scale and manifest as onycholysis and oily patches. Alternatively, where disease gives rise to substantial scale, it accumulates in a compacted form as subungual hyperkeratosis. The hyperkeratosis may maintain attachment between nail and nail bed, or result in a split.

Avoidance of trauma is more important in management of onycholysis than in most other aspects of psoriasis of the nail unit. The leverage effect of a long nail or the sharp trauma of a cleaning probe beneath the nail damage the nail bed and contribute to disease. Although direct treatment of the nail bed is possible with the nail in situ, access presents a problem. This can be overcome to some extent by using formulations of vitamin D analogs and steroids designed for use on the scalp. However, these products tend to run off the edge of the digit and surface tension limits their penetration to the onycholytic space. Ointment base preparations are an alternative. A rim of ointment placed beneath the free edge of the nail at night will melt and disperse beneath the nail. A third option is to trim the nail back to the point of cleavage from the nail bed. This exposes the diseased area to direct application of ointment preparations.

The patient will need a demonstration of the technique because it is sometimes assumed that it is painful to clip nails to this level. If it is performed carefully by making small symmetric snips on alternate sides of the nail until they meet in the middle, it is pain free. Trying to cut continuously from one side can hurt because the instrument sticks into the nail bed in the midline. The patient will have an ugly nail for a few months as it regrows, but if they find the technique works they can repeat it on other digits, or the same digit if they relapse.

Where the problem is subungual hyperkeratosis rather than onycholysis, clipping back may not be so easy or beneficial. A controlled trial of topical therapy compared calcipotriol ointment with a combined betamethasone dipropionate and salicylic acid ointment.[11] Both resulted in a similar reduction of nail thickness (which probably partly reflected subungual hyperkeratosis), although changes in other markers of nail disease were not defined. The level of reduction of nail thickness was not clear because interpretation of the results entailed calculations of "responders" and "nonresponders" rather than on an intention to treat basis. Tazarotene gel 0.1% may also be of use when applied to the free edge for 24 weeks, although this treatment can be at the expense of moderate irritation of the nail folds as a side effect.[10]

Table 1 Sites of Nail Unit Steroid Injection as Therapy for Different Patterns of Psoriatic Nail Disease

Psoriatic Feature	Site of Active Disease	Site of Injection	Likelihood of Good Outcome	Need for Local Anesthetic
Pitting	Proximal matrix	Proximal nail fold	Moderate	Patient dependent
Surface ridging	Proximal matrix and nail fold	Proximal nail fold	High	Patient dependent
Nail plate thickening	Matrix	Deep proximal nail fold	High	Yes
Subungual hyperkeratosis	Nail bed	Nail bed	High	Yes
Onycholysis	Nail bed	Nail bed	Moderate	Yes
Nail atrophy	Matrix	Probably not helpful	Low	—

Other Topical Agents

One percent 5-fluorouracil in propylene glycol[12] or in 20% urea cream[13] has been used where pitting and nail thickening are the main problems. However, it can dramatically exacerbate onycholysis and so should be avoided where this is a feature. It has also been used in acrodermatitis continua of Hallopeau with good results.[14] Cyclosporin is difficult to incorporate into a topical formulation, but some success has been reported with a 10% oily preparation used over several months.[15] The product has been demonstrated as unstable, which in some instances may be the basis of a poor result.[16] An open study of 10 subjects entailed the application of a nail lacquer contained 8% clobetasol propionate daily for 21 days followed by 2 times a week for the following 9 months. Onycholysis, pitting, and oily patches were reported to improve. A lack of a control group and no longer term data means these results are difficult to interpret.[17]In one study, anthralin ointment (0.4-2%) was applied as a short contact therapy to the nail bed for 30 minutes before washing. Moderate improvement was recorded in 60% of patients after 5 months.[18]

Steroid Injections

Steroid (triamcinolone acetonide 2.5-10%) can be injected into a psoriatic digit. The options include a "needle-less" injector (Dermojet; Robbins Instruments, Chatham, NJ) or a syringe and needle.[19-23] Dermojet has become unpopular because of potential for blood splash-back and a single report of the amputation of a treated digit after development of epidermoid inclusion cysts after Dermojet treatment. An insulin syringe is a convenient alternative with a fine gauge needle that will not blow-off. The site of injection should reflect the apparent origin of the dystrophy (Table 1). Injection is usually symmetric on both sides of the digit pointing towards the midline. The most common site to treat is the matrix, where small doses can be put into the middle and lateral proximal nail fold in the midthickness of the structure. These injections may not require anesthetic, although patients vary in their preference and temperament. Deeper injection may be useful for a thickened nail. Deep proximal nail fold and nail bed injections are very painful and require preliminary anesthetic. Options include a proximal ring block, distal wing block or just a small bleb at the site of steroid injection. Nail bed access is via the lateral nail folds and local anatomy may mean that there are difficulties penetrating between the nail plate and the distal phalanx.

Studies in which authors used injected steroid can be compared in Table 2. One important consideration is how often a digit may be treated and the risk of atrophy. With weaker concentrations it is probably safe to treat a single digit every 3 months over a prolonged period, where any atrophy would act as a warning to the clinician. Mild degrees of atrophy are reported in the studies of injected steroid, but they appear to be short term.[20] Atrophy of the insertion of the extensor tendon on the dorsum of the distal phalanx is another theoretic concern. However, cases of digital tendon rupture in the literature make this seem an unlikely complication.[24,25] In one, an elderly lady received 29 steroid injections for her carpal tunnel disease.[24] In another,[25] a 62-year-old woman was treated 4 years before tendon rupture with 2 injections for a trigger thumb. Other instances also report rupture associated with repeat treatment of trigger finger.[26-28] There are no reports of tendon rupture in the dermatological literature.

When greater concentrations of steroid are used (10% triamcinolone acetonide), nail ridging and subungual hyperkeratosis respond better than pitting and onycholysis. Benefit may be sustained for at least 9 months with seldom more than one treatment.[23,29] However, the authors used four injections per digit of 0.1-mL each and required a preliminary ring block. Risk of side effects and the discomfort of treatment limit this technique to one or two injec-

Table 2 Comparison of Results of Different Studies of Steroid Injection in the Treatment of Psoriatic Nail Disease

Study	Saleem and Azim[24]	de Berker and Lawrence[23]	Gerstein[21]
Site	Matrix and nail bed	Matrix and nail bed	Matrix
Protocol	4 mL × 0.1 mL	4 mL × 0.1 mL (mean 1.2 doses)	1 mL × 0.2 mL
Follow up (months)	Up to 6	9 (3-17)	14
Number of patients	35	19	4
Number of nails	100	46	17
% digits improved at end of follow up:			
Onycholysis	41% (15/37)	50% (18/36)	
Pits/ridges	× pits 58% (41/71)	× pits 45% (9/20)	Combined features: 35% (6/17)
		× ridges 93% (15/16)	
Thickening		89% (10/12)	
Subungual hyperkeratosis	100% (57/57)	100% (16/16)	

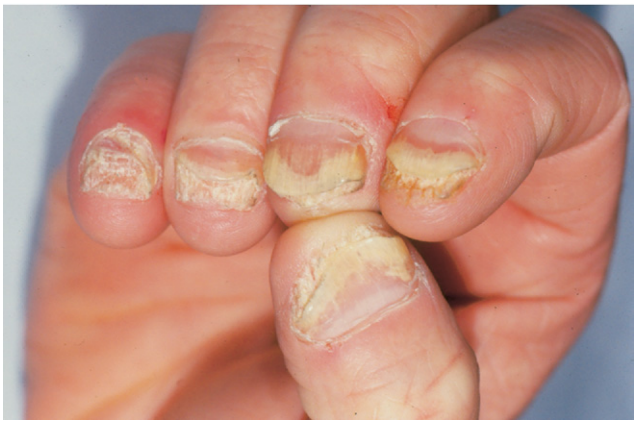

Figure 4 Widespread nail disease warranting systemic treatment.

tions. A compromise of smaller volumes, or weaker concentrations, injected into the proximal nail fold alone may allow more frequent injections with no anesthetic.

Radiation Therapies

Several small studies have shown that PUVA can help psoriatic changes of nails[30,31] although the response may not be marked and some features, such as pitting and onycholysis respond less well than others.[32] Local PUVA with application of psoralen paint to the nail fold can work and avoids the side effects of systemic psoralen.[33]

A double-blind study of superficial radiotherapy in psoriatic nail dystrophy demonstrated a temporary benefit[34] as did treatment with electron beam therapy.[35] Grenz rays have also been reported as useful.[36] One case report describes a 3- year remission from generalized nail psoriasis after 13.5 Gy administered in 9 fractions over 1- to 2-week intervals.[37]

Systemic Therapies

Systemic therapy is seldom given for nail disease alone but may be needed where there is a significant loss of function, often associated with pain (Fig. 4). In a study of skin, nail and joint psoriasis treated with cyclosporine or acitretin for 10 weeks, both therapies produced a significant improvement in nail disease from baseline at doses of 3.0 mg/kg/d and 0.52 mg/kg/d, respectively.[38] An open trial of low-dose acitretin (0.2-0.3 mg/kg/d) demonstrated complete clearance of nail lesions in 25% of subjects, moderate improvement in a further 25%, and mild improvement in 33% during the course of 6 months[39] A report of the good response of severe psoriatic nail changes to oral cyclosporine in a single patient required between 3 mg/kg/d and 5 mg/kg/d.[40]

Observations of psoriasis of the nail unit when taking acitretin suggest that thick nails and those with subungual hyperkeratosis, improve. However, if the nails are of normal thickness, or atrophic, at the outset, they may become pathologically thin and fragile when taking acytretine.[41]

Methotrexate may produce benefit to psoriasis of the nail unit in tandem with skin improvement. It does not thin the nail in the same manner as acitretin. Both methotrexate and acitretin may be helpful for pustular forms of psoriasis. There has been a single report of psoriatic nail improvement for a patient treated with fumaric acid esters after a poor response to topical therapies, PUVA and ciclosporin.[42]

Biological Therapies

Improvement in psoriatic nails has been informally noted and in some series, formally documented during treatment with biological agents used for treating severe cutaneous or arthropathic psoriasis[43] (Table 3).[44-51] Isolated cases have also been published where patients being treated for psoriatic arthritis with biological agents have developed skin and nail disease de novo.[44]

Infliximab has been more thoroughly assessed than other biologics for nail improvement. In two randomized, controlled trials[45,46] and two open studies,[47,48] infliximab was associated with a reduction of the mean Nail Psoriasis Severity Index by more than 50%[45,47] or clearance in more than 45% to 100% of cases.[46,48] Small open series or individual reports are made for etanercept, alefacept and efalizumab and give the impression of being helpful in some instances.[49-52]

Surgical Therapy

Toenails in patients with psoriasis are more likely to be hypertrophic than are fingernails. This combines with distorted growth patterns to cause pain and reduced mobility. Topical and injected therapy is less effective for toes than fingers, making surgical options more relevant. Simple avulsion is practically never appropriate. Podiatry using a nail burr to debulk and shape the nail can be a useful long term intermittent management plan. An alternative is periodic dissolution of the nail by 40% urea paste used under occlusion for 4 to 6 weeks. This is usually for hypertrophic nails or nails that are distorted with persistent ingrowing. Avulsion and phenolic ablation

Table 3 Reports of Biologics Used in Psoriatic Nail Disease

Agent	Results	Comment
Infliximab[44]	In 301 patients randomized to infliximab, single nail NAPSI improved by 56% over 50 weeks	RCT
Infliximab[45]	In 305 patients, 45% had clearance of psoriatic changes of the nail by week 50	RCT
Infliximab[46]	In 25 patients with NAPSI of >14, nail involvement cleared at 22 weeks	Open trial
Infliximab[47]	Mean NAPSI of 56 declined to 3 over 38 weeks	Non randomized observational trial
Alefacept[48]	In 5 patients, 2 improved, 2 had no change, 1 was worse	A small series with equivocal improvement
Efalizumab[49]	Clearance of nail psoriasis in 4 patients during the course of 19 to 33 weeks	Small open series
Etanercept[50]	Single case with minimal improvement	Single case
Etanercept[51]	Acrodermatitis improvement in 1 case	Single case

NAPSI, Nail Psoriasis Severity Index; RCT, randomized controlled trial.

of the matrix provides permanent cure, although pain from the nail problem should be carefully distinguished from pain due to arthritis of the distal interphalangeal joint, which will persist after surgery.

Pustular Psoriasis of the Nail Unit

Pustular psoriasis of the nail unit may present in conjunction with widespread pustular psoriasis, palmoplantar pustular psoriasis or as isolated disease in one or more digits. The latter is often the most difficult to manage and can be in the form of a small number of scattered pustules or more overwhelming and painful coalescing pustules of the distal digit described as acrodermatitis of Hallopeau. In all instances, it is important to rule out infection at the outset. Where presentation is with a single digit, treatment for staphylococcal infection may be warranted while results are awaited. Oral retinoids, usually acitretin, are a common first-line systemic choice. Response varies, and patient relapse when off treatment is fairly common.[41] Retinoid can be combined with PUVA, which may provide additional benefit. The main topical therapy is calcipotriol.[53] It may be used long term in an attempt to prevent relapses. In the short term, it may be used with topical steroid in a combined preparation containing betamethasone dipropionate.[54] Super potent topical steroids may be used in isolation for short periods as may nail unit steroid injection. The place of biological therapy in pustular psoriasis of the nail unit is not yet established, although there are isolated reports of success.[52] In our experience, infliximab and adalimumab can produce some benefit, although the former has also been associated with precipitation of pustular disease.[44]

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