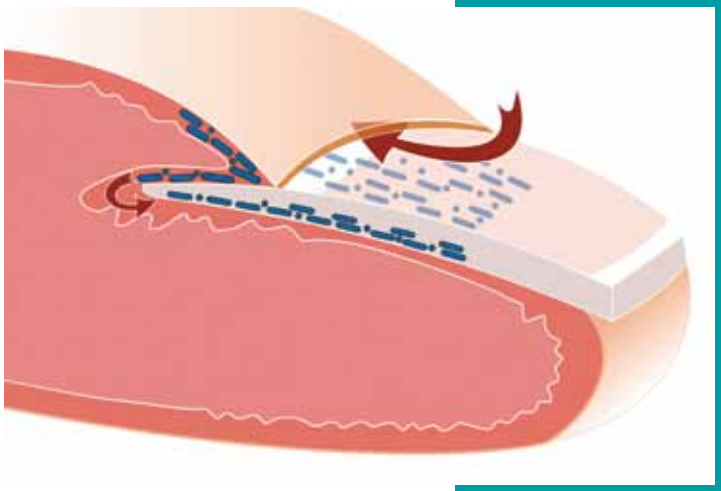
English edition
2008

n°1

The nail



What's new ?

Pierre Fabre
DERMATOLOGIE

The nail - What's new ? - n°1

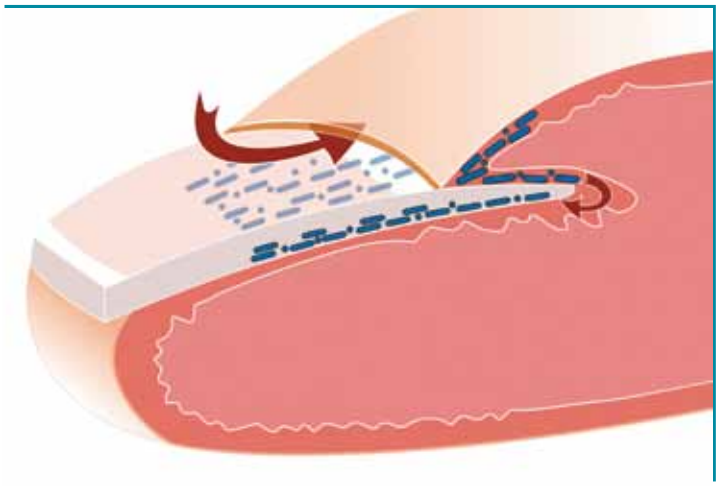


Diagram of proximal subungual onychomycosis (Courtesy of R. Baran)

Pierre Fabre Dermatology noticed that the field of nail disease is very often considered as the poor cousin of dermatology. To raise the interest of dermatologists in this subspecialty, Pierre Fabre Dermatology decided to publish an annual Journal on the subject, written by European dermatologists, all of whom are acknowledged as eminent specialists in nail diseases as well as in dermatological pathology and surgical pathology.

These specialists were asked to summarize a few articles published in international Journals and to add their comments. Each author has illustrated his articles with photos taken from his personal collection and, if this is not the case, credit is given to the owner. They were also requested to describe a personal clinical case and one of the team is asked to write a complete article for Medical Training.
This Journal has already been published in French three times and Pierre Fabre Dermatology has now asked us to take the plunge to publish in English for the European dermatologists community.

The team of authors has shown its dynamism in the clinical cases and the diversity of the observations will certainly satisfy most of us. You will discover six cases in this issue, which I feel sure will be of interest to you.

Dr Richert (Belgium) describes a whitlow which is not one, Pr. Mascaro (Spain) informs you about an epithelioma which has become frequent, Dr. Goettmann (France) diagnoses a rapidly developing tumour which is extremely painful, Pr. Correia (Portugal) will surprise you when he tells you about the genesis of onycholysis of his case and Dr. Cannata (Italy) confesses to having been astonished by a patient presenting Urbach-Wiethe disease.
More soberly, I will tell you about a benign tumour of peripheral nerve, the perineurioma of the nail apparatus.

We retained the clinical case of Pr. Haneke (Germany) for our Continuing Medical Education. This clear text, including ten photos, should give you the key to the excision of a junctional nevus of the nail matrix, presenting as longitudinal melanonychia.
As is the case every year, I assume full responsibility for our foreign colleagues' prose.

We wish to sincerely thank Pierre Fabre Dermatology and Dr. Coustou, Publishing Editor, in particular, who have contributed in this manner to familiarizing dermatologists with the mysteries of the nail.
Pierre Fabre Dermatology will continue research for nail treatment.

Robert Baran

The nail - What's new ? - n°1

Condensed selected articles with commentaries

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Clinical cases

Continuing Medical Education

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The nail - What's new ? - n°1

Condensed selected articles with commentary

Robert BARAN

Sensitization to acrylates is a common adverse reaction to artificial fingernails

Lazarov A. JEADV 2007; 21: 169-174.

Although precise figures for adverse reactions to nail-care products are not available, it is thought that one of the main risks from artificial nails is contact allergy. A 4-year retrospective study of patients with suspected allergic contact dermatitis (ACD) from artificial nails was conducted. Patients tested with the methacrylate artificial nail series were evaluated clinically and patch test results were analyzed.

ACD to components of artificial nails may be a frequent cause of hand eczema, as observed in more than one third of our patients (38.2%). About half of the patients were beauticians specializing in nail sculpturing [Fig 1] who developed occupationally related ACD. All the patients had involvement of the hands and fingers [Fig 2], whereas forearms and distant sites (face and neck) [Fig 3] were more frequently seen in patients with occupational allergic contact dermatitis. Typical clinical features were those of chronic dermatitis but atypical forms such as a lichenoid and psoriasiform ACD were also observed.

Mucosal erythema and oedema developed in 2 patients with allergic contact dermatitis due to MAAN after application of dental crowns with an acrylate-based cement. The most frequent allergens triggering ACD were 2-hydroxyethyl methacrylate (2-HEMA) and 2-hydroxypropyl methacrylate (2-HPMA) (17.5% each), followed by ethyleneglycol dimethacrylate (EGDM; 13.4%). A quarter of the patients tested with ethyl cyanoacrylate (ECA), a component of nail glue, had positive results.

Acrylic monomers used when sculpturing artificial nails are important contact and occupational sensitizers that can produce cross-reactions with other acrylic compounds and trigger allergic reactions when re-exposure occurs in a different setting.

Fig 1 - Metalized papered board template for sculptured artificial nails

Fig 2 - Dermatitis of the proximal nails folds from sculptured nails

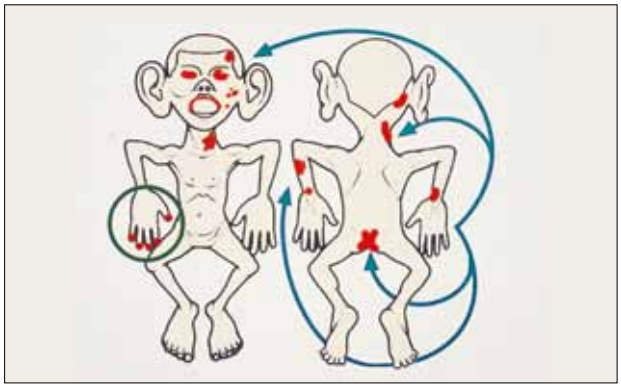

Fig 3 - Distribution of nail cosmetics dermatitis

COMMENTARY R. BARAN

It is obvious that in the case of contact dermatitis the sculptured nails must be removed with acetone as soon as possible.

Rotational alignment of the finger nails in a normal population

Bansal R, Craigen M.A.C. J Hand Surg (Europ.vol) 2007; 32E: 80-84.

The authors measured the alignment of the nails in the hands of 100 normal adults with the interphalangeal joints extended and the metacarpophalangeal (MCP) joints at 0° and 90°. All fingers were naturally supinated (i.e. rotated towards the thumb), the index and little finger being the most supinated. When examining individual hands in MCP joint extension, only 17% of hands had all nails parallel. With the MCP joints flexed, this improved to 56%. If the little finger was excluded, this improved to 78%. When comparing matching fingers from the two hands, 76% of the little, 83% of the ring, 77% of the middle and 80% of the index fingers matched. Thumbnails were assessed in extension and found to match the other side in 95% of individuals. This study identifies that examination of the injured hand alone with all joints extended is an unreliable method of assessing malrotation following fracture, especially in the little finger. Comparing matching fingers in the two hands is more reliable, but there is still substantial variation in approximately 20% of normal individuals.

COMMENTARY R. BARAN

This article is of great interest for dermatologists, surgeons and in forensic situations.

A forgotten but important risk factor for infective endocarditis in patients with prosthetic valve: Pedicure.

Turgut F, Kanbay M, Uz B et al. Scand J Infect Dis 2007; 39: 274-276

Infective endocarditis (IE) is a microbial infection of the endothelial surface of the heart. *Staphylococcus aureus* often causes life-threatening deep-seated infections such as bacteriemia, endocarditis and pneumonia. *S. aureus* is the most common cause of IE in many areas of the developed world. *S. aureus* frequently enters the circulation from the skin and nares. Endocarditis and septicaemia often have significant mortality despite aggressive antimicrobial therapy.

The authors report on a 36-year-old woman admitted to the hospital with fever. The patient had a history of aortic and mitral valve replacement in 1996 because of chronic rheumatic heart disease. Since that time she had been using an anticoagulant agent regularly. She had no other medical problems and had been in good health. The patient reported that she underwent pedicure 1 week earlier at a coiffeur's premises, but had neither surgery nor dental procedure carried out prior to hospitalization.

On physical examination she appeared to be in severe distress. Her vital signs were a temperature of 38.8° C, heart rate of 109 beats per minute, blood pressure of 135/90 mmHg and a respiratory rate of 36 per minute. Cardiac examination revealed metallic valve sounds and no murmur, gallop or pericardial rub. Distal extremities were cold. Skin examination revealed ecchymotic lesions on the hallux, petechiaes in the distal extremities and splinter haemorrhages in the proximal nail beds. Blood tests showed haemoglobin of 13.6 gm/dl, wbc 11.500/mm3, creatinine 1.8 mg/dl, serum C-reactive protein 258 mg/l.

The patient was admitted to the intensive care unit. Hours after admission, her fever rose to 40.2° C, CRP levels increased to 707 mg/l. Because the patient had a history of valve replacement, spiking fever and high CRP values, a suspicion of staphylococcal septicaemia was raised. Intravenous ampicillin-sulbactam and gentamicin were started. A transthoracic echocardiogram clearly showed a 2.2 cm vegetation located at the left atrium. A diagnosis of endocarditis was established using Duke criteria. On the 3rd day of admission the patient did not respond to resuscitation and died.

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Robert BARAN

A forgotten but important risk for infective endocarditis in patients with prosthetic valve: pedicure.

COMMENTARY R. BARAN

Patients with valvular heart disease have an increased risk of developing infective endocarditis. In this reported case, the patient had prosthetic valve infection with evidence of peripheral emboli.

The role of antibiotic prophylaxis is to prevent infection of the abnormal valve during procedures that are associated with transient bacteriemia. The pedicure was the most likely cause of the patient's endocarditis.

Manicure or pedicure are procedures that often take place in non-sterile conditions. Autoclaved instruments and other sterile techniques should be used and patients with valve replacement must receive antibiotic prophylaxis.

Hand adornment and infection control

Ward DJ. Br J Nursing 2007; 16: 654-656

Studies have shown that despite infection control guidelines recommending that false fingernails, nail varnish, stoned rings and wrist watches not be worn by clinical staff, a large proportion of them continue to do so. The recently updated epic guidelines (2007) state that hand jewellery and false finger nails should be kept short, clean and free from nail polish.

The term 'artificial nails' covers several types of nail attachments [Fig1]. They are not recommended for use on the hands of clinical staff because:

- false fingernails inhibit good hand hygiene
- they can lift at the edges, creating a breeding area for micro-organisms
- they are a risk factor for persistent pathogen carriage
- fungal organisms can multiply in moisture trapped between the false and natural nail [Fig 2]
- they can tear gloves and interfere with the donning of gloves
- the colonization of artificial nails increases with time
- the percentage of gram-negative bacteria is higher on artificial than it is on natural nails.

Edel et al (1998) reported on the percentage recovery of gram-negative bacteria from fingernails and found that the recovery was 5% on natural nails and 35% on artificial nails. Hedderwick et al (2000) compared natural and artificial nails and found that 92% of artificial nails were contaminated compared with 62% of natural nails which had nail polish on them.

Micro-organisms isolated during the study included *Staphylococcus aureus*, gram-negative bacteria, enterococci and yeasts.

- Moolenaar et al (2000) identified a possible role in artificial nails in colonization of nurses' hands with *Pseudomonas aeruginosa* [Fig 3]

It is recommended by Pratt et al (2007) that the fingernails of clinical staff be kept short and clean. This is due to:

- most microbes on the hands being found on and around the fingernails
- long fingernails tearing the gloves
- a higher percentage of micro-organisms being found on the nails of staff with long compared with short fingernails.

The published research seems to back up general recommendations regarding fingernails and jewellery on the hands. The fact that national evidence-based guidelines recommend the removal of hand and wrist jewellery and the wearing of short, natural, unvarnished nails also adds weight to local policies and procedures regarding hand decontamination.

In light of national recommendations and the research evidence available, it is important that staff are educated in the infection control aspects of hand adornment and that managers support infection control teams in reducing the wearing of such items by clinical staff to minimize the risk of contamination and infection.

Fig 1 - Nail gel system

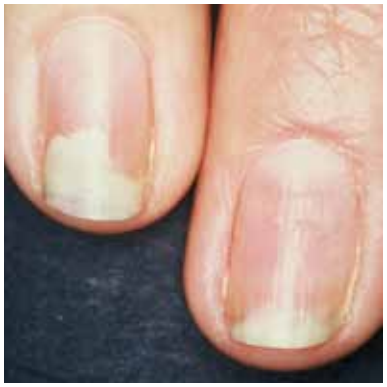

Fig 2 - Onycholysis due to *Candida* spp. following artificial acrylic nail

Fig 3 - Onycholysis associated with Pseudomonas following false acrylic nails

Children's fingernail hygiene and length as predictors of carious teeth

Larsen CD, Stavisky E, Larsen MD, Rosenbaum MS. NY State Dent J 2007; 73: 33-37

Two dental residents collected data on 104 randomly selected inner city children (ages 3 to 8-years-old) from the Episcopal Hospital Pediatric Dental Clinic in Philadelphia in 2002. The purpose of this study was to produce a preliminary assessment of the plausibility of simple indicators of hygiene as predictors of dental health. Fingernail length was measured as 10 mm to 10 mm beyond the end of the finger-tip. The cleanliness of fingernails was based on the number of nails with foreign matter under the nail. Residents quantified the number of decayed, missing or filled teeth (DMFT) according to ADA guidelines during regular clinic visit. The number of dirty fingernails and fingernail length are statistically significant predictors of the number of DMFT. The combination of absolute value of fingernail length and the number of dirty fingernails yielded improved and statistically significant predictions of DMFT. The number of dirty fingernails had the most impact on predicted DMFT. Based on this observational study of a single population, it can be suggested that further study of simple hygiene indicators as predictors of dental health be conducted on children from diverse backgrounds.

During evaluation and treatment of children as patients, dentists focus primarily upon a child's oral cavity. When planning treatment and care, however, the pediatric dentist can consider the patient as a whole. The field of dentistry in general and pediatric dentistry in particular is increasingly assessing risks of dental caries associated with behaviour, socioeconomic background and clinically assessed conditions. Typically, information on the patient's socioeconomic background and general and oral health is collected when making risk assessments, treatment plans and prognostic evaluations.

Literature does exist on studies of risk factors, such as poverty, the relation to other conditions such as asthma, and risk assessment for dental health.

The purpose of this study was to produce a preliminary assessment of the plausibility of simple indicators of hygiene as predictors of dental health. Many of the children involved in this study did not have previous clinical visits, so clinical variables, such as evidence of earlier caries, were not available.

The more important variable is the number of dirty fingernails. The number of missed appointments was problematic as a predictor variable and not significant either in a single or multiple regression of DMFT. It has been shown that children with low socioeconomic status more often miss appointments and have worse oral health.

COMMENTARY R. BARAN

It may seem surprising to link fingernails and teeth. But to a certain extent and after further thought, this appears potentially normal.

Robert BARAN

Iontophoretic drug delivery across human nail

Murthy SN, Wiskirchen DE, Bowers CP. J Pharm Sci 2007; 96: 305-311.

Topical trans-nail delivery of antifungal drugs is limited by several physico-chemical and physiological factors. Use of chemical permeation enhancers has been a common approach for enhancing trans-nail delivery of drugs. The potential of physical permeation enhancement techniques has been found to be higher than the potential of chemical permeation enhancers in transdermal delivery of hydrophilic drugs and macromolecular therapeutic agents. However, application of physical permeation enhancement techniques has not been explored for trans-nail drug delivery. In the current work, iontophoresis was applied across human nail *in vitro* to assess its efficiency in enhancing drug delivery. Salicylic acid (SA) was used as test diffusant. The influence of pH, ionic strength, and current density was studied. Obviously, rise in current density increased the trans-nail transport flux. It appears that about 50-100 mM ionic strength is required for optimal conduction of electric current across nail. The flux enhancement factor (iontophoretic flux/passive flux) also rose with augmentation of pH due to ionization of SA. This study demonstrates the efficacy of iontophoresis in enhancing the trans-nail delivery of drugs.

COMMENTARY R. BARAN

Transungual drug delivery has been in favour since the development of nail varnish with ciclopirox and amorolfine.

Multiple research is developing regularly without, however, being fully convincing. Let's bet that it will take another decade to win the jackpot.

Artificial acrylic finger nail may alter pulse oximetry measurement

Hinkelbein J, Koehler H, Genzwuerker HV, Fiedler F. Resuscitation 2007; 74: 75-82.

Pulse oximetry is the most common technique to monitor oxygen saturation (SpO_2) during intensive care therapy. However, intermittent co-oximetry is still the 'gold standard' (SaO_2). Besides acrylic nails, numerous other factors have been reported to interfere with pulse oximetry. Data of measurements with artificial finger nails are not sufficiently published. Acrylic finger nails may impair the measurement of oxygen saturation depending on the pulse oximeter used and may cause significant inaccuracy. Hence, removal of artificial acrylic finger nails may be helpful to assure an accurate and precise measurement with pulse oximetry.

Subungual blood is not always a reassuring sign

Daniel R, Jellinek NJ. J Am Acad Dermatol 2007; 57: 176

Nail tumors are often preceded by or first recognized after trauma and may even bleed spontaneously. Therefore, the presence of blood does not necessarily rule out a concomitant neoplasm [Fig 1]. It is important to keep this fact in mind when utilizing the method of Huang and Ohara, as well as when using dermoscopy on the nail apparatus.

Huang YH, Ohara K. Medical pearl: subungual hematoma: a simple and quick method for diagnosis. J Am Acad Dermatol. 2006; 54: 877-878.

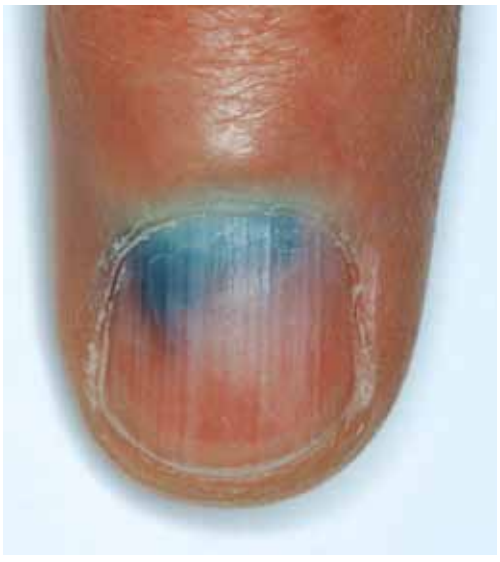

Fig 1 - Proximal subungual hematoma probably following trauma (Courtesy of R. Baran)

Giuseppe CANNATA

Can wearing acrylic nails harm your natural nails ?

Mayo Clin. Womens Healthsource 2006; 10:10

The biggest risk of wearing artificial, or acrylic, nails is infection. If you snag an acrylic nail, it may separate from your natural nail or the nail bed, allowing space for dirt to get in [Fig 1].
If not cleaned and reglued properly, this gap between the acrylic and natural nail provides an ideal environment for bacteria or fungi to grow. An infection may either develop due to accumulated moisture under acrylic nails left on for too long (three months or more), or from the use of unsanitary nail tools.
If an infection develops, remove the acrylic nail and clean the area with soap and water. If it persists, see a dermatologist. Left untreated, an infection may permanently damage your nail.

COMMENTARY R. BARAN

It is easy to remove false nails made of liquid monomer and powder polymer by dipping the fingers in pure acetone. On the other hand, the polymerizing gels are not soluble in acetone when they are briefly exposed to UVs. Therefore, an abrasive treatment (usually with a drill) must be carried out to remove this kind of false nail-advice which is not indicated by the manufacturer.

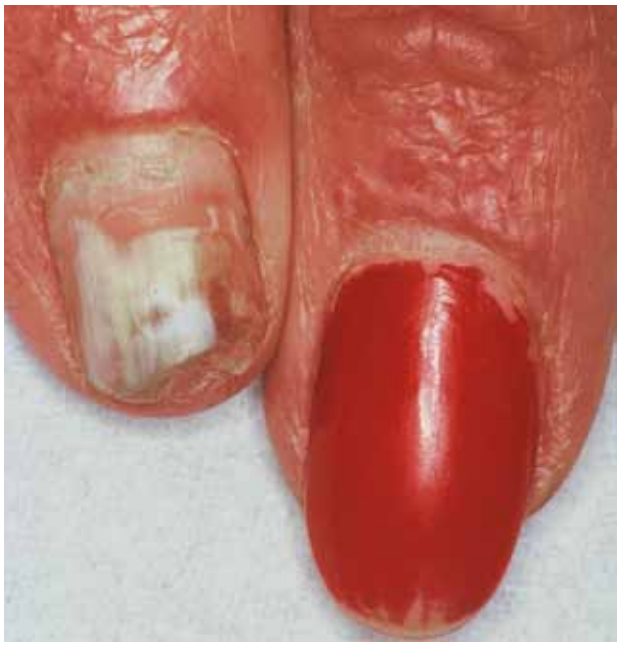

Fig 1 - Pseudo leuconychia after tearing off the false nail (Courtesy of R. Baran)

Giuseppe CANNATA

Vanity burns: an unusual case of chemical burn caused by nail glue

Tang CL, Larkin G, Kumiponjera D, Rao GS. Burns 2006; 32: 776-777

Nail glue is a commercially available product for attaching a false nail onto a natural nail.

A young healthy 28-year-old female accidentally spilled her nail glue onto her left inner thigh during application. She was wearing denim jeans at the time and did not suffer from an instantaneous burning sensation. The area of spillage left a patch of itchy erythematous skin. She denied using any other cosmetic chemical compound. The nail glue was locally manufactured and contained various types of cyanoacrylate. She denied any chemical reaction to her nails. After a few days, she washed her jeans and noted that there was a hole in the jeans where the spillage had been. In the meantime, the area of skin became progressively pale, forming a crust and exudated.

She was alarmed by her condition and went to her general practitioner. Her general practitioner took a wound swab, which grew *Pseudomonas*. Over the next 2 weeks, she developed a greenish-black eschar on the wound. This showed no signs of improvement despite a 10-day course of ciprofloxacin and a regular Granuflex (Hydrocolloid) dressing for 5 weeks.

She was then referred to the plastic surgery department. At presentation, she was found to have a 5cmx 5 cm area of full thickness burn on the upper medial aspect of the thigh with a greenish-black eschar. The surrounding skin was slightly erythematous. The eschar was lifted mechanically in the dressing clinic and a wound swab taken at the base of the wound showed mixed skin and faecal flora. She had the wound debrided surgically and a split skin graft operation under general anaesthesia.

COMMENTARY R. BARAN

Adverse reactions due to nail glue are not uncommon. Nail glue may cause chronic, localised or distant dermatitis, irritant paronychia, allergic onycholysis and onychodystrophy. Allergic contact dermatitis from nail glue typically affects the eyelids, cheeks, sides of the neck, hands, perianal and periungual areas. This is due to the fact that the cyanoacrylate compound contains an array of monomers that may polymerise and form hydrogen bonds with the cells in the presence of water or weak bases. Accidental contact with skin or tissue may cause rapid bonding and subsequently localised irritation.

This is the first and also unusual case report of a chemical burn caused by commercial nail glue.

Giuseppe CANNATA

Lacquer nail

Rigopoulos D, Charissi C, Belyayeva-Karatza Y, Gregoriou S. JEADV 2006; 20: 1153-1154.

Antifungal nail lacquers have been shown to be an effective treatment in the management of onychomycosis either alone or combined with oral antifungals. Nail lacquers act as transungual delivery systems for antifungal agents applied once or twice a week after trimming of the nail plate by a nail file. Adverse effects reported so far are mild and local, including mild pruritus, a burning sensation and transient vesicle formulation on the skin under the nail plate.

Over a period of several years, we have also observed a distinct nail morphology in several patients treated with antifungal nail lacquers for onychomycosis. This morphology features

- thinning of the nail plate;
- triangular onycholysis, with the base lying at the free edge of the nail, where the thinning is maximal;
- median longitudinal onychorrhexis; and
- subungual erythema.

These alterations may be attributed to excessive employment of the nail file, resulting in profound thinning of the nail plate. Most of the patients were women, fearful of losing their nail due to onychomycosis. Nail dystrophies of mechanical aetiology are frequently self-inflicted, and have been occasionally associated in literature with obsessive-compulsive disorders.

COMMENTARY R. BARAN

The triangular aspect of the onycholysis, probably associated with worn-out nails corresponds to the description of a 'Bidet nail' in women obsessed with personal hygiene

(Baran R, Moulin G. The bidet nail: a French variant of the worn-down nail syndrome. Br J Dermatol 1999; 140:377).

Alternate nail cleaners

Kotwal RS, Thomas A, Deglurkar M.. Ann R Coll Surg Engl 2006; 88: 516.

This is the letter of a reader working at Trauma and Orthopaedics Surgery, Royal Berkshire Hospital (UK) to the authors about 'Alternate nail cleaners' article.

'We read this Technical Tip with interest and tried it out but would like to express concerns regarding the use of plastic nail cleaners. Different types of nail cleaners are available (Laboratories Pharmaceutiques Vygon, Ecouen, France) and (Becton Dickinson, Franklin Lahes, NJ, USA) and it was not specified which one to use. We tried using one and failed to prise the nail from its bed. The pointed end cannot be used and so faces the surgeon's hand putting the surgeon at risk of self-harm if it slips during the procedure. The length of the plastic cleaner does not give an adequate lever arm. This combined with the fact that it is malleable makes the procedure difficult and the sharp tip can cause injury to the surgeon. Lastly, although the plastic cleaners come with a surgical hand-brush impregnated with a solution of chlorhexidine or PVP iodine, they are not sterile. For these reasons we do not recommend the cleaner found in hand-scrubbing packs for prising the nail. We routinely use the McDonald dissector for the above procedure. A long lever arm and blunt ends make it a very safe and easy to use instrument'.

Author ' s response

We use the nail cleaner found in the 'E-Z Scrub' scrubbing packs. We direct the convex surface towards the nail bed. We find avulsing the nail using this instrument to be fast and clean; we have not yet experienced any complications.

Successful treatment of psoriatic nails with low-dose cyclosporine administration

Syuto T. EJD 2007; 17: 3: 248-249

Nail involvement in patients with psoriasis significantly lowers quality of life in cosmetic terms, and can be refractory to treatment [Fig 1,2]. Several topical or systemic therapies, such as steroids, calcipotriol, retinoids, and cyclosporine A (non-micro emulsion preconcentrate) have been reported for nail psoriasis, however, few patients have responded well to the treatments. In this clinical study, we assessed the efficiency of low dose micro emulsion preconcentrate cyclosporine therapy for psoriatic nails.

After informed consent was given, 16 patients (9 males and 7 females) with nail psoriasis, aged 27-84 years were enrolled in this study. Thirteen of 16 patients were unresponsive to preceding treatments, such as topical (corticosteroids) or systemic (retinoids, CyA, Sandimmum®) treatment and PUVA therapies. Each patient took CyA MEPC (Neoral®, Novartis Pharma, Tokyo, Japan), 3.0 mg/kg/day twice a day before meals. No patient received any other systemic or topical treatments or photo therapy. The evaluation of clinical findings and blood tests, including serum CyA through level, were carried out every 4-8 weeks after administration. In patients whose nails improved, the dosage of CyA MEPC was reduced to 1.5 mg/kg/day in a single administration before breakfast.

Fifteen of 16 patients showed improvement. Two patients obtained a complete resolution, 10 a significant improvement, 3 a slight improvement and 1 patient no change. In 5 patients whose nail changes were significantly improved, we reduced CyA MEPC dosage to 1.5 mg/kg/day. In 2 patients whose nail changes had completely resolved, we tried to taper off. These 7 patients have had no relapse in the 4 to 15 months follow up period. No adverse effect was noted in any patient during the treatment. It is of note that the significant improvement has continued within 15 months after CyA administration in spite of relapsed cutaneous lesions.

COMMENTARY

The use of systemic drugs in the treatment of nail psoriasis appears to be legitimate, especially when the involvement appears on several nails and reaches the matrix. The authors do not describe the characteristics of the modifications of the nails or the average length of treatment to maintain its effectiveness. A total improvement was obtained on only two patients and the authors did not justify the prescription on an 84-year-old patient. The clinical improvement of nail psoriasis with cyclosporine in a context of extensive vulgaris psoriatic arthritis has been described, but the results have not always been reproducible. It would be of interest to have prospective studies carried out, which would allow identification of the patients whose nail modifications responded best to the treatment with cyclosporine, and also publish a helpful guide for dosage, the length of treatment and the possible synergy with topical treatments.

Fig 1 - Nail psoriasis

Fig 2 - Nail psoriasis with pronounced onycholysis

Osvaldo CORREIA

Twenty nail dystrophy in vitiligo

Khandour S, Bansal A, Sharma V et al. J Dermatol 2007; 34: 189-192

Twenty nail dystrophy (TND) is a manifestation of several dermatoses and its association with vitiligo is rare. It may be consequent upon a common autoimmune insult to the melanocytes and the nail matrix. The authors report a patient with acrofacial vitiligo who developed TND. Nail matrix biopsy revealed focal lichenoid reaction and chronic inflammatory infiltrate in the dermal papillae and around blood vessels. Hematological, biochemical and serological investigations showed no evidence of other autoimmune diseases.

A 14-year-old boy presented with depigmented macules on the face and extremities since 9 years of age. They first appeared on the lower extremities and then spread to involve the eyelids, scalp, upper limbs and upper chest.

He also gave history of localized alopecic patches over the scalp with a sparsening of the eyelashes 6 years prior that resolved within 2-3 months. Three years prior, he started developing roughness, longitudinal ridging, thickening and discoloration of the nail plates of all the finger and toenails. Oral and topical antifungal treatments did not give any improvement.

Nail clipping for fungus was negative. A nail matrix biopsy revealed hyperkeratosis, marked acanthosis with elongation of rete ridges and dense lympho-histiocytic infiltrate in the dermal papillae and mild infiltrate around blood vessels. A focal lichenoid reaction characterized by chronic inflammatory infiltrate at the dermoepidermal junction with basal cell liquefaction was also observed. Hematological and biochemical investigations were normal. Antinuclear antibody and rheumatoid factor were negative. Thyroid function test was within normal limits and anti-thyroperoxidase antibodies were absent.

A diagnosis of twenty nail dystrophy with acrofacial vitiligo was made and the patient started on oral minipulse steroid therapy consisting of 5 mg betamethasone 2 days/week. He did not show any improvement in the nail changes after 4 months of therapy.

The association of TND with vitiligo is very rare and has been described in only five cases.

A common autoimmune insult to the nail matrix and melanocytes was proposed to be the possible cause of this correlation.

Awareness of this association will widen the clinician's perspective to carefully examine the nail changes in patients of vitiligo and conversely examine patients of TND for depigmented macules of vitiligo.

COMMENTARY

In most cases trachyonychia results from an unknown and complex etiopathogeny [Fig1]. The mycological examination and the biopsy of the matrix is necessary to avoid repeated and useless systemic antifungal treatment. Lichenoid features are histologically the most frequent. Systemic corticotherapy or intramatricial treatments have been prescribed, sometimes successfully. The association with immunological diseases and the characteristics of inflammatory infiltrate in the biopsy suggest an autoimmune etiopathogenesis of the condition. However, the frequent absence of auto-antibodies in the blood and the association with classical auto-immune systemic diseases, like systemic lupus, causes doubt about the real participation of auto-antibodies. On the other hand the participation of T lymphocytes and cytokines is probable.

COMMENTARY R. BARAN

Once again the author of this article has confused twenty-nail dystrophy and trachyonychia. This dystrophy can affect only one finger (therefore 19 are missing ?). Trachyonychia simply shows the rough character of the nail and this term has never been synonymous with twenty-nail dystrophy. Nevertheless we could accept 'trachyonychia of twenty-nails dystrophy' affecting all or some digits.

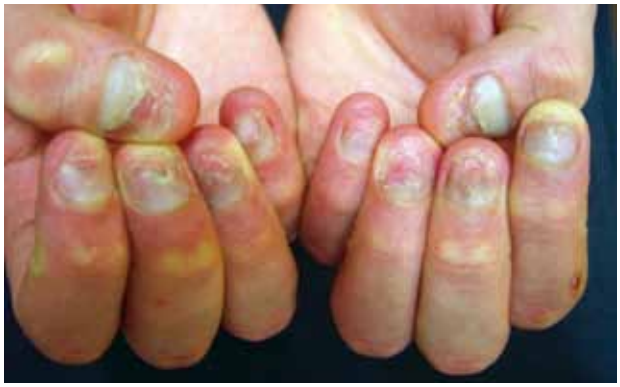

Fig 1 - Lichen planus associated with twenty-nail trachyonychia

An investigation into keratinolytic enzymes to enhance ungual drug delivery

Mohorčič M, Torkar A, Friedrich J et al. Int J Pharmaceutics 2007; 332: 196-201.

The two most common disorders of the nail unit are psoriasis [Fig 1] and onychomycosis (fungal infections of the nail plate and/or bed) [Fig 2]. Onychomycosis is normally treated with oral antifungals, while psoriasis necessitates repeated monthly injections of corticosteroids into the nail folds. Ideally, these diseases would be treated topically to eliminate the inherent side effects of the current treatments such as pain, systemic adverse events and drug interactions, and to increase patient compliance. The effectiveness of topical therapy is, however, limited by the very poor permeability of drugs through the nail plate. The latter is a compact structure made up of a large number of layers of dead, keratinised cells and can be divided into two parts: dorsal and ventral, the dorsal cells being flatter and more closely connected to one another than the ventral cells (De Berker and Forslind, 2004). So far, only a few chemicals that can increase drug penetration into the nail plate have been identified.

It is thought that these enhancers act by reducing the keratin disulphide bonds which are responsible for the integrity of the nail keratins and hence, for the barrier properties of the nail plate (Sun et al.,1999).

Since the nail plate is composed mainly of keratins (Lynch et al.,1986) the authors hypothesised that keratinolytic enzymes might also compromise the barrier properties of the nail plate, and thereby act as ungual enhancers, due to their hydrolytic action on the keratins of the nail plate. Keratin filaments and keratinic tissues such as skin stratum corneum and ground nail plate are known to be hydrolysed by keratinase.

Fresh human nail clippings, obtained from volunteers, were placed in a glass vial containing keratinase (from the fungus *Paecilomyces marquandii*) and were incubated at 35°C for 48h in order to observe the effects of keratinase on the nail plate.

The enzyme acted in a concentration-dependent manner, such that when nail clippings were incubated in a solution containing the lower enzyme concentration of 1 mg/mL, corneocyte detachment from their neighbours occurred to a lesser extent. Very little is known about the intercellular matrix present between nail cells. It is composed of proteins (and/or mucopolysaccharides), which are likely to be in a random coil state.

Limitation of enzyme activity to the exposed part of the nail (in practice, to the dorsal nail surface) may be sufficient for enhanced ungual drug delivery, as the dorsal nail surface is known to be the main barrier to ungual drug permeation and its removal, by filing, has been shown to increase drug flux through the nail plate.

Fig 1 - Psoriasis presenting with onycholysis

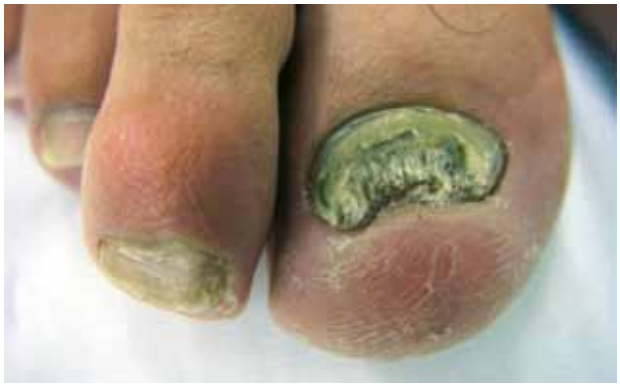

Fig 2 - Total dystrophic nail plate of the big toe

In addition to acting on the intercellular matrix, keratinase corroded the surface of corneocytes.

The permeation profiles of the model drug, metformin, in the presence and absence of keratinase, the drug concentration in the receptor phase started to increase, more so in the presence of keratinase, than in its absence. >>>

Osvaldo CORREIA

An investigation into keratinolytic enzymes to enhance ungual drug delivery

The flux and the permeability coefficient through the enzyme-exposed bovine hoof membrane were significantly higher than those of the control.
The irreversible damage to the hoof membrane and continued enhanced drug permeation indicate that, in practice, it might be sufficient to pre-treat diseased nail plates with an enzyme formulation, for example, using a transdermal-type patch for several hours, after which the patch would be removed and drug application would take place, for example via the application of a drug-containing nail lacquer.
From these studies, the authors have observed that keratinase produced by P. *marquandii* disrupted the nail plate by acting on the intercellular matrix as well as on the nail corneocytes. The keratinase enzyme increased the permeability of bovine hoof membranes, used as a model for the nail plate. The results suggest that keratinase enzymes may act as ungual enhancers to increase the permeation of topically applied drugs into the nail plate.

COMMENTARY
The authors succeed in demonstrating the interest of a keratinolytic system which could be very useful in simplifying the penetration of drugs into the nail and have a major role in pathologies as frequent as psoriasis and onychomycosis for which the treatment is long, frequently systemic and not always effective. Similar systems, such as the association of papain and salicylic acid have shown an increase in the permeability to imidazoles. (Quintanar-Guerrero D. 1998).

Toenail mercury and dietary fish consumption

Rees J. J Exposure Science and Environmental Epidemiology 2007; 17: 25-30.

Mercury is an established environmental pollutant with a variety of serious health effects in humans (Risher et al.1999). Numerous attempts have been made to identify and characterize useful biomarkers of exposure to mercury, including blood, urine, hair, fingernails and toenails, both as correlates of environmental exposures and also in relation to diseases such as coronary heart disease. Toenail mercury concentrations are reasonably stable indicators of exposure over time and toenails have the advantage over hair and fingernails of being less susceptible to external contamination. Toenail mercury content is significantly associated with fish consumption; in fact, knowledge of fish consumption alone can be sufficient to characterize mercury exposure as measured in toenails.

New England is one of three areas in the United States with the highest annual deposition of mercury. Since 1994, the New Hampshire Department of Health and Human Services has issued a fish consumption advisory because of mercury contamination.
27 participants consisting of 16 males and 11 females with a mean age of 59 years (range 37-73); a mean BMI of 27.7 (range 22.2-36.6); and a mean of 2.9 (range 0-8) years of education beyond high school. The mean total toenail mercury concentration was 0.27 mcg/g.
Of the 27 participants analyzed, 17 (63%) had not eaten any finfish within the past 3 days. The numbers of participants who reported eating any finfish at least once per week were 26/27 (96%).

COMMENTARY
This interesting study shows the importance of analysis of metals from fragments of the big toenails which act as reservoirs.

Osvaldo CORREIA

Brittle nails

Kitamori K, Kobayashi M, Akamatsu H et al. Weakness in intracellular association of keratinocytes in severely brittle nails. Arch Histo Cyto. 2006; 69: 323-328.

Kazlow Stern D, Diamantis D, Smith E et al. Water content and other aspects of brittle versus normal fingernails. J Am Acad Dermatol 2007; 57: 31-36

The incidence of brittle nails is about 20% of the subjects. Its frequency was higher in women (27%) than in men (13%).
In order to elucidate the morphological features of brittle fingernails [Fig 1, Fig 2], clipped nails were obtained from two individuals experiencing severely brittle nails and were subjected to morphological observation . It was found that numerous cracks were present in the nail plate of brittle nails. At the electron microscopic level, marked dilatation of intercellular spaces was frequently observed, and electron-dense layers were either not present or were disrupted.
A brittle nail is caused by occupational exposure, systemic disease, or primary dermatologic conditions (Scher and Bodian, 1991). Mechanical or chemical insults suffered during occupational exposure in the general household are a common cause of brittle nails. The normal nail plate has a water content of approximately 18%. When this content dips below 16% as a result of mechanical or chemical insult, the nail becomes brittle (Scher and Bodian, 1991). It is worth noting that wet working conditions increase the brittleness of nails, but do not cause it (Lubach and Beckers, 1992). Frequent contact with water reportedly increases the rate of brittle nails in women but not in men, thus suggesting that the bridges between nail corneocytes may be weaker in women than in men. Accordingly, frequent hydration and drying increase the incidence of brittle nails in women. Although a brittle nail is apparently caused by various mechanical and chemical insults, including excess dehydration, the morphological features of the brittle nail, particularly at the electron microscopic level, have long remained unclear. In this study, it was found that the intercellular spaces were wider and dilated in brittle nails, in which electron-dense layers were either not present or were disrupted. Furthermore, the occurrence of desmosomes was low in the nail plates of brittle nails. These results suggest that brittleness is associated with defects in the intercellular junctions of corneocytes. Similar - but less severe- changes in intercellular junctions were observed in desiccated nails.

COMMENTARY

The incidence of brittle nails in the population is very high. Dehydration is considered as one of the main reasons. However, the recent study by Kazlow Stern and coll. has not confirmed this point of view. It is evident that dietary factors can be implicated in the genesis of brittle nails. Some studies have indicated a 25% increase in nail thickness after ingestion of biotin. The brittle nails of patients with psoriasis have also improved with ingestion of gelatin. The effects of biotin or gelatin on brittle nails are, however, debatable. It is thought that water, but also lipids, such as gamma linolenic acid have an influence on brittle nails like those of atopic patients, for example. We believe that the treatment of brittle nails benefits from an intake of lipids and proteins.

Fig 1 - Onychorrhexis associated with transverse grooves, probably due to pushing back the cuticle

Fig 2 - Onychoschizia (distal spliting into layers)

Sophie GOETTMANN

Thumbnail lamellar onychoschizia in a tea-picker

Tan C, Zhu WY. Int J Dermatol. 2006 ; 45:1390-1391.

A 32-year-old Chinese woman who picked tea leaves for a tea factory annually from March-September presented complaining of recurrent nail brittleness for 7 years. Fragility of the predominant right-thumbnail plate appeared approximately 2 weeks after starting the annual seasonal work and completely recovered 3 weeks after finishing this type of work.
Picking the newly-grown tea leaves was a repetitive procedure which required holding the leaves between the right thumbnail and index finger and then the right thumbnail was slightly tilted and the free edge of its plate was incised into the leaves. The raw leaves were thus pinched off from the tea tree. Each day, the patient was required to work for 8 hours. Examination revealed lamellar horizontal splitting to the integrity of the right distal thumbnail plates. Mild desquamation and scaling were presented on the tip of the right thumbnail. The other nine fingernails were normal.

The process of picking tea is still repetitive manual work. The authors' report thumbnail fragility in a tea-picker who pinched the tea leaves off with the right index fingernails every year from March-September. Possibly, lamellar dystrophy is a result of frequent wetting and drying of the right dominant thumbnails during picking the leaves. Moreover, it is speculated that catechine, a biological acid in the tea, could modify the keratin content of the nail plate or break the amino acid chains, causing brittleness of the thumbnail. Causes related to other skin diseases, systemic disease or drugs were easily excluded from this case.

Distribution of toenail dystrophy predicts histologic diagnosis of onychomycosis

Walling HW, Sniezek PJ. J Am Acad Dermatol. 2007; 56: 945-948.

Onychomycosis (OM) is a common problem, accounting for up to half of all diseases of the nail, with an estimated prevalence of 10% of the general population and approaching 60% in the elderly. OM, generally caused by dermatophyte fungi, is often symptomatic and can cause functional impairment. Previous studies have shown a correlation between OM and increasing age, psoriasis, tinea pedis, diabetes, peripheral arterial disease, malignancy, and immune dysfunction.
The clinical presentation of OM often involves hyperkeratosis with thickening and discoloration of the nail plate, though other disorders, such as nail psoriasis, onychogryphosis, lichen planus, nail trauma, local tumors, and vascular disorders, may yield a nearly identical clinical picture. Methods of diagnosing OM include potassium hydroxide (KOH) microscopy, culture, and nail clipping with periodic acid-Schiff (PAS) staining for histologic exam.
The authors were interested in studying the pattern of toenail dystrophy in adult patients in whom OM was clinically suspected. The goal of this study was to determine whether particular distribution patterns of dystrophy were associated with an increased likelihood of fungal infection of the nail. All nail clippings included were obtained from adult patients for the purpose of determining the presence or absence of OM. Cases of nondermatophyte fungus were excluded. Specimens for which a description of the distribution of nail dystrophy (described in terms such as thickening, discoloration, subungual hyperkeratosis, or debris) was unavailable were excluded. Repeated nail plate biopsies from the same patient were excluded, as were patients with previously documented treatment with systemic antifungal agents. Specimens from a total of 311 patients were available for analysis. Overall, 150 specimens (48.2%) were histologically positive for OM. OM was significantly more likely to be diagnosed in men compared to women, and in persons over the age of 64. The presence of tinea pedis was also positively correlated with OM. When the clinical distribution of nail dystrophy was studied with the histologic results, involvement of the third or fifth toenails of either foot (with or without dystrophy of other nails) was significantly correlated with the presence of dermatophyte.
Specifically, 63.1% cases involving the third toenail and 65.9% cases involving the fifth toenail were histologically positive for OM. Dystrophy of the great toenail was seen in 257 of the 311 (82.6%) cases and was associated with OM in about half of these and was less likely to be associated with OM when both great toenails were dystrophic (44.6%). Dystrophy of the first and fifth nails on the same foot was predictive of OM.

The author' s study shows that less than half of clinically suspected toenails harbored histologically identifiable fungus, which is supported by other studies. Observation of patterns of dystrophy particularly correlated with OM may serve to limit misdiagnosis and lead to appropriate clinical decision-making.
In this study, they found that dystrophy of the third or fifth toenails, dystrophy of the first and fifth nails of either foot, and unilateral dystrophy, as well as male gender and age over 64, are predictive of a histologic diagnosis of OM. Female gender was a negative predictor. The presence of these patterns of dystrophy may help to clinically distinguish OM from mimickers such as psoriasis and nail trauma. The presence of dermatophytes in only half (128/257) of clippings from dystrophic great toenails was somewhat unexpected and may reflect the tendency of this nail to be subjected to minor trauma.
This study has several limitations. Cultures and KOH results were not available to correlate with histologic findings. PAS staining of nails has been reported to be the diagnostic method of greatest sensitivity with the highest negative predictive value and a similar positive predictive value compared to culture and KOH results.
This study was retrospective and based on routine clinical practice at our institution, with reliance on medical records for associated conditions.
While clues from the clinical distribution of toenail dystrophy do not obviate the need for diagnostic testing, this information may raise clinical suspicion and assist in decision-making regarding which definitive test or tests to perform. Because the negative predictive value of these diagnostic tests may be relatively low (<60% for KOH microscopy and culture), repeat testing may be warranted in patients with negative initial testing who have a suspicious distribution of dystrophy. Conversely, when the clinical pattern does not suggest OM, alternative diagnostic considerations could be entertained with greater confidence.

COMMENTARY

This article presents important defects. It is retrospective. Even if the patients whose clinical exam data was not available have been excluded, the clinical exam was not carried out for the study and was, therefore, not standardized.
The absence of mycological nail samples associated with histological tests seriously limits the interpretation of the results.
In fact, PAS positivity solely is not enough to establish the diagnosis of onychomycosis.
Moreover, to determine dermatophytes on PAS stain without associated mycological removal is debatable.
The fact that only 48% of the tests (PAS) carried out for suspected onychomycosis are positive, leads us to believe that the physicians were not used to differentiating onychomycosis from traumatic pathologies.
It is surprising that the involvement of the third and fifth toenails is particularly correlated to a positive PAS. The nail of the 5th toe is often dystrophic due to the repeated microtrauma on the lateral side of the shoe.
Onychomycosis can involve a various number of nails and there do not seem to be any rules. Only one nail can be infected; some nails or all of them can be involved; the most often the big toenails; the little toenails can also be affected without an infection of the big toenail.
Onychomycosis often appears on thick pathological and/or onycholytic nails due to repeated microtrauma.
The diagnosis of onychomycosis is based on clinical and mycological comparison and in difficult cases on additional and histological comparison.
An attentive clinical exam with observation of the aspect of subungual hyperkeratosis (consistency, colour) after cutting the nail is the key to diagnosis.
Mycological samples should be taken imperatively before prescribing a treatment, and repeated if necessary (in case of negativity, even when the clinical exam is extremely suggestive).
In no case the localization of a nail dystrophy can be an argument for a sure diagnosis. It would be more interesting to classify the clinical signs between those which should then permit, in the case of nail dystrophy, to orientate the diagnosis towards onychomycosis and those which would guide towards a mechanical origin.
The yellow or white longitudinal spikes with smooth ends [Fig.1] opaque leukonychia, the powdery aspect, the orange color of the subungual hyperkeratosis are excellent clinical clues whichever toe is affected.
The location of the nail dystrophy should never be used alone to make a diagnosis and a fungal infection cannot be excluded because of its location. A mycological sampling should be repeated if there are very suggestive semiological elements, as a possible coincidental location may exist.

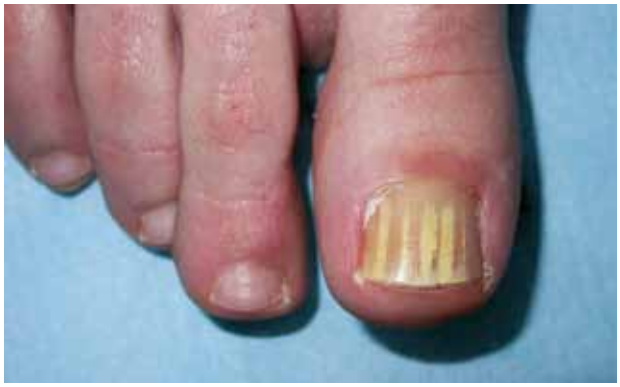

Fig 1 - Distal to proximal yellow- white longitudinal spikes of the big toenail due to *Fusarium oxysporum*

Sophie GOETTMANN

Beau's lines after chemotherapy for ALL

Miyoshi I, Kubota T, Taguchi H. Intern Med 2007; 46:61

A 38-year-old man was transferred to our hospital for suspicion of acute leukaemia. On admission, the white cell count was 4.100/mm^3 with 38% blasts, and the platelet count was 16.000/mm^3. A bone marrow aspirate contained 92% blasts. He was diagnosed with acute lymphoblastic leukaemia. Immediately, he received induction chemotherapy consisting of doxorubicin, vincristine, L-asparaginase, and prednisolone over a 2-week period. This resulted in a complete remission, although he had severe oral mucositis and total alopecia. The so-called Beau's lines were noted on all of his fingernails.
His toenails also showed similar transverse lines. Beau's lines (transverse depressions of the nails) occur in various conditions such as cancer chemotherapy, acute debilitating illnesses, and hypoxia at high altitude or deep sea. They reflect temporary cessation of nail matrix formation. The nail damage does not appear on the nail plate until 6-8 weeks after the insult, it moves distally with the growth of the nail and is lost at about 6 months.

COMMENTARY

There is a photo accompanying the original article where onychomadesis exists on all the fingers presenting as a transverse fracture of the nail plates, the new nail pushing the old one.
A Beau's line is a transverse depression which corresponds to a slowing down of nail growth, whereas onychomadesis corresponds to a temporary interruption of growth. Onychomadesis appears on the base of the nail about three weeks (six weeks for toenails) after the activating factor, but goes unnoticed at the beginning because the proximal part of the nail is not yet detached or lifted.
Etiology of polydactylous onychomadesis is 'acute medical stress' (severe illness, high temperature, childbirth, hypoxia, medical treatment ...).
In children temperature is the first of the etiologies. Nail symptomatology comes after the temperature, which should be looked for during the medical questioning [Fig 1, 2, 3]. Even in these systemic causes all the nails are not necessarily involved. In adults the elimination of the dystrophy takes 6 months for the fingers and about 12 for the toenails. The onycholysis of the proximal portion of the toenail can injure the subungual fold and cause an inflammatory episode, even a pyogenic granuloma, atypical in its proximal position.

In antineoplastic treatments Beau's lines and/or onychomadesis can follow each other according to the rhythm of treatments. Usually they are not invalidating for the patient as opposed to the involvement of the nail bed, which is responsible for onycholysis with subungual erosion or ulceration (onycholysis due to taxane).

Fig 1 - Onychomadesis and Beau's lines following febrile throat infection

Fig 2 - Same patient

Fig 3 - Same patient three months later showing involvement of four fingers

Sophie GOETTMANN

Subungual haematomas

Gamston J. Emerg-Nurse. 2006; 14: 26-34.

This review of literature treating subungual haematomas is aimed at defining the most suitable care.

Patients with subungual haematoma usually present in emergency departments, either for pain relief or for cosmetic reasons. In typical presentations, patients complain of severe, throbbing pain in their finger, while the affected nail is discoloured from the haematoma and the finger tip is tender and swollen.

Subungual haematomas occur when there is bleeding beneath the nail. In such cases, the haematoma becomes trapped between the rigid structures of the nail above and the distal phalanx below.

When the haemorrhage is extensive it can lead to the shedding of the nail plate.

Subungual haematomas are typically caused by crush injuries such as the dropping of a weight on a toe or the shutting of a finger in a door, sports involving frequent abrupt stops and quick pivoting, such as basketball, tennis or squash, can also cause subungual haematoma in the big toe, or hallux, and the second toe.

Bleeding under the nail puts pressure on the nerve endings in the nail bed and pulp which is sometimes so painful that it causes a drop in blood pressure and leads to lightheadedness and sometimes fainting.

When describing the injury, practitioners should include an assessment of the percentage of the nail bed covered by the subungual haematoma and record any other associated trauma to the nail, the nail margins or the surrounding tissues. Owers and Eckersley for example describe an 'explosive' type of pulp injury that is often associated with crush injuries, in which the pulp is put under such pressure that the skin splits. These injuries are usually associated with comminuted fractures.

- examination of the affected digit should include:
- testing the extensor and flexor tendons
- testing circulation by capillary refill
- checking the sensitivity of the area

An underlying fracture to the distal phalanx caused by injury is often associated with subungual haematomas, so anterior-posterior and lateral X-rays are recommended.

Treatment of subungual haematomas has traditionally been by a procedure called trephining, in which the haematoma is decompressed by burning small holes in the affected nail with a heated lancet or paperdip.

The authors conclude by saying that an intact nail provides a splint to the injured finger and that removing the nail in such patients therefore is unnecessary, and can damage the delicate structures of the nail bed.

The researchers excluded patients with subungual haematoma of less than a quarter of the surface area of the nail because they assumed that these patients had no significant nail bed laceration.

All patients included in the study were X-rayed to find out if there were fractures associated with the subungual haematomas.

All 47 patients in their study group had their affected nail removed under digital block and their nail beds were examined for laceration.

If laceration was less than 3 mm deep, the nail was replaced over the nail bed and the patient was discharged. If the laceration required repair, it was sutured using polyglactin 910 and the nail replaced.

Forty four per cent of patients with subungual haematoma covering at least half of the nail also had underlying fracture and, of these, 52% had lacerations that required repair.

Nail removal is unnecessary in patients with subungual haematoma as long as the nail margins and nail are intact.

After draining, patients should be advised to take regular analgesia, elevate their affected digit and use ice packs intermittently for between 24 and 48 hours.

Hot cautery is the most common form of trephination, and many practitioners still carry it out using paperclips that have been straightened and heated until red hot.

A scalpel blade (N° 11) can be used to score and then cut through the affected nail.

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Sophie GOETTMANN

Subungual haematomas

COMMENTARY

Subungual haematomas are frequent. In most cases they are small, not very painful once the initial pain has passed and do not need to be evacuated [Fig 1]. This is the case of the majority of haematomas of sportsmen/women (ski, jogging, tennis). These haematomas are caused by repeated rubbing of the nail in the shoe.

Those which are the most often severe and which must be treated urgently are caused by the fall of a heavy object, a direct violent choc, or a crush injury with or without degloving of the nail apparatus.

As it is absolutely necessary to detect a fracture, an X-ray must be systematically carried out in these cases. A painful subungual haematoma without an associated fracture must be evacuated and followed by an antiseptic treatment avoiding contact with water for a few days. The technique used is of little importance. The orifice must be large enough to allow efficient draining. In case of a fracture not needing surgical treatment (a non displaced fracture, most often caused by crushing), the haematoma must be evacuated and antiseptic treatment applied [Fig 2, 3]. A surgical avulsion with stitches on eventual wounds of the nail bed would probably be more traumatising. Antibiotherapy is debatable.

Surgical treatment is required in the case of a displaced fracture when a bone fragment risks wounding the nail bed. In these cases the nail is often partially or totally avulsed. With meticulous surgery, antibiotherapy can theoretically be avoided. Even so, it is often prescribed.

Fig 1 - Recurrent haematoma at the base of the big toenail in a patient under anticoagulant

Fig 2 - Haematoma of the thumb following a door car injury 10 weeks previously

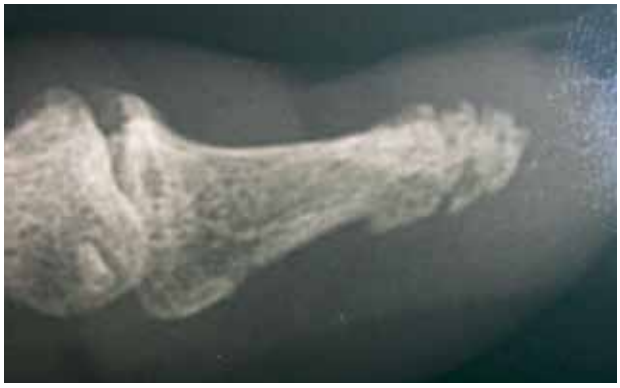

Fig 3 - Same patient as Fig 2. X-rays show a fracture of the tuft of the phalanx

Sophie GOETTMANN

Nailfold bleeding of fingers in a mountaineer with severe frostbite

Maeda M, Yamazaki T, Tawada C. J Dermatol 2007; 34: 219-220.

Nailfold bleeding of fingers is well known in patients with collagen diseases, especially in systemic scleroderma and dermatomyositis. The authors report a case of severe digit-frostbite in a male, non-professional mountain climber with elongation and bleeding clots of nailfolds of fingers, and discuss histopathological features of nailfolds.

A 43-year-old male was transported to the emergency centre by helicopter directly from 'Yarigatake' mountain in the Japanese alps because of unconsciousness and finger-necrosis of 4-5 h duration due to losing his way during a winter skiing exercise. At first, he was in shock because of the accident and had severe necrosis (grade III) of the bilateral middle and left ring fingers with no sensation of warmth or pain. After whole body-warming, he was transported to our department in order to treat frostbite of bilateral fingers, especially the right ring and left middle and ring fingers where necrotic and gangrenous changes were evident. The patient was very reluctant to undergo amputation of the fingers because many of his friends had undergone finger amputation after similar accidents.

A daily i.v. injection of prostaglandin PGE-1 (aloprostagil: 60 mg/day) improved, and finally cured, the frostbite lesion within 22 days, with exfoliate changes of necrotic lesions.

The cuticles and/or nailfolds of whole fingers were markedly elongated and histopathological examination of the exfoliated change of cuticle and/or nailfold of the right ring finger after 2 weeks of PGE1 injections showed three layers with blood clots or coagulation in the middle layer.

Sato et al reported nailfold bleeding clots in patients with systemic scleroderma and Vayssairat also described nailfold capillary microscopic abnormalities in patients with anticardiolipin antibodies. The authors also found nailfold elongation with bleeding clots and capillary abnormalities, and additionally, their histopathological changes in patients with collagen diseases such as systemic scleroderma, dermatomyositis and systemic lupus erythematodes. In general, three layers in the cuticle and/or nailfold, consisting of upper, middle and lower layers, are seen in collagen diseases such as systemic scleroderma, dermatomyositis and so forth, and bleeding clots are always found in the middle layer, whereas in a healthy control, only one or two layers are common in the cuticle and/or nailfold.

COMMENTARY

There are two interesting points in this observation. Despite a very disturbing initial clinical aspect, the medical treatment by injections of prostaglandins has allowed a recuperation leading us to believe that the necrotic zones were superficial.

In a similar situation such a treatment probably deserves to be tried before any radical gesture is carried out.

Histological abnormalities of the cuticle region are similar to those observed in systemic diseases with repercussion on the distal circulation. It can be surmised that Raynaud's syndrome which causes decrease in the distal blood flow and coldness has the same effect on the distal micro circulation.

Sophie GOETTMANN

Giant onychomatricoma : report of two cases with rare clinical presentation

Estrada-Chavez G, Vega-Memije ME, Toussaint-Caire S, Rangel L, Dominguez-Chetrit J. Int J Dermatol 2007; 46: 634-636

Onychomatricoma was reported for the first time by Baran and Kint as a rare nail matrix with specific clinical and histologic features, including a macroscopic appearance of filiform digitations originating from the nail matrix which are inserted in the nail plate. The appearance of the lesion may resemble that of an 'anemone'. All previous reports have been mostly from Europe, with only one case from North America. These are the first case reports from Mexico. They show rare clinical characteristics, in particular involving the entire nail matrix.
Two cases are presented:

Case 1
A 59-year-old man presented with a 2-year history of a painful subungual on the thumb of the right hand. The patient had a history of previous trauma with posterior dystrophic nail plate growth. Therefore, avulsion of the nail plate was performed by a primary care physician; however, the dystrophy persisted in the regrowing nail and became painful.
Clinically, it was observed a rough, thickened nail plate, with transverse overcurvature, yellowish discoloration, and a few splinter hemorrhages on the surface, suggestive of a diagnosis of onychomatricoma.

Case 2
A 45-year-old woman presented with a 3-year history of gradual nail dystrophy, which was initially misdiagnosed as onychomycosis by a general practitioner and treated unsuccessfully with antimycotics for several months without improvement. The patient had cut and scratched off part of the nail plate to reduce the volume and size of the nail. The clinical appearance included a rough, moderately thickened nail plate, with a yellow-brown colour.
In both case, X-ray of the affected thumb did not show any alteration of bone structure.
Onychomatricoma has specific clinical characteristics; however, because of its low frequency, it is usually not identified.
More than 10 cases have been described, mainly by Baran and co-authors, who reported the characteristic clinical aspects for the first time in 1992; however, it was not until 1998 that the histological aspects were described as a filamentous tumor with multiple 'glove-finger' digitations lined with matrix epithelium. The filamentous morphology is better seen at the time of nail plate avulsion. The tumor can be seen arising from the nail matrix with tufted, long, filiform projections. The ventral portion of the nail plate exhibits woodworm-like, deep holes.

COMMENTARY

Onychomatricoma is a benign progressively developing nail tumor - most often over many years. It presents like a longitudinal xanthonychia. Thickness of the nail plate is more pronounced in this affected segment.
Xanthonychia widens very progressively over time and the plate then presents with a transverse overcurvature. Pinkish proximal filiform hemorrhages exist. The lesion is not painful, but the size of the nail can make it uncomfortable.
Some nails are pigmented or associated with a pterygium.
The treatment is surgical. Primary, partial or total avulsion of the pathological nail plate reveals multiple holes. The body of the tumor is inserted on the proximal nail matrix which is difficult to cleave. Pieces of the fragile digitations often remain in the holes of the nail plate when it is being pulled out. Nail regrowth is generally normal. Occasionally some longitudinal irregularities can be observed on the surface of the plate indicating that the matrix has suffered during the delicate cleavage of the tumor. Recurrence is rare.
The two reported cases deserve our attention due to the considerable size of the two lesions and the rapidity with which they appeared. In one of the two cases, the lesion apparently appeared after a trauma.
In both cases the lesions were traumatized .
It is difficult to assert the role of trauma in the rapid development of the lesions.
The painful nature of one of the tumors could be due to previous surgical avulsion, without excision of the tumor. In both cases total matricectomy was carried out, the tumor covering the whole surface of the matrix. The recognition of this lesion should lead to surgery before the lesion becomes too large.

In case of doubt of diagnosis, high resolution MRI reveals a characteristic aspect of the onychomatricoma and especially the intra-ungual holes.
Giant forms are rare [Fig.1-5]. Their considerable size after only few years of development, suggest the intervention of factors which trigger this accelerated growth (role of trauma ?)

Fig 1 - Giant onychomatricoma. Pachyonychia of the third toe marked on its lateral portion

Fig 2 - Same patient

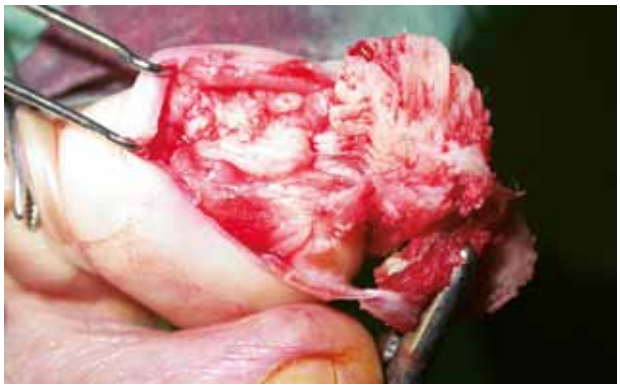

Fig 3 - Avulsion of the nail plate shows multiple holes at its proximal part

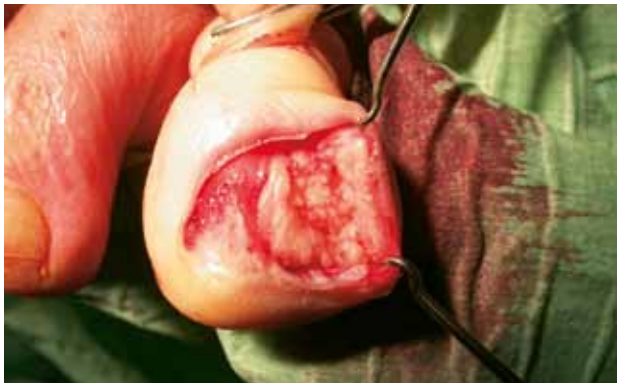

Fig 4 - Irregular surface of the matrix and nail bed due to partial cutting of the digitations remaining in the nail plate.

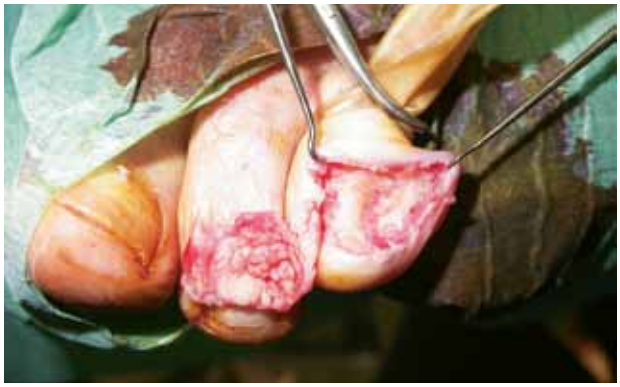

Fig 5 - Excision of total matrix and nail bed, removing the whole lesion.

Eckart HANEKE

Use of Dermabond in nail injuries

Ritz M, Southwick G, Greensmith A, Vijayasekaran V. J Hand Surg Br 2006; 31: 122

Treatment of many fingertip injuries necessitates replacement of an avulsed nail as a form of dressing and cover of a disrupted nail bed. This is mostly done by suturing the nail, or a nail substitute (foil or plastic) back into position.
Over the past few years, the authors have used 2-octyl cyanoacrylate or DERMABOND (Trademark of ETHICON Inc, New Jersey, USA) topical skin adhesive to glue the nail back into position. This not only retains the nail well as a wound dressing, but also holds the nail in position for some considerable time, until the new nail grows out and lifts the old nail, or substitute.
We have found this to be a useful adjunct. It is quick and easy to use and is readily available.

COMMENTARY

To glue a nail back into position is not new. This technique has been described in the literature a certain number of times. The authors of this letter to the Editor have omitted the work of Iselin and of his assistant Recht. (La primauté de la conservation de l'ongle dans les écrasements de la pulpe. Mémoires de l'Académie de Chirurgie 1963; 89:717-723).

COMMENTARY R. BARAN

A new article (Yam A et al. A novel method of rapid nail bed repair using dermabond. Plast Reconstr Surg 2008; 121:148e-149e) confirms Ritz et als' paper.

Occurrence of *Scopulariopsis* and *Scedosporium* in nails and keratinous skin. A 5-year retrospective multi-center study

Issakainen J, Heikkilä H, Vainio E, Koukila-Kähkölä P, Castren M, Liimatainen O, Ojanen T, Koskella M, Meurmann O. Med Mycol 2007; 45: 201-209.

More than 40 species in 8 genera have been identified in the ascomycetes family Microascaceae and more than 20 additional members of this family have thus far been recovered in their mitosporic (asexual) stages. The reservoirs of these Microascaceae include numerous, partly species-specific outdoor niches, such as soil, dead plant material, dung and keratinous substrates.
The main microascacean genus encountered in human keratinous tissues is *Microascus* in its mitosporic *Scopulariopsis* stage. Several members of this large genus, especially *Microascus (Scopulariopsis) brevicaulis*, can grow in nails, which may be confirmed by direct microscopy. In clinical nail samples [Fig 1] *Scopulariopsis* spp. are regularly seen, although much more seldom than dermatophytes.
It is widely accepted that identifying *Scopulariopsis* in a nail specimen is not in itself diagnostic of a fungal infection. This sort of a finding requires careful clinical interpretation, well-based laboratory evidence and exclusion of a possible underlying dermatophytosis.
Scopulariopsis spp. do occur alone and may be the causative agent for at least 1-5% of fungal nail infections. *Scopulariopsis brevicaulis* can cause both distal and proximal subungual onychomycosis. An underlying local or systemic nail disorder is often suspected but seldom proven.
Two other microascacean genera, *Pseudallescheria* and *Petriella*, are usually observed in culture in their asexual *Scedosporium* stages. Two species are known to be opportunistic pathogens, namely the *Scedosporium apiospermum* stage of *Pseudallescheria boydii* and

Occurrence of Scopulariopsis and Scedosporium in nails and keratinous skin. A 5-year retrospective multi-center study

the *Scedosporium prolificans* stage of an unknown *Petriella* spp. These fungi are less common in keratinous sites, although they may, at least when supported by an underlying dermatophyte infection, grow in symptomatic nails for several months. They are notorious for causing serious, treatment-resistant infections in respiratory tract cavities and in deep tissues, and in patients who have some local or general debilitating factors. In immunocompromised patients, they may represent disseminating skin pathogens.

Rarely, *Scedosporium apiospermum* may cause toe-web infections which mimic tinea pedis.

In this retrospective (5 year study, the authors have reviewed the occurrence and significance of microascacean fungi in clinical specimens.

The population of Finland during the study period of 1993-1997 was about 5 million. Laboratory data were collected from the six largest public health laboratories in Finland.

These laboratories studied about 85.000 keratinous specimens (35.000 nail). About 23.000 specimens (15.000 nail) were positive for dermatophytes (i.e. *Arthoderma* anamorphs, not Microascaceae), from which 18.000 yielded *Trichophyton rubrum*. The remaining specimens yielded primarily *T. mentagrophytes*.

All specimens were studied using standard methods that would reveal at least the most common keratinophilic dermatophytes such as *Trichophyton* species. As a rule, a part of the specimen was clered with potassium hydroxide and then directly examined microscopically. General-purpose mycological agars, such as Sabouraud glucose or Malt extract, supplemented with antibacterials were used to culture portions of the specimens. At least one medium without cycloheximide was usually included in culture studies to allow for the growth of opportunistic fungi. Delimitation and identification of fungal genera and species were performed according de Hoog and Guarro techniques.

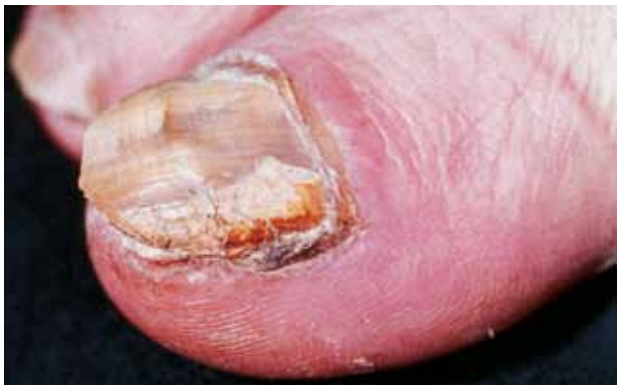

Fig 1 - Onychomycosis of the big toenail due to *Scopulariopsis brevicaulis*

A given case could fulfil the SME (Stronger Microbiological Evidence) inclusion criteria if a fair amount of microascaceous colonies (++ to +++) was recorded in the primary culture or if the microascaceous fungus was the only fungus recovered in culture from the specimen and direct microscopy of the same specimen revealed a mycelial fungus. In other words, the alternative allowed mixed-growth findings if there was a fair number of microascaceous colonies in culture, while allowing unquantified or sparse culture findings in cases in which the microascaceous fungus grew in pure culture and the findings gained support by hyphal elements in direct microscopy.

In the primary search of laboratory records for the period 1993-1997, there were 521 cutaneous cases which were found to be positive for any microascaceous fungi. Out of these, 456 involved *Scopulariopsis* spp. and 65 involved *Scedosporium* spp (46 nails).

After applying the SME and other first-stage reduction criteria, the clinical records were reduced to 158 patients whose cases were associated with *Scopulariopsis* spp (144 nails) and seven cases that involved *Scedosporium* spp (six nails). After the second stage exclusions, the clinical files examined concerned 137 *Scopulariopsis* patients (129 nails) and all seven yielding *Scedosporium* spp.

On the basis of data obtained from two mycologist-led laboratories, about 80% of *Scopulariopsis* cases involved *S. brevicaulis*, 10% *S. candida*, 5% *S. fusca* and the remaining 5% were caused by other species, including *S. acremonium*, *S. brumptii* and strains forming *Microascus* teleomorphs. Most *Scedosporium* strains were identified morphologically as *Scedosporium apiospermum* anamorphs of *Pseudallescheria boydii*. Atypical strains, suggestive of *Petriella* anamorphs, were relatively common in nail specimens, but could not be systematically separated from other *Scedosporium* results.

In all groups, the patients were, on average, older than 50 years and the symptoms were nearly always related to toe nails.

No systemic predisposing diseases were identified.

18% of the nail problems were never treated. If treatment did occur, surgical nail avulsion was reported more often in the non-dermatophyte groups (23%) than in the dermatophyte group (3%).

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Eckart HANEKE

Occurrence of Scopulariopsis and Scedosporium in nails and keratinous skin. A 5-year retrospective multi-center study

The use of oral terbinafine was more common in the dermatophyte group than the non-dermatophyte groups (38% versus 14%), but the use of oral itraconazole (15-20%) and topical amorolfine (10-21%) was similar in both of these groups.
The infections of the patients of the non-dermatophyte groups seemed to be more resistant to treatment - cure or improvement was recorded in only 18% of cases, but in the dermatophyte group the corresponding rate was 36%.
There were six cases of nail infections caused by or from which *Scedosporium* was recovered. In two, there was evidence of an underlying dermatophyte infection in that *Trichophyton rubrum* was isolated in culture one year after the initial recovery of *Scedosporium* and both had early symptoms suggestive of tinea pedis. Both cases responded favorably to oral antifungals.
These data show that benign skin and nail problems are often handled in a hasty manner in a general clinical practice. Because of the scattered nature of these data, the lack of histological specimens and few repeat cultures, the present retrospective study could not meet the criteria of proving or disproving the causative role of Microascaceae in the superficial infections.

COMMENTARY

The criteria of Mary English are very strict and are not very often used in daily work. The authors have defined SME (Stronger Microbiological Evidence) as follows:
a) Either a few colonies of *Microascus* fungus exist or there is profuse growth of fungi.
b) Microascaceae are the only fungi grown in culture and direct microscopy reveals a mycelial fungus
Or alternatively:
a) Mixed growth findings, if there was a fair number of Microascaceae colonies in culture.
b) Sparse growth, but only of *Microascus*

Avulsion injuries of the nail bed do not need nail bed graft

Ogunro O, Ogunro S. Techn Hand Up Extrem Surg 2007; 11: 135-138.

In 1955, Flatt brought our attention to the fact that when acute nail bed injuries were allowed to heal by secondary intention, poor results were obtained. These injuries were simply treated by dressings with resultant desiccation of the residual nail bed and its culture media. Since then various types of graft have been used in the treatment of these injuries. The most successful to date has been the use of split thickness nail grafts as described by Sheppard.
Ogo, however, reported spontaneous regeneration of the nail bed in avulsion injuries that were treated without nail bed graft after amputation at the level of the cuticle.
Despite this, avulsion injuries of the nail bed have continued to be treated with nail bed grafts, often obtained from an uninjured toe and thus compounding the patient's original injury by inflicting another injury. The authoritative texts in hand surgery continue to advocate this method.
From 1985 to 1992, 12 fingers with acute avulsion injuries of the nail bed were treated in 12 patients. The patients were all males with severe industrial trauma to their digits. All injuries presented with the avulsion of the nail bed with an intact germinal matrix except for one case, where at least 50% of the germinal matrix was avulsed.
There were 5 associated phalangeal fractures, 3 of which involved loss of the dorsal cortex of the distal phalanx.
There were 8 cases of pulp avulsions, 3 of which necessitated cross finger pedicle flap, and 5 needed a V-Y flap.

Eckart HANEKE

Avulsion injuries of the nail bed do not need nail bed graft

The technique of nail bed treatment consisted of general debridement and repair of the nail bed wherever possible. The segment of the nail bed loss was not grafted. It was simply covered by the nail splint and secured in place by applying proximal sutures of 5-0 nylon through the eponychium to exit in the nail fold, taking care to avoid suturing the germinal matrix. The suture was then passed through the lateral drainage hole in the splint and then passed retrograde through the fold to exit on the eponychium.

Using the same technique, a second suture was applied through the medial drainage hole. Gentle traction on the suture ends would seat the nail splint in the eponychial fold.

Distal sutures are then applied as described by Ogunro.

The splint was trimmed to a length similar to the length of the uninjured nail on the contralateral side, thus restoring some length to the regenerating nail bed.

Where V-Y flap or distal flaps were necessary, the flaps were sutured to the distal end of the splint instead of the nail bed. This prevented palmar traction on the nail bed and served as a firm support to the flaps and preserved the 'dead space', which became filled with hematoma and organized into the regenerating nail bed.

Appropriate dressing was applied for a period of 2 weeks and then followed by the use of a protective Stack splint. The nail splint was removed at approximately 6 weeks or when the nail bed was observed to be fully regenerated as perceived through the transparent splint.

The fingers were followed up until full nail bed regeneration and nail growth. The follow-up ranged from 6 months to 6 years. After the surgical procedure, a hematoma formed in the 'dead space' beneath the nail splint. The excess blood drained through the drainage holes. The hematoma retained its physiological characteristics, and desiccation did not occur. At approximately 1 week, the hematoma became more organized and firm in its consistency and could not be dislodged. At approximately 3 weeks, almost complete ingrowth of nail bed tissue could be observed replacing the hematoma.

The regenerated nail bed was grossly similar to the natural nail bed and demonstrated the sensitivity characteristic of the nail bed. By 6 weeks when the splint and sutures were removed, there was no gross difference between the regenerated nail and the residual nail tissue. Histological studies obviously could not be performed. At this time, the nail was noted to have regenerated approximately 4 mm distal to the eponychium, and further nail growth continued until restoration of its full length. This pattern of reconstitution of the hematoma into the nail bed followed by regeneration of the nail was observed in all the digits. All the digits demonstrated regeneration of the nail bed and nail, which was equal to or within 2 mm of the original nail length, when compared with the uninjured contralateral side. In patients with a concave or flat nail, the regenerated nail was noted to assume the convexity of the nail splint due to its moulding effect on the regenerating nail bed. There were no infections in any of the cases studied.

Although the standard of care for acute avulsion injuries of the nail bed is split thickness nail bed graft, this study demonstrates that the avulsed nail bed has its own inherent regenerative potential. Hence, the intervention with split thickness nail bed graft is not necessary as long as the nail bed is adequately protected. It seems that effective coverage of the nail bed prevents desiccation and protects the clot and its culture milieu conducive to spontaneous regeneration of the nail bed and nail.

COMMENTARY

Injuries of the nail bed are usually treated with a split thickness nail graft taken from a normal nail bed. This treatment sometimes results in additional injuries. In 1987 Ogo reported spontaneous regeneration of the nail bed. Unfortunately this work has been forgotten. The authors have shown that when desiccation of the nail bed is avoided it can regenerate and the nail grows almost normally.

COMMENTARY R. BARAN

Even before Ogo, Nardo Zaias theorized that regeneration of the nail bed from the paronychial area was possible and E. Zook confirmed this in 'The Perionychium' (Hand Clinic 1990; 6: 57) where he said that the split thickness nail bed graft maintains an ideal environment favouring its regeneration.

Eckart HANEKE

Presence of specialized mesenchymal cells (onychofibroblasts) in the nail unit: implications for ingrown nail surgery

Lee D-Y, Lee K-J, Kim W-S, Yang J-M. J Eur Acad Dermatol Venereol 2007; 21: 575-576.

Ingrown nail is a common disease that causes pain, discomfort and difficulty in walking. It is treated with either conservative therapy or surgery.

In their department, the authors have used two surgical methods for ingrown nail. The first one was nail avulsion and matricectomy. The second one was nail avulsion and electrocautery of the nail matrix. In their experience, the second one is simple, but it has a high recurrence rate compared to the first one. The main difference between the two surgical methods is that the first one includes removal of the dermal tissue underlying the nail matrix and nail bed epithelium to expose the periosteum of the distal phalanx.

The authors recently found CD 10 expression in a well-defined mesenchymal cell population beneath the nail matrix and proximal nail bed within the nail unit. They proposed calling the specialized mesenchymal cells onychofibrolasts because they can be distinguished from the dermal fibroblasts by their CD 10 expression.

Epithelial-mesenchymal interactions are essential for the development and maintenance of skin appendages such as the hair follicle and the nail. It has been previously reported that the nail-matrical fibroblasts induced hard keratin expression in the non-nail matrical keratinocytes through epithelial-mesenchymal interactions, which suggests an important role of the mesenchymal cells in nail formation.

Thus, the presence of onychofibroblasts within the nail unit suggests that the complete removal of the nail matrix and the underlying dermis, including the onychofibroblasts, may be necessary for the definite treatment of ingrown nail.

COMMENTARY

Although the authors' observation is very interesting I have a few objections:

complete excision of the matrix, either by surgery or electrocautery is a totally inadequate and absolutely useless procedure. The result is a complete loss of the nail, most frequently the big toenail, even though we know how important it is in walking. Hundreds of authors have reported that lateral matrix horns excision by surgery or phenolic treatment is sufficient with a low level of recurrence.

It is evident that a morphogenetic influence of the connective tissue of the matrix exists as can be observed after a superficial shaving of a lentigo or after the healing of a split thickness nail matrix graft without scar.

On the contrary after phenolisation, electrocautery or CO_2 vaporisation of the lateral horn of the matrix, the deep wound heals without regrowth of a matrix epithelium and consequently without recurrence of the ingrown nail.

Iontophoretic permselective property of human nail

Murthy SN, Waddell DC, Shivakumar HN, Balaji A, Bowers CP. J Dermatol Sci 2007; 46: 150-152.

Delivery of therapeutically effective levels of drugs to nail strata is a significant task in treating nail disorders. Although oral drug delivery is somewhat successful in treating several nail disorders, side effects may be severe due to considerable high doses. Topical monotherapy is considered less efficient in treating nail disorders such as onychomycosis due to poor trans-nail bioavailability of drugs. The ability of keratolytic and thiolytic agents to enhance penetration is limited by several factors. James et al reported iontophoresis enhanced transport of prednisolone sodium phosphate across the thumb nail. The authors found that iontophoresis could enhance the transport of salicylic acid due to electrorepulsion.

At pH7, the total transport of glucose due to anodal iontophoresis was 12.42 ± 1.3 nmol/(cm2h); whereas at pH<5, it was less than the passive flux of glucose. The pH dependent transport due to cathodal iontophoresis followed an opposite trend. In the case of cathodal iontophoresis, the transport was many folds higher at pH<5 as compared to that at any pH>5. The cathodal iontophoretic transport flux of glucose at physiological pH was 1.12 ± 0.21 nmol/(cm2h). At pH5, the anodal and cathodal transports of glucose did not differ significantly from the passive flux.

These results clearly indicate that the nail plate exhibits

iontophoretic permselectivity similar to human skin.
Water solubility being one of the criteria for drug permeation across the nail, antifungal drugs that are poorly water-soluble do not reach significant penetration across the nail plate. Provided a suitable iontophoretic device could be designed and the electrical protocols are optimized, the transport of not only ionic drugs, but also uncharged drugs could be enhanced across the nail stratums.

COMMENTARY

Substances which do not dissolve in water have difficulty in penetrating the nail plate as the nail is not lipophilic. Iontophoresis can therefore improve nail permeation.

The transverse figure-of-eight suture for securing the nail

Bristol SG, Verchere CG. J Hand Surg 2007; 32A: 124-125

Exposing the subungual germinal and sterile matrices may necessitate removal of the nail plate after trauma and for reconstructive procedures. Replacing the plate under the eponychial fold is required to prevent pterygium. Various techniques have been described for securing the nail plate back in its anatomic position.
Schiller secures the nail plate with a horizontal mattress suture through the eponychial fold. This technique, however, is unidimensional, and the plate may elevate or rotate under the fold. In addition, when the eponychial fold is injured by trauma it becomes a less reliable anchor. Other techniques of fixation include a longitudinal figure-of-eight suture for nail bed fracture lacerations as well as tissue glues [Fig 1].
After anesthesia, irrigation, and debridement, the hand is prepared and draped in a sterile fashion. The nail plate is removed, and the distal phalangeal fracture (if present) is reduced. Any nail bed laceration is repaired. Two small wedge defects or slits in the distal aspect of the plate are created. The nail plate is then replaced under the eponychial fold. An absorbable or nonabsorbable suture of sufficient strength (usually 4-0; in children, 5-0) is placed into one side of the paronychium in a distal-to-proximal fashion. The suture is run through the notches in the distal aspect of the nail plate and then placed from distal to proximal into the opposite paronychium. The suture must be placed distal enough to cover the nail plate and proximal enough to gain purchase on the nail. The positions of the entry and exit points of the suture may have to be adjusted for nail size – for instance, when only part of the nail remains. The distal entry point around the midpoint of the exposed nail plate is appropriate in almost all situations, even when the nail plate is only partially intact. The suture is then tied across the nail plate to its free-starting end to create a skewed figure-of-eight pattern, securing the nail snugly both proximally into the fold and ventrally onto the nail bed.
If a nonabsorbable suture is used, then it is removed between 2 and 3 weeks after surgery.

The transverse figure-of-eight suture is quick, straightforward, and easy to teach. It is also simple to remove if necessary. This is a useful addition to the armamentarium of anyone attempting to fasten the nail plate to the nail bed.

COMMENTARY

This is a simple procedure for traumatic nail avulsion. Suturing the nail to the paronychium instead of the proximal nail fold avoids trauma, and the fixation is more robust. The article of the French hand surgeon P. Recht is not mentioned by the authors.

COMMENTARY R. BARAN

It is true that following the teaching of his Master Iselin, P. Recht has been a precursor in covering the nail bed. (J. Dermatol Surg 1976; 2: 327-28).

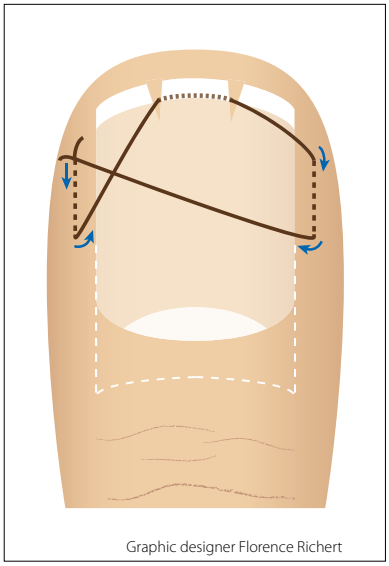

Fig 1 - Diagram of the eight-suture (Courtesy of R. Baran)

Eckart HANEKE

Does a bone deformity of the distal phalanx undergo remodeling after removal of a congenital ectopic nail ? A case with periodic radiographic follow-up

Sano K, Hyakusoku H. J. Nippon Med Sch 2006; 73: 332-336.

Only 26 cases of congenital ectopic nail have been reported since 1931; among them, 24 in Japan. If the ectopic nail occurs at the finger tip, an M- or Y-shaped bone deformity of the distal phalanx is occasionally identified on radiography. It has been suggested that an accompanying bone deformity might undergo remodelling after removal of the ectopic nail. Only one case in a child has been reported in which an M-shaped bone deformity became shallow 4 weeks after removal of the ectopic nail.
A 3-year-old girl presented with a painless, hard keratotic projection, 2 mm wide and 3 mm long, on the tip of the left ring finger. The projection had been present since birth just under the normal nail and had been trimmed by the patient's mother periodically because of its slow continuous growth. Neither active nor passive motions at any joint of that finger were restricted. Radiography disclosed a Y-shaped bifurcation of the tip of the distal phalanx of the left ring finger, corresponding to the location of the projection. No other anomalies were identified and the family history was not contributory.
Under general anesthesia, the projection regarded as a 'small nail' was removed with the surrounding tissue. The surgical wound was approximated directly. Histologic examination revealed a keratogenous zone, possibly of the nail matrix and nail tissue protruding through the normal horny layer of the epidermis, namely a small but complete nail matrix with normal nail plate.
No diachronic bone remodelling of the bifurcated deformity in the distal phalanx had been observed radiographically for more than 1 year after the removal of the ectopic nail.

COMMENTARY

There are two theories concerning the etiology of the ectopic nail:
- the polydactylism theory
- the embryonic aberration theory

It is not clear if a double ectopic nail is analogous or represents the same abnormality. The double finger nail is rare and has been described as a circumferential nail, claw-like fingernail, the clam nail deformity (shell shaped nail) or the palmar nail syndrome. The clinical characteristics of the ectopic nail and the double fingernail are different. The authors have reported that even if there is no bone remodelling after removal of the ectopic nail, the cosmetic appearance of the finger remains satisfactory and there is no recurrence.

Nail salvage using the eponychial flap

Adani R, Leo G, Tarallo L. Techn Hand Up Extrem Surg 2006; 10: 255-258.

Nail involvement in fingertip injuries is a common problem in hand surgery. Fingertip defects can be treated in different ways, including shortening with primary closure, skin grafts, and local or distant flaps. The associated defect of the nail complex influences the surgical approach and makes the reconstruction more complex.
Since 1998, the authors have used the technique described by Bakhach in the treatment of distal fingertip amputations with nail involvement. This technique uses a flap of the proximal nail fold that is plicated backward to expose the nail root lying under the eponychium, and this lengthens the visible part of the nail, restoring a good appearance of the nail apparatus.
It is essential to have an intact proximal nail fold; its ventral skin, called eponychium, covers the nail matrix.
A preoperative plan is necessary; a skin rectangle, as wide as the remaining portion of the nail, is drawn at a distance of 0.5 to 0.6 cm from the distal border of the proximal nail fold. The rectangle's longitudinal length depends on the amount of nail to be exposed and corresponds to the difference between the length of the contralateral fingernail and that of the injured finger, considering that the maximum limit is 0.4 cm (generally ranges between 0.2 and 0.3 cm).
After de-epidermisation of the rectangular area, leaving the underlying subcutaneous vascular network intact to ensure the survival of the eponychial flap and nail matrix, the lateral margins of the flap are incised.
Proper execution requires complete removal of the remaining portion of the nail, because its presence would prevent proximalization and, in particular, separation of the eponychium along its whole length and width. The eponychium is detached using a fine elevator.
Now, the eponychial flap can be delicately slid proximally and its end sutured; this makes it possible to expose the nail matrix, increasing the extent of exposure of the nail bed and matrix. In this way, a nail with total length of 3 mm is obtained even in cases where the surgical removal of the nail matrix is considered.
The eponychial flap is then plicated backward and fixed by stitches; finally, some stitches are made on the medial and lateral borders.
The nail bed should then be protected through the application of a Silastic or polypropylene nail to avoid possible hematoma or scar adhesions between the eponychial flap and nail matrix.
Pulp reconstruction is performed using either a large Tranquilli-Leali flap or a modified Venkataswami flap. The apex of the local flaps should be fixed into the underlying bone phalanx using a needle to avoid traction on the nail bed.
The nail should protrude from the eponychium by at least 2 mm for precision grip and good cosmetic appearance.

COMMENTARY

The terminology of surgeons differs from that of dermatologists. What the authors call eponychium, is in fact the proximal nail fold. The correct terminology should be flap of the proximal nail fold.
It is not clear why the authors claim that the remaining nail has to be removed completely to bring the proximal nail fold flap into its correct position as it is sufficient to separate it from the underlying nail fold. This would also obviate the need of applying a silastic sheet.

Eckart HANEKE

Onychocosmeceuticals

Haneke E. J Cosm Dermatol 2006; 5: 95-100

The nail acts both as a mechanical tool and a protective organ as well as an extremely important sensory organ. The nail plate protects the tip of the digit against trauma, provides defence, allows scratching, improves dexterity, and enhances fine touch.
Nail growth is controlled by a variety of cell-cell, cell-matrix, and cell-tissue interactions as well as by signalling factors, many of which are not yet clearly defined. It also depends on age, blood supply, intensity of mobilization, dominance of the respective hand, a variety of diseases and drugs, as well as hereditary factors, temperature, altitude, etc.

Onychocosmeceuticals
There are many preparations on the market made up of a variety of vitamins, sulphur-containing amino acids or proteins, hormones, calcium, iron, zinc, selenium and other 'essential' elements and minerals, medicinal yeast, crushed egg shells, and even organic food. Their effect appears to be mainly psychological as some patients report miraculous improvement within a few days or weeks, whereas most others do not see any effect. Even though some overt deficiency states may cause brittle, fragile, or soft nails, this by no means proves that the uncritical supplementation of these substances might improve the nails of an otherwise healthy person.

Biotin, also known as vitamin H, is often called the hair and nail vitamin. It is part of many enzymes that play an important role in carboxylation processes.
Marked biotin deficiency is associated with poor nail quality. It was shown to improve the quality of hooves in horses and some studies in men reported a positive effect in brittle nails. Biotin was also said to increase the nail growth rate. However, biotin is a substance synthesized to a great extent by intestinal bacteria, and the true need of biotin intake per day is not known.
Therapeutic dosages are 2.5-10 mg daily. However, our own experience was rather disappointing.
Severe **vitamin A** deficiency was associated with egg shell nails. However, vitamin A overdoses have a considerable onychodestructive effect comparable to that of synthetic retinoids. Thus, preparations for nail improvement should not contain high vitamin A doses.
A combination of **evening primrose oil** (two capsules three times daily), **pyridoxine** 25-30 mg and **vitamin C**, 2-3 g daily, was recommended for brittle nails. There is a lack of scientific evidence for either of these vitamins on nail quality.
A preparation containing **thiamine** mononitrate 60 mg, calcium D-pantothenate 60 mg, medicinal yeast 100 mg, L-cystine 20 mg, keratin 20 mg, and p-amino benzoic acid 20 mg is marketed under the name of Pantovigar®. It is claimed to improve hair growth and nail quality. None of the substances, not even cystine and keratin, have a proven beneficial effect on nail growth or quality.
Vitamin E is widely used as an antioxidant. No beneficial effect on normal or brittle nails is documented in the scientific literature.
Because hair and nails are sulphur-rich structures, the addition of amino acids, **sulphur**-rich **proteins**, and **gelatine** have been claimed to improve nail growth and quality. However, the biochemical composition of the nail is genetically regulated and widely independent from nutritional factors.
Although sulphur itself does not improve nail growth it was found that **cystine** may have a positive effect on the growth of hyponychium cells. Cystine was also claimed to be incorporated into growing hair and nails. However, this has never been confirmed in humans.
Also, other proteins did not prove to enhance the cosmesis or quality of the nails.
Calcium is apparently not responsible for nail hardness as the nail is relatively poor in calcium.
The amount of **iron** found in the nail reflects the iron content of the person. It has long been observed that iron deficiency causes brittle nails, longitudinal ridges, and koilonychias. Iron supplementation over a long time was found to improve brittle nails even without an obvious iron deficiency [Fig 1].
Zinc deficiency is known to cause soft, fragile nails, longitudinal ridging, striations, and gray discoloration in addition to periungual blistering and chronic paronychia. Prolonged treatment with zinc was said to improve brittle nails even without demonstrable zinc deficiency.
Selenium supplementation strengthened the nail in selenium deficiency. Selenium intoxication caused transverse lines, nail loss, swelling of the fingertip, and purulent discharge.

Other essential or trace elements have not been proven to play an important role in nail growth or quality.
Although **fluorides** are essential for enamel hardness of the teeth, nothing is known about their effect on soft or brittle nails.
Although **silicium** is necessary for protein synthesis in certain algae, nothing is known about human nails.
Silicilic acid, an instable compound with rapid polymerization to large silicates was found to improve brittle nails.
A preparation containing **rhodanides** is marketed to improve hair loss and nail quality. Nothing is known about its presumed mechanism of action.
Chitin is one of many naturally occurring polymers. Its breakdown may be catalyzed by enzymes called chitinases, secreted by microorganisms such as bacteria and fungi and produced by some plants.

Nutrition
Overt malnutrition has a negative effect on nail growth. In severe cases in dark-skinned people, multiple longitudinal pigmented bands may occur. Cachexia and bulimia cause soft and brittle, often fissured nails, whereas severe nail dystrophy is observed in kwashiorkor.

Nail care oils
There are a lot of so-called nail oils containing jojoba oil, bisalbolol, panthenol, vitamins, and amino acids. Some oils may help to hold humidity. In general, oils as well as creams and ointments make the nail more elastic and thus prevent nail splitting.

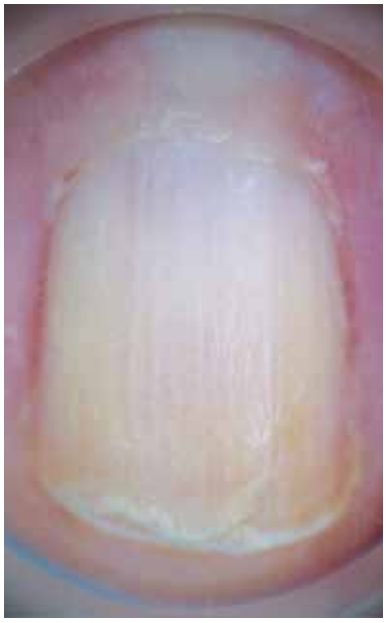

Fig 1 - Onychoschizia in a sixty-five y-o. woman

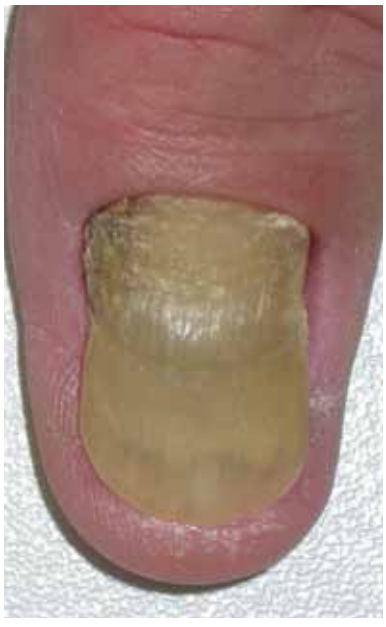

Fig 2 - Yellow nail syndrome

COMMENTARY

Some substances are able to improve nail changes. However, in practice, the results are disappointing.

COMMENTARY R. BARAN

We entirely agree with E. Haneke's conclusion. Nevertheless, we have recently reported in a double-blind trial that chitin accelerates nail growth. Moreover, if vitamin E has good but irregular results on yellow nail syndrome [Fig. 2], daily addition of fluconazole gives extremely satisfactory results despite absence of onychomycosis [Baran R. & Thomas L. Combination of fluconazole and alpha-tocopherol in the treatment of yellow nail syndrome. J Drug Dermatology

Jose Maria MASCARO

Nailfold capillaroscopy is useful for the diagnosis and follow-up of autoimmune rheumatic diseases. A future tool for the analysis of microvascular heart involvement

Cutolo M, Sulli A, Secchi S, Paolino S, Pizzorni C. Rheumatol 2006; 45: iv44-iv46.

This short paper is interesting as it reviews the features of the main patterns of the vascular net of the proximal nail fold in autoimmune rheumatic diseases.

Nailfold capillaroscopy (NV) represents the best method to analyse microvascular abnormalities in autoimmune rheumatic diseases. Architectural disorganization, giant capillaries, haemorrhages, loss of capillaries, angiogenesis and avascular areas characterize >95% of patients with overt scleroderma (SSc). The term 'SSc pattern' includes, all together, these sequential capillaroscopic changes typical to the microvascular involvement in SSc. The capillaroscopic aspects observed in dermatomyositis and in the undifferentiated connective tissue disease are generally reported as 'SSc-like pattern'.

Recently, three defined major nailfold video capillaroscopy (NVC) patterns have been considered useful in assessing the appearance and progression of the sclerodermic microangiopathy ('early', 'active' and 'late' patterns).

The early differential diagnosis between primary and secondary Raynaud's phenomenon (RP) is the best advantage NVC may offer. In addition, interesting capillaroscopic changes have been observed in systemic lupus erythematosus, anti-phospholipid syndrome and Sjogren's syndrome. Further epidemiological and clinical studies are needed to better standardize the NVC patterns.

In future, the evaluation of nailfold capillaroscopy in autoimmune rheumatic diseases might represent a tool for the prediction of microvascular heart involvement by considering the systemic microvascular derangement at the capillary nailfold.

The patterns identified within the 'SSc pattern' include:

1. 'Early' NVC pattern: few enlarged/giant capillaries, few capillary haemorrhages, relatively well-preserved capillary distribution, no evident loss of capillaries;
2. 'Active' NVC pattern: frequent giant capillaries, frequent capillary haemorrhages, moderate loss of capillaries, mild disorganization of the capillary architecture, absent or mild ramified capillaries; and
3. 'Late' NVC pattern: irregular enlargement of the capillaries, few or absent giant capillaries and haemorrhages, severe loss of capillaries with extensive avascular areas, disorganization of the normal capillary array, ramified/bushy capillaries.

In conclusion, the regular evaluation of nailfold capillaroscopy in autoimmune rheumatic diseases will represent soon a tool for the analysis even of the microvascular heart involvement by considering the systemic involvement of the microvessels in these diseases.

Jose Maria MASCARO

Assessment of nailfold capillaroscopy by x 30 digital epiluminescence (dermoscopy) in patients with Raynaud phenomenon

Beltran E, Toll A, Pros A, Carbonell J, Pujol R. Br J Dermatol 2007; 156: 892-898.

Dermoscopy is an useful tool for dermatologists to study melanocytic lesions. Its possible usefulness in the assessment of capillary nailfold morphological changes (capillaroscopy) has recently been advocated.

The aim of the authors of this study was to assess the practical utility of digital epiluminescence microscopy as a capillaroscopic instrument in patients with Raynaud phenomenon (RP) as well as to compare the sensitivity and specificity rates obtained by epiluminescence microscopy with those previously reported with conventional capillaroscopic devices.

56 consecutive patients with primary RP (PRP: 5) or secondary RP (SRP: 51) were included in the study. A control group of 10 healthy subjects was also evaluated. 26 patients (46%) had systemic sclerosis (SS), 12 (21%) presystemic sclerosis (pre-SS), 1 (2%) dermatopolymyositis-SS, 1 (2%) mixed connective tissue disease, 2 (4%) Sjögren syndrome, 2 (4%) an overlap syndrome, 1 (2%) rheumatoid arthritis and 6 (11%) other connective tissue diseases. Capillary nailfold changes were studied using a nonportable digital epiluminescence device (magnification x 30). Following a systematized protocol, capillary nailfold morphology, density and distribution were evaluated. Several capillaroscopic patterns were identified (normal, sclerodermic [Fig1, 2, 3], non-specific, nondiagnostic) as previously defined. A possible relationship between capillary nailfold changes and the intensity of RP or the presence of associated autoimmune diseases were assessed.
The sclerodermic pattern showed a sensitivity of 76.9% and a specificity of 90.9% in SS. A typical capillaroscopic SS pattern was observed in 73% of cases of limited SS and in 82% of cases of diffuse SS. Patients with Sjögren syndrome and dermatopolymyositis
SS showed a non-specific capillaroscopic pattern. A normal capillaroscopic pattern was also observed in 11 of 12 patients with pre-SS. In one of two patients presenting severe sclerodactyly and in all patients showing hand oedema (3 of 56), capillaroscopic changes could not be evaluated. Avascular areas correlated significantly with severe RP ($P<0.002$), bone resorption ($P<0.007$) and diffuse SS ($P<0.008$).

In conclusion, digital epiluminescence seems to be a useful and reliable technique in the evaluation of capillary nailfold morphological changes. This technical variation allows the identification of specific capillaroscopic patterns associated with connective tissue diseases. It also permits us to differentiate PRP from SRP. The results obtained with this technique are similar to those previously reported using standard capillaroscopy devices.

COMMENTARY

Capillaroscopy is a relatively simple and non invasive technique which can be applied to any patient. It reveals the changes in blood capillaries which give rise to clinical symptoms visible to the naked eye. Capillaroscopy of the nail fold network has proved to be very useful in diagnosis and also in prognosis of diverse systemic diseases, particularly autoimmune connectivopathies. This technique has been the matter of many scientific publications in internal medicine, dermatology, rheumatology, angiology and even ophthalmology Journals.[1,2,3]
Although, capillary changes are not specific (for example splinter haemorrhages are frequent in subacute bacterial endocarditis, chronic glomerulonephritis, vasculitis, trichinosis, liver cirrhosis, scurvy, psoriasis and minor trauma), it is certain that with their presence the possibility of a mixed connective tissue disease (MCTD) and particularly of a systemic lupus erythematosus (SLE) should be envisaged.
The auto-regulatory microvascular responses of the skin are altered in patients suffering from primary Sjögren syndrome (PSS).[1] The alteration of the reactive hyperaemia response (extended time to reach the red blood cells, maximal capillary velocity at rest - after 1 minute ischemia) may not be linked to Raynaud phenomenon (RP).

Moreover, the usefulness of capillaroscopy of the nail fold and of the nail bed can be of greater interest concerning other pathology than connective tissue diseases. Patients suffering from retinal artery tortuosity (a family disease

Jose Maria MASCARO

Assessment of nailfold capillaroscopy by x 30 digital epiluminescence (dermoscopy) in patients with Raynaud phenomenon

which causes visual disorders due to small haemorrhages caused by minimal trauma) can be associated with notable tortuosity of the nail fold capillaries.[3] On the one hand this proves there is a systemic vascular pathology and on the other hand that it is possible to benefit from this simple technique.
Another example of the versatility of this method of exploration is explained in a short article by Houtman & Jans[2] where the examination of a patient suffering from RP reveals the existence of an avascular zone on a finger. The serology for Borrelia was positive and after a specific treatment with doxycycline the clinical manifestations (retrospectively diagnosed as acrodermatitis chronica atrophians) were completely effaced, which would confirm ex juvantibus that it was a complication of borreliosis.

An interesting controversy on the usefulness of capillaroscopy can be seen in a brief article by Cutolo et al. indicating that the difference between PRP and SRP depends on an associated disease. The criteria necessary to define the PRP would be the symmetry of flares, the absence of necrosis, tissue ulceration or gangrene, the absence of a secondary cause, the absence of antinuclear antibodies, a normal sedimentation rate and the presence of a normal capillary network of the nail fold.
Videocapillaroscopy would therefore be an important element in the early discovery of alteration in vascular microcirculation which, associated with other manifestations (stronger attacks, lesions consecutive to distal ischemia and antibodies specific to the associated disease) would define SRP. Cutolo et al studied videocapillaroscopy in 129 patients to determine if they were suffering from PRP or SRP.
Only 19 were suffering from the second disease and six of them had, however, a normal microcirculation pattern, whereas 13 others only presented with minimal modifications although after this, the clinical presentation progressively deteriorated. Based on the authors' conclusion it is necessary to carry out repeated exploration of the patients suffering from PR at six monthly intervals to detect at the earliest possible moment microvascular alterations at the same time as other examinations (such as antibody findings). In his reply to the authors, Hirschl indicates that although exploration was useful in his group of patients, the videocapillarosocpy revealed an alteration of the nail vascular network before any other alteration in only four out of the 46 observed. He indicated that most of the patients suffering from connective tissue disease had a normal appearance of the nail bed and nail fold capillaries at the beginning of their course. To sum up, while pointing out the interest of capillaroscopy, Cutolo as well as Hirschl showed up the limit of this method and the necessity of repeating examination of the patients.

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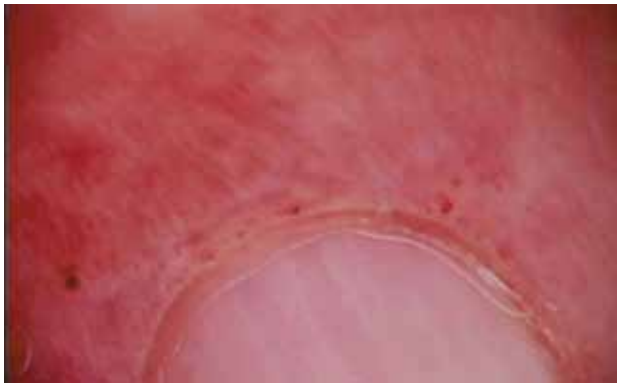

Fig 1, 2, 3 - Dermoscopy showing pictures of capillaroscopy (x 30) with dilated capillaries haemorrhages and avascular areas in three patients affected by systemic scleroderma (Courtesy of Department of Dermatology & Rheumatology. Hospital del Mar. Barcelona, Spain).

Assessment of nailfold capillaroscopy by x 30 digital epiluminescence (dermoscopy) in patients with Raynaud phenomenon

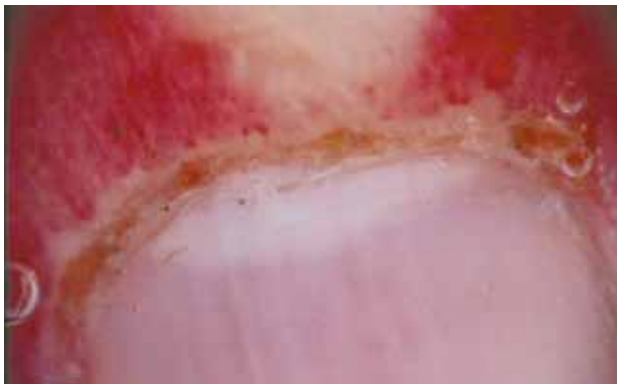

Fig 2

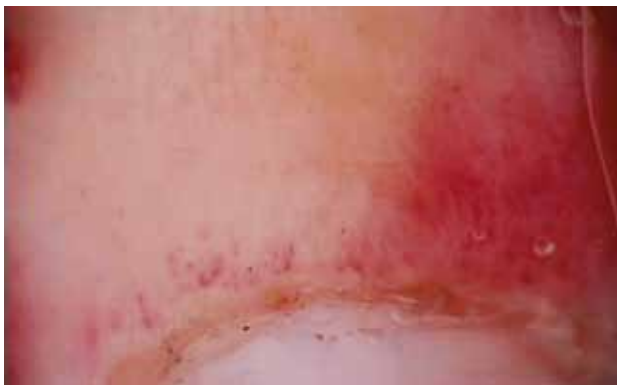

Fig 3

Correlation between homocysteine plasma levels and nailfold videocapillaroscopic patterns in systemic sclerosis

Caramaschi P, Volpe A, Canestrini S, Mambara LM, Faccini G, Carletto A, Biasi D. Clin Rheumatol 2007; 26: 902-907.

Hyperhomocysteinemia may represent an aggravating factor among the complex mechanisms involved in scleroderma damage contributing to the injury of endothelium.

Hyperhomocysteinemia was recognized as a modifiable independent risk factor for coronary, cerebral, and peripheral vascular diseases. McCully first reported in 1969 that homocysteine (Hcy), a nonessential sulphur-containing amino acid, was implicated in the development of arterial occlusive lesions. Hyperhomocysteinemia is caused either by genetic defects of enzymes involved in Hcy metabolism or by reduced vitamin intake. Moderate hyperhomocysteinemia is often due to the frequent mutation (C677T) in the gene encoding for methylenetetra hydrofolate reductase when concomitant low-level folate is present; severe hyperhomocysteinemia is usually provoked by cystathionine ß-synthase deficiency.
As known, hyperhomocysteinemia may cause vascular damage by several mechanisms: it is directly toxic to endothelium and may impair its physiologic thromboresistance by interfering with the action of natural anticoagulants like protein C, thrombomodulin, and annexin II. Moreover, Hcy may favour an oxidant status by generating superoxide radicals, by inhibiting antioxidant enzymes, and by supporting oxidation of low density lipoprotein by arterial smooth muscle cells. Finally, in vitro it was demonstrated that Hcy alters nitric oxide release by cultured endothelial cells and increases collagen production by cultured rabbit smooth muscle cells.

60 Italian nonsmoking patients affected by SSC consecutively observed at our department from January 2004 to March 2005 were enrolled for this study. All patients fulfilled the American College of Rheumatology criteria for the diagnosis of SSc. The distinction between limited cutaneous SSc and diffuse cutaneous SSc was made according to the criteria of LeRoy et al.
Hcy plasma concentration was significantly correlated with serum creatinine level (correlation coefficient= 0.52,$p<0.001$).
There was no difference in Hcy concentration between limited and diffuse SSc, between active and inactive disease, and among different autoantibody profiles, respectively, in patients with ACA posivity, anti-Scl70 positivity and ANA positivity without ACA, and anti-Scl70 antibodies; p=0.907.

Jose Maria MASCARO

Nail changes in connective tissue diseases: do nail changes provide clues for the diagnosis ?

Tunc SE, Ertam I, Pirildar T, Turk T, Ozturk M, Doganavsargil E.
JEADV 2007; 21: 497-502

This study has been designed to evaluate the frequency and the specificity of nail changes associated with connective tissue diseases (CTD).
In a case-control study, 190 patients including those with systemic lupus erythemasos (SLE: 56), rheumatoid arthritis (RA: 47), primary Sjögren's syndrome (pSS: 35), systemic sclerosis (SSc: 39), and dermatomyositis/polymyositis (DM/PM: 13) were enrolled in the study. Patients with SLE and other CTDs were compared with two different control groups. Twenty nails were examined. Nail features were noted and classified. Nail samples were collected for mycological cultures.
In patients with SLE, erythema of proximal nailfold ($P<0.01$), splinter haemorrhages in fingernails ($P<0.01$), capillary loops in proximal nailfold ($P<0.05$), periungual erythema ($P<0.05$), and thin nail plates ($P<0.05$) were more common than those in controls. Only splinter haemorrhages were associated with the disease activity. In patients with SSc and DM/PM, splinter haemorrhages ($P<0.05$) and capillary loops in proximal nailfold ($P<0.01$) in fingernails were common as well. Increase in longitudinal curvature ($P<0.001$), transverse curvature ($P<0.01$), and white dull colour in fingernails were other frequent findings in patients with SSc. Increase in transverse curvature was associated with the disease activity in SSc. In patients with RA, splinter haemorrhages ($P<0.05$), red lunula ($P<0.05$), and white dull colour ($P<0.05$) in fingernails were frequent. The sensitivity values of all these changes were very low. However, their specificity values were found to be relatively high.
Proximal nailfold is the most important site of affection in CTDs. These nail changes can be used in combination with highly sensitive diagnostic modalities to establish an accurate diagnosis.

Capillaroscopy is a dynamic process in mixed connective tissue disease

Diogenes AHM, Bonfa E, Fuller R, Caleiro MTC. Lupus 2007; 16:254-258.

Scleroderma pattern (SD pattern) which is characterized by nailfold microhemorrhages, enlarged loops, decreased capillary density and avascular areas is frequent in up to 80% of systemic sclerosis (SSc).
In mixed connective tissue disease (MCTD) more than half of the patients have SD pattern characterized by giant capillaries, nailfold hemorrhages and bushy capillaries.
In contrast to SSc where the angiopathy is an indicator of the disease, this does not seem true for MCTD except for the presence of avascular areas (AA).
Repeated studies using videomicroscopy in the same patient show that the presentation may vary with either progression of the disease or neo angiogenesis with neo-vascularization of the previous AA.
The authors followed 63 consecutively selected patients affected by MCTD using videomicroscopy for 5 years. Ten presented a modification, 7 have become normal, 3 developed a SD pattern.
Interestingly MCTD patients with interstitial lung disease (ILD) presented a significant higher frequency of avascular areas (76% of the patients affected by ILD had AA while solely 24% with ILD had not AA).

COMMENTARY

The articles we have summarized in this Journal show how the study of microcirculation may be helpful in detecting marked vascular alterations which could have an effect on other organs.
Concerning what some authors call visceral Raynaud phenomenon (coronary heart disease), the recognition of the characteristic features of capillaroscopy in patients suffering from secondary Raynaud phenomenon could play a role in the prognosis and detection of visceral risk at an early stage.
Nowadays, as in industrialized countries a periodic examination of the elderly is a rule in preventive medicine, non invasive studies of the microcirculation of the nail fold carried out by dermatologists could be included, because of their simplicity and moderate cost.

Jose Maria MASCARO

R-Spondins in cutaneous biology

Blaydon DC, Philpott MP, Kelsell DP. Cell Cycle 2007; 6: 895-897

The R-spondins are proteins linked to the Wnt signalling pathway. This encompasses a complex net of proteins which play a crucial role in embryogenesis, cancer and some varied physiological processes. The term WnT is a hybrid of wingless and int names of genes the former acting in the development of drosophila and the latter in that of vertebrate animals.

Recently the authors of the present article have identified the first phenotype associated with mutations of human R-spondins. The mutations of RSP04 (Human R-spondin 4) a responsible for a total anonychia of hands and feet without bone malformations, a rare autosomal recessive condition.

An independent study confirmed the association of RSP04 mutations in human development and adds to our understanding of the signalling pathways involved in the patterning of epidermal appendages.

In common with many developmental pathways, WnT signalling overlaps between developmental biology and oncology, as loss or inappropriate activation of the secreted protein WnT and/or its downstream components is associated with many tumour types.

In addition aberrant activation of the WnT pathway has been observed in different types of cancer.

Human R-spondin 1 (RSP01) has been associated with the other non-melanoma skin cancer type, squamous cell carcinoma (SCC). Disruption of the RSP01 gave results in a recessive syndrome characterized by XX-male sex reversal, a non-epidermolytic form of palmoplantar keratoderma (PPK) and a predisposition to SCC in lesional skin as in KID syndrome due to autosomal dominant mutations of the gene Cx2GJB2 or as in HURIE2 disease where the gene is located in chromosome 49. However concerning the latter diseases the problem is more complex because of others alterations of genes are able to produce a similar KPP without predisposition to cancers. Therefore one cannot attribute this tendency only to a defect of the program of differentiation of hyperproliferation of the keratinocytes.

COMMENTARY

This demonstrates how at present the mutation of a protein linked to the WnT, the R-spondin 4 gives rise to a total anonychia, an autosomal recessive condition without underlying bone alterations of the distal phalanges.

This shows the interest of biologic studies of development for in numerous physiological phenomena in humans and animals, the mutations, alterations or deregulations of the signalling pathway or its constituents also play an important role.

For dermatologists it is very interesting to see how WnT can play a part in the genesis of SCC and in other aspects of our speciality such as KPP.

COMMENTARY R. BARAN

There are several varieties of total anonychia. Over 20 years ago we suggested that bony distal phalanges were necessary for nail production (Baran R, Juhlin L. Bone dependant nail formation. Br J Dermatol 1986; 114:371-5).

Our hypothesis has recently been confirmed by molecular genetics. However if it is not possible to obtain normal nails with missing distal phalanges, the article of Blaydon et al. indicates that normal bony phalanges do not necessarily imply the presence of nails.

Bertrand RICHERT

The relationship between nail and distal phalangeal bone involvement severity in patients with psoriasis

Serarslan G, Hayal G, Karazincir S. Clin Rheumatol 2007; 26:1245-1247.

The aim of this study was to investigate the relationship between nail involvement and joint manifestations and whether there was a correlation between nail psoriasis severity and bone manifestations in psoriatic patients without symptomatic psoriatic arthritis in plaque type psoriasis. 31 patients with nail involvement and 39 patients without nail involvement were enrolled in the study.

70 patients with plaque type psoriasis and without signs and symptoms of joint swelling, pain and tenderness were included in the study. Full demographic details and history of the disease were recorded for each patient.
Psoriasis severity was graded according to the Psoriasis Area Severity Index (PASI). Patients with PsA or other joint diseases such as systemic lupus erythematosus and rheumatoid arthritis were excluded from the study.

Diagnosis of the psoriatic nail involvement was made clinically. Onychomycosis was excluded by KOH examination and cultures. Involvement of the nail was graded according to the Nail Psoriasis Severity Index (NaPSI). Pustular psoriasis of the nails was not included in the study.

X-ray of the hands and feet with magnification were performed in patients with and without nail involvement. The presence of erosion was accepted as DIP involvement. Tuftal involvement was evaluated and graded from 0 to 4. Zero indicated no lesion, 1 indicated tuftal minimal erosion, 2 indicated tuftal bone resorption, 3 indicated tuftal periostal osteitis, and 4 indicated overlap of erosion and osteitis.

31 psoriatic patients with nail involvement and 39 psoriasis patients without nail involvement were enrolled in the study. The mean PASI was 5.9±3.2 in group I and 6.5±3.0 in group II. There was no statistical significance between the two groups of gender, mean age, duration of the disease and PASI score. Nail psoriasis severity index was scored as mild in 18 fingernails and 20 toenails, moderate in 4 fingernails and 1 toenail and severe in 3 fingernails.
There was no difference in DIP involvement in patients with and without finger - and toenail involvement.

This study determined that (1) DIP involvement was present in the 2 groups regardless of nail involvement, (2) bone involvement was higher in patients with nail involvement than patients without nail involvement, and (3) there was a correlation between nail psoriasis severity and bone involvement severity [Fig 1, 2].

In conclusion, DIP involvement was present in the two groups regardless of nail involvement; however, bone involvement was higher in patients with nail involvement than patients without nail involvement, and a correlation was detected between nail and bone involvement severity in patients without PsA. Therefore, whether the psoriatic patients with nail involvement are prone to develop PsA remains to be determined by further prospective studies.

The relationship between nail and distal phalangeal bone involvement severity in patients with psoriasis

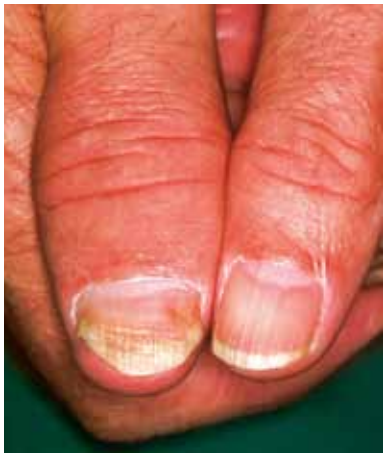

Fig 1 - Painful swelling of the distal joint of the right thumb. Biopsy of the nail bed and radiography confirm the diagnosis of psoriasis

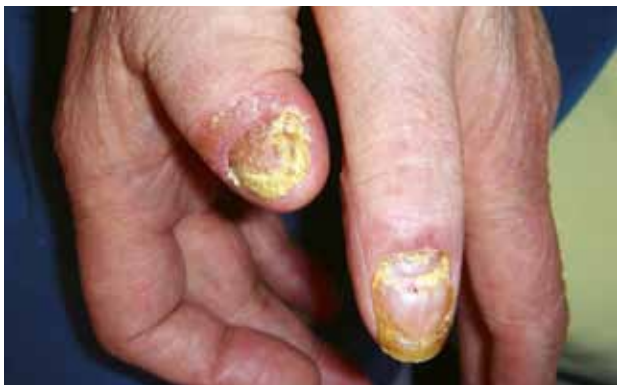

Fig 2 - Pronounced joint involvement with total disappearance of the bony phalanx. This was associated with the long standing nail psoriasis.

COMMENTARY

These results can be compared to a previous study (cf 'L'ongle-Quoi de Neuf, N° 1, 2005; Scarpa R. Manguso F Oriente A, Peluso R et al). Is the involvement of the distal interphalangeal joint in psoriatic patients related to nail psoriasis ? (Clin Rhumatol. 2004; 23:27-30) which evaluated the involvement of the distal interphalangeal joints in psoriatic patients with or without nail involvement. The authors were able to demonstrate that statistically there was no difference between the distribution of the distal interphalangeal joint involvement in patients with or without psoriatic onychopathy.

In the study presented here, the authors did not find any difference in the involvement of the distal interphalangeal joint in patients with or without fingernail or toenail involvement.

Bertrand RICHERT

Therapeutic effects of a 12-week course of alefacept on nail psoriasis

Köver JEM, Langewouters AMG, Van de Kerkhof PCM, Pasch MC. JEADV 2006; 20:1252-1255.

Nail psoriasis is a common finding in psoriatic patients with the frequency of patients being affected reaching up to 79%. These nail changes affect quality of life in a great proportion of the patients. More than half of the patients with psoriatic nail changes suffer from pain and are restricted in their daily activities because of these changes.

The authors performed an open prospective study with eight patients who received a weekly dose of 15 mg of alefacept i.m., for treatment of moderate to severe plaque psoriasis. The total course of alefacept treatment was 12 weeks. At baseline and after 12 weeks of treatment, digital high-resolution photographs were taken, which were analysed using the NaPSI. The NaPSI is a numeric, objective and reproducible scoring system for psoriatic nail changes and is used to evaluate and quantify the severity of psoriasis of the nail bed and nail matrix. NaPSI scoring was performed on randomized photographs by an examiner other than the treating physician. During the course of alefacept the patients' skin psoriasis was regularly assessed using the psoriasis area and severity index (PASI).

The overall group consisted of 2 women and 6 men with a mean age of 44.9 years. Group I with a NaPSI >15 comprised 5 patients: 1 woman and 4 men with a mean age of 43.4 years. Group II with a NaPSI ≤15 comprised 3 patients: 1 woman and 2 men with a mean age of 47.3 years.

In group I, considered as having moderate to very severe nail psoriasis (with a NaPSI >15), 2 patients showed improvement, in 2 patients the nail changes remained unchanged and in 1 patient nail pathology was aggravated.

In the group considered as having only mild nail psoriasis (with a NaPSI ≤15, group II), one patient improved, in one patient no changes were seen and in one patient the nail changes worsened. All but one patient showed an improvement in the activity of the skin psoriasis as measured with the PASI score; however, in none of the patients was PASI 75 reached.

The results observed on psoriasis activity of the nails following alefacept treatment are worse than seen after infliximab therapy, which is in line with the more modest therapeutic efficacy of alefacept when compared to infliximab with respect to psoriatic plaques.

A more extensive study is required covering both more patients and a more extensive period of time. Furthermore, it would also be clinically relevant to compare the effects of alefacept on nail psoriasis with the effects of other biologicals [Fig 1, 2].

COMMENTARY

This series is too short to be able to appreciate the effectiveness of the treatment of nail psoriasis and of course, more important studies are necessary.

At present, few biologics are promising in nail involvement ... but who would prescribe a biologic for a limited nail involvement except for a concert artist ???

Fig 1 - Psoriatic nail and paronychial involvement (Courtesy of Pr. Chimenti, Rome)

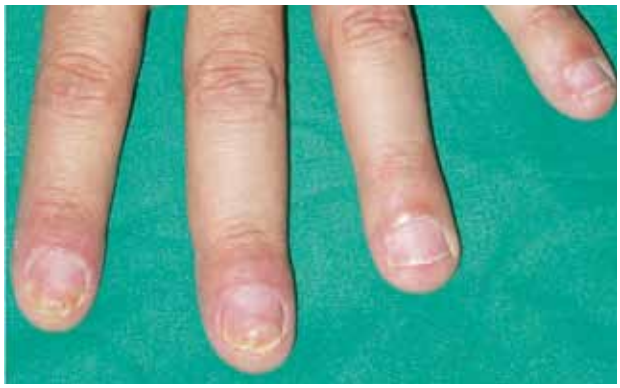

Fig 2 - Same patient after twelve weeks under infliximab. (Courtesy of Pr. Chimenti, Rome).

Bertrand RICHERT

Nail matrix biopsy of longitudinal melanonychia: diagnostic algorithm including the matrix shave biopsy

Jellinek N. J Am Acad Dermatol 2007; 56 :803-810.

This article details an algorithmic approach to LM, including a careful history and physical examination, dermoscopy, and ability to sample the matrix using 3 biopsy techniques, a 3-mm punch excision, a lateral longitudinal excision, and a matrix shave biopsy.

Shave biopsy of the nail matrix

Tangential incisions are made at the junction of the proximal and lateral nailfolds. This skin is carefully undermined by using a Freer elevator or fine-tipped hemostat, with care taken to avoid injury to the underlying matrix. The proximal nailfold is then reflected proximally with a skin hook or suture. This technique exposes the proximal nail plate and underlying matrix, the proximal portion of which originates just distal to the insertion of the extensor digitorum tendon.

Further exposure is garnered through proximal nail plate avulsion. An English anvil-action nail splitter is delicately inserted transversely in one nail sulcus at the level of the proximal third of the nail plate, advanced under the lateral portion of the plate, and carefully moved transversely, cutting across the nail plate to the other sulcus. The proximal plate is then reflected laterally and secured with a haemostat. This manoeuvre could be likened to opening the hood of a car. This second step fully exposes the proximal nail bed and matrix (visualized distally as the lunula). The nail plate is only loosely connected to the matrix and proximal bed; hence the delicate epithelium does not tear when the proximal plate is reflected laterally.

The matrix is carefully examined with good surgical lighting to identify the origin of LM. As with all biopsies of melanonychia, it is wise to note and confirm the presence of gross matrix pigmentation with an assistant in the room. Given that darkly pigmented LM may originate from subtle or no melanocytic hyperplasia, it is imperative that the appropriate site be identified, confirmed, and subjected to biopsy. Without this confirmation, the surgeon may later doubt the accuracy of his/her sampling if the histopathology fails to show any significant hyperplasia.

The goal for this surgery is excisional sampling. The origin of the band is identified and then scored with 1- to 2-mm margins with a scalpel blade. The scalpel blade is then turned horizontally, parallel to the matrix surface, to meticulously shave the scored specimen. Use of a Teflon-coated scalpel blade provides a smoother cut and less drag. A specimen may measure 1 mm in thickness and will still confer adequate sampling of the matrix epithelium and a significant portion of dermis.

The matrix shave specimen may be placed on a piece of paper or cardboard, placed in a cassette, and then into the formalin jar. The specimen adheres to the paper and remains flat, facilitating subsequent processing.

Repair is straightforward. The laterally reflected nail plate is trimmed longitudinally at its lateral free edge by 2 to 3 mm and then returned to its original position. Trimming the lateral plate reduces the likelihood of lateral embedding and pain with post-operative tissue edema. The proximal nailfold is then released and returned to its anatomic position over the matrix, proximal bed and proximal plate. Given the relative instability of the underlying plate, this skin should be sutured at each tangential incision with 4-0 nylon or polypropylene suture. These sutures are removed at 7 to 10 days, and adhesive wound closures (Steri-Strips) used on incision sites to prevent loose tissue edges from catching and tearing.

3 mm punch biopsy

The proximal nailfold is carefully undermined using a nail elevator or fine-tipped haemostat, then reflected and stabilized with either a skin hook or suture. This procedure exposes the entire matrix and overlying proximal nail plate. The site of origin of the pigmented band is identified in the matrix and confirmed with an assistant. The intact nail plate helps guide this identification, as most bands are clearly visualized by mapping from the pigmented band in the nail plate proximally to the matrix origin.

A 3-mm punch is used to score the overlying plate above the origin of melanonychia and then carried through matrix down to bone. Without using forceps, which tend to crush and tear friable matrix tissue, fine-tipped scissors are inserted vertically around the specimen and delicately used to snip

Bertrand RICHERT

Nail matrix biopsy of longitudinal melanonychia: diagnostic algorithm including the matrix shave biopsy

the base at the level of periosteum circumferentially around the cylinder created by the punch. Once this is completed, the scissor tips can gently lift and remove the specimen without crush artefact. The specimen is transferred to a formalin jar as specimen one or two, depending on whether or not biopsy was done on cuticle and/or proximal nailfold.

The punch instrument then needs to be examined. Occasionally the round nail plate specimen, which is only loosely adherent to the underlying matrix, detaches from the matrix during the biopsy and remains in the punch itself. Finally, after the specimens have been removed, the reflected proximal nailfold is released and returned to its normal anatomic location, and the incision edges reapproximated. There is no tension on this tissue and the underlying plate is secure, so adhesive skin closure (Steri-Stripping), suturing, or simply application of a pressure dressing that will keep the tissue reapproximated, are all appropriate options.

Some nail surgeons prefer to open a wider nail plate window before or after removing the matrix specimen as related above, and others perform a proximal nail plate avulsion as previously described prior to biopsy. These additional procedures provide broader gross examination of the surrounding matrix and facilitate further surgical exploration if the adjacent matrix tissue demonstrates worrisome features [Fig 1].

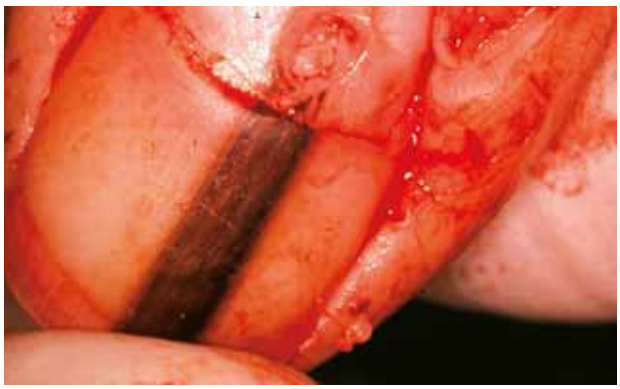

Fig 1 - Proximal nail avulsion showing that the pigment spreads farther the punch area used initially through the nail plate

Lateral-longitudinal biopsy

After adequate anaesthesia has been obtained, the digit is soaked in chlorhexidine or similar antiseptic for 10 to 15 minutes to soften the nail plate. A scalpel blade (either N°15 or N°10) is inserted halfway between the cuticle and distal interphalangeal crease, 1 to 2 mm medial to the pigmented band, and used to cut down through skin and soft tissue, extending distally through the nail plate to the hyponychium, extending 3 to 4 mm distally onto the digital tip. The blade is then reinserted proximally at the same starting point and moved laterally, coursing around the entire matrix horn, into the nail sulcus and extending to the hyponychium, curving medially at the hyponychium and beyond to meet the end point of the first incision. The final shape is nearly elliptical, with care taken to ensure narrow margins around the visualized pigmented band, and inclusion of the laterally located matrix horn. All incisions are carried down to the level of bone.

The tissue is then removed distally-to-proximally, using fine-tipped scissors and a skin hook to avoid tissue crush or manipulation, with care taken to remove the tissue at the level of periosteum. Using the scissors with 'tips down' facilitates this technique. This tissue is then carefully placed in a formalin jar, with a pathology slip explicitly labelled to cut the tissue longitudinally and not traditionally 'bread-loafed'.

An adequately performed lateral longitudinal excision will remove the entire lateral matrix horn. Occasionally, however, small matrix remnants may be left behind. These fragments can cause postoperative cysts, spicules, and/or pain. Hence, their removal before tissue repair is recommended. The lateral matrix pocket can be debrided with a small curette or haemostat tip covered with gauze. Both serve the purpose of destroying and removing any residual matrix fragments. These decrease the likelihood of spicules or cysts but increase the risk of periostitis and postoperative pain and may be performed at the surgeon's discretion.

The repair is straightforward, involving most importantly a single suture that realigns the proximal nailfold to the lateral nailfold, a more proximal suture of the proximal nailfold, and a distal suture at the hyponychium. A half-buried horizontal mattress suture from the lateral nailfold through the nail plate to stabilize the tissue is optional. Generally 4-0 nylon

Nail matrix biopsy of longitudinal melanonychia: diagnostic algorithm including the matrix shave biopsy

or polypropylene is appropriately sized for this tissue and tension level. Suture removal is between 10 and 14 days.

Traditional techniques include punch biopsy, which is one accepted and widely used technique for LM less than 3 mm in width originating in the distal matrix, and lateral longitudinal excisions for lateral pigmented bands of varying width. LM greater than 3 mm in width in the mid-nail plate, or those of any width originating in the proximal matrix present a more difficult challenge and are elegantly biopsied using a nail matrix shave technique as detailed above.
LM broader than 6 mm and diffuse melanonychia are much less common and represent a significantly increased likelihood of melanoma. They also demand tissue diagnosis. In such cases, multiple punch biopsies, a transverse matrix incisional biopsy, or en-bloc excision of all nail tissues may be used as a preliminary investigation.
The nail matrix shave biopsy provides adequate samples of wider bands and is less invasive than a transversely-oriented matrix excision.

COMMENTARY

Although thanks for initiating the author into the technique of tangential biopsy have been given at the end of the article, I would like to make a few remarks.
Firstly, it concerns a non exhaustive summary of a personal presentation given at the Council for Nail Disorders.
The risk and clinical factors have been skipped over and it mostly concerns a clarification of surgical techniques. Tangential biopsy is described first, whereas it should be situated at the end and instead 3mm punch biopsy, which all dermatologists should be able to routinely carry out, put in its place from the very beginning. Latero-longitudinal biopsy is more delicate but any surgically orientated dermatologist should be able to perform it.
Tangential biopsy requires expertise. On the other hand this technique has still not been validated. The images of latero-longitudinal biopsy show a curve towards the interior of the proximal part of its external incision and the proposition of lateral cul-de-sac curettage to avoid the appearance of spicules is certainly not to be recommended. In fact, as the author himself writes, the eventuality of seeing a periostitis appear is real. It is much simpler to make an incision curved toward the exterior which will carry away in the biopsy piece the whole of the lateral cul-de-sac [Fig 2].

Concerning the 3mm biopsy, it is imperative to always avulse the proximal part of the nail in order to check the integrity of the matricial network, the absence of spreading of the pigment [see Fig 1] in order to facilitate harvesting the biopsy specimen (extremely difficult to carry out through a 3mm hole in the nail) and/or cut off any pigment spreading.
Concerning the proposed algorithm it will of course be ideal as soon as tangential biopsy has been validated.
This article is therefore slightly futuristic ...

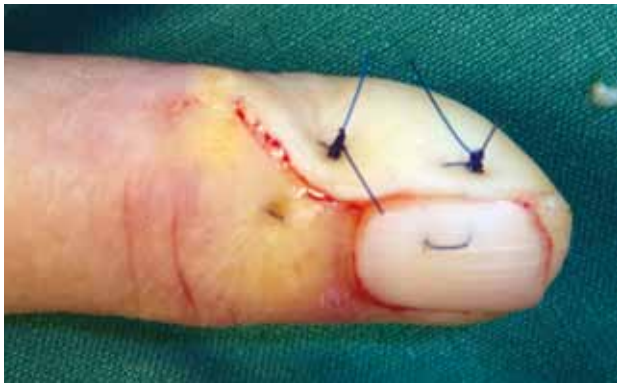

Fig 2 - The curved incision enables to remove the lateral horn of the matrix and diminish the risk of spicule formation

Bertrand RICHERT

Fifth toenail clinical response to systemic antifungal therapy is not a marker of successful therapy for other toenails with onychomycosis

Avner S, Nir N, Henri T. JEADV 2006; 20:1194-1196

This study aims to test the hypothesis that treatment failure of fifth toenail onychomycosis is not a marker of treatment failure of the other toenails with onychomycosis.

The fifth toenail, due to its location, suffers repeated friction/pressure trauma from shoes (especially modern narrow ones) – the same trauma as other toes suffer during athletic activity. This is evident by the common finding of callus, a known sign of long-term, repetitive friction or pressure near that toe.

The repeated trauma may cause onychodystrophy, which, in turn, increases the likelihood of fungal infection of the toenail. As even effective antifungal treatment does not change the deformed structure of the matrix, one might be mycologically cured without evident visual improvement of the toenail. Moreover, it is known that both itraconazole and terbinafine reach the nail plate via the nail matrix and the nail bed. A thickened, dystrophic nail prevents the drugs from reaching their target - the fungus, which 'hides behind the armour'.

Fifty patients entered the study. Eligible patients had both fifth toenail deformity (with or without onychomycosis) and onychomycosis (without lunula involvement) in at least one other toenail in the affected side.

All patients were treated with oral terbinafine 250 mg/d for 4 months. Mycological tests (KOH preparation and mycological culture) were taken before (0 months) and after (4 months) from both the fifth toenail and the target toenail. Blood tests for CBC and LFT were performed before the study and every month until the end of the terbinafine treatment.

Mycological cure was defined as negative KOH preparation (direct smear) and negative mycological culture, whereas clinical cure was defined as more then 90% clearance of the previously affected part of the nail plate.

Of the 50 patients who entered the study, seven patients did not complete the study.

The 43 patients who completed the study were between 19 and 52 years of age (mean 35) and changes in all toenails had occurred between 3 and 20 years (mean 7 years).

Characteristics of the fifth toenail before the study were: 37/43 (86%) patients who had distal lateral subungual onychomycosis (DLSO) in toenails 1-4, 32 of whom also had fifth toenail total dystrophy (TD).

At the end of the treatment period, in the subgroup of 21 patients who initially had fifth toenail onychomycosis, only 4/21 (19%) of the fifth toenails compared with 12/21 (57%) of the other toenails were completely cured (CC), defined as both clinical and mycological cure. The mycological cure (MC) rates were 52% and 71% respectively.

All four clinically and mycologically cured fifth toenails had initial onychomycosis, and by the time they were cured so had the other toenails in the same foot.

The fifth toe and toenail are frequently exposed to more daily mechanical pressures than the other toenails. The presence of callus near (usually lateral to) this toenail is direct evidence of the repeated trauma that this area suffers from mal-fitting (narrow) shoes. The repeated trauma, in turn, exerts direct pressure on the nail matrix, causing nail thickening, which predisposes the nail to fungal infection This, however, decreases antifungal drug diffusion through the nail bed and nail matrix, thus limiting the ability of drugs to reach their target.

This study supports the hypothesis that, due to these factors, clinical improvement of the fifth toenail after systemic antifungal therapy is less favourable and does not correspond with the clinical cure rate of the other toenails. Therefore, patients should be told to adjust their expectations as to the visual results of their antifungal treatment.

Fifth toenail clinical response to systemic antifungal therapy is not a marker of successful therapy for other toenails with onychomycosis

COMMENTARY

This is both an amusing and serious study which confirms the fact that the fifth toenail has been excluded from all the clinical evaluations for a number of years in all the therapeutic studies on onychomycosis.
It also shows that, occasionally, a well treated onychomycosis reveals a congenital or underlying traumatic dystrophy [Fig 1, 2].

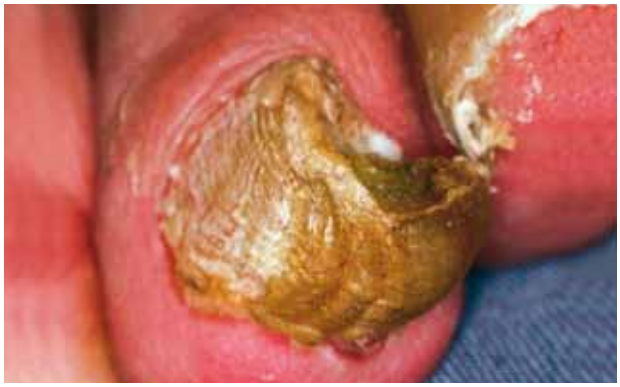

Fig 1 - Dermatophyte onychomycosis of the great toenail and of the second lesser toenail, the latter being frankly dystrophic.

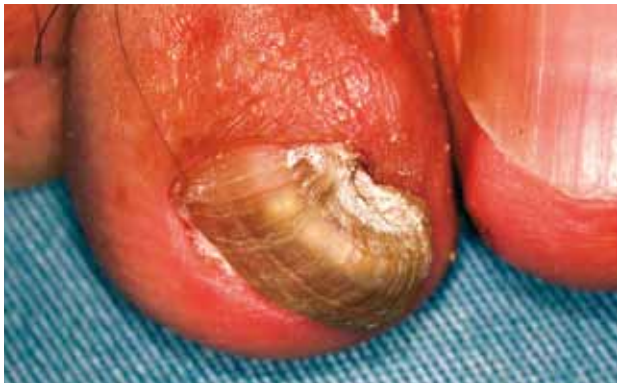

Fig 2 - Mycologic cure stage. The great toenail is clinically cured, the second lesser toenail shows an improvement without lessening of the dystrophy. Repeated questioning reveals a history of an old trauma responsible for the dystrophy. The altered nail was very likely a welcoming host for the dermatophyte.

Bertrand RICHERT

Fungal thigmotropism in onychomycosis and in a clear hydrogel pad model

Piérard GE, Piérard-Franchimont C, Quatresooz P. Dermatology 2007; 215:107-113

A broad range of eukaryotic cells are able to orientate their direction of growth in relation to the physical and topographical features of the growth substrate. The ability to sense and respond to features of the growth substrate is indeed an adaptation of a large number of tip-growing cells that live on and within solid materials. This tropic behaviour is known variously as thigmotropism, contact-sensing growth, touch-sensitive response or contour guidance. Typical examples include plant roots that can reversibly rotate the root apex or achieve the circumnavigation of obstacles while growing in soil. Another example is provided by the guided growth of embryo axonal or dendritic processes that grow within solid embryonic or regenerating tissues to achieve the innervation of specific sites.
Thigmotropism is well recognized in pathogenesis, i.e. in the penetration stages of some pathogenic fungi. In particular, filamentous forms of dermatophytes, nondermatophyte molds and dimorphic yeasts such as *Candida albicans* exhibit in vitro the capability of thigmotropism.

The aim of the present study was to assess, using histomycology, the involvement of thigmotropism in the fungal invasion in onychomycosis. We also compared this phenomenon with that incidentally disclosed during the fungal invasion of hydrogel pads (Laser Aid®, Geistlich Pharma, Wohusen, Switzeland).

From their laboratory files they retrieved the histomycology material corresponding to proven onychomycoses. The examined samples corresponded to 200 cases of dermatophyte infection, 50 cases of yeast infection showing both yeast-like cells and hyphae, and 50 cases of nondermatophyte mold infections. The sections were stained by the PAS method, and observations were made under polarized light. They focused their attention on the overall orientation of the hyphae inside structures of the nail apparatus.

Laser Aid hydrogel corresponds to a transparent 100 x 50 x 3.3 mm pad composed of polysaccharides and polyacrylamide polymers. This medical device is designed to cool the skin during laser therapy. In a clinical setting, this material has to be discarded after a single usage. In the present observations, the hydrogel pads were experimentally applied several times onto healthy skin and stored in a refrigerator between the successive sessions. After a few weeks, the material focally lost its transparency. These cloudy areas corresponded to a mycotic invasion of the pad as revealed histologically. Thigmotropism of these fungi was assessed under the microscope.

The nails were heterogeneous in structure. The typical subungual cornified tissue was strikingly different from the nail plate. In rare instances the superficial part of the nail showed transversal bands corresponding in histological section to wedge-shaped alterations of the nail structure. Similar alterations were also incidentally found encased in the mid part of the nail plate. In the experience of the authors, these altered structures are barely recognized by conventional optical microscopy. In contrast, they clearly appear under polarized light. The autors found that these structures may host fungi more commonly than the rest of the nail plate. This condition clinically resulted in a seemingly striated mycotic leukonychia.
In the distal and lateral subungual onychomycoses, dermatophyte hyphae predominantly run parallel to the wavy pattern of the hyperkeratosis beneath the nail plate. When invading the nail plate from beneath, the main orientation of the hyphae changed to run almost parallel to the nail surface without any evidence for nail plate alteration. A similar parallel configuration occurred in the superficial white onychomycosis and in the mid-plate onychomycosis as well. These patterns were lost when the nail plate was dystrophic. In this instance the fungi followed cracks on the disturbed orientation of onychocytes in a more haphazard way.

Fungal thigmotropism in onychomycosis and in a clear hydrogel pad model

The yeast mycelium of *C. albicans* often showed a unique haphazard pattern of infiltration inside the nail. The individual hyphae and pseudohyphae showed a helical or twisted growth originating from clumps of yeast-like cells. The growth of *Candida* thus appeared multidirectional inside the nail contrasting with the more oriented pattern of dermatophyte invasion.

Basically, the filamentous forms of nondermatophyte molds followed orientations similar to dermatophytes, but usually they formed many branchings. A haphazard or wavy pattern predominated in a number of cases. Not infrequently the nail structure appeared dystrophic under polarized light.
In the model of the hydrogel pad, fungal hyphae were running either haphazardly or in almost parallel arrays. Some fungi were straight, but other looked spirally orientated. Chlamydoconidia and arthroconidia were present in large numbers, but isolated spores were not seen, and there was no aerial mycelium.

In conclusion, thigmotropism can in part explain the diversity of orientations and shapes of fungi invading nail plates. The same phenomenon was disclosed inside hydrogel pads. As this material is transparent and easy to cut for microscopic examination, fungal thigmotropism is conveniently explored in this way.

COMMENTARY

This is an extremely interesting study with outstanding illustrations, as it is always the case in G. Pierard' s work. All the histological slides resemble modern art. This article clearly demonstrates the role of thigmotropism in the invasive mechanism of onychomycosis. However, the study in the clear hydrogel pad leaves us asking for more ... but it does refer to a forthcoming article. We are impatiently waiting for the next episode !
Concerning transversal leucomycosis it would have been interesting to give a reference; this type of exceptional onychomycosis has been described by Robert Baran, N. McLoon, RJ Hay (Could proximal white subungual onychomycosis be a complication of systemic spread ? The lessons to be learned from Maladie Dermatophytique and other deep infections. Br J Dermatol 2005; 153: 1023-25).
The case described in this publication came from our private clinic.

The nail - What's new ? - n°1

Clinical cases

Robert Baran' s clinical case

A 51 year-old woman consulted for a tumour on the hyponychium and the adjacent distal glove. It covered the extremity of the pulp of the left index finger. This bright red nodule, the size of a pea, was perfectly round [Fig 1].

After questioning the patient we learned that the tumour had appeared nine years earlier, that it had already been electrocoagulated by a dermatologist and it had recurred one year later. The same specialist treated it the same way again. He never asked for an histopathological exam. Its reappearance and rapid increase in size motivated this new consultation.

There was no sensitivity to pressure. However, the patient felt pain if the region was traumatized. There was no local or general medical case history. The X-ray of the finger tip was normal.
Using a local anaesthetic, the distal third of the nail plate was cut and an almond-shaped transverse excision of the tumour down to the bone was performed and then it was sutured. It appeared histologically as a polypoid formation. This multinodular lesion had well defined limits, dilated vessels in the superficial region, while in depth the presence of spaces separated by slits were noted. Both of these features are observed in fibroma of the tendon sheath. Some zones encompass small-spindle-shaped cells, epithelioid or curved and plump at different levels.
The stroma was composed of more or less abundant collagen with dilated vessels.
The mitotic index was weak and without abnormal mitosis.
The immunohistochemistry was negative concerning the S-100protein HBM45, cytokeratin, Kpl, actin and CD34.
On the other hand, the vimentin was diffusely positive and also the EMA on 80% of the fusiform cells [Fig 2].

What is your diagnosis ?

Benign tumours of peripheral nerves can be classified into three main categories:
Schwannomas, neurofibromas and perineuriomas.
The positivity of the EMA (Epithelial Membrane Antigen) the negativity of the S-100 protein and the neurofilaments allow us to diagnose a **perineurioma**. The absence of immuno-reactivity to actin and the positivity of EMA eliminate the diagnosis of fibroma of the tendon sheath.

Baran R, Perrin C. Perineurioma. A tendon sheath fibroma-like. Variant in a distal subungual location. Acta Dermatol Venereol. 2002; 83: 60-61.

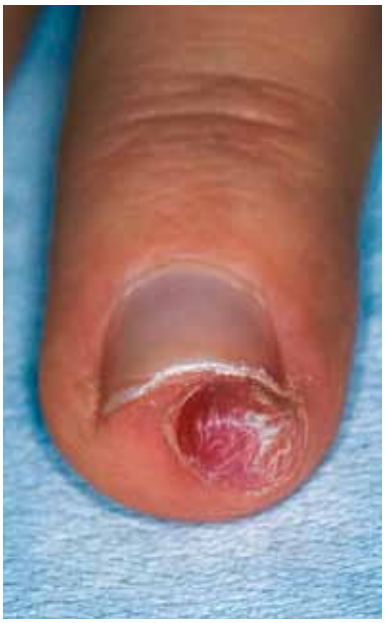

Fig 1 - Perineurioma of the distal index finger

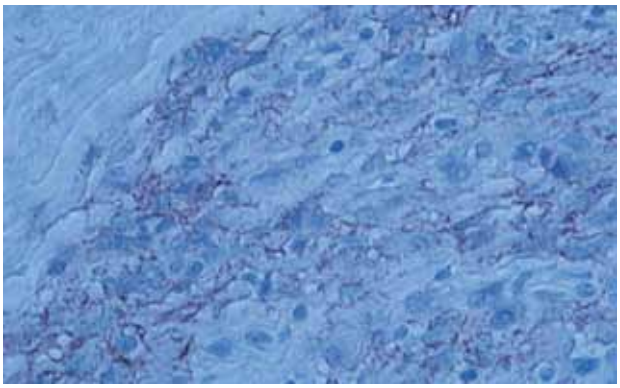

Fig 2 - EMA marker (Epithelial Membrane Antigen)

Giuseppe Cannata' s clinical case

INTRODUCTION

Congenital lipoid storage disease is very rare. It is a transmitted autosomal recessive trait of which the gene has recently been brought to light. Some mutations are associated with a severe increase of the muco-cutaneous disease.

A 38 year-old female patient presented with a histological and clinical muco-cutaneous disease typical of Urbach-Wiethe syndrome.

COMMENTARY

We have included this very exceptional clinical case, even though nails are not involved, the peri-ungual soft tissue is affected.
The lipoid proteinosis, also known as hyalinosis cutis and mucosae is a genetic disease which appears in childhood. Histological examination together with electronic microscopy reveals lipoid infiltrations and the dissociation/duplication of the basal layer around the blood vessels at the dermo-epidermal junction.

The hoarse voice caused by infiltration of the vocal cords is quite striking. Mouth, pharynx, larynx and hypolarynx are covered with mucous membranes.
The multiple irregular, yellowish lipoid infiltrations produce waxiness and thickening of the skin and the papules are mainly situated on the edges of the eyelids and the nostrils [Fig 1], the dorsum of the limbs [Fig 2] and lateral digits [Fig 3]. The lesions of the elbows [Fig 4] and the knees are very pronounced.

This patient did not present with grand mal epilepsy, as is frequent in mental retardation, which both indicate the seriousness of the prognosis of the disease.

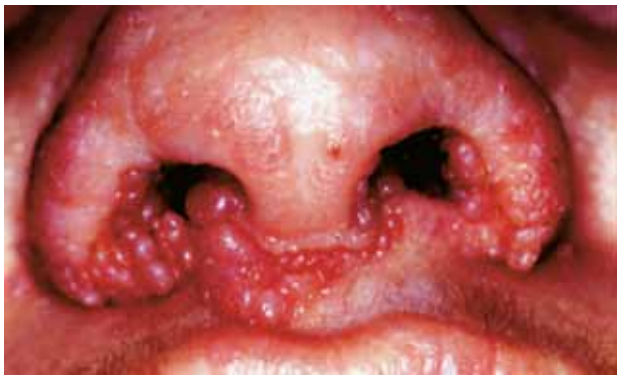

Fig 1 - Papules involving the nares

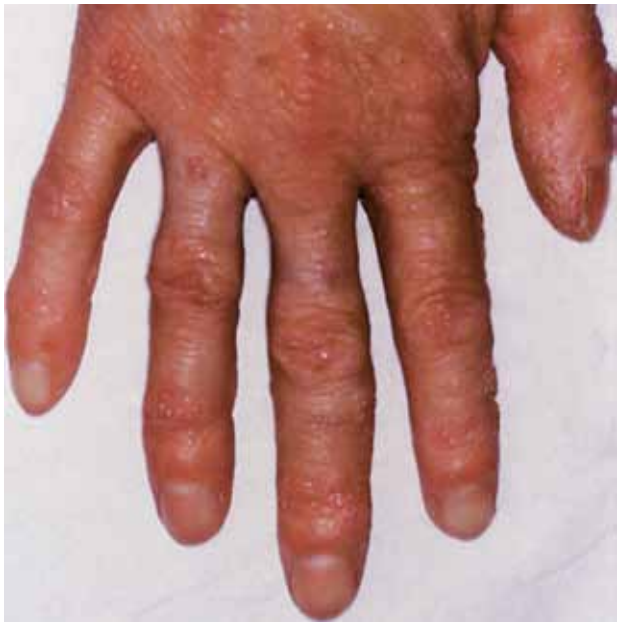

Fig 2 - Lesions of the dorsum of the hand and the fingers

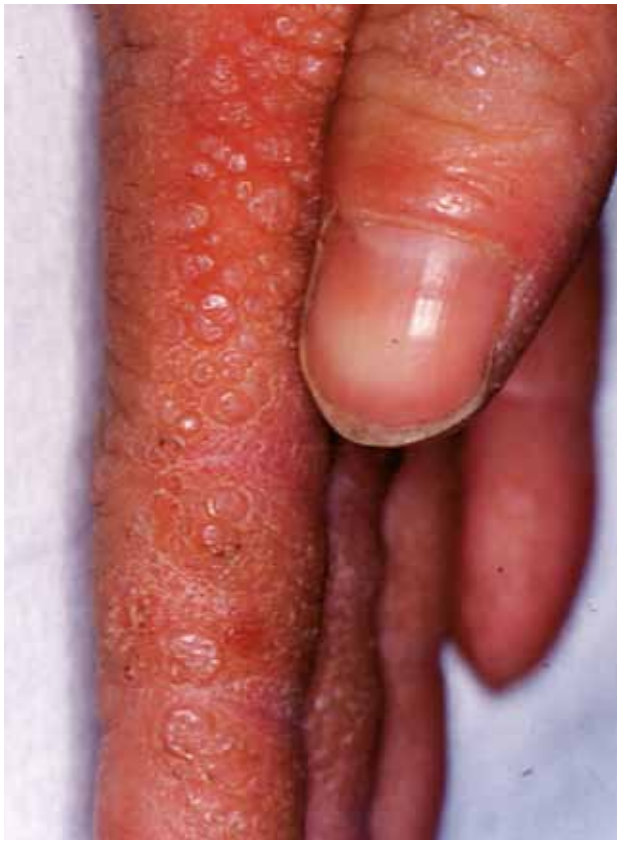

Fig 3 - Blow-up of the finger lesions

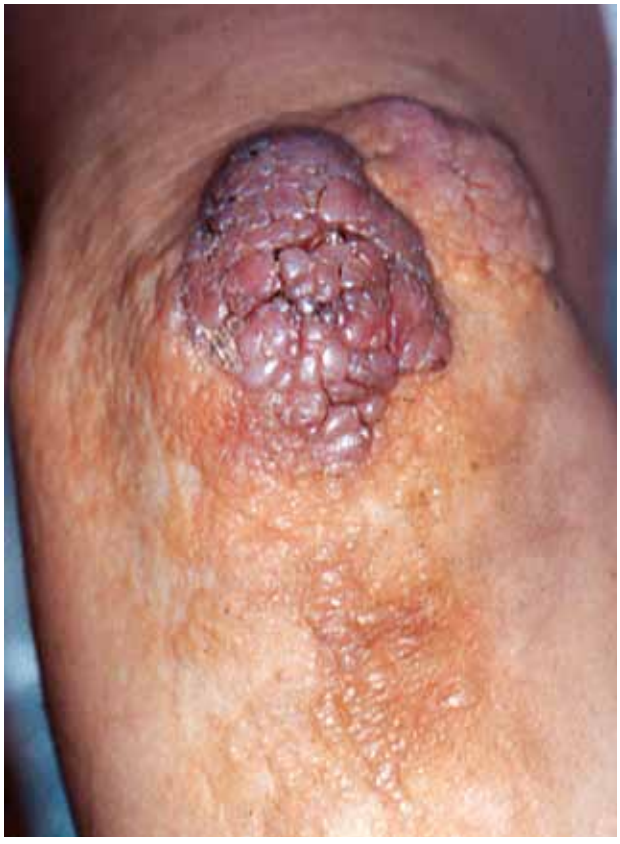

Fig 4 - Prominent plaque made of papules and nodules on the elbow area

Osvaldo Correia's clinical case

A 7 year-old boy developed an upper respiratory tract infection which was treated with a 300 mg dose of cefadroxil twice a day for eight days. On the fifth day he left for a holiday in the sun. Two weeks later he developed proximal onycholysis and onychomadesis of most of the nails of his hands [Fig 1-4]. There were no cutaneous lesions and three months later the nail alterations were completely healed with the application of emollients.

COMMENTARY

Onychomadesis can develop after an acute infection. However, the appearance of onycholysis with onychomadesis after exposure to the sun when under antibiotic treatment indicates drug-induced photosensitivity. The most frequently incriminated antibiotics are the quinolones and the tetracyclines. Anti-inflammatory, antipsychotic, diuretic, retinoid and several anti-neoplasic drugs can also not be ignored.

The reasons for drug sensitivity are still not well understood.

They act on the development of radicals in biological systems, oxygenated or not. The photolability of a drug is not the only factor which determines the phototoxic activity. The compound must be present in sufficiently high levels in the skin and, in this particular case, in the nail matrix.

COMMENTARY R. BARAN

If the term onycholysis means detachment of the nail it is usually reserved for the distal part of the nail. Moreover, photoonycholysis does not start on the proximal region, but on the contrary in the central or distal area.

Could this case be an exception to the rule or just a toxic effect of the antibiotic on the nail matrix ?

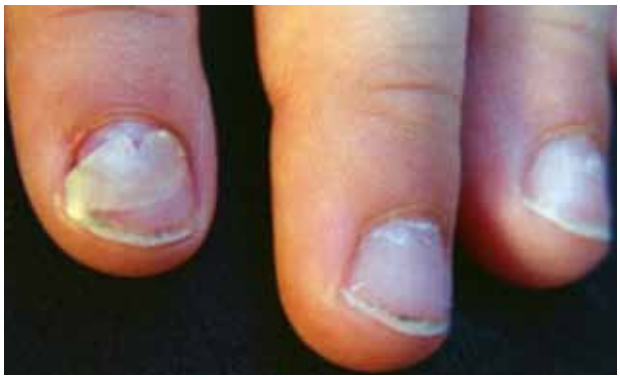
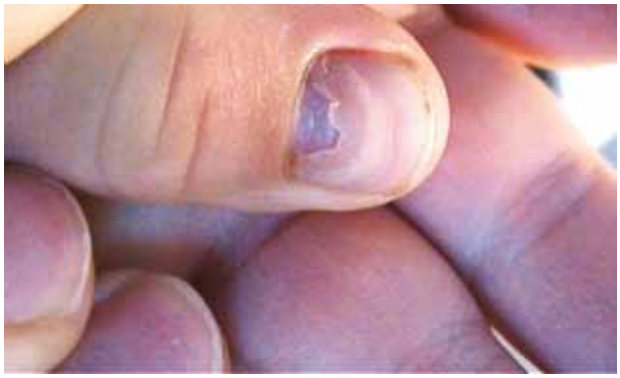

Fig 1 and 2 - Onychomadesis

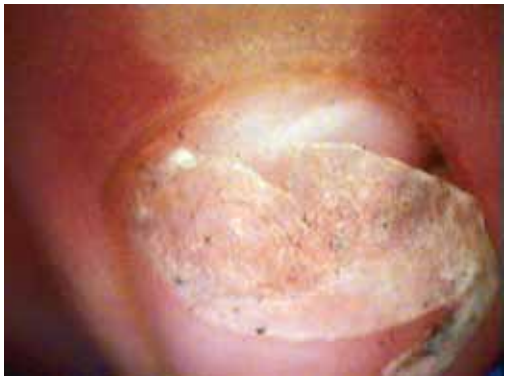
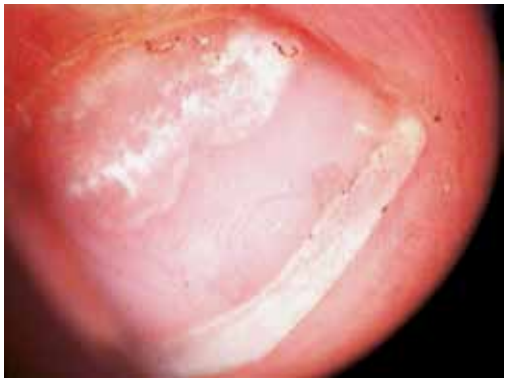

Fig 3 and 4 - Onychomadesis associated with onycholysis (dermoscopic pictures)

Sophie Goettmann' s clinical case

A 47 year-old man consulted for a lesion of the left 5th finger which had appeared two months previously and was initially painful. But with time the pain was less intense.

A similar episode, concerning the same hand, was indicated in his medical history seven years before and there were no other recurrences. No diagnosis was made the first time. The lesion spontaneously regressed in a few months. The clinical examination showed a pinkish hypertrophic lesion of the nail bed, with a hyperkeratotic centre which partially lifted the nail. Distal onycholysis was present [Fig 1].
Under the distal part of the nail of the left 4th finger an atrophic scar lesion existed showing a punctiform depression [Fig 2].
Front view and profile X-rays revealed a bone wide erosion. The tuft of the phalanx of the 4th finger was normal, although on the X-ray brought by the patient and taken when the lesion was developing there was also bone involvement [Fig 3].
The diagnosis of multiple subungual keratoacanthomas was certain. Subungual keratoacanthoma is rare and is revealed by a rapidly developing subungual keratotic tumour, which is extremely painful. The pain very often wakes the patient at night.
The signs for diagnosis are: rapid development, pain and usually osteolysis. Differential diagnosis is mainly epidermoid carcinoma which develops much more slowly. The histological exam of this type of lesion is sometimes difficult and development plays an important role in the diagnosis.
Subungual keratoacanthoma usually needs surgical treatment as it does not regress.
The pain disappears with excision. Recurrence is rare but sometimes leads to amputation. The osteolysis, probably due to pressure, disappears within a few months.
The particularity of our observation are the multiple signs of the keratoacanthoma in a patient with no case history. Multiple keratoacanthoma has been reported in immuno-depressed patients (kidney transplanted patients).
However, our case illustrates that spontaneous regression is occasionally possible in this region with a minor and non-incapacitating subungual scar. Some cases of spontaneous regression, with disappearance of the osteolysis have already been described in medical literature.
This regression can perhaps give us a delay for excision of the subungual keratoacanthomas especially if they are not too painful or if the pain is controlled with analgesics.
In our case, the initial development of the subungual keratoacanthomas was approximately five months.

As the pain linked to the second keratoacanthoma was becoming less and less incapacitating, we were able to envisage that regression had begun. The patient was still under observation, but had not been operated on. Two months later, that is four months after the onset of the pain, the lesion regressed [Fig 4].

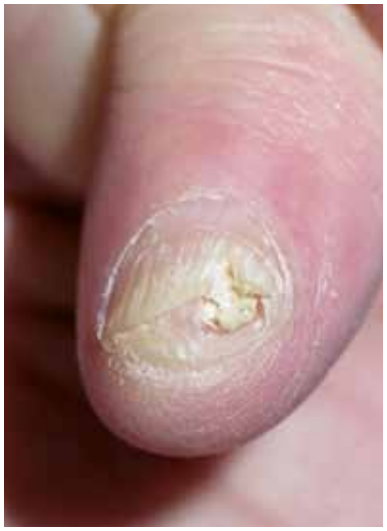

Fig 1 - Subungual keratosis of the fifth finger

Fig 2 - Subungual retractile scar of the fourth finger (sequela of a previous keratoacanthoma)

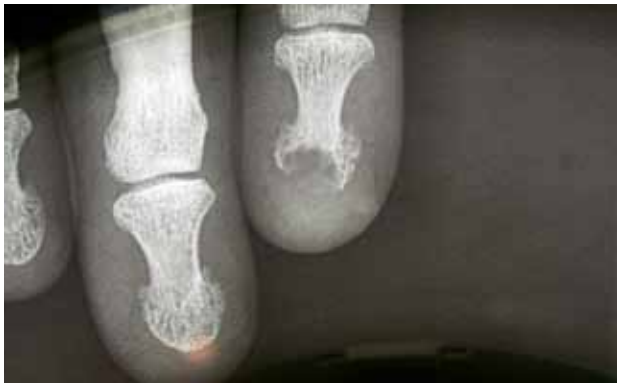

Fig 3 - Erosion of the distal phalanx after keratoacanthoma of the fourth finger

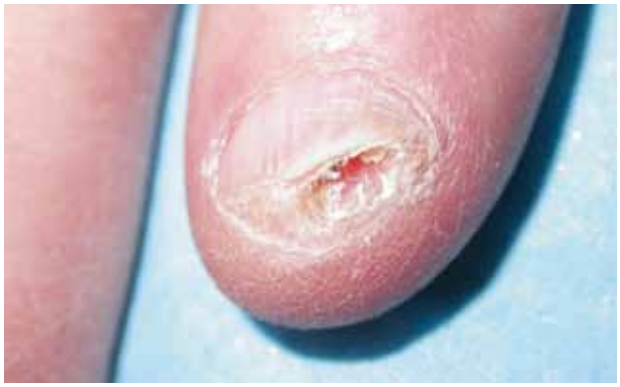

Fig 4 - Involution of keratoacanthoma of the fifth finger two months after the features of figure 1

Jose Maria Mascaro' s clinical case

A woman aged 76 with a history of multiple and superficial basal cell epitheliomas of the face and trunk, remembered the appearance of warts on her fingers in her youth.

One year ago the nail plate on the second finger of her left hand changed colour and in her own words it "appeared unstuck" . The clinical exam rapidly showed the reason: a brownish, keratotic mass was lifting the nail plate. The biopsy, followed by total excision of the mass revealed Bowen's disease.

In this case we can speculate on the role of HPV on the development of Bowen's disease in the nail bed. [Fig 1].

Fig 1 - Bowen's epithelioma

Bertrand Richert's clinical case

This nine-year old girl was referred to our department for a nail alteration involving her left index finger. The condition started a few months ago with a pus collection around the nail considered as a whitlow and the child received oral flucloxacilline and topical fusidic acid. As the condition did not improve after 2 weeks, the antiotherapy was shifted to an association amoxycillin-clavulanic acid. The child did not complain, had no pain and no fever. Due to the lack of response to therapy, blood testing and X-rays were ordered. These were totally normal. Systemic treatment were discontinued and topical povidone iodine disinfection was maintained.

Three weeks later, the pustular lesions spontaneously faded away and only a moderate periungual erythema remained and all treatments were suspended.

In the following months, the nail growth was frankly dystrophic and the parents sought medical advice from a dermatologist. He immediately thought of onychomycosis and sampled some nail keratin. KOH and culture were both negative. A weekly treatment with fluconazole 5 mg/kg was however prescribed. No improvement was observed, on the contrary, the nail continued to deteriorate.

The girl is then referred to the nail outpatient clinic. The nail alteration [Fig 1, 2] was isolated and clinical examination did not reveal any other skin or mucous membrane alteration. There is no familial dermatologic history.

What is your diagnosis and management ?

The clinical history is very classical and stereotyped and corresponds to parakeratosis pustulosa. This condition was first described by Sabouraud in 1931 and further detailed by Hjorth in 1967. It electively affects girls around the age of seven. Only one finger is involved, most commonly the thumb and the index finger. It begins with an acute inflammatory episode responsible for sub-acute paronychia, sometimes with pustules, evoking an infectious process. With time, the condition evolves towards pulpitis associated with nail dystrophy evoking onychomycosis, psoriasis or atopic dermatitis. Amazingly, nail dystrophies predominate on one side of the nail. Pitting is common.

This disorder should not be considered as a real entity but rather as a symptom of an inflammatory disease of the nail apparatus such as psoriasis, contact dermatitis or atopic dermatitis. Histological examination reveals one or several characteristics of these conditions. The reason why parakeratosis pustulosa electively affects the two first finger of girls around seven remains a mystery ...

In some rare instances, the allergologic exploration may identify a responsible agent and its eviction allows full recovery. In most patients, the condition evolves towards complete healing, without any sequellae, in a few months or occasionally even years. On the other hand, some may develop a frank psoriasis.

No treatment should be prescribed and reassuring the parents is necessary. Photographs at regular intervals may help in this case. For inflammatory flare up, topical application of an association of fusidic acid and betamethasone is useful.

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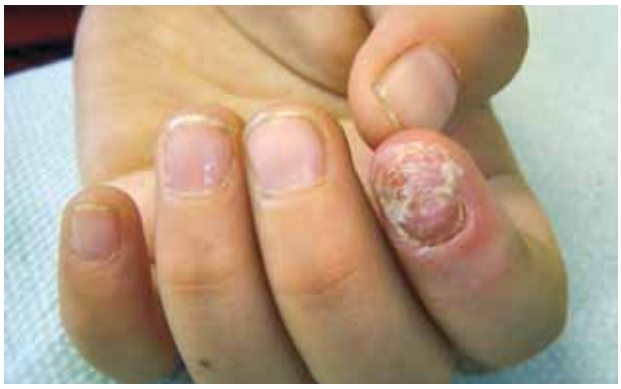

Fig 1 - Parakeratosis pustulosa

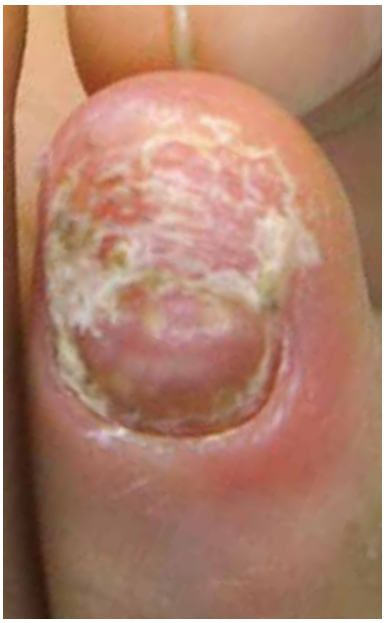

Fig 2 - Blow-up of the same lesion

The nail - What's new ? - n°1

Continuing Medical Education

Eckart HANEKE

Excision of a junctional naevus of the nail matrix

The differential diagnosis of longitudinal melanonychia may be very difficult. It may be the result of matrix melanocyte activation, of a lentigo, a naevus or a malignant melanoma.

There are, however, some signs that give additional information, such as the width of the brown streak, its localisation, the patient's age, the presence of Hutchinson's melanotic whitlow, etc., but none are absolutely certain. This is the reason why a histopathological examination of the origin of the melanonychia is indicated. However, a matrix biopsy may induce a postoperative nail dystrophy. Many physicians are therefore hesitant to perform such a biopsy. We have developed a surgical technique which completely avoids the risk of postsurgical nail dystrophy.[1,2,3]

In order to localise the melanocyte focus a piece of the nail's free margin may be clipped and submitted to histolopathological examination [Fig. 1].

Three possibilities exist:

1. When the pigment is in the deep layer of the nail plate the melanocytes are located in the distal portion of the matrix.
2. When the melanin is in the middle layer of the nail plate, the melanocyte focus has to be in the middle of the matrix.
3. When the pigment is in the dorsal layer the melanocytes are in the proximal portion of the matrix.

The patient's hand or foot is cleansed with a disinfectant. Local anaesthesia is performed either with a proximal digital block or a transthecal anaesthesia. In case of finger localisation, a sterile glove is donned and a small hole is cut into the corresponding finger tip. It is then rolled proximally to give a perfect tourniquet and a bloodless field [Fig. 2].

The tip of a nail elevator is inserted under the free margin of the proximal nail fold to separate it from the underlying nail plate. While incising the proximal nail fold it is left in lateral position in order to protect the underlying matrix. The proximal nail fold is reflected allowing the origin of the melanonychia to be visualised [Fig. 3)].

The nail elevator is then flipped around 160° in order to get the tip of the instrument under the proximal part of the nail plate. This is gently freed from the matrix [Fig. 4].

The nail plate is cut transversely at the border between its proximal and middle third [Fig. 5]. and the proximal nail third is reclined exhibiting the melanocyte lesion [Fig. 6].

A shallow incision with a safety margin is carried out around the lesion [Fig. 7].

The melanocyte focus is horizontally removed by tangential excision ("shave excision"), which leaves a very superficial wound [Fig. 8]

The reclined nail plate is laid back on the matrix and fixed with a stitch [Fig. 9].

Finally, the proximal nail fold is laid back and re-sutured [Fig. 10].

The very fine tissue slice is transferred onto a piece of filter paper. Stretched out perfectly the tissue on the filter paper is immersed into 4% formalin fixative. Complete fixation is achieved within less than 3 hours and the specimen can be

processed within less than one working day.
Since 1988, we have operated more than 30 patients with longitudinal melanonychia using this method. We have never observed postoperative nail dystrophy, not even when almost all of the matrix had been superficially removed. Most cases were due to a lentigo or a junctional naevus of the matrix. In case of a melanoma, an immediate re-excision followed the initial intervention.

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COMMENTARY R. BARAN

It is clear that the author does not limit his technique to junctional matrix naevi. Each longitudinal melanonychia can profit from this biopsy method when it is considered. The examination of the free margin of the nail that we have proposed in order to localise the melanocyte focus may be replaced by a dermatoscopical examination.

Braun R, Baran R, Saurat JH, Saurat L. Surgical pearl. Dermoscopy of the free edge of the nail plate pigmentation and the location of its probable origin in the proximal or distal nail matrix. J Am Acad Dermatol 2006; 55: 512-3.

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Eckart HANEKE

Excision of a junctional naevus of the nail matrix

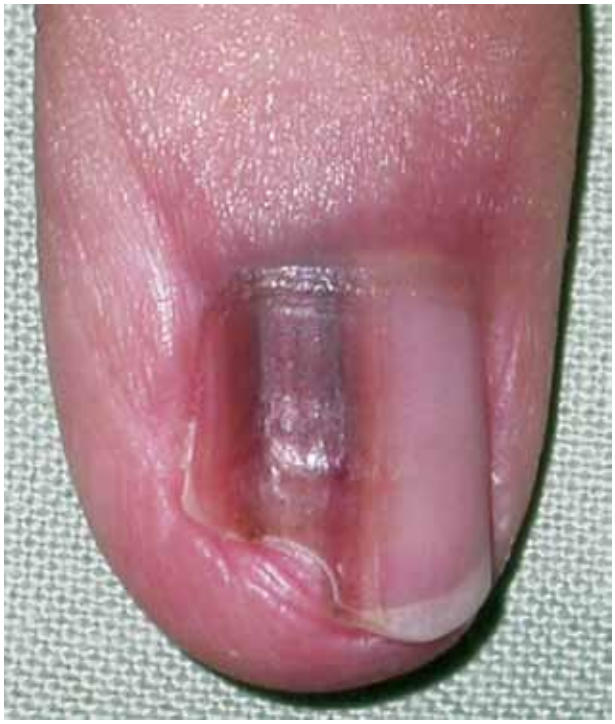

Fig 1 - Wide brown melanonychia, acquired in a patient of more than 40 year old

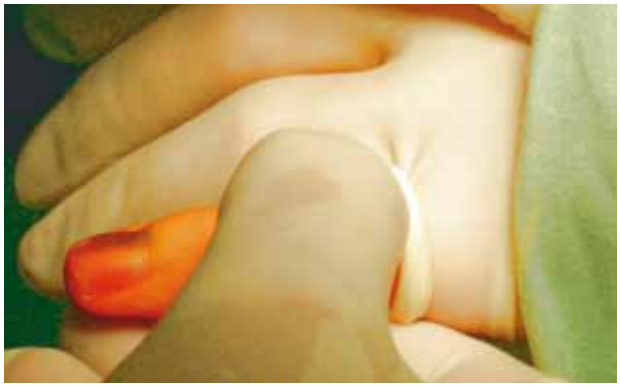

Fig 2 - Use of a tourniquet made of the sterile glove of the patient. The proximal nail fold is flipped back

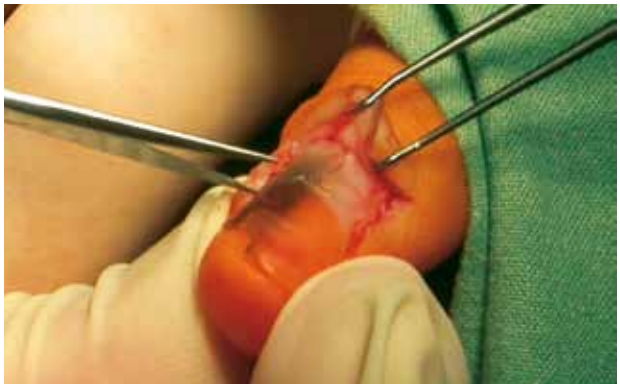

Fig 5 - The proximal nail fold is flipped back

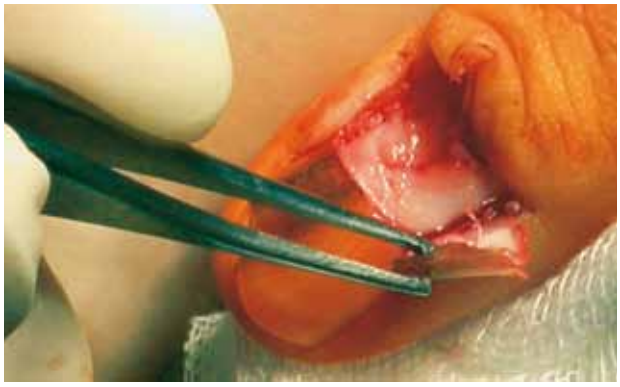

Fig 8 - The melanocytic area is then horizontally shaved

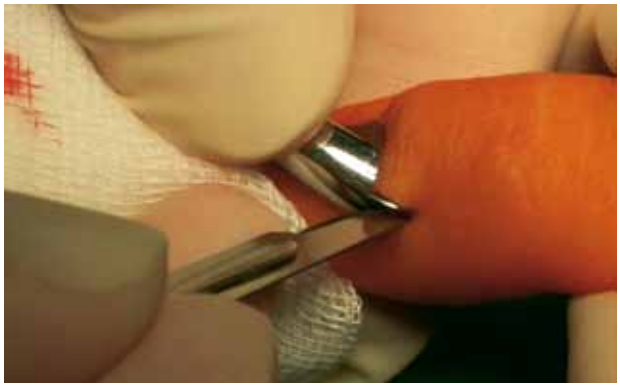

Fig 3 - The proximal nail fold is incised on both sides

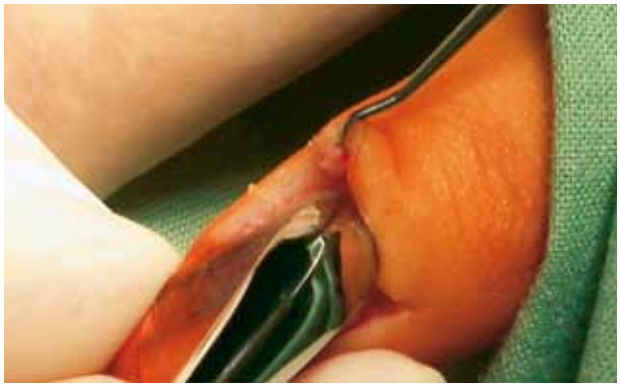

Fig 4 - The proximal nail fold is separated from the nail plate with an elevator

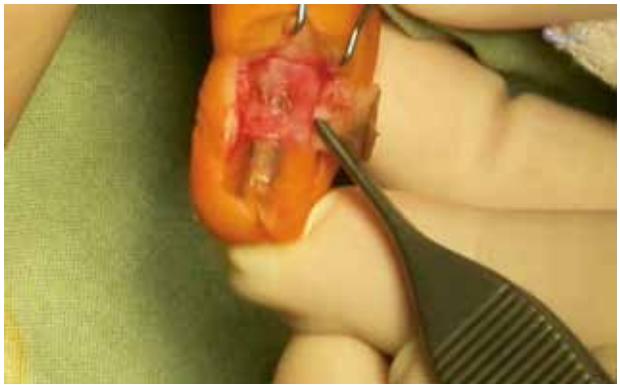

Fig 6 - A transverse section at the proximal third of the nail plate enables its elevation and show the melanocytic lesions

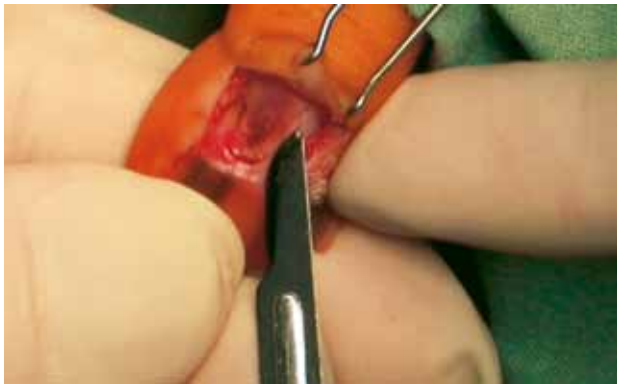

Fig 7 - A superficial incision is performed around the melanocytic lesion

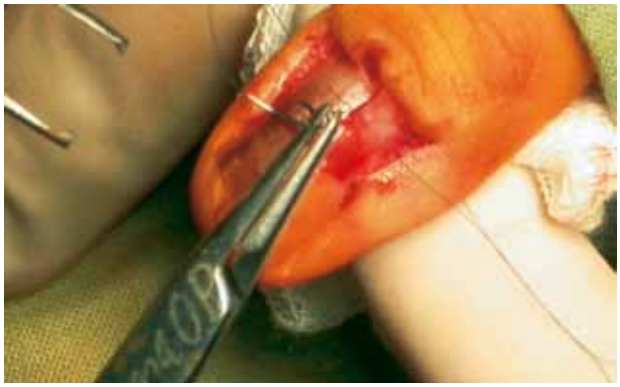

Fig 9 - The proximal third of the plate is placed back on the subungual tissue

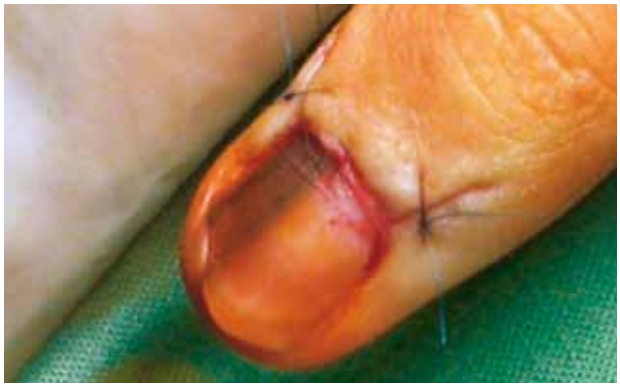

Fig 10 - Sutures of the incised proximal nail fold

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