

Importance of doing nail biopsy - personal experience and literature review

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The nail complex is the structural and functional unit of the nail. The nail consists of the plate; bed; matrix; proximal, lateral, and distal grooves; proximal and lateral folds; and hyponychium.

Acquired causes of deformed or dysmorphic nails are numerous and those affected are often very concerned about their unsightly nail problem. Since an accurate diagnosis is needed in order to plan management, nail biopsy could be of value in establishing the actual diagnosis.

Apart from onychomycosis several other diseases can lead to dysmorphic nails. The list includes psoriasis, lichen planus, twenty nail syndrome, lichen sclerosis et atrophicus, eczema, Darier's disease and also tumours like melanocytic nevi, Bowen's disease, melanoma, and others.

Nail changes have been reported in about 10 percent of cases of lichen planus. The majority of nail changes result from damage to the nail matrix, or nail root. Usually only a few fingernails or toenails are involved, but occasionally all are affected. Nail changes associated with lichen planus include longitudinal ridging and grooving, splitting, nail thinning and nail loss. In severe cases, the nail may be temporarily or permanently destroyed.

Lichen planus of the nails is a well known cause of nail dystrophy and nail biopsy is considered mandatory to confirm the diagnosis. Lichen planus can be present exclusively on nails and this could be misdiagnosed as onychomycosis.

Onychomycosis may be confused clinically with all other causes of nail dystrophy, and it is important to confirm the diagnosis of onychomycosis with appropriate mycological analysis.

In practice, due to the possibility of misdiagnosis, at least one positive laboratory test such as simple direct microscopy or culture is now mandatory for

the diagnosis of onychomycosis. However mycology can be negative in some cases and nail histopathology could be a useful tool to confirm the actual diagnosis, under these circumstances.

Performing successful nail surgery requires a comprehensive understanding of nail anatomy and physiology.

Nail biopsy is a safe and useful diagnostic procedure for many nail disorders when routine clinical and laboratory methods fail to provide a diagnosis. Prerequisites for nail biopsy are an understanding of the surgical anatomy of the nail, adequate anaesthesia and haemostasis, and a nail abnormality for which histopathology can provide the diagnosis. Indications and methods of nail biopsy vary according to the site and type of pathology in the nail unit. Nail bed and perionychial biopsies can be performed easily and with minimal scarring. They are most commonly used to diagnose tumours as well as infectious and inflammatory disorders of the nail.

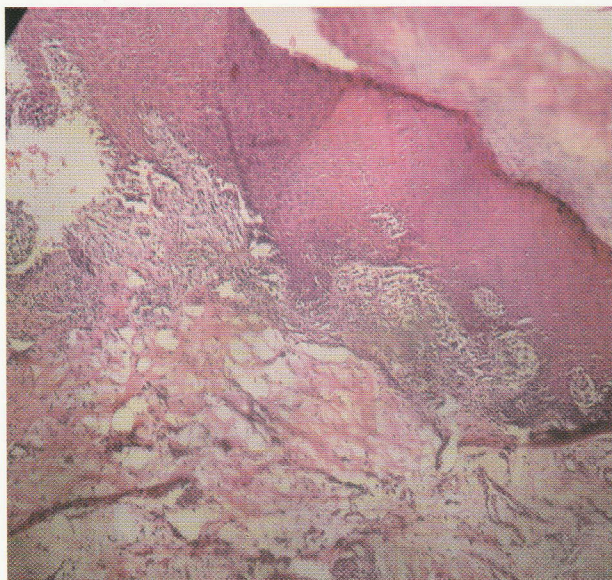
Where nail matrix is required several techniques can be used to harvest the tissue. Lateral longitudinal nail biopsy is the gold standard of incisional nail biopsies. It can be obtained under local anaesthetic and requires only normal biopsy instruments.

Nail matrix biopsy can also be done using punch probes usually 4 mm driven down to the periosteum.

Biopsy of the nail plate alone, or with associated nail bed and occasionally matrix, may be needed to confirm fungal infection in atypical cases.

Recently a 45-year old man presented to us with dystrophic finger nails of 3 years duration, the initial fungal studies showed positive results for fungal culture, but he did not respond to standard oral antifungal therapy, and later we decided to perform a longitudinal nail biopsy, which revealed typical changes of lichen planus.

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For years, nail biopsy has been shunned as a difficult and scarring procedure, which is seldom required in day-to-day practice. Only a few studies with a limited number of patients have been carried out to assess its utility in dermatology.

In one study 270 patients with nail disorders (both infectious and noninfectious) were assessed, in 205 cases, the clinical diagnosis could be confirmed with the help of routine diagnostic aids, in the form of potassium hydroxide preparation, fungal culture, and biopsy of associated skin lesions. In the remaining 65 cases, various types of nail biopsies were carried out after ruling out contraindications to nail surgery. Histopathologic changes were found in 63% of cases. Findings were more characteristic in infectious disorders of the nail unit. The diagnostic yield varied with the type of biopsy procedure. Side effects in the form of scarring and nail dystrophy were seen in 29.2% of the patients, and the authors conclude that nail biopsy is useful, especially in cases with isolated nail involvement, an absence of skin lesions, and disorders such as twenty-nail dystrophy. It should be advocated in cases in which the routine diagnostic procedures fail to yield results. Nail biopsy was found to be a simple, safe, and useful procedure, especially in cases in which the clinical diagnosis is otherwise obscure¹.

In another study, thirty-two patients with total nail dystrophy (TND) were screened clinically. The histopathologic features of skin and longitudinal nail

biopsies were also evaluated. The efficacy of nail unit biopsy was thereby assessed. It revealed, young males in the 10 to 20-year old age group were most commonly affected (52%). *Alopecia areata* was the most commonly associated dermatosis (22%). LNB revealed a specific diagnosis of either psoriasis or lichen planus in 52% of the cases, whereas the rest showed nonspecific histologic changes (spongiotic trachyonychia). Scarring was a major risk associated with LNB, as evident in 28 of cases, and they concluded the diagnostic utility of nail biopsy in TND patients and advocate this procedure in cases in which the clinical diagnosis is otherwise obscure. However, it cannot be recommended in the routine evaluation of patients with a relatively benign disorder such as TND.

A similar study reviewed longitudinal nail biopsies performed at Henry Ford Hospital on patients with acquired nail dystrophies to verify whether the procedure did, indeed, provide useful diagnostic information and to see which microscopic features were most helpful in histopathologic diagnosis. Clinical diagnoses included psoriasis, lichen planus, Darier's disease, isolated longitudinal defects, and diffuse thickening. They found that clinical diagnosis could be supported by histopathologic findings in eight of twenty cases of acquired nail dystrophy. Namely diagnosis of psoriasis in four cases, lichen planus in three cases, and Darier's disease in one case. The other twelve cases showed nonspecific eczematous changes. They conclude that longitudinal nail biopsy may be a useful diagnostic tool in certain cases of acquired nail dystrophy³.

In conclusion nail biopsy is a useful diagnostic procedure which a dermatologist should be able to perform when the clinical diagnosis is obscure and routine laboratory methods have failed to establish the diagnosis.

References

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