Isolated Nail Lichen Planus– an expert consensus on treatment of the classical form

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Abbreviations used:

LP: lichen planus

NLP: nail lichen planus

JAK: janus kinase

IFN: interferon

ABSTRACT

Lichen planus is a benign inflammatory disorder of unknown etiology that may affect the skin, mucosae, scalp and nails. When the nails are affected, it may lead to permanent destruction with severe functional and psychosocial consequences. Therefore, prompt diagnosis and early treatment are essential, even in mild cases. There are currently no guidelines for the management of nail lichen planus and the published literature on treatment is limited. The aim of this paper is then to provide practical management recommendations for the classical form of nail lichen planus, especially when restricted to the nails. Topical treatment has poor short-term efficacy and may cause long-term side effects. Instead, intralesional and intramuscular triamcinolone acetonide should be considered first line therapies. Oral retinoids are second line choices, and immunosuppressive agents may also be considered.

CAPSULE SUMMARY

- Nail lichen planus may cause significant discomfort and permanent nail destruction, so prompt treatment is essential.
- Intralesional triamcinolone acetonide is the first-line treatment, but systemic corticosteroids, retinoids, and immunosuppressive agents may also be considered.

INTRODUCTION

Lichen planus is a benign inflammatory disorder of unknown etiology that may affect the skin, mucosae, scalp and nails[1,2]. Nail involvement affects adults more than children[3,4]. Fingernails are more commonly affected than toenails. Different clinical presentations have been recognized[5,6] but, in this paper, we will only discuss the management of the the classical variant, especially when restricted to the nail unit.

The longitudinal pattern of nail plate ridging and fissuring is quite characteristic of this variety of NLP. Onycholysis and nail bed hyperkeratosis may also be present. Dorsal pterygium, anonychia and nail bed atrophy are, instead, less frequent. In most cases the diagnosis of NLP is clinical, but in questionable cases, a biopsy is necessary with site selected according to clinical examination findings[8].

Nail involvement in LP may be severe and can rapidly worsen with irreversible scarring as a potential outcome. This causes significant discomfort to patients, affecting their quality of life. Therapeutic medications with proven efficacy are limited, and treatment is notoriously challenging, with high rates of failures, relapses and recurrences. If NLP is not properly and promptly treated, improvement can be difficult to achieve[9]. No guidelines exist for the treatment of NLP and there is no medication with a specific indication for its treatment. Moreover, no validated scoring system exists to objectively assess the efficacy of prescribed medications. Treatment of the nail unit in general is notoriously challenging, because delivery of topical drugs is difficult, mildly effective and time-consuming and clinicians are often reluctant to prescribe systemic treatments when the disease is localized only to the nails thus limiting potential therapeutic options.

MATERIALS AND METHODS

A literature search in the PubMed database has been performed and a total of 21 papers were collected[10-30] (Table 1 – supplemental material). Due to the limited literature, we evaluated papers with cases of isolated NLP, but also papers with LP affecting the nails and other body areas. However, since the purpose of this paper was to review efficacy of treatment, we believe that it should be evaluated independently if it was the more appropriate option to choose.

The authors were then invited to participate in a survey to:

1. Define the severity of clinical presentation;

NLP severity has been defined as MILD: thinning, longitudinal ridging, distal splitting less than 3mm in length, onycholysis less than 25%, no nail bed hyperkeratosis (Fig.1A); MODERATE: partial fissuring, longitudinal grooves, distal splitting between 3 and 5 mm, onycholysis between 25% and 50%, mottled erythema of the lunula, subungual hyperkeratosis (Fig.1B); SEVERE: complete fissuring, deep grooves, splitting more than 5 mm, onycholysis more than 50%, diffuse erythema of the lunula (Fig.1C). Pterygium and anonychia belong to this last stage, but since they do not respond to any treatment, they will not be discussed afterwards. We agreed not to create a numeric score because in NLP the dystrophy is too diffuse and cannot be assessed in quadrants as in nail psoriasis.

2. Define when systemic treatment is preferred or indicated;

"Few-nail disease" should be defined as a disease affecting 3 nails or less. However, we do not impose the threshold of the 3 nails for the initiation of a systemic treatment, but we indicate it as a suggestion. Quality of life of patients, in fact is an important factor to take into account when prescribing a treatment because dystrophy involving the first 3

digits might have significant functional consequences even if the severity of the disease is mild, justifying systemic treatments.

3. Define the number of months necessary to evaluate the first results of treatment and the number of months over which a treatment is judged unsuccessful;

There are no data on nail growth in NLP. Normally the nail growth rate is 2-3 mm/month for fingernails and 1- 2 mm/month for toenails[31], therefore a minimum of 3 to 6 months is necessary to evaluate the results of treatments.

4. Define the percentage of success of a treatment;

No improvement or worsening is a disease reduction of 0%; minimal improvement is a disease reduction of ≤ 25%; mild improvement is a disease reduction of 26-50%; moderate improvement is a disease reduction of 51-75%; great improvement is a disease reduction of 76-99%; clinical cure is a disease reduction of 100%.

RESULTS

After reviewing the literature[10-30], it is clear that treatment of NLP is challenging. Prospective studies with long term follow up have never been performed and evidence-based studies are not even feasible because the pathogenesis of NLP and molecular targets for drug development are unknown. Most of the reported papers are single case reports or expert opinions where detailed data on disease localization and severity are lacking. This provides an incorrect evaluation of treatment efficacy and indications. Not all patients, and not even all affected nails, responded to the given therapy; not all patients responded in the same way and the first prescribed successful treatment was, sometimes, not effective in case of recurrences. It was impossible to predict which patient

respond to treatment and which will not. In general, due to a faster growth rate and reduced thickness, fingernails responded better and quicker than toenails: however, the thumb responded less and more slowly.

According to the authors' experience, however, effective treatment options exist and include intralesional and systemic treatments (Fig. 2). Topical treatment is not instead recommended due to limited drug penetration and potential side effects related to the long-time application[32]. Environmental exposures that may worsen the disease, and delay the response to treatment, should always be limited or avoided.

DISCUSSION

According to the literature and to the authors' experience, early treatment is always recommended for NLP and the wait and see approach is generally not advisable due to the dystrophic nature of the disease and the unpredictable course.

It is very important to suppress inflammation to treat NLP[33,34] and the first-line therapy should always be triamcinolone acetonide. The intralesional route of administration is considered an optimal targeted therapy, as the drug is delivered to the site of inflammation, namely the nail matrix or nail bed with numerous advantages if properly performed.

When the nail matrix is affected, injections are quite tolerable for patients, even for older children (at least >14 years old). Ethyl chloride spray, "talkesthesia" and the concomitant use of vibrating devices can be utilized instead of digital block anesthesia. Even 20 nails can be treated in one office visit in few minutes. Injections in the nail bed are instead too painful without a digital block anesthesia.

While adverse events[35-37], including atrophy, are possible, there is strong consensus that they are minimal or even non-existent when this technique is used with appropriate training[38]. Hematomas and transient numbness of the distal digit are, instead, more frequent.

As with nail psoriasis[39], there is not enough evidence regarding the optimal dosage, dilution, number and frequency of injections, and maximum duration of treatment.

According to the authors, triamcinolone acetonide should be injected in a concentration of 2.5, 5 or 10 mg/ml according to disease severity. If lower concentrations vials are not commercially available, dilutions of 10 mg can be made with 1% lidocaine without epinephrine or sodium chloride. A volume of 0.1 ml per nail plate quadrant is enough and the solution should be slowly injected with a 30 Gauge needle. The needle should be inserted till a loss of resistance and then the liquid injected until blanching of the area is observed[38]. An insulin syringe with a built-in needle or a Luer lock syringe are the best for injections under pressure, frequent when injecting within the nail unit. Different techniques of injection are shown in Fig. 3[40,41]. Needle-less injecting instruments (port-o-jet or dermo-jet) are not supported by the authors due to the potential risk of splash back of blood and the scarce manageability of the existing instruments on a small and convex structure like the nail unit.

Injections should be repeated every 4 to 5 weeks, for a minimum of 4 to 6 months to appreciate results. If improvements are seen, it is appropriate to continue until there is marked or complete improvement and then taper for few months. Tapering is best performed by extending the period between injections (once every 6 to 8 weeks). If no

clinical response is achieved after 6 sessions, another treatment modality should be evaluated, and tapering is not necessary.

Intramuscular triamcinolone should be considered as an adjunct to intralesional administration in case of severe disease, especially if more than 3 nails are affected, in any presentation. Intramuscular triamcinolone is also recommended if intralesional injections are not feasible because the patient is affected by nail bed LP, the physician lack of expertise, or if the patient refuses them. It should be done even if there is one or few nails affected as stated before.

A dose of 0.5-1 mg/kg every month for at least 3 to 6 months is suitable for both children and adults, with dosages of 1 mg/kg/month advised during the active treatment phase (at least for the first 2-3 months and especially in severe cases). Caution must be taken due to systemic side effects even if they are quite rare. Underlying conditions such as diabetes, glaucoma and osteoporosis should always be ruled out. Bone protection with calcium and vitamin D should also be discussed[42]. Treatment is continued until there is marked or complete improvement and then tapered with dosage reduced to half of the therapeutic dose. If no clinical response after 6 months is achieved, change of treatment should be considered and tapering is not necessary.

Oral steroids might be also an option, however, they may cause unwanted side effects due to the required high dosages kept daily for many months[43]. For this reason, the authors discourage their use in NLP.

For patients, who refuse or who have contraindications to steroids, oral retinoids can be a valid option. Acitretin 0.2 - 0.3 mg/kg a day[44] or alitretinoin 30 mg/day[10-12] are known to be effective in patients with cutaneous and oral LP, but their role in treating

NLP is less known. Known side effects of retinoids include nail softening and brittleness[45] which are unwanted in NLP affected patients that already suffer from nail fragility. Thus, low dosages of acitretin are always recommended, lower than those used for nail psoriasis (0.3 – 0.4 mg/kg a day)[39]. Dose adjustments may be however needed over time, because side effects may occur (usually 2-18 weeks after starting treatment). Retinoids are also well known to accelerate nail growth, and this is the mechanism by which they probably improve matrix NLP[46]. The desquamative effect of retinoids can instead improve the typical hyperkeratosis of nail bed LP.

Alitretinoin is known to have fewer side effects than acitretin, higher anti-inflammatory properties and a better regulation of keratinocytes differentiation and proliferation[47]. Moreover, alitretinoin seems to reduce the susceptibility of the epidermis to friction, another factor that negatively influences nail growth in NLP. Unfortunately, alitretinoin is not available in every country.

In case of improvement, retinoids are continued until cure and only then the drug dosage is progressively reduced. If no clinical response after 6 months is achieved, a change of treatment should be considered, and tapering is not necessary. According to the authors' experience, however, mild to moderate cases however respond to retinoids much better than severe ones.

Azathioprine 100mg/day, cyclosporine 3-5 mg/kg/day or mycophenolate mofetil 1000 mg/twice a day can be considered, as monotherapy or as an adjunctive-to-steroid therapy in severe case with poor response to steroids. Their efficacy is not well studied for NLP and the authors support their use only as a 3rd option. However, it should be noted that patients that do not respond to a first-line therapy are unlikely to respond to other

253 treatments. These patients should be in any case followed over time and provided by
254 comprehensive nail care instructions, including, but not limited to, mechanisms of
255 trimming their dystrophic plates, avoidance of overaggressive manicuring, as well as
256 optimal moisturization of the nails.

257 The use of hydroxychloroquine and methotrexate is not supported as they are thought,
258 by our group, to be ineffective. Biologics are not included in our list as there is minimal
259 experience on their usage for NLP: they should be used off label, as the other drugs, but
260 the costs are by far more expensive.

261 A future potential therapy may be tofacitinib, an inhibitor of the enzymes JAK 1 and 3,
262 upregulated in LP. Pro-inflammatory cytokines and the IFNγ pathway are thus inhibited
263 and CD8+ T-cell recruitment reduced[48]. Tofacitinib has never been evaluated in patients
264 with NLP, but it has been studied in scalp LP patients resistant to conventional
265 treatments, resulting in an 80% clinical improvement, either as monotherapy or as
266 adjunctive therapy[49]. Further studies are however necessary because the costs are high.

267

268 **CONCLUSION**

269 To conclude, NLP should always be treated and regardless of treatment chosen, a long
270 term follow-up for all affected patients is advisable because relapses are common.

271 This paper underlines the importance of early treatment as the course of the disease is
272 unpredictable and often aggressive. Triamcinolone acetonide, both intralesional and
273 intramuscular are first line therapies. Oral retinoids are second line choices, and
274 immunosuppressive agents may also be considered.

275

FIGURE LEGENDS

Fig.1 – NLP mild form (A): note longitudinal ridging and splitting limited to the distal portion of the plate. Onycholysis is mild and nail bed hyperkeratosis is absent. NLP moderate form (B): partial fissuring, longitudinal grooves, distal splitting between 3 and 5 mm. Mottled erythema of the lunula can be roughly observed in the 2nd fingernail. Onycholysis is more marked and nail bed hyperkeratosis can be observed in the thumb. NLP severe form (C): complete fissuring and splitting more than 5 mm, onycholysis more than 50%, diffuse erythema of the lunula.

Fig.2 – Clinical treatment algorithm according to the number of nails involved, the severity of the disease and the location of the inflammation. Different shades of blue indicate the 1st to the 3rd option selected according to authors' experience (not all treatments are approved by the regulatory authorities of all countries).

Fig.3 – Intralesional matrix and bed injection techniques - *De BERKER*[40] (A): 2 injections in the proximal nail fold, 1 injection per side, starting 2 millimeters proximal to the cuticle (nail matrix LP); 2 injections under the nail plate starting from the lateral folds, 1 injection per side (nail bed LP). *RICHERT* (personal data) (B): 3 injections (fan-like) starting from the median part of the proximal fold to reach the proximal matrix and its lateral horns (nail matrix LP); 3 injections (fan-like) under the nail plate from the hyponychium to reach the whole bed (nail bed LP). *GROVER*[41] (C): 1 injection starting 2mm proximal to the proximal nail fold and advancing roughly up to the middle (nail matrix LP); 1 injection with the needle inserted slightly more medially and advanced towards the center of the nail bed. If the syringe is in parallel axis to the finger, the risk to encounter the bone is higher (nail bed LP). [Graphic designer: Florence Richert]

REFERENCES

1. Samman PS. The nails in lichen planus. *Br J Dermatol* 1961;73:288-92.
2. Chiheb S, Benchikhi H. Clinical characteristics of nail lichen planus and follow-up: a descriptive study of 20 patients. *Ann Dermatol Venereol* 2015;142:21-25.
3. Pandhi D, Singal A, Bhattacharya SN. Lichen planus in childhood: a series of 316 patients. *Pediatr Dermatol* 2014;31:59-67.
4. Halteh P, Scher RK, Brinster NK, Lipner SR. A 10-Year-Old Boy with Dystrophy of the Fingernails. *Pediatr Dermatol* 2017;34:193-194.
5. Iorizzo M, Lipner S. Nail lichen planus. In: Tosti A, ed. Nail disorders. St. Louis, Missouri: Elsevier; 2018:27-30.
6. Piraccini BM, Starace M, Misciali C, Fanti PA. Nail unit lichen planus. In: Rubin AI, Jellinek NJ, Daniel CR 3rd, Scher RK, eds. Scher and Daniel's Nails. 4th edition. Springer; 2018:127-143.
7. Daniel CR, Tosti A, Iorizzo M, Piraccini BM. The disappearing nail bed: a possible outcome of onycholysis. *Cutis* 2005;76:325-327.
8. Grover C, Bansal S. Nail biopsy: a user's manual. *Indian Dermatol Online J* 2018;9:3-15.
9. Lipner S. Nail lichen planus: a true nail emergency. *J Am Acad Dermatol* 2019;e177-178.
10. Pinter A, Patzold S, Kaufmann R. Lichen planus of nails – successful treatment with alitretinoin. *J Dtsch Dermatol Ges* 2011;9:1033-1034.
11. Iorizzo M. Nail lichen planus – a possible new indication for oral alitretinoin. *J Eur Acad Dermatol Venereol* 2016 (ePub2014);30:509-510.

12. Alsenaid A, Ruzicka T, Braun-Falco M, Wolf R. Successful treatment of nail lichen planus with alitretinoin: report of 2 cases and review of the literature. *Dermatology* 2014;229:293-296.

13. Butsch F, Jetter A, Schopf RE. Successful treatment of palmoplantar nail lichen planus with cyclosporine. *J Dtsch Dermatol Ges* 2014;12:724-725.

14. Goettmann S, Zaraa I, Moulonguet I. Nail lichen planus: epidemiological, clinical, pathological, therapeutic and prognosis study of 67 cases. *J Eur Acad Dermatol Venereol* 2012;10:1304-1309.

15. Prevost NM, English JC III. Palliative treatment of fingernail lichen planus. *J Drugs Dermatol* 2007;6:202-204.

16. Mostafa WZ. Lichen planus of the nails: treatment with antimalarials. *J Am Acad Dermatol* 1989;20:289-290.

17. Irla N, Schneiter T, Haneke E, Yawalkar N. Nail lichen planus: successful treatment with etanercept. *Case Rep Dermatol* 2010;2:173-176.

18. Kato N, Ueno H. Isolated lichen planus of the nails treated with etretinate. *J Dermatol* 1993;20:577-580.

19. Manousaridis I, Manousaridis K, Peitsch WK, Schneider SW. Individualizing treatment and choice of medication in lichen planus: a step by step approach. *J Dtsch Dermatol Ges* 2013;11:981-991.

20. Banga G, Patel K. Glicolic acid peel for nail rejuvenation. *J Cutan Aesthet Surg* 2014;7:198-201.

21. Daulatabad D, Nanda S, Grover C. Intra-individual right-left comparative study of medium depth peels in superficial nail abnormalities. *J Cutan Aesthet Surg* 2017;10:28-32.

22. Takeuchi Y, Iwase N, Suzuki M, Tsuyuki S. Lichen planus with involvement of all twenty nails and the oral mucous membrane. *J Dermatol* 2000;27:94-98.

23. Tosti A, Peluso AM, Fanti PA, Piraccini BM. Nail lichen planus: clinical and pathologic study of twenty-four patients. *J Am Acad Dermatol* 1993;28:724-730.

24. Ujiie H, Shibaki A, Akiyama M, Shimizu H. Successful treatment of nail lichen planus with topical tacrolimus. *Acta Derm Venereol* 2010;90:218-219.

25. Abell E, Samman PD, Intradermal triamcinolone treatment of nail dystrophies. *Br J Dermatol* 1973;89:191-197.

26. Grover C, Bansal S, Nanda S, Reddy BS. Efficacy of triamcinolone acetonide in various acquired nail dystrophies. *J Dermatol* 2005;32:963-968.

27. Gerstein W. Psoriasis and lichen planus of nail: treatment with triamcinolone. *Arch Dermatol* 1962;86:419-421.

28. Piraccini BM, Saccani E, Starace M, Balestri R, Tosti A. Nail lichen planus: response to treatment and long term follow-up. *Eur J Dermatol* 2010;20:489-496.

29. Brauns B, Stahl M, Schön MP, Zutt M. Intralesional steroid injection alleviates nail lichen planus. *Int J Dermatol* 2011;50:626-627.

30. Tosti A, Piraccini BM, Cambiaghi S, Iorizzo M. Nail lichen planus in children: clinical features, response to treatment, and long-term follow-up. *Arch Dermatol* 2001;137:1027-1032.

31. Siblinga SM. Observations on growth of fingernails in health and disease. *Pediatrics* 1959;24:225-233.

32. Deffer TA, Goette DK. Distal phalangeal atrophy secondary to topical steroid therapy. *Arch Dermatol* 1987;123:571-572.

33. Wenzel J, Scheler M, Proelss J, Bieber T, Tuting T. Type I interferon-associated cytotoxic inflammation in lichen planus. *J Cutan Pathol* 2006;33:672–678.

34. Di Lernia V. Targeting the IFN-γ/CXCL10 pathway in lichen planus. *Med Hypotheses* 2016;92:60-61.

35. Woon CY, Phoon ES, Lee YJ, Ng SW, Teoh LC. Hazards of steroid injection: suppurative extensor tendon rupture. *Indian J Plast Surg* 2010;43:97-100.

36. Baran R. Proximal nail fold steroid injection responsible for Hoignè syndrome. *J Eur Acad Dermatol Venereol* 2014;28:1563-1565.

37. Grover C, Kharghoria G, Daulatabad D, Bhattacharya SN. Nicolau syndrome following intramatricial triamcinolone injection for nail lichen planus. *Indian Dermatol Online J* 2017;8:350-351.

38. Clark A, Jellinek N. Intralesional injections for inflammatory nail diseases. *Dermatol Surg* 2016;42:257-260.

39. Rigopoulos D, Baran R, Chiheb S, Daniel CR, Di Chiacchio N, Gregoriou S, et al. Recommendations for the definition, evaluation, and treatment of nail psoriasis in adult patients with no or mild skin psoriasis: A dermatologist and nail expert group consensus. *J Am Acad Dermatol* 2019;81:228-240.

40. De Berker DA, Lawrence CM. A simplified protocol of steroid injection for psoriatic nail dystrophy. *Br J Dermatol* 1998;138:90-95.

41. Grover C, Bansal S. A compendium of intralesional therapies for nail disorders. *Indian Dermatol Online J* 2018;9:373-382.

42. Caplan A, Fett N, Rosenbach M, Werth VP, Micheletti RG. Prevention and management of glucocorticoid-induced side effects: A comprehensive review: A review of glucocorticoid pharmacology and bone health. *J Am Acad Dermatol* 2017;76:1-9.

43. Roger L. Serious adverse events with low-dose, long-term corticosteroid therapy in rheumatoid arthritis. Am J Med 1995;99:692-4.

44. Baran R. Retinoids and the nails. *J Dermatol Treat* 1990;1:151-154.

45. Baran R. Action therapeutique et complications du retinoide aromatique sur l'appareil ungueal. *Ann Dermatol Venereol* 1982;109:367-371.

46. Galosi A, Plewig G, Braun-Falco O. The effects of etretinate on fingernail growth. *Arch Dermatol Res* 1985;277:138-140.

47. Cheng C, Michaels J, Scheinfeld N. Alitretinoin: a comprehensive review. *Expert Opin Invest Drugs* 2008;17;437-443.

48. Alves de Medeiros AK, Speeckaert R, Desmet E, Van Gele M, De Schepper S, Lambert J. JAK3 as an emerging target for topical treatment of inflammatory skin diseases. *PLoS One* 2016;11:e0164080.

49. Yang CC, Khanna T, Sallee B, Christiano AM, Bordone LA. Tofacitinib for the treatment of lichen planopilaris: a case series. *Dermatol Ther* 2018; 31:e12656.