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Color Atlas of Nails

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Contents

1 Nail Evaluation

Examination of the nails under sufficient lighting should be an integral part of diagnosis. Before the doctor examines the patient, his or her assistants should help the patients to do the following:

1. Remove shoes, socks, stockings
2. Remove all nail cosmetics
3. Have an informative nail questionnaire filled out

This will save time for the physician.

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2 Anonychia/Micronychia

- Total or partial absence of the nail
- May be congenital or acquired

Table 2.1. Causes of anonychia/micronychia

Congenital	Acquired
• Amniotic bands • Teratogens (drugs, alcohol) • Nail patella syndrome • Epidermolysis bullosa • Ectodermal dysplasias • DOOR syndrome • Iso-Kikuchy syndrome	• Trauma • Bullous diseases • Idiopathic atrophy of the nails • Psoriasiform acral dermatitis • Ischemia

2.1 Congenital Anonychia/Micronychia

Teratogens

Nail hypoplasia is more common when drugs are taken during the first months of pregnancy.

Table 2.2. Causes of anonychia due to teratogens

- Alcohol
- Carbamazepine
- Hidantoine
- Morphine
- Trimethadione
- Warfarin

Nail Patella Syndrome

Nail hypoplasia is more marked on the ulnar side of the digit. It may be limited to the thumb or involve several nails; in this last case severity decreases usually from the first to the other nails.

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Table 2.3. Clues for diagnosis

- Congenital nail hypoplasia more marked on one side of the nail
- Other family member affected (AD, mutation of the LMX1B gene)
- Exostosis of the iliac crests
- Absence or hypoplasia with luxation of the patellae
- Nephropathy in up to 60% of cases

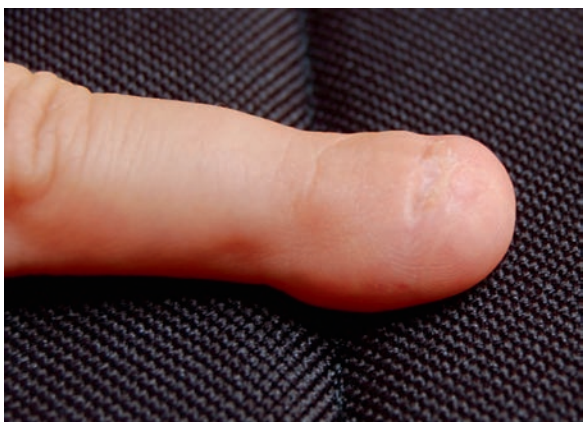

Fig. 2.1. Congenital anonychia due to unknown cause.

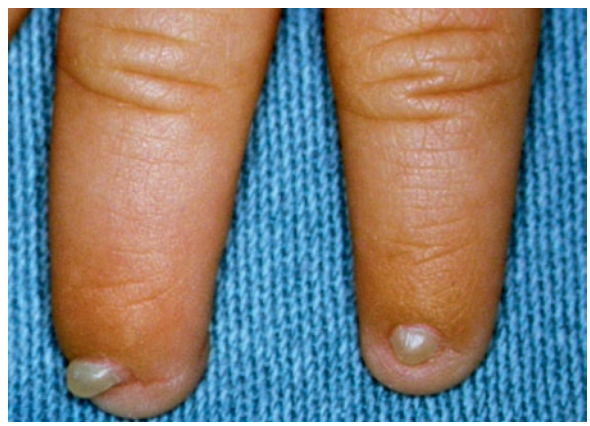

Fig. 2.2. Congenital micronychia due to due to anticonvulsants taken by the mother during pregnancy (courtesy of Prof. A. Oranje, Rotterdam, NL).

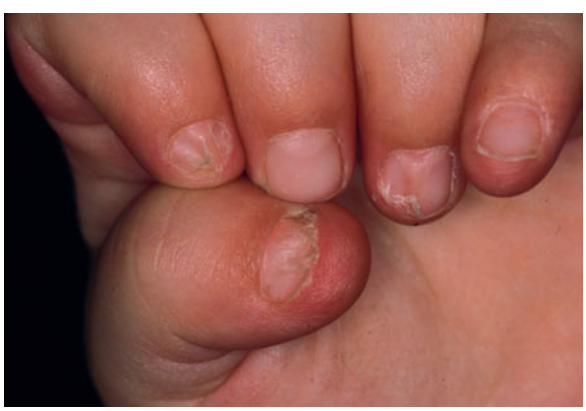

Fig. 2.3. Nail patella syndrome – nail hypoplasia and triangular lunula.

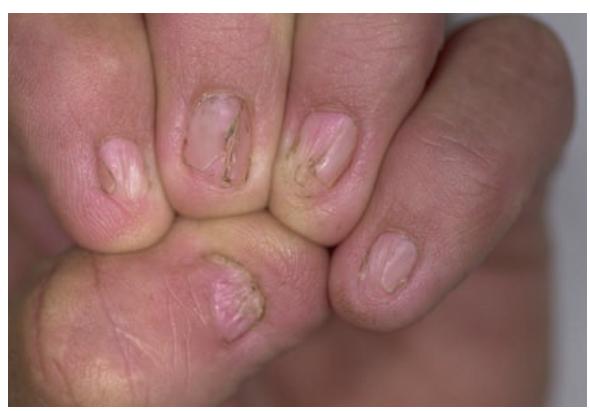

Fig. 2.4. Nail patella syndrome – nail hypoplasia is more marked on the ulnar side of the digit.

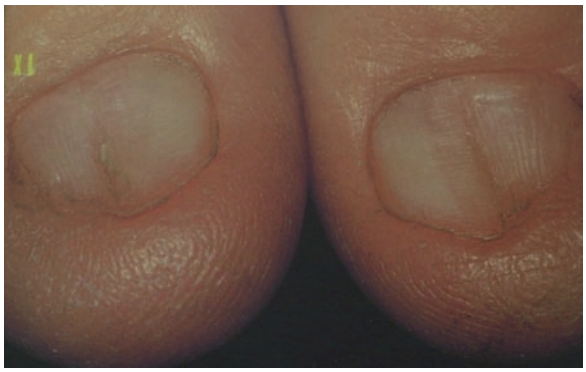

Fig. 2.5. Nail patella syndrome – the condition is bilateral and symmetric.

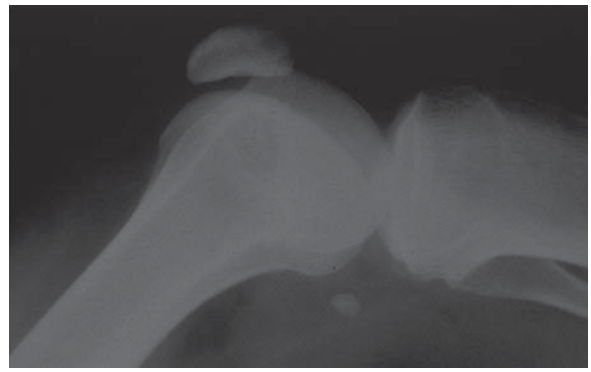

Fig. 2.6. Nail patella syndrome – X-ray showing hypoplasia of the patella.

Epidermolysis Bullosae

Anonychia is a feature of junctional and dermolytic epidermolysis bullosa, where it is a sequela of bullae formation. It is usually associated with cutaneous blisters or erosions and periungual and subungual granulomatous tissue. Other possible signs are:

- Nail atrophy
- Nail thinning
- Onychogriphosis
- Onychomadesis
- Pachyonychia
- Pincer nails

Ectodermal Dysplasias

Nail hypoplasia is a common feature of ectodermal dysplasias; it may be associated with nail thickening, thinning or fragility.

Table 2.4. Ectodermal dysplasias

Types	Nails	Associated dermatological features
Hydrotic ectodermal dysplasia (Clouston syndrome) AD	thick, hypoplastic	palmo-plantar keratosis, alopecia
Hypohidrotic ectodermal dysplasia (Christ-Siemens-Touraine) XR	thin, fragile	alopecia
Ankyloblepharon-Ectodermal defects-Cleft lip and palate (AEC, Hay-Wells syndrome) (Rapp-Hodgkin syndrome) AD	thin, fragile, hypoplastic	cicatricial alopecia

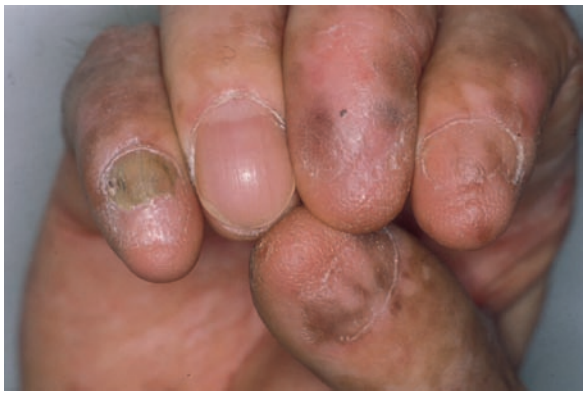

Fig. 2.7. Dermolytic epydermolysis bullosa – absence and hypoplasia of some nail plates due to repetitive blistering.

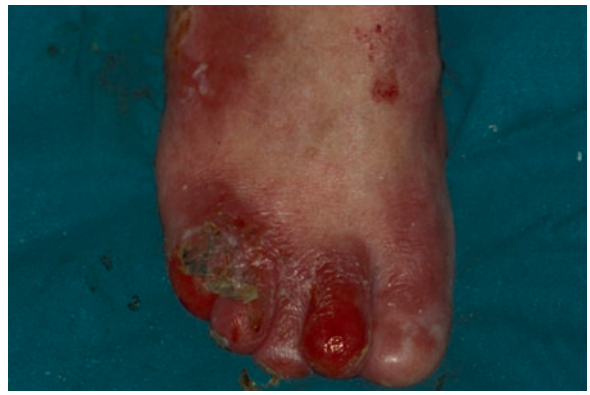

Fig. 2.8. Junctional epydermolysis bullosa – the nail plate is absent and the distal digit covered by granulation tissue.

Fig. 2.9. Ectodermal dysplasia, AEC type – the nail plates of the fingernails are thin, brittle and hypoplastic.

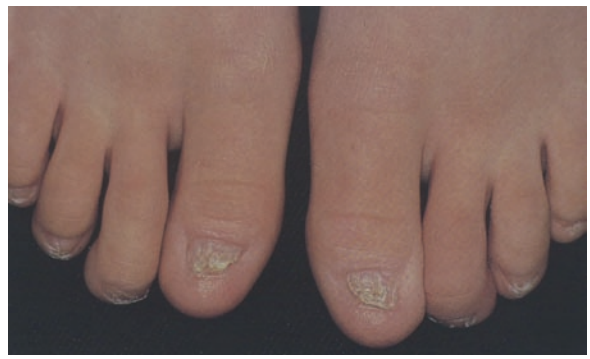

Fig. 2.10. Ectodermal dysplasia, AEC type, same patient of Fig. 2.9. – the nail plates of the toenails are thin, brittle and hypoplastic.

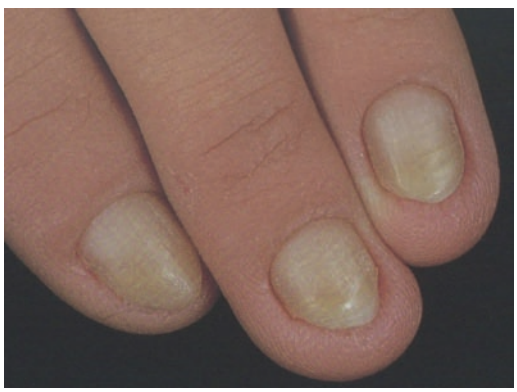

Fig. 2.11. Hidrotic ectodermal dysplasia – the nail plates are thick and hypoplastic.

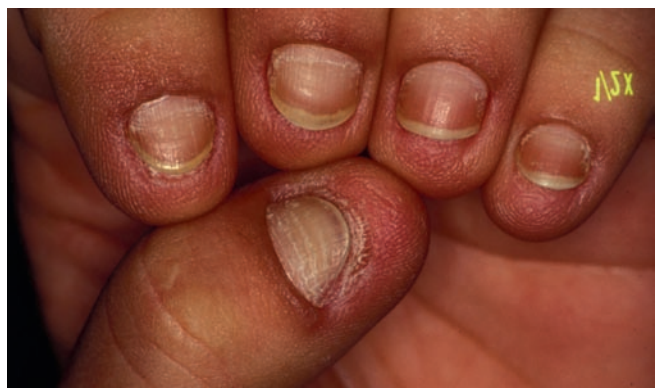

Fig. 2.12. Hidrotic ectodermal dysplasia – the nail plates are thick and hypoplastic.

Iso Kikuchy Syndrome (Congenital Onychodysplasia of the Index Finger)

Anonychia/micronychia/hemionychogriphosis of the index finger may be bilateral. The defect is more common on the radial side of the digit. The condition is congenital and the cause is unknown. The nail lesions are not associated with other abnormalities.

Table 2.5. Clues for diagnosis

- Lateral X-ray of the digit shows Y shaped bifurcation of the distal phalanx
- Deformed lunula

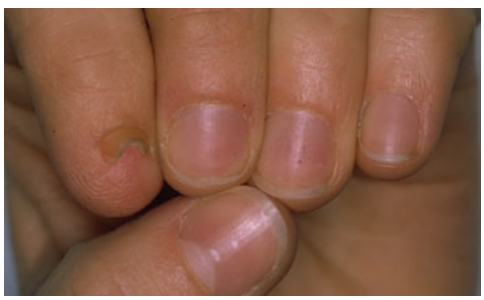

Fig. 2.13. Iso Kikuchi syndrome – micronychia of the index finger. The nail plate is thickened and deformed.

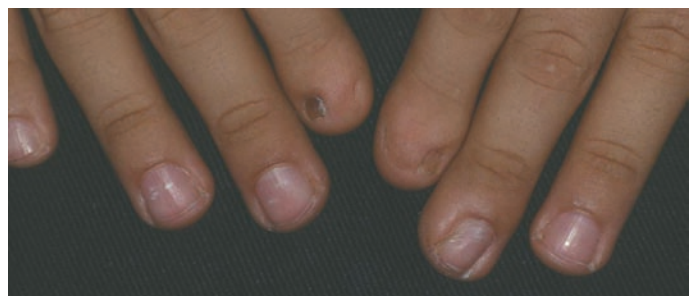

Fig. 2.14. Iso Kikuchi syndrome – micronychia of both index fingers. The 3rd finger of the left hand is also partially involved.

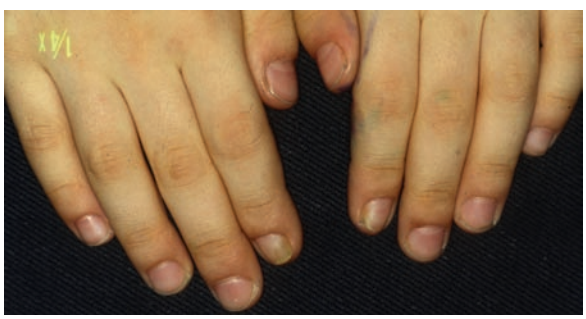

Fig. 2.15. Iso Kikuchi syndrome – micronychia of both index fingers.

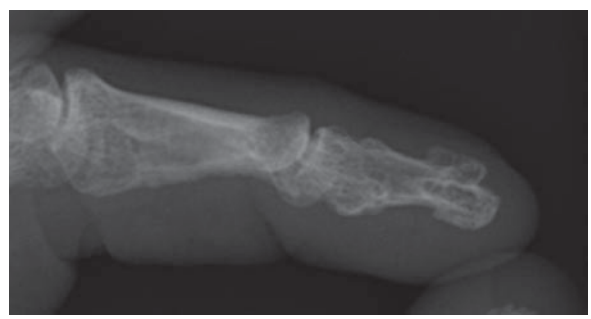

Fig. 2.16. Iso Kikuchi syndrome – lateral X-ray of the 2nd finger showing Y shaped bifurcation of the distal phalanx.

2.2 Acquired Anonychia/Micronychia

Acquired anonychia/micronychia result from total or partial destruction of the nail matrix due to inflammatory disorders or trauma. Among inflammatory disorders the most common cause is nail lichen planus, especially in its more severe form described as idiopathic atrophy of the nails. This condition develops very rapidly, with or without pterygium formation. Psoriasiform acral dermatitis, a rare condition that affects children, causes a typical shortening of the nail without underlying bone abnormalities. Nail lesions are associated with erythematous desquamative lesions of the fingertips.

Bullous and ischemic disorders (particularly Lyell disease) are a rare cause of anonychia/micronychia.

In ischemic diseases anonychia is usually associated with bone destruction and acro-osteolysis.

Table 2.6. Causes of traumatic anonychia/micronychia

- Accidental injuries
- Surgery
- Burns
- Freezing
- Chemical damage

Table 2.7. Bullous diseases causing anonychia/micronychia

- Bullous pemphigoid
- Epydermolysis bullosae
- Erythema multiforme
- Lyell disease

Table 2.8. Ischemic diseases causing anonychia / micronychia

- Raynaud's disease
- Peripheral neuropathies:
  - Carpal Tunnel Syndrome
  - Diabetes
  - Syringomyelia
- Burger's disease
- Scleroderma

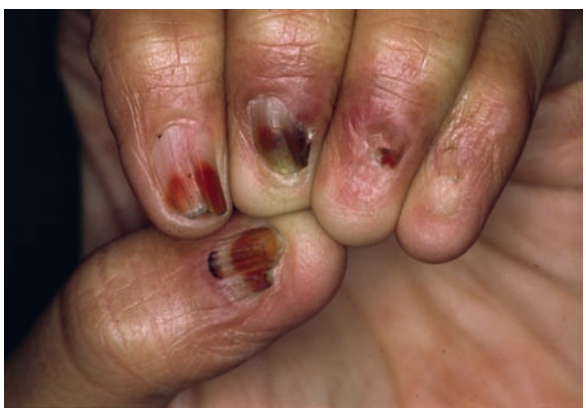

Fig. 2.17. Idiopathic atrophy of the nail

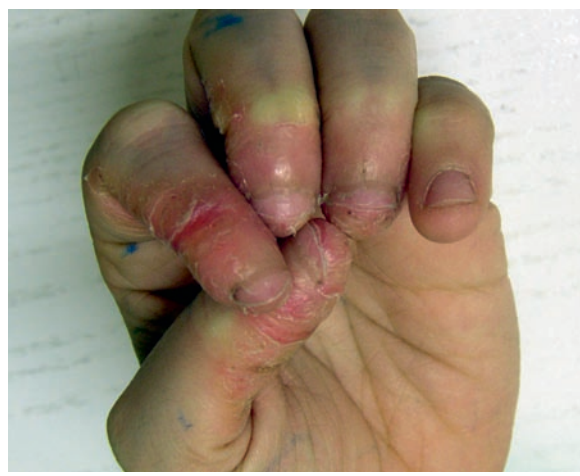

Fig. 2.18. Mycronychia in a patient with psoriasiform acral dermatitis

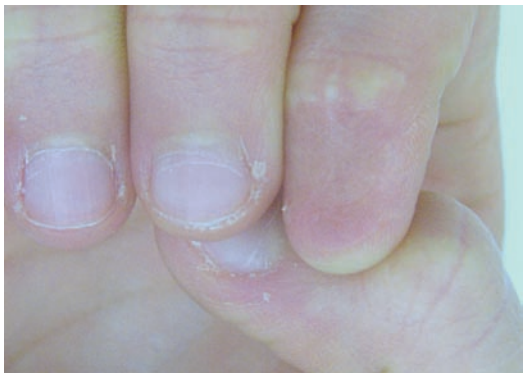

Fig. 2.19. Anonychia as a consequence of surgery

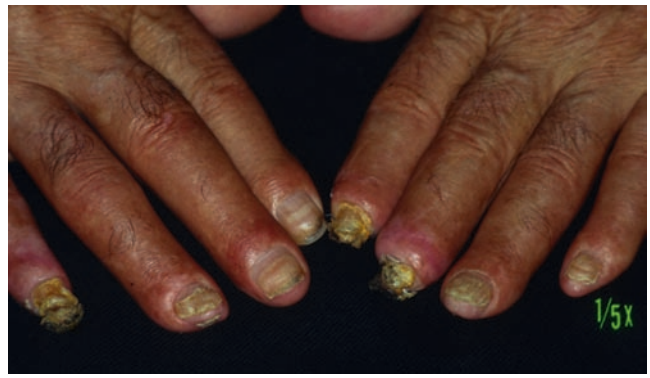

Fig. 2.20. Micronychia and partial loss of the distal phalanx due to frost bite

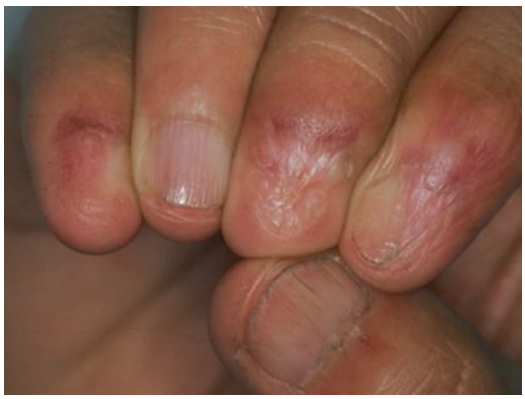

Fig. 2.21. Micronychia and anonychia in bullous pemphigoid

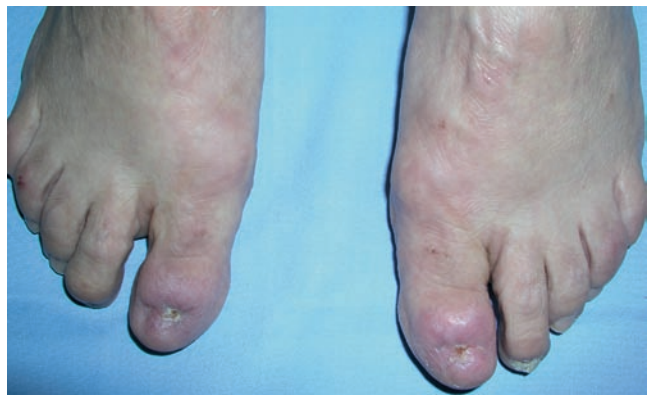

Fig. 2.22. Micronychia due to acquired epidermolysis bullosa

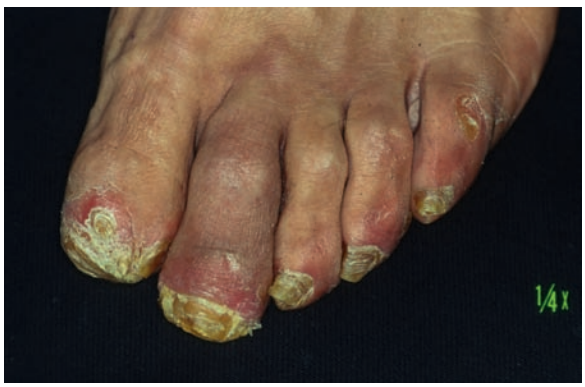

Fig. 2.23. Micronychia due to Burger's disease

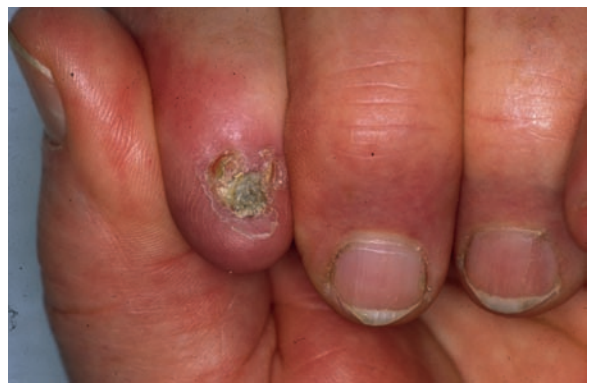

Fig. 2.24. Micronychia due to carpal tunnel syndrome

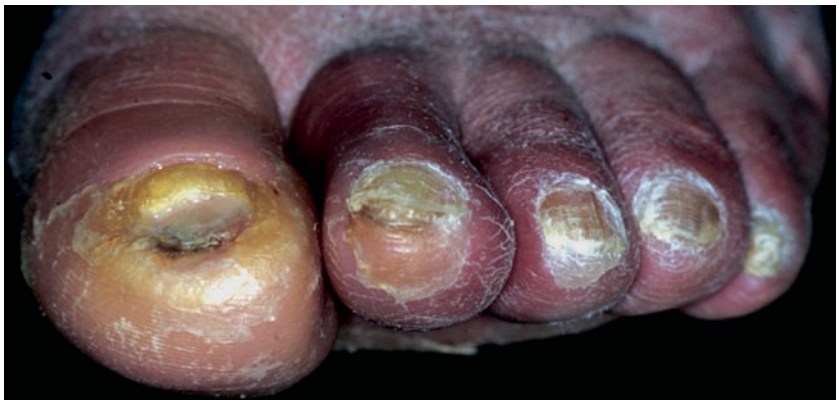

Fig. 2.25. Diabetes mellitus type II producing ischemic nail and bone changes

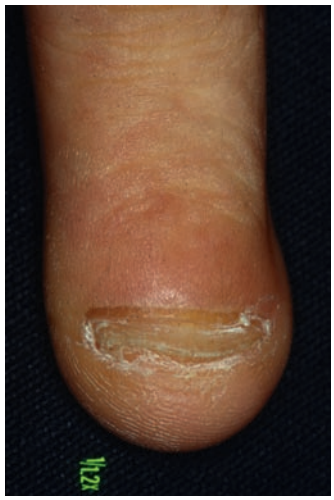

Fig. 2.26. Micronychia in a patient with syringomyelia

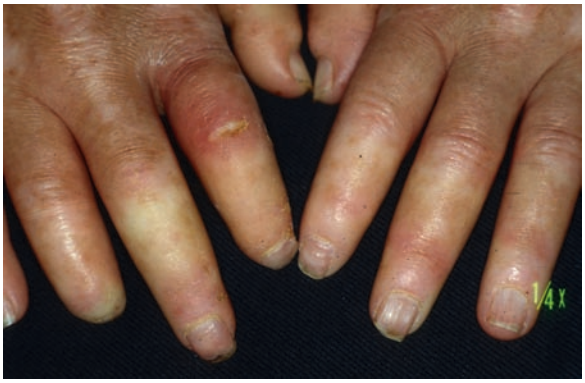

Fig. 2.27. Micronychia of some fingernails in a patient with scleroderma

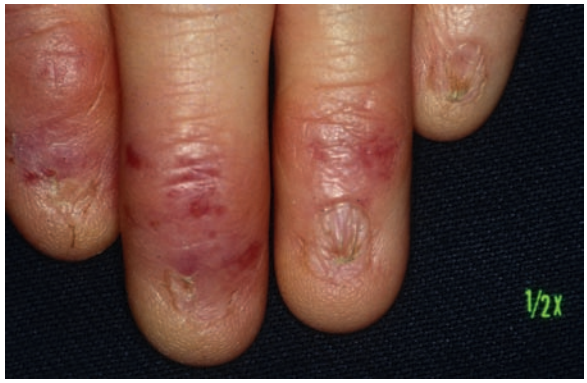

Fig. 2.28. Micronychia and anonychia in a patient with severe Raynaud's disease

3 Macronychia

3.1 Racquet Nails

Table 3.1. Causes of macronychia

- Racquet nails
- Proteus syndrome
- Rubinstein Taybi syndrome

The nail plate is wider than long and the nail appears abnormally broad. The condition is more often limited to the thumb. Nail broadening is due to the shortening of the bone of the distal phalanx.

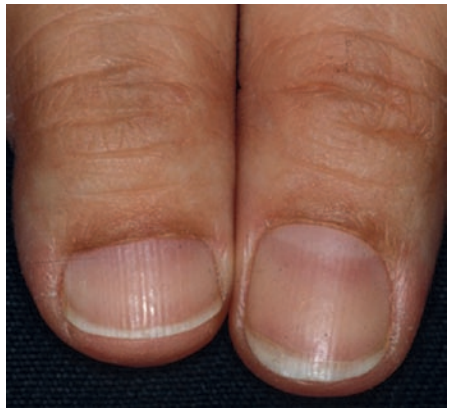

Fig. 3.1. Racquet nail – note that the nail plate is wider than long compared with the controlateral normal nail plate.

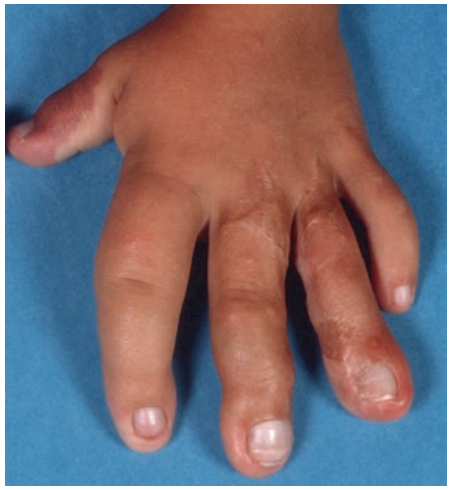

Fig. 3.2. Macronychia of some fingernails with megadactily in Proteus Syndrome (courtesy of Prof. A. Oranje, Rotterdam, NL).

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4 Polydactyly

Polydactyly is more common in fingernails than in toenails. There are seven types of it according to the site of bone duplication. When duplication is limited to the distal phalanx the only clinical finding may be a broader nail that may show an incision in the lunula.

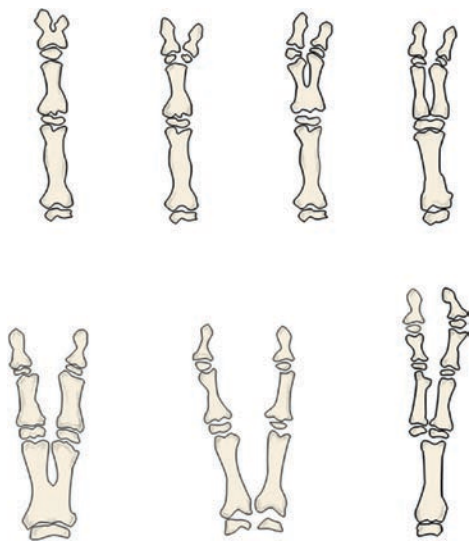

Fig. 4.1. Schematic drawing showing the seven types of polydactyly.

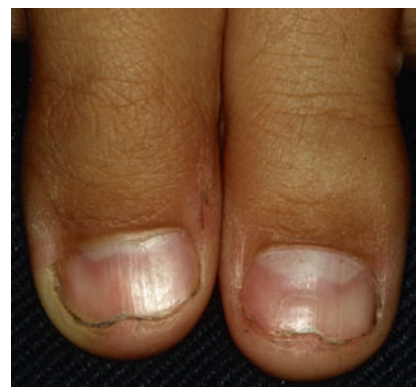

Fig. 4.2. Macronychia with duplication of the lunula in a patient with polydactyly limited to the distal phalanx.

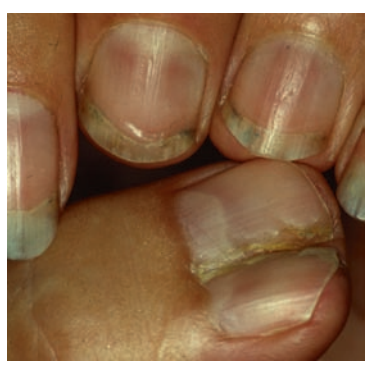

Fig. 4.3. Polydactyly – duplication of the nail of the first digit because of the duplication of the distal phalanx.

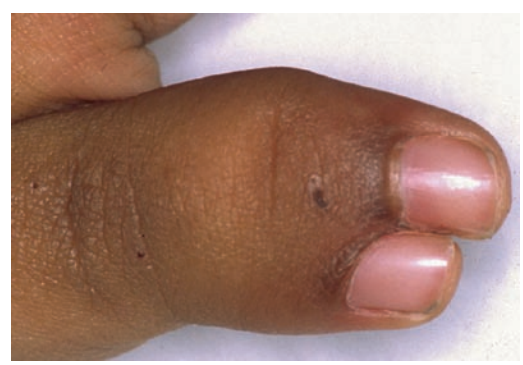

Fig. 4.4. Polydactyly – the intermediate phalanx is bifid and the distal phalanx is duplicated.

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5 Abnormal Thickness

Nail thickening is a common sign of a large number of different conditions.

Acquired thickening may be due to conditions that reduce nail growth or inflammatory disorders of the nail bed, which result in nail bed hyperkeratosis.

Nail thickening is also commonly seen in patients with foot deformities due to chronic trauma and friction.

Table 5.1. Causes of abnormal thickness

Congenital	Acquired
• Pachyonychia congenita • Epidermolysis bullosae • Ectodermal dysplasias • Chronic muco cutaneous candidiasis	• Onychogryphosis • Pachyonychia • Dystrophic fifth toe • Yellow nail syndrome • Onichomatricoma • Inflammatory nail disorders: – Psoriasis – Pytiriasis rubra pilaris – Lichen planus of the toenails – Contact dermatitis – Onychomycosis

5.1 Congenital Abnormal Thickness

Pachyonychia Congenita

Pachyonychia congenita (PC) are a group of genetic disorders characterized by nail thickness. PC type I is the most common form and it is caused by a mutation in the keratin 16 or 6A gene. Clinical features include nail abnormalities, palmo-plantar keratoderma, and leukokeratosis. Nail thickening may be preceded by nail bed erythema. Severity of the disease may vary in the different families.

Table 5.2. Clues for diagnosis

• Nail thickening of the 20 nails, due to nail bed hyperkeratosis, is more evident on the distal half of the nail. Nails show a yellow-brown discoloration, are hard and difficult to trim • Palmoplantar keratoderma is a typical feature of type 1 Pachyonychia congenita

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Epidermolysis Bullosae

Nail abnormalities are frequent in all types of epidermolysis bullosae (EB) and, in some patients, may be the only symptom of the disease. This is especially seen in dominant dystrophic EB, which may only produce dystrophic toenails. Trauma favors and worsens nail abnormalities. Pachyonychia and onychogryphosis are often associated with nail bed hemorrhages due to subungual blisters. Anonychia and atrophy can also be common features.

Table 5.3. Clues for diagnosis

- Nail thickening associated with skin and nail blistering
- Isolated nail thickening may be the first symptom

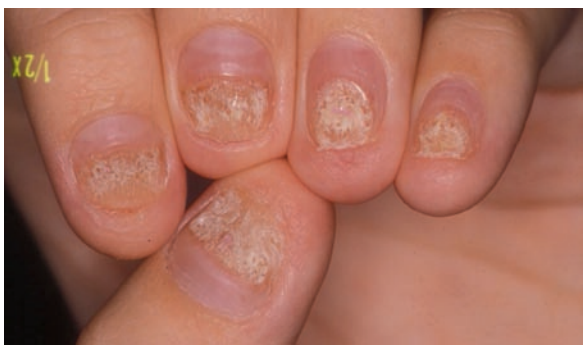

Fig. 5.1. Pachyonychia congenita – severe fingernail thickening.

Fig. 5.2. Pachyonychia congenita – subtle nail changes.

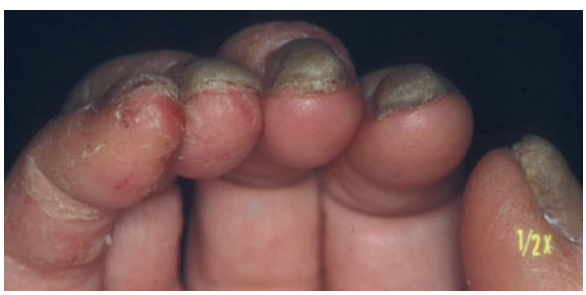

Fig. 5.3. Pachyonychia congenita – the nails are thick, *yellow-brown* in color and with a transverse over curvature. Note a palmar keratoderma.

Fig. 5.4. Pachyonychia congenita – the nail plates are so thick that the trimming is very difficult.

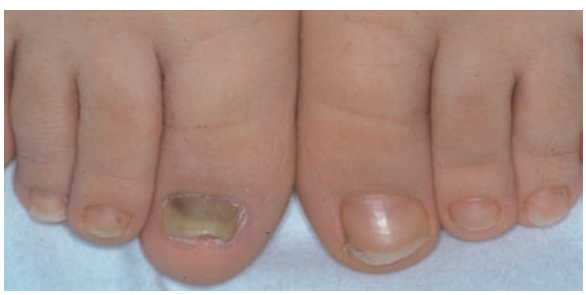

Fig. 5.5. Thickening and shortening of the great toenail in a patient with dominant dystrophic epidermolysis bullosa. Also note the presence of a hematoma.

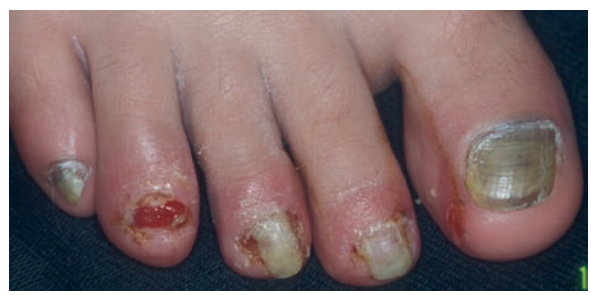

Fig. 5.6. Nail thickening, erosions, and granulomatous tissue in a patient with late onset junctional EB.

5.2 Acquired Abnormal Thickness

Onychogryphosis

The nail growth is asymmetrical as the medial part of the nail matrix grows faster than the lateral part. The nail is thickened, yellow to brown in color, and with an oyster shell appearance. Nail hardness is severe and difficulties in nail trimming may produce very long horn-like nails. It most commonly affects the great toe of elderly with poor foot care and podiatric abnormalities. Peripheral vascular deficiency is sometimes associated.

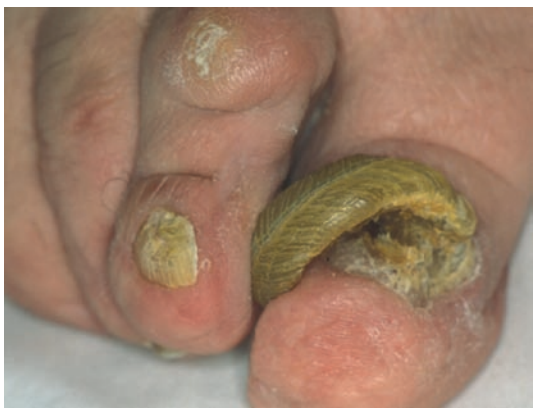

Fig. 5.7. Onychogryphosis – the thick nail plate curls laterally with a horn like appearance.

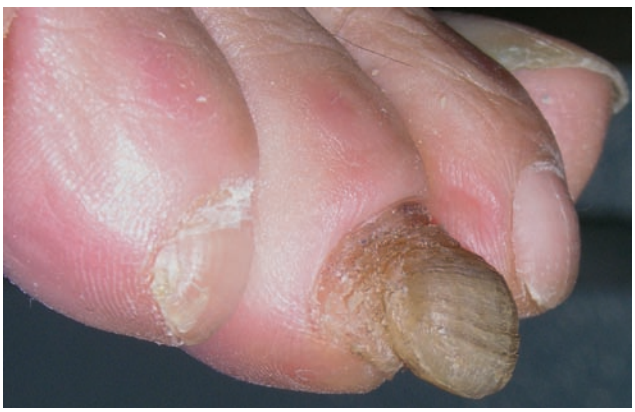

Fig. 5.8. Onychogryphosis – the thick nail plate is yellow brown in color and with an oyster shell appearance.

Pachyonychia

Nail thickening is due to repetitive trauma and mainly affects patients with podiatric abnormalities or practicing sports. The condition is more common on the hallux, mono, or bilateral. The nail plate is thickened, yellow or gray in color, shortened, and detached from the nail bed. Nail growth rate is considerably decreased.

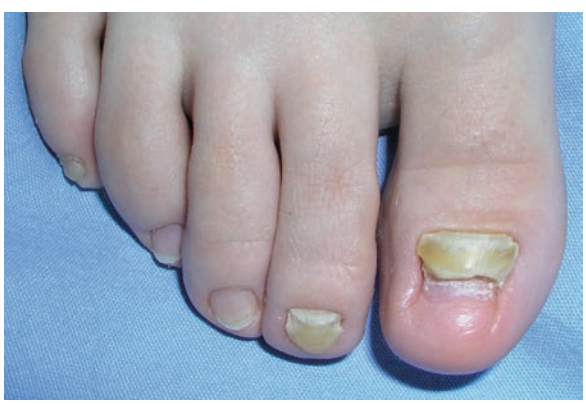

Fig. 5.9. Pachyonychia – nail thickening and shortening due to repetitive trauma.

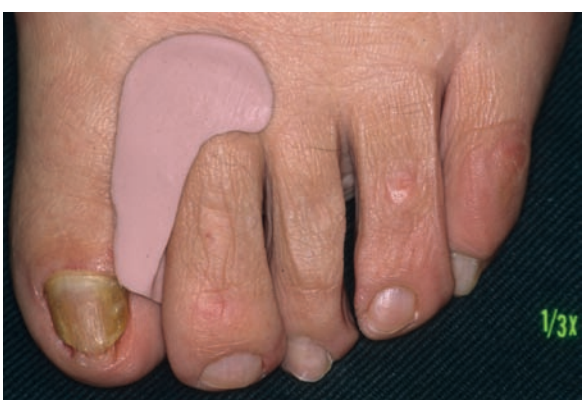

Fig. 5.10. Pachyonychia – nail thickening due to repetitive trauma from overlapping of the 2nd on the 1st digit, can be improved by the application of a silicone spacer.

Onychomatricoma

Onychomatricoma is a benign tumor that originates from the nail matrix. The affected nail is thickened, hypercurved, and white yellow in color. The nail plate shows longitudinal ridging and splinter hemorrhages. At the frontal view the tumor has a very characteristic picture because the nail plate shows multiple holes in its thickened free margin. These correspond to longitudinal hollows that contain the digitating tumor, which perforates the nail plate.

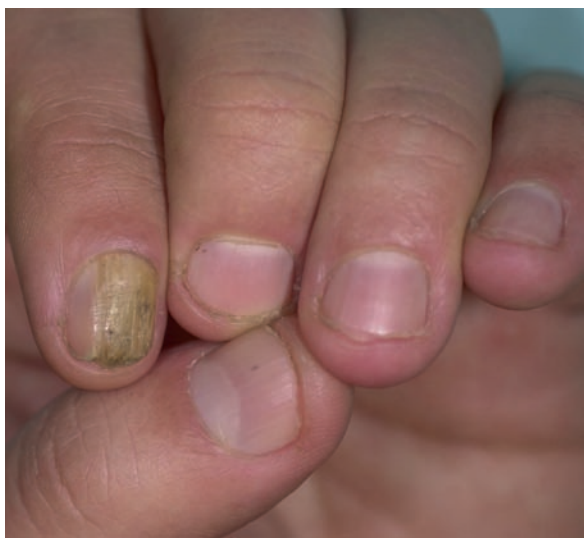

Fig. 5.11. Onychomatricoma – the affected nail is thickened, hypercurved and white yellow in color.

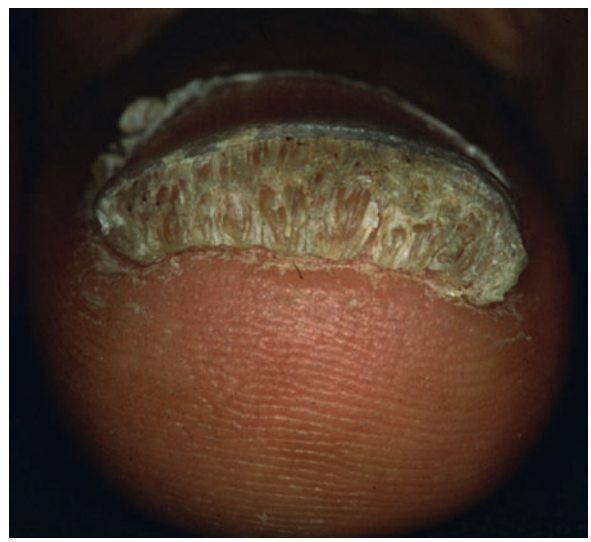

Fig. 5.12. Onychomatricoma – at the frontal view the nail plate shows multiple holes in its thickened free margin.

5.3 Nail Thickening due to Inflammatory Disorders

Nail thickening is a feature of several inflammatory disorders affecting the nail bed: (psoriasis, pytiriasis rubra pilaris, lichen planus, contact dermatitis and onychomycosis) the hyperkeratotic nail bed uplifts the nail plate resulting in a thickened nail. Differential diagnosis may be very difficult on clinical basis, and mycology and pathology may be required.

Psoriasis

Nail bed hyperkeratosis is a typical feature of toenail psoriasis. The hyperkeratosis is often silvery white, but may have a yellow hue and be indistinguishable from onychomycosis. It should be kept in mind that onychomycosis and psoriasis may be associated and that a diagnosis of psoriasis does not exclude onychomycosis. Other signs of nail psoriasis may or may not be present. Severe nail bed hyperkeratosis in the fingernails is occasionally seen in manual workers due to Koebner's phenomenon.

Pytiriasis Rubra Pilaris

Distal subungual thickening is a common feature of PRP type I (AD, adult acute onset). Splinter hemorrhages and longitudinal ridging may also be present. The distal part of the nail plate presents a yellowish discoloration due to patchy parakeratosis.

Lichen Planus of the Toenail

Toenail lichen planus may cause massive thickening and yellow discoloration of the toenails with a picture that resemble the Yellow Nail Syndrome. In these patients, a typical lichen planus of the fingernails is usually associated.

Contact Dermatitis

Contact dermatitis of the nail bed and hyponychium produces nail bed hyperkeratosis, which may be associated with onycholysis. This is very commonly seen in occupational contact dermatitis due to irritants or allergens. The first three digits of the dominant hand are most commonly affected.

Onychomycosis

Subungual hyperkeratosis is a feature of distal subungual onychomycosis, where it is usually associated with onycholysis and yellow discoloration of the nail plate. In onychomycosis, hyperkeratosis is typically associated with longitudinal streaks that correspond to the pattern of fungal invasion.

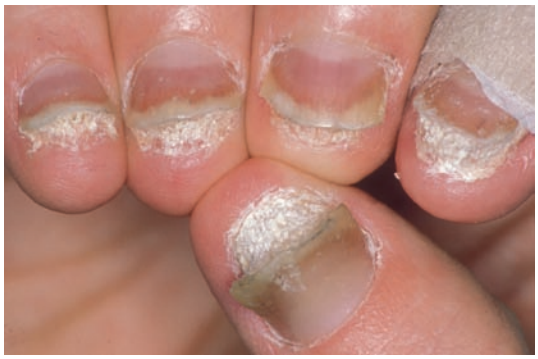

Fig. 5.13. Nail bed psoriasis of the fingernails – note the silvery white hyperkeratosis together with other specific signs of nail psoriasis such as salmon patches and pitting.

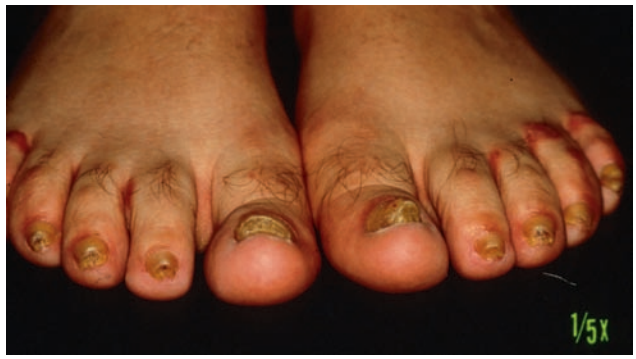

Fig. 5.14. Psoriasis of the toenails – severe hyperkeratosis with yellowish discoloration of the nail plates

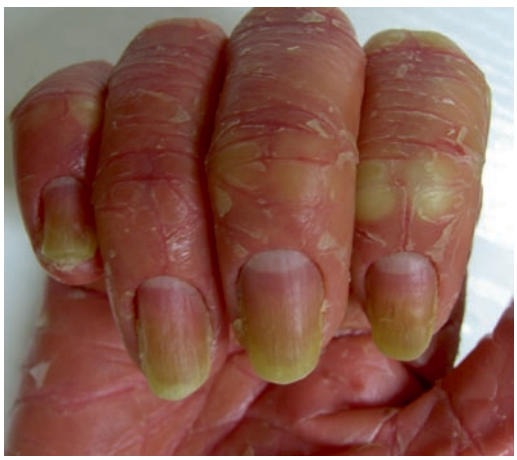

Fig. 5.15. Pytiriasis rubra pilaris – note the thickening and yellow discoloration of the fingernails.

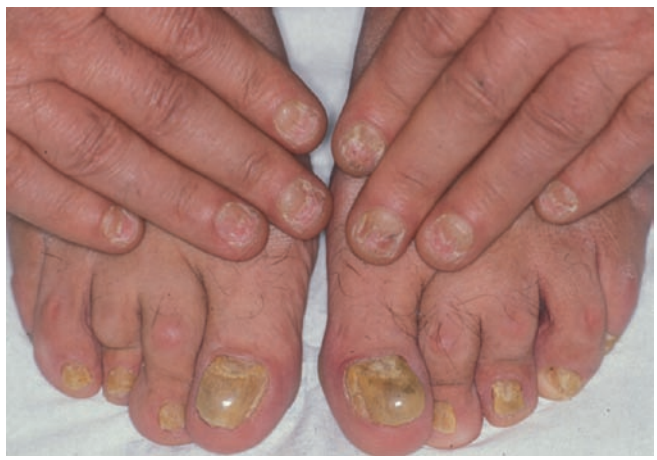

Fig. 5.16. Lichen planus with toenails changes Yellow Nail Syndrome like. Note typical lichen planus in the fingernails.

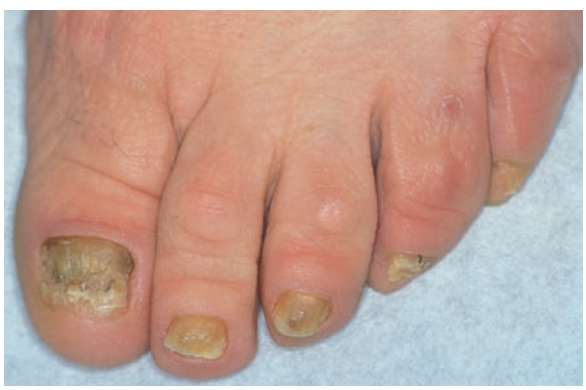

Fig. 5.17. Lichen planus of the toenails. A closer view of the toenails showing the yellow discoloration of the thick and dystrophic nail plates.

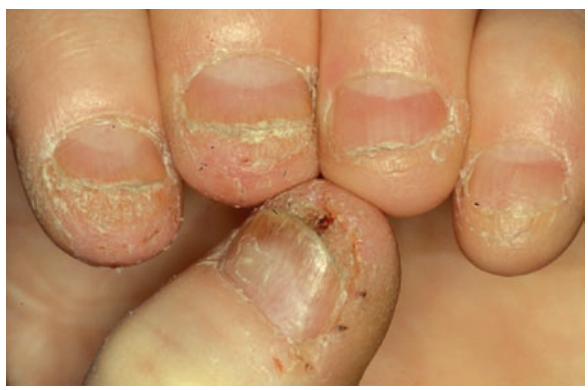

Fig. 5.18. Nail thickening, nail bed hyperkeratosis and contact dermatitis of the hyponychium in a manual worker.

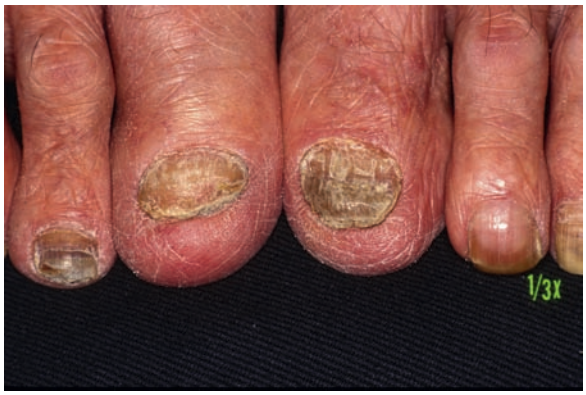

Fig. 5.19. Distal subungual onychomycosis due to dermatophytes – thick and dystrophic nail plates. Diagnosis is difficult as the nail abnormalities are not specific. The presence of scaling due to tinea pedis is a clue.

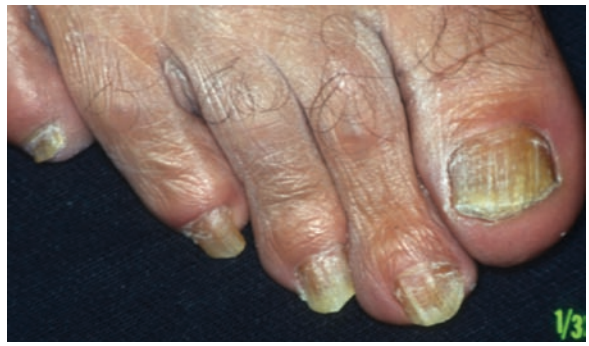

Fig. 5.20. Distal subungual onychomycosis due to dermatophytes – thick nail plate with hyperkeratosis associated with longitudinal streaks. Tinea pedis is also present.

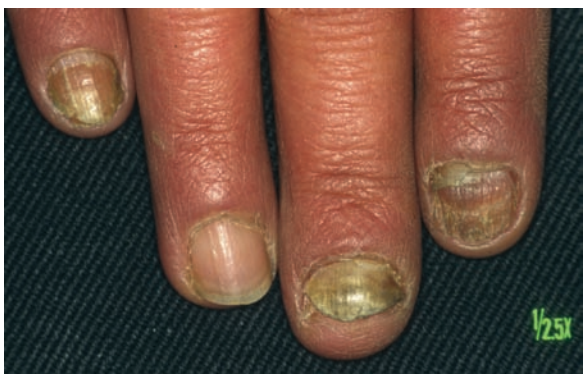

Fig. 5.21. Distal subungual onychomycosis due to dermatophytes – thick nail plate with onycholysis and yellow discoloration.

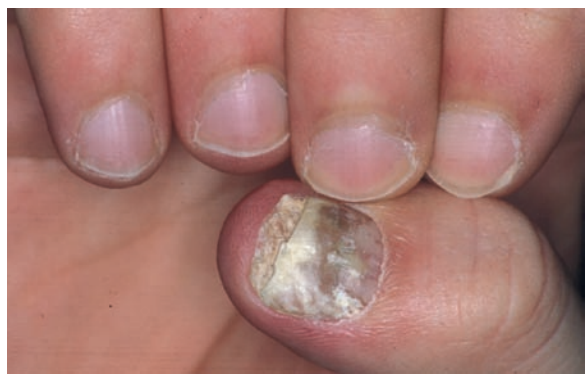

Fig. 5.22. Onychomycosis with nail bed hyperkeratosis due to *Candida* species.

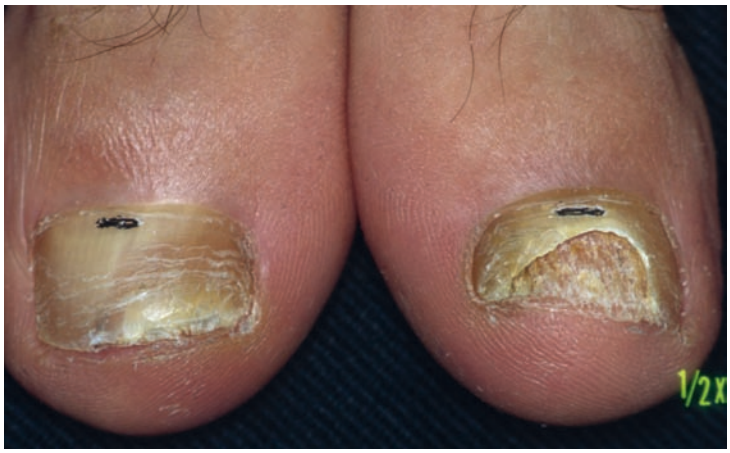

Fig. 5.23. Distal subungual onychomycosis – the hyperkeratotic nail bed is visible after cutting the nail plate.

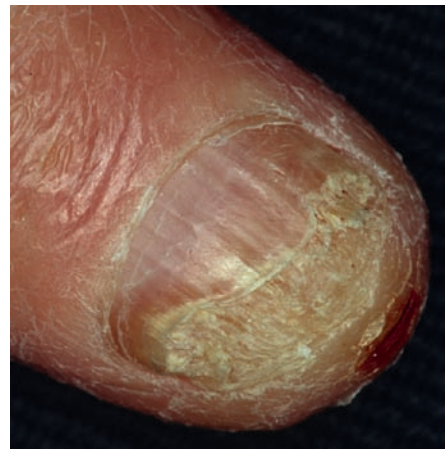

Fig. 5.24. Distal subungual onychomycosis – the onycholytic nail plate has been clipped away.

Table 5.4. Acquired nail thickening – differential diagnosis

	Nail clues	Look for
Psoriasis	Involvement of numerous nails White scales Onycholysis with erythematous border	Psoriasis of the scalp Coiled loops at dermoscopy (see page 100–101)
Pytiriasis rubra pilaris	Involvement of all nails Distal subungual thickening Yellowish color of the nail plate	Other family members Palmoplantar keratoderma Orange plaques all over the body
Lichen planus	Involvement of toenails Yellowish color of the nail plate	Typical fingernail changes Oral involvement
Contact dermatitis	Dominant hand usually involved Thickening usually mild	Onycholysis or paronychia Hand eczema
Onychomycosis	Yellow discoloration of the nail plate Few nails involved Toenails most commonly affected	Tinea pedis Yellow streaks

6 Nail Thinning

Nail thinning is a symptom of diseases that disturb the keratinization of the proximal nail matrix with production of a thin nail plate. It is usually associated with other signs of matrix damage such as fissuring, ridging, and onychorrhexis.

In trachyonychia, thinning is associated with nail roughness (sandpapered nails).

Nail thinning requires a careful examination of the patient as it can be the first sign of lichen planus that, if left untreated, may destroy the matrix with subsequent scarring. Systemic amyloidosis can affect the matrix with a clinical presentation that closely resembles lichen planus. A punch biopsy from the nail matrix should be taken in all cases of severe thinning to rule out lichen planus. A biopsy is not necessary in trachyonychia which is a benign disorder that does not produce nail scarring. Thinning may also be seen in nail fragility where it is usually mild and limited to the fingernails.

Table 6.1. Causes of nail thinning

- Lichen planus
- Amyloidosis
- Trachyonychia
- Nail fragility
- Trauma

Fig. 6.1. Typical nail lichen planus – ridging and longitudinal fissuring of the second fingernail.

Fig. 6.2. Typical nail lichen planus – thinning, longitudinal ridging, and fissuring of all nail plates.

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DOI: 10.1007/978-3-540-79050-1_6, © Springer-Verlag Berlin Heidelberg 2010

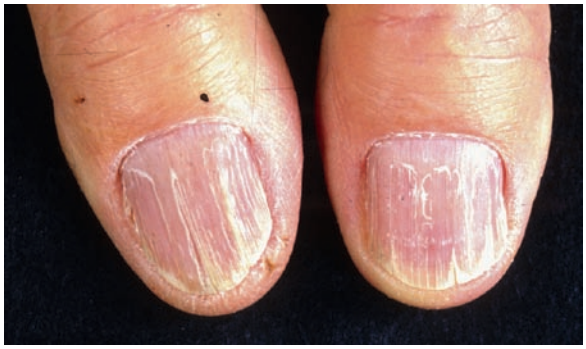

Fig. 6.3. Amyloidosis – the nail plate is very thin and brittle with longitudinal fissuring and distal splitting.

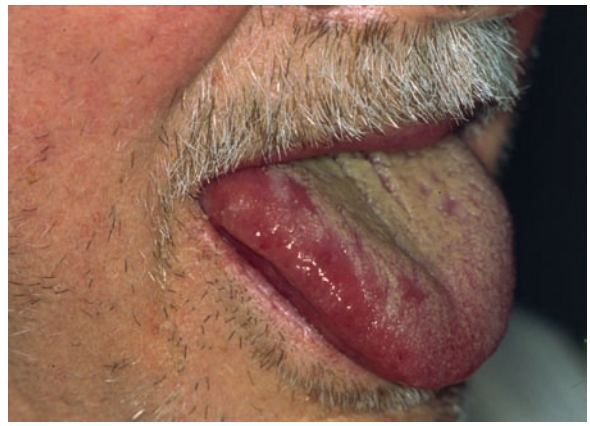

Fig. 6.4. Amyloidosis – macroglossia is characteristic and helps in performing the diagnosis.

Fig. 6.5. Trachyonychia (rough nails) – note the sandpapered appearance of the nail plate.

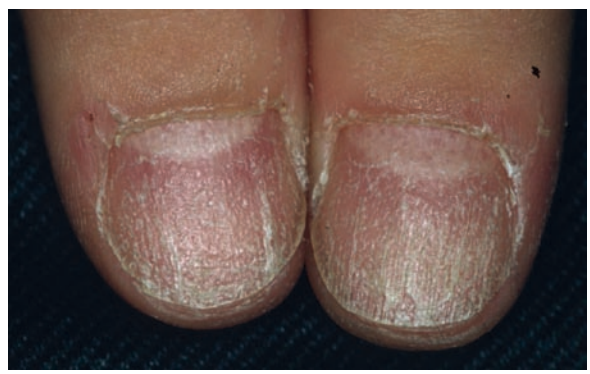

Fig. 6.6. Trachyonychia (rough nails) due to alopecia areata. Note the mottled erythema of the lunulae.

Fig. 6.7. Onychoschizia in nail fragility – note the distal lamellar splitting.

Fig. 6.8. Onychoschizia in nail fragility – note the distal lamellar splitting.

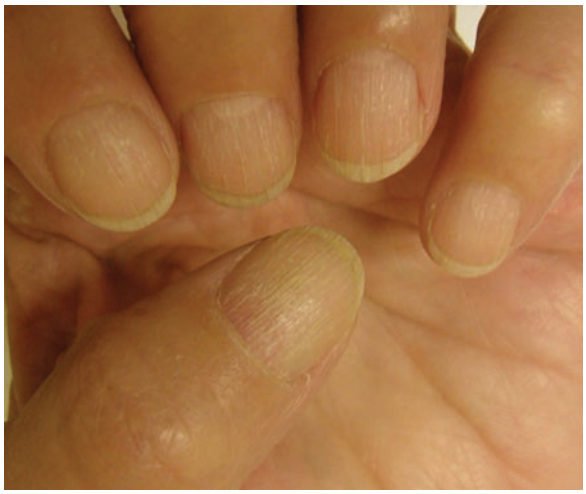

Fig. 6.9. Nail fragility in old age – longitudinal ridges and superficial nail plate desquamation.

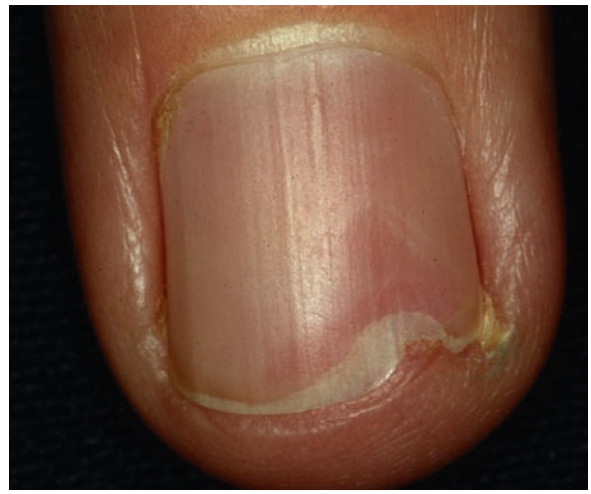

Fig. 6.10. Distal thinning of the nail plate due to rubbing on clothes' surfaces in a tailor.

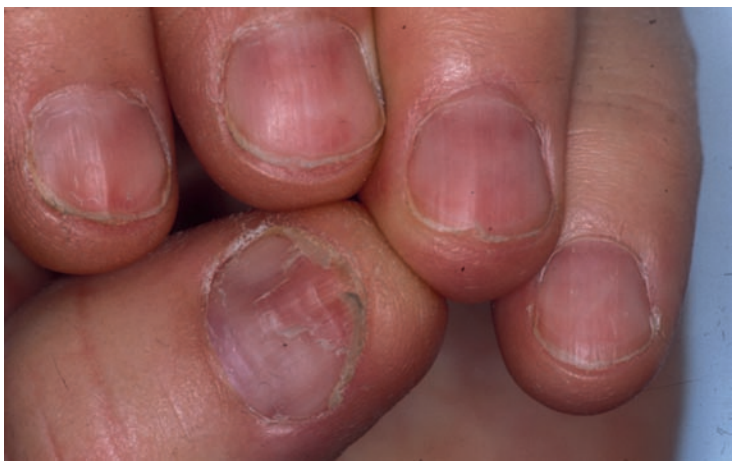

Fig. 6.11. Occupational nail thinning due to chemicals.

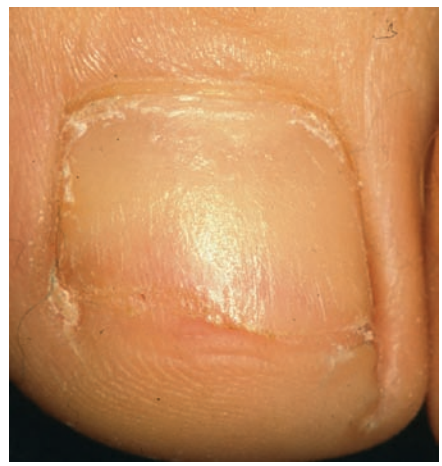

Fig. 6.12. Nail thinning due to repetitive filing of the nail surface in a patient using an antifungal nail lacquer.

Table 6.2. Nail thinning – differential diagnosis

	Nail clues	Look for
Lichen planus	Multiple fissuring Mottled lunulae Pterygium	Oral lesions
Amyloidosis	Splinter hemorrhages	Oral lesions (tongue)
Trachyonychia	Nail roughness Usually most nails	Alopecia areata of the scalp
Nail fragility	Onychoschizia	Usually women Occupational factors
Trauma	Limited to one or few nails Limited thinning to a portion of the nail plate	Occupational factors Signs of abrasions

7 Abnormal Shape

7.1 Clubbing

Clubbing describes a bulbous appearance of the digit that presents an enlarged and excessively curved nail plate. The angle between the proximal nail fold and the nail plate (Lovibond's angle) is greater than 180° and the rhomboidal space, which can normally be seen facing the distal portion of two symmetrical digits, disappears (Window or Schamroth's sign). Probably, clubbing is due to a peripheral vasodilatation due to hypoxemia. Abnormal platelets activate endothelial cells causing vasodilatation and provoke the release of fibroblast growth factors, which cause the hypertrophy of periungual tissues.

Three types of clubbing can be identified:

- Simple type
- Hypertrophic pulmonary osteoarthropathy
- Pachydermoperiostosis (during or after puberty going along with hyperhidrosis and seborrhea)

Table 7.1. Causes of simple clubbing

Congenital	Acquired
• Congenital cardiopathy	• Intrathoracic neoplasms • Chronic intrathoracic suppurative diseases • Inflammatory bowel diseases • Gastrointestinal neoplasms • Liver disorders

7.2 Pseudoclubbing

In pseudoclubbing, the digit has a bulbous appearance but the Lovibond's angle is preserved. Causes of pseudoclubbing include nail bed tumors and inflammatory disorders that affect the distal phalangeal bone (psoriatic arthritis).

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Fig. 7.1. Clubbing – note the bulbous appearance of the nail plate.

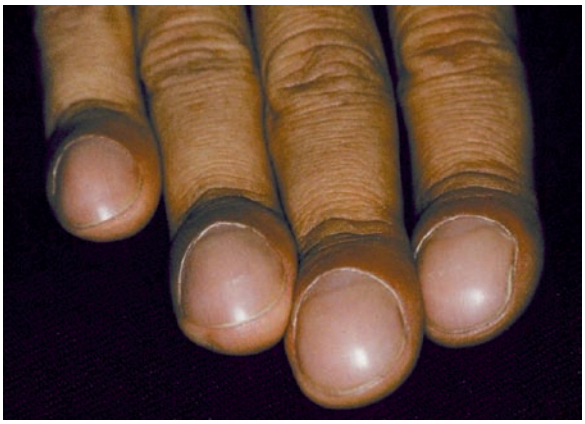

Fig. 7.2. Clubbing – note the bulbous appearance of the nail plate.

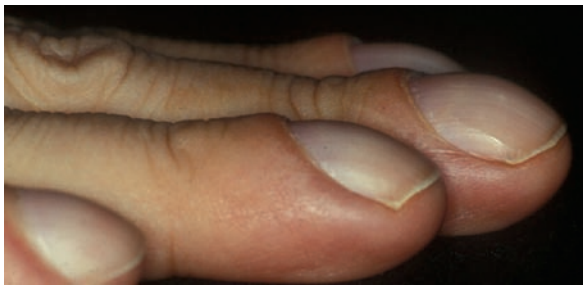

Fig. 7.3. Clubbing – the angle between the proximal nail fold and the nail plate (Lovibond's angle) is greater than 180°.

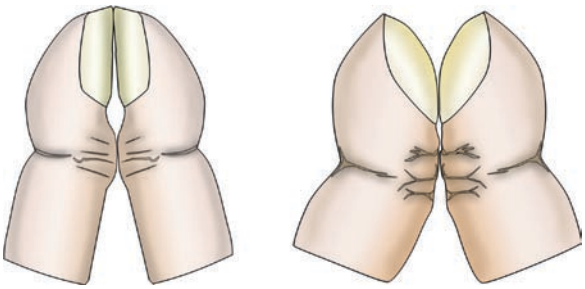

Fig. 7.4. Schamroth's sign – the diamond shape window between fingers is absent.

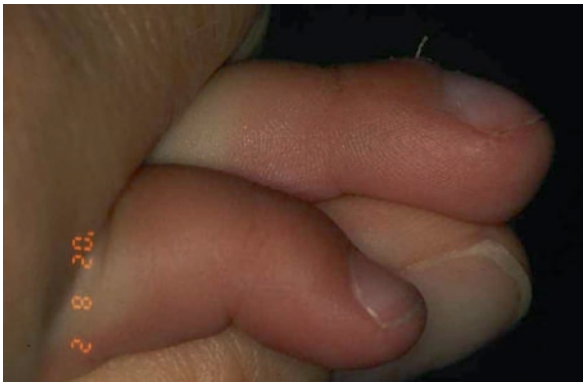

Fig. 7.5. Pseudoclubbing – the digit has a bulbous appearance but the Lovibond's angle is preserved.

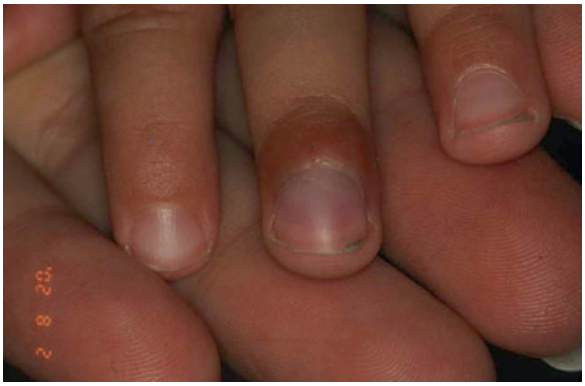

Fig. 7.6. Same patient of Fig. 7.5, frontal view – an hemangioma of the nail bed was the responsible cause of the pseudoclubbing.

7.3 Koylonychia

The nails are thinned and have a spoon shape due to upward eversion at their lateral edges. Always check for iron deficiency even if it is physiologic in the toenails of young children who have thin and soft nails. When it affects fingernails, it is usually occupational as in:

- Dentists
- Glass workers
- Construction workers
- Mushroom-growers
- Cabinet makers
- Butchers
- Oil burner repairers
- Automotive workers
- Slaughterhouse workers

7.4 Nail Beaking

Parrot beak nails is a condition limited to fingernails. The distal nail plate bends around the fingertip. The condition temporarily improves after immersion in warm water. There is no treatment, just advise the patients to keep the nail short.

Nail beaking is also a typical sign of systemic scleroderma. Ischemic changes in the distal finger result in bone reabsorption with bending of the nail around the shortened fingertip. A similar nail abnormality may result from traumas affecting the bone of the distal phalanx.

7.5 Pincer Nails

The distal nail plate is overcurved and pinches the underlying nail bed causing pain even at rest. They are most common in the great toenails of women wearing high-heeled shoes. Involvement of other toenails may be observed. X-ray of the digit may reveal osteophytes of the distal phalangeal bone.

Pincer fingernails may be a sign of severe osteoarthritis.

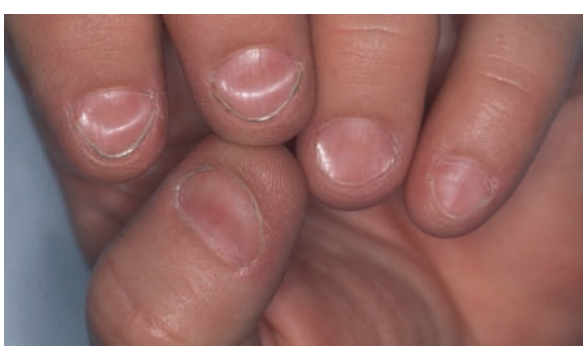

Fig. 7.7. Severe koylonychia.

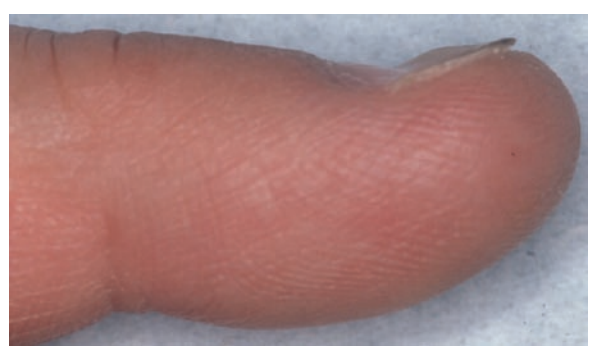

Fig. 7.8. Lateral view of koylonychia – the eversion of the nail plate becomes more evident.

Fig. 7.9. Parrot beak nails – note the curvature of the free margin simulating the beak of a parrot.

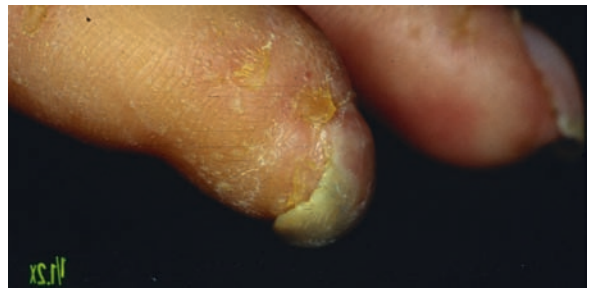

Fig. 7.10. Nail beaking in systemic scleroderma – the curvature of the nail plate is more pronounced and is due to bone reabsorption.

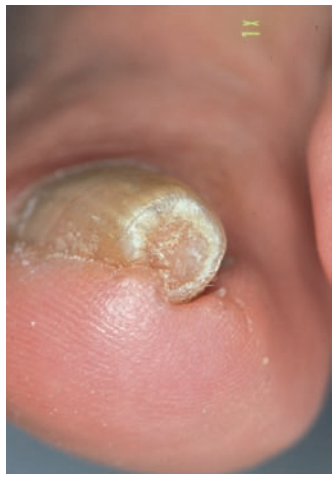

Fig. 7.11. Pincer nail of the first toenail – the distal nail plate is overcurved and pinches the underlying nail bed.

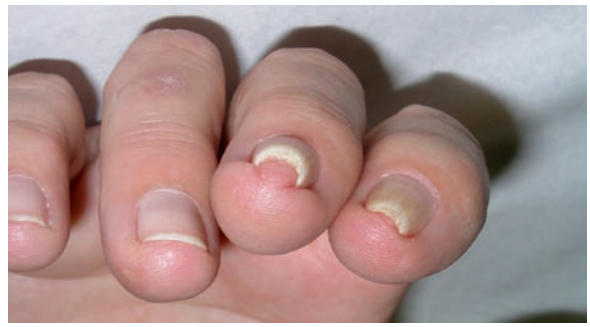

Fig. 7.12. Pincer nails in a patient with severe osteoarthritis.

8 Abnormal Surface

8.1 Pitting

Pits are small depressions of the nail plate surface. Pitting is commonly seen in nail psoriasis and in the nails of patients with alopecia areata.

In nail psoriasis, pits are typically large, deep, irregular in size, randomly distributed, and are due to defective keratinization of the proximal nail matrix with clusters of parakeratotic cells in the dorsal nail plate. These clusters are easily detached leaving the pits that migrate distally with nail growth.

In alopecia areata of the nails, pits are regular in size and geometrically distributed.

8.2 Nail Crumbling

The nail plate is thickened, grossly deformed and with irregular and scaly surface. It is typical of severe nail psoriasis and total dystrophic onychomycosis.

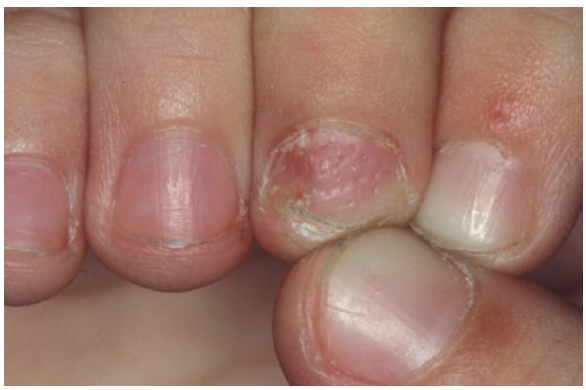

Fig. 8.1. Pitting due to psoriasis – pits are irregular in size and distribution.

Fig. 8.2. Pitting due to psoriasis – all fingernails are affected.

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DOI: 10.1007/978-3-540-79050-1_8, © Springer-Verlag Berlin Heidelberg 2010

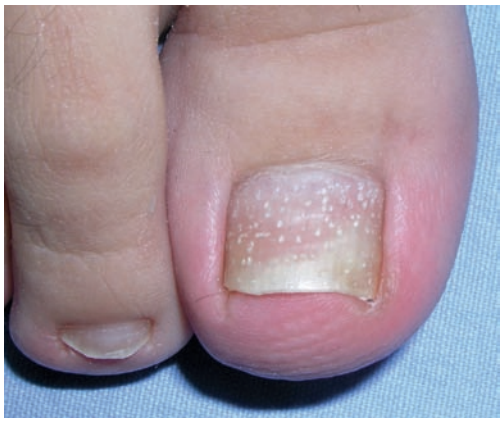

Fig. 8.3. Pitting due to psoriasis in the big toenail – this localization is very rare.

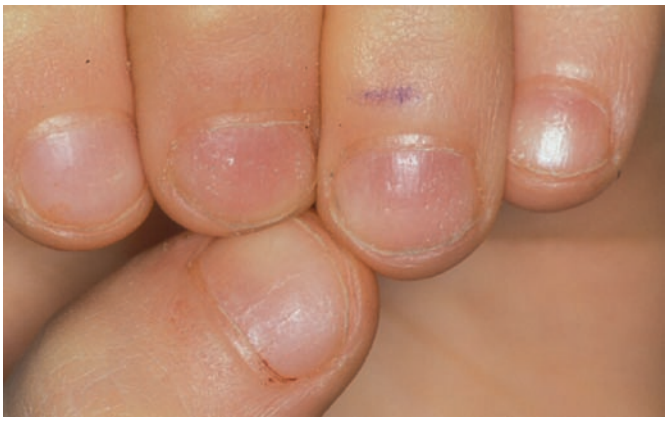

Fig. 8.4. Pitting due to alopecia areata – pits are very small and regular in size and distribution. Pitting can be the only manifestation of the disease.

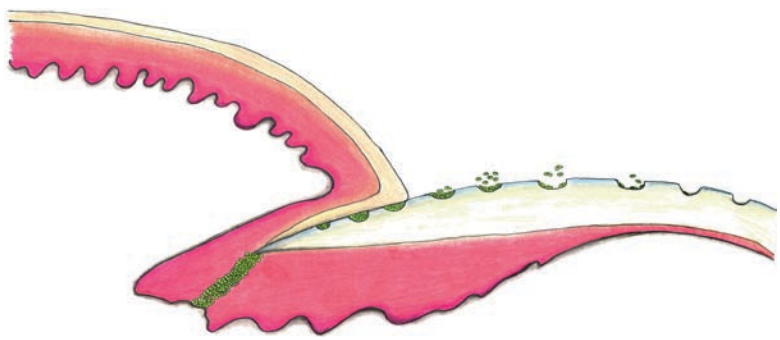

Fig. 8.5. Pitting – clusters of parakeratotic cells in the dorsal nail plate are easily detached leaving the pits that migrate distally with nail growth.

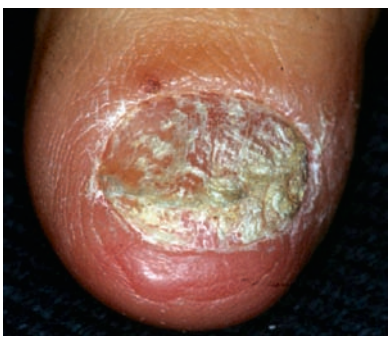

Fig. 8.6. Nail crumbling in severe psoriasis – the nail plate is thickened, rough and deformed.

8.3 Trachyonychia

The nail plate surface is abnormal due to excessive longitudinal ridging that causes roughness and opacity. The nails look as though they have been sandpapered in the longitudinal direction.

Trachyonychia may affect all nails and for this reason it is also called twenty nail dystrophy (TND).

It is most commonly seen in children.

A less severe variant is shiny TND, characterized by diffuse regular pitting. The two variants may coexist in the same patient.

Trachyonychia may be caused by nail lichen planus, psoriasis and alopecia areata. It can also be idiopathic.

Fig. 8.7. Trachyonychia of all fingernails – the nail plate is rough, lusterless and split at the distal margin.

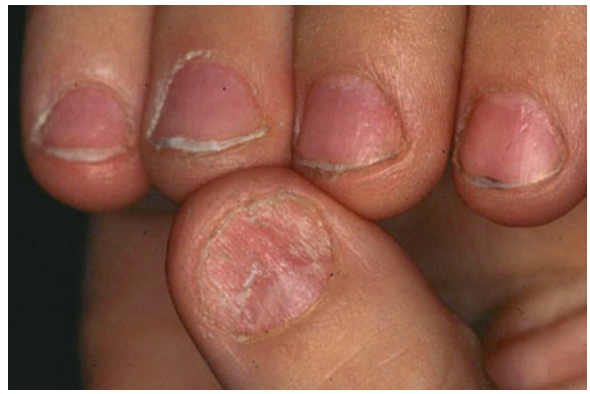

Fig. 8.8. Trachyonychia of the thumb – the condition can be limited to a single digit.

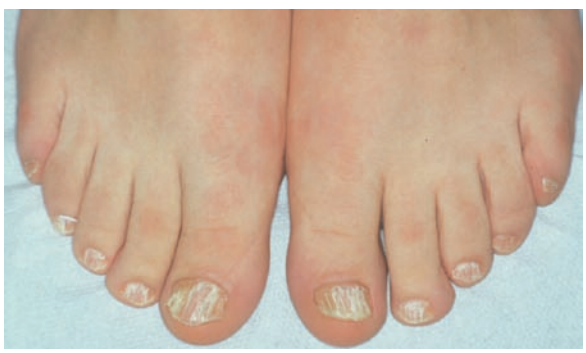

Fig. 8.9. Trachyonychia of all toenails.

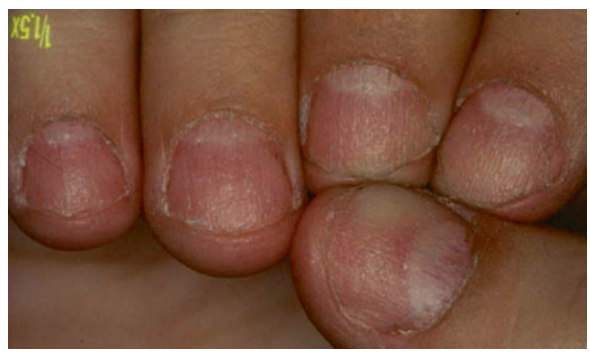

Fig. 8.10. Trachyonychia of all fingernails – shiny variant.

Fig. 8.11. Trachyonychia of all fingernails – shiny variant.

Fig. 8.12. Trachyonychia of all fingernails – shiny variant.

8.4 Transverse Grooves

Beau's Lines

These indicate a mild insult to the proximal nail matrix that interfere with matrix keratinization. They are usually deep in the central portion of the nail plate and move distally with nail growth. Multiple lines indicate a repetitive insult. The insult can be temporally traced by measuring the distance between the line and the proximal nail fold (growth of the normal nail is 1 mm/month for toenails and 3 mm/month for fingernails).

Onychomadesis

Onychomadesis indicates a detachment of the nail plate from the proximal nail fold with the formation of a transverse whole thickness sulcus. It is due to a severe insult producing complete arrest of nail matrix activity. Onychomadesis associated with pyogenic granuloma may be a consequence of mild nerve injury and it is observed after cast immobilization.

Table 8.1. Beau's lines/onychomadesis

Several nails	Few nails
• Acrodermatitis enteropathica • Severe metabolic stress • High fever (rheumatic, malaria) • Viral infections (Kawasaki, Measles, Hand foot mouth syndrome) • Typhus • Stevens Johnson syndrome • Drugs • Bullous disorders • Deep saturation/high altitude • Hemodialysis • Myocardial infarction	• Trauma • Paronychia • Congenital misalignment

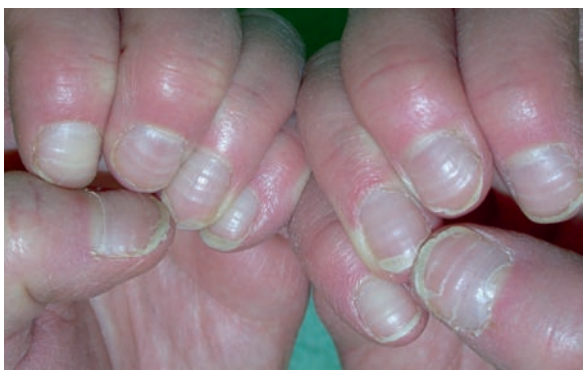

Fig. 8.13. Multiple Beau's lines in a patient undergoing polychemotherapy. Each line corresponds to a cycle of treatment.

Fig. 8.14. Beau's lines due to overzealous manicuring – note in the second finger the absence of the cuticle.

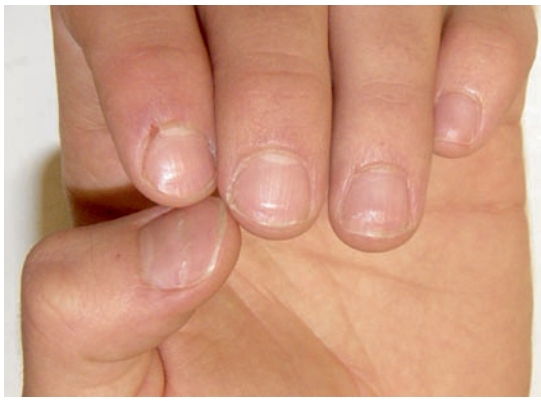

Fig. 8.15. Beau's lines and latent onychomadesis of the fingernails.

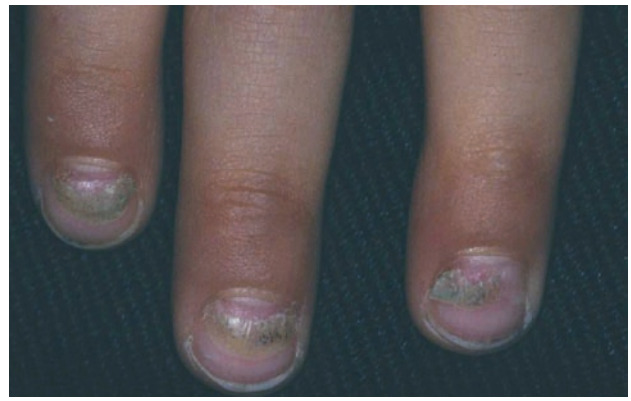

Fig. 8.16. Onychomadesis, latent form – the nail plate is not completely split and the two sides of the nail plate are kept together by the keratinized nail bed.

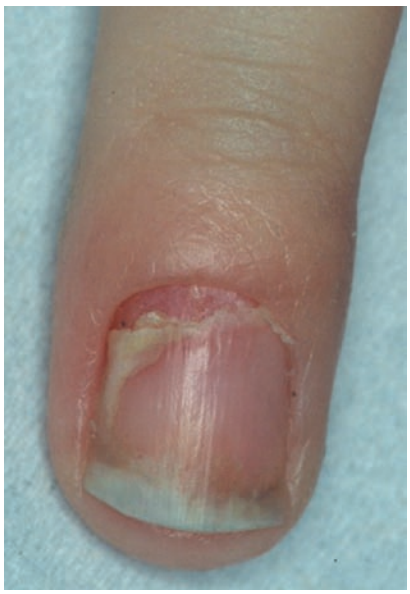

Fig. 8.17. Onychomadesis – the nail plate is completely detached.

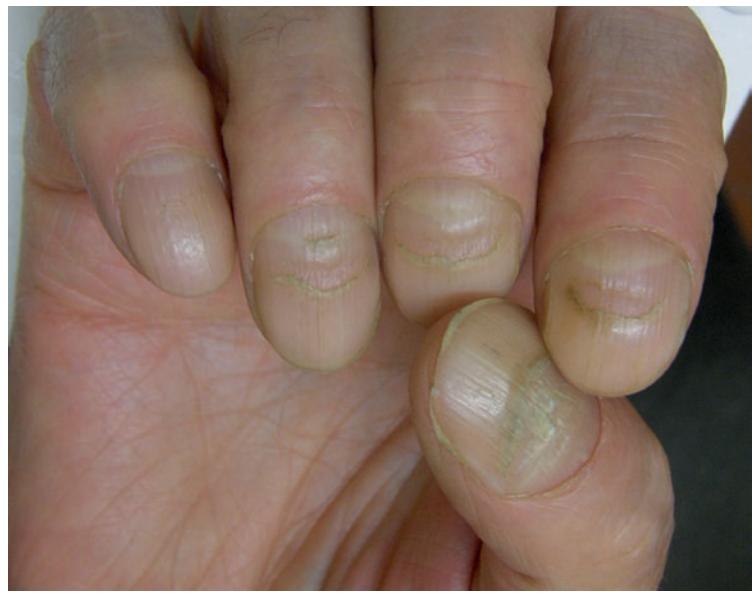

Fig. 8.18. Onychomadesis of all fingernails due to a systemic illness.

Habit Tic (washboard nails)

The habit tic of repeatedly pushing back the cuticle of one digit using another finger produces multiple transverse grooves with a central depression.

Myxoid Cyst

Myxoid cyst is a benign tumor due to gelatinous material stored in a cavity in connection with the distal interphalangeal joint. The cyst appears as a nodule on the proximal nail fold associated with multiple nail plate grooves due to the compression of the nail matrix by repetitive swelling and discharge episodes.

8.5 Longitudinal Grooves

Herringbone Nails

The nail plate surface presents longitudinal ridges that cross its surface diagonally from the lunula to the distal margin in a V-shaped pattern. Herringbone nails are very common in children.

Heller's Median Canaliform Dystrophy

This is a single median longitudinal groove that can also split and be associated with transverse cracks (inverted fir tree appearance). It may be self-induced by habit tic, but in most cases is idiopathic.

Fibrokeratoma

Benign tumor of the proximal nail fold area producing a longitudinal groove by compressing the nail matrix and the nail plate.

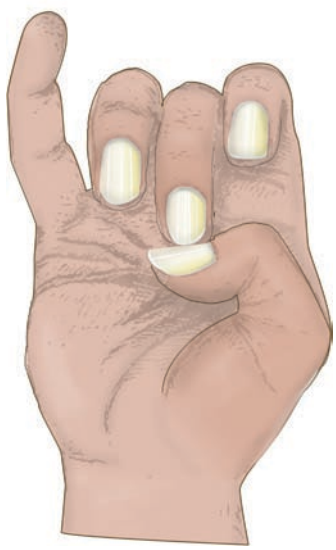

Fig. 8.19. Schematic drawing showing how the transverse grooves typical of the washboard nails are produced.

Fig. 8.20. Longitudinal furrow with transverse grooves due to habit tic.

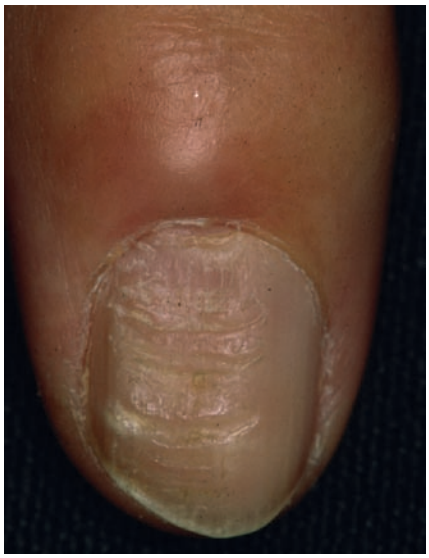

Fig. 8.21. Transverse grooves due to myxoid cyst growing under the proximal nail fold.

Fig. 8.22. Herringbone nails – they are a common physiological condition in children and disappear in adulthood.

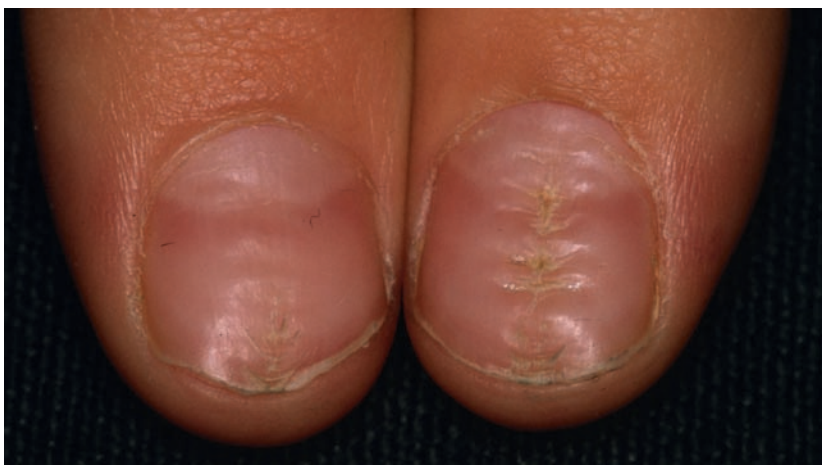

Fig. 8.23. Heller's median canaliform dystrophy.

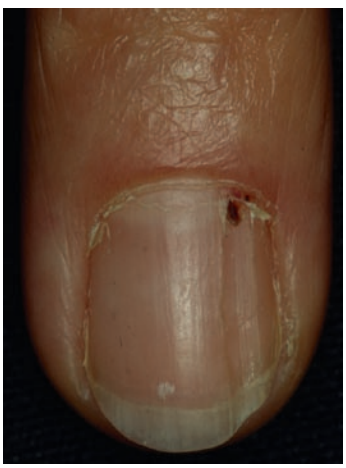

Fig. 8.24. Longitudinal groove due to a fibrokeratoma growing out from the proximal nail fold.

8.6 Nail Fragility

In nail fragility, nails split, flake, become soft and loose elasticity. It can be a consequence of factors that alter nail plate production or factors that damage the already keratinized nail plate. Clinically there are different types of nail fragility that may be associated:

Onychorrhexis

The nail plate is thin and presents multiple fissures that often reach the free edge that can be split.

Onychoschizia

Onychoschizia represents a lamellar splitting of the dorsal portion of the distal nail plate. Fine horizontal layers and triangular pieces may be torn from the free margin.

Keratin Granulation

The abuse of some nail varnishes damages the superficial layer of the nail plate causing granulations in the nail keratin that clinically appear as fine scaling white spots.

Worn Down Nails

Triangular area of thinning with the base lying at the distal margin of the nail plate. This type of fragility is usually caused by frictional traumas.

8.7 Elconyxis

Severe fragility of the dorsal nail plate may produce irregular defects in the nail plate surface.

8.8 Nail Beading

Thin ridges extend longitudinally from the proximal nail fold (PNF) to the free edge. They may have a beaded appearance. It is a physiological sign of aging.

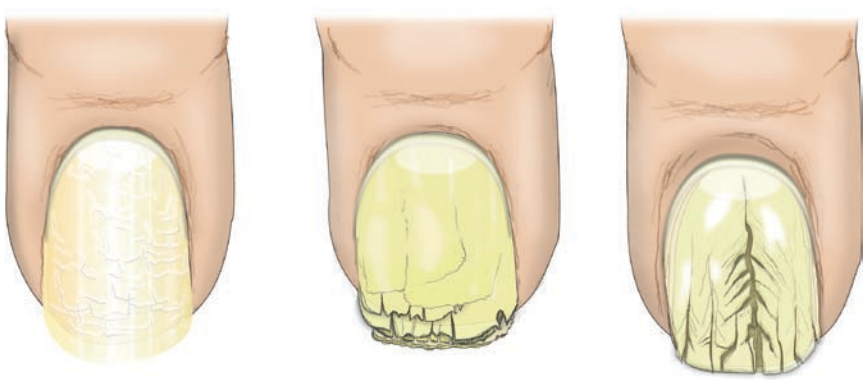

Fig. 8.25. Most common clinical variants of nail fragility.

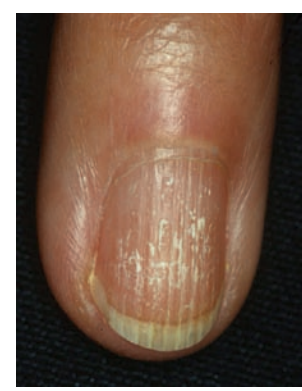

Fig. 8.26. Nail fragility due to keratin granulation appearing as white spots on the nail plate.

Fig. 8.27. Worn Down Nails.

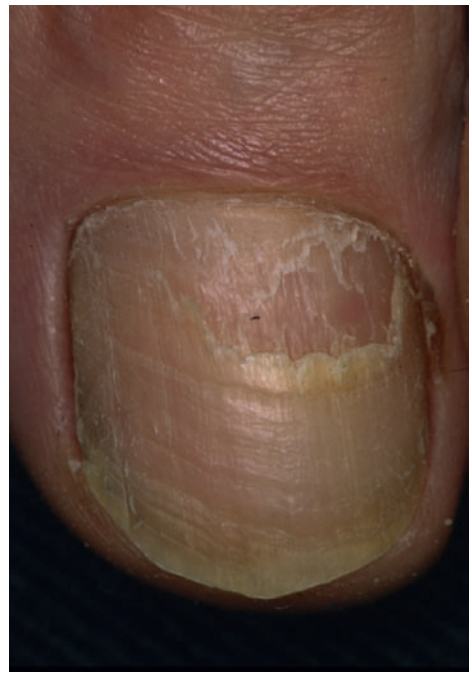

Fig. 8.28. Elconyxis in a patient treated with systemic retinoids.

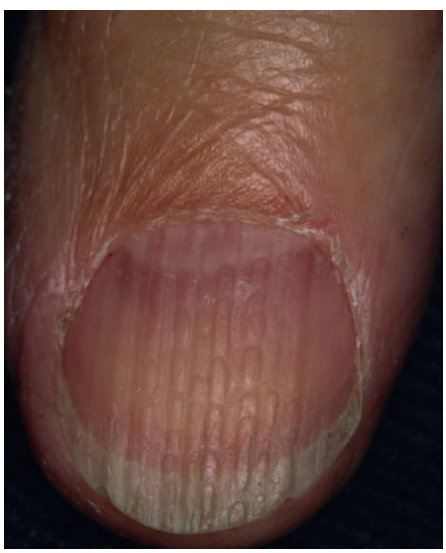

Fig. 8.29. Nail beading – a surface abnormality physiological in old age.

Fig. 8.30. Nail thinning and beading in old age.

9 Nail Detachment

9.1 Onycholysis

Onycholysis describes detachment of the nail plate from the nail bed. It may be caused by traumatic, inflammatory, infective or neoplastic nail disorders. Linking onycholysis to a specific cause is impossible in some cases (idiopathic onycholysis). Onycholysis may affect the fingernails or the toenails. It generally starts distally due to disruption of the onychocorneal band and moves proximally. Proximal onycholysis is a consequence of onychomadesis or tumors in the distal nail matrix. The detached nail plate looks white due to the presence of air. Green discoloration indicates the presence of *Pseudomonas*. Red discoloration is typical for drug-induced onycholysis or photo-onycholysis. A yellowish color is typical for onychomycosis.

Table 9.1. Onycholysis – differential diagnosis

	Nail clues	Look for
Psoriasis	Erythematous border Involvement of numerous nails (usually fingernails)	Other signs of nail psoriasis Coiled loops at dermoscopy
Lichen planus	Nail thinning and fissuring Limited to fingernails	Oral involvement Pterygium
Onychomycosis	Yellow discoloration Usually one or few toenails	Tinea pedis
Connective tissues disorders	Proximal nail fold capillary abnormalities	Raynaud phenomenon Check serum autoantibodies
Pompholyx	Usually most digits Limited to fingernails	Hot season Hyperhidrosis
Tumors	Limited to one digit	Subungual mass Perform an X-ray
Traumas (mechanical – chemical)	Usually fingernails Irregular proximal border Transverse leuconychia	Mild paronychia Sport activities Podiatric abnormalities Overzealous manicuring Occupation
Drugs	All – most nails Hemorrhagic changes	Thumb involvement, usually spared in photo-onycholysis
Idiopathic	Fingernails	Chronic paronychia Occupation associated with water contact

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DOI: 10.1007/978-3-540-79050-1_9, © Springer-Verlag Berlin Heidelberg 2010

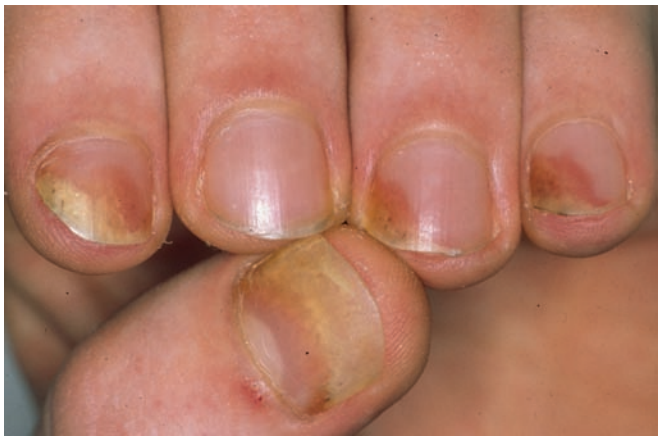


Fig. 9.1. Psoriatic onycholysis – this case is very typical due to the presence of an evident erythematous border that surrounds the onycholitic area.

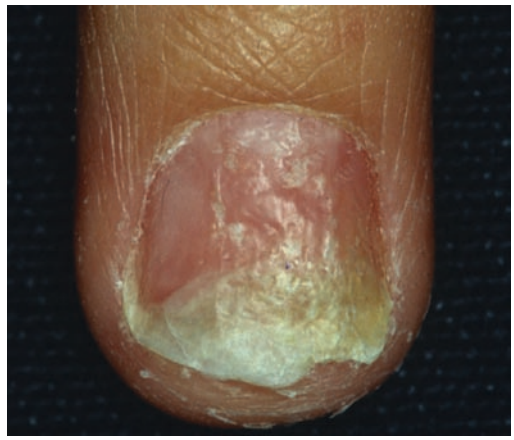


Fig. 9.2. Psoriatic onycholysis – the presence of psoriatic pits suggests the diagnosis.

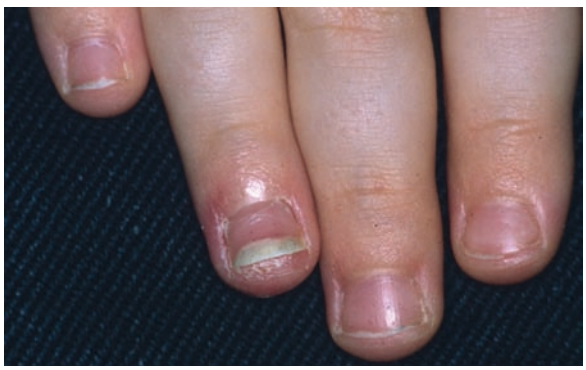


Fig. 9.3. Parakeratosis pustolosa – onycholysis is associated with mild eczema of the hyponychium.

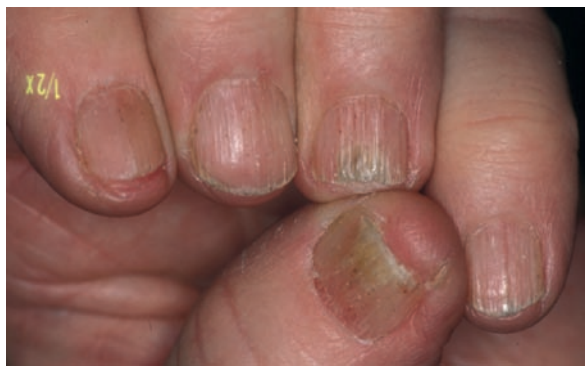


Fig. 9.4. Onycholysis in nail lichen planus – note other signs of the disease such as thinning and ridging.

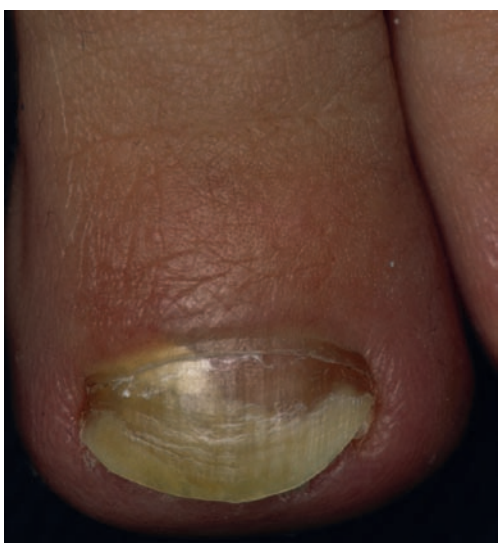


Fig. 9.5. Onycholysis due to onychomycosis – note the *yellow* hue in the cuticular area.

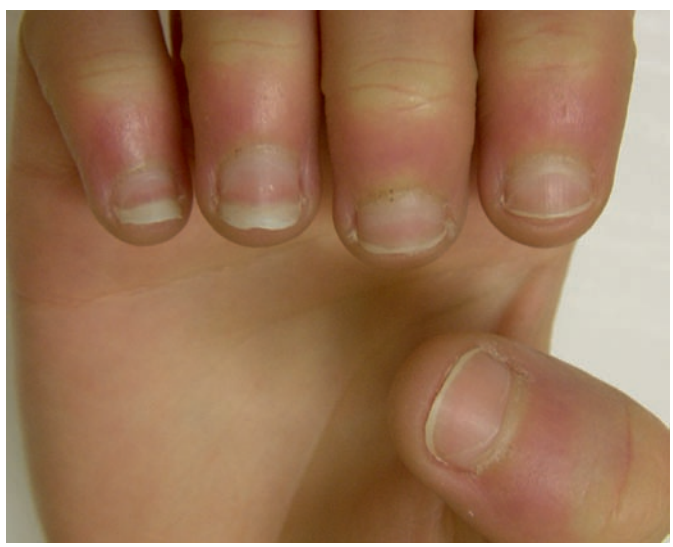


Fig. 9.6. Onycholysis in a patient with Raynaud's phenomenon – note cuticles hemorrhages.

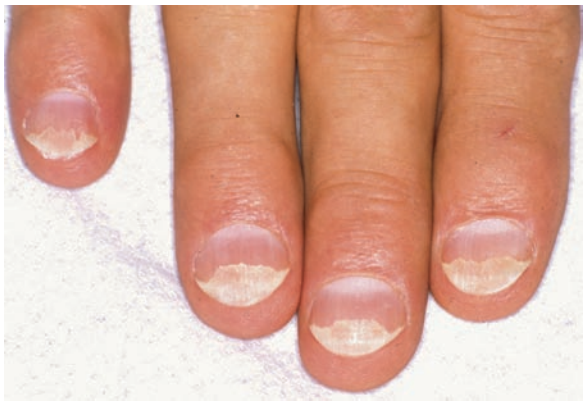


Fig. 9.7. Onycholysis in a patient with pompholix.

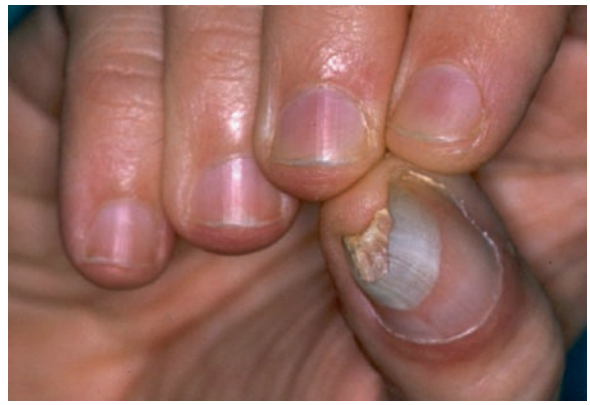


Fig. 9.8. Onycholysis due to the presence of a nail tumor that uplifts the nail plate.

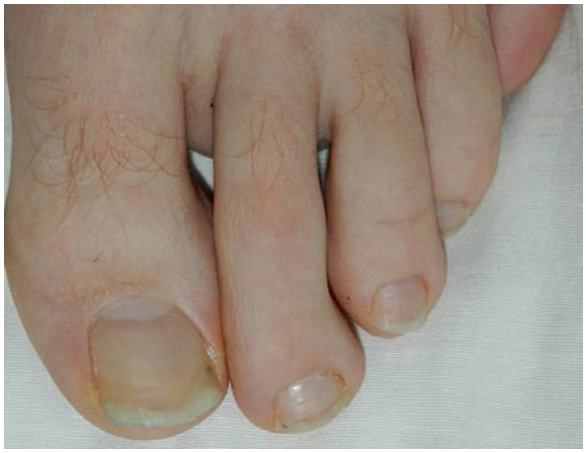


Fig. 9.9. Traumatic onycholysis due to overlapping of the second toe on the first toe.

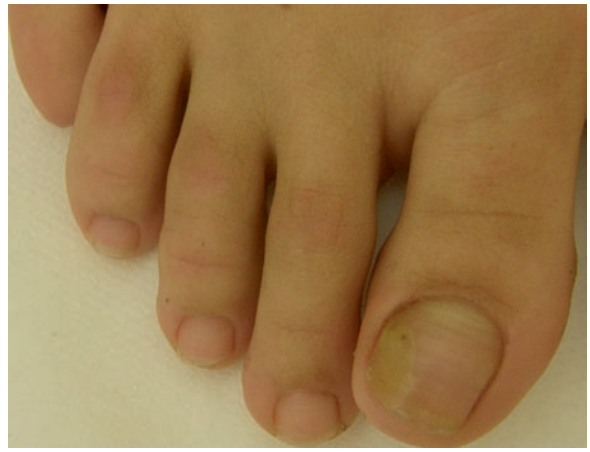


Fig. 9.10. Traumatic onycholysis due to overlapping of the second toe on the first toe.

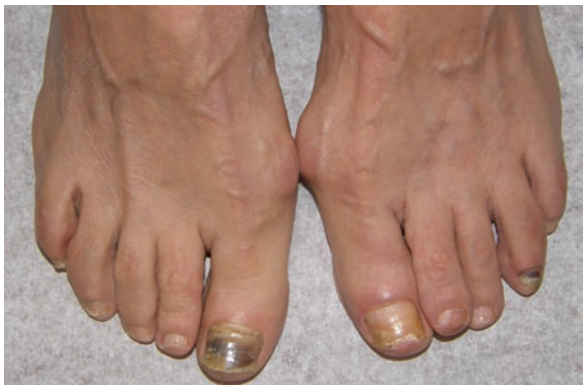


Fig. 9.11. Traumatic onycholysis – note the *red–brown* color due to subungual hematoma and the podiatric abnormalities.

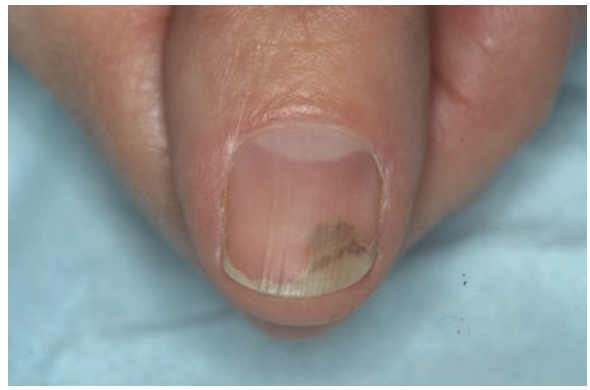


Fig. 9.12. Occupational onycholysis – the detachment followed penetration of a foreign body under the nail plate.

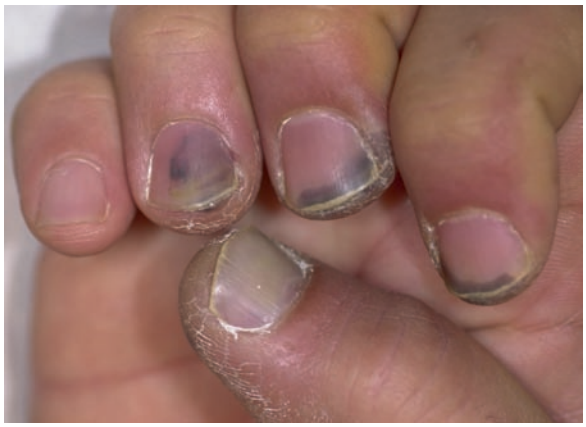


Fig. 9.13. Occupational onycholysis – the hemorrhages were due to fluorhydric acid.

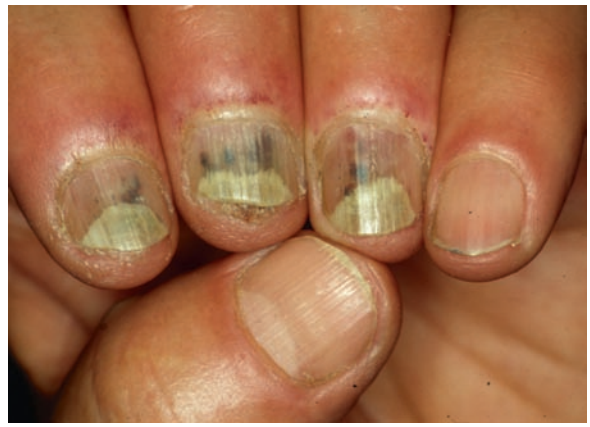


Fig. 9.14. Onycholysis due to radiodermitis in a veterinarian – note the nail bed hemorrhages and diskeratosis together with proximal nail fold capillaries abnormalities.

Fig. 9.15. Photo-onycholysis – note the hemorrhagic hue of the onycholysis that suggests the diagnosis.

Fig. 9.16. Photo-onycholysis – note the hemorrhagic hue of the onycholysis that suggests the diagnosis.

Fig. 9.17. Idiopathic onycholysis.

Fig. 9.18. Idiopathic onycholysis – note the association with paronychia and the *green* discoloration due to *Pseudomonas*.

10 Abnormal Color

10.1 True Leukonychia

The nail is milky white as a result of the presence of parakeratotic cells within the nail plate. Leukonychia does not fade with pressure and moves distally with the nail growth. Patterns:

- Punctate – usually traumatic and most commonly seen in children. It may also be due to inflammatory diseases of the distal matrix such as alopecia areata.
- Transverse – traumatic, rarely due to drugs (Mee's lines) or systemic diseases.
- Longitudinal – sign of Darier's disease and typically associated with longitudinal erythronychia and distal splitting.
- Total/subtotal – congenital, may be associated with auditory abnormalities.
- Proximal – due to proximal subungual onychomycosis (fungal element within the nail plate).

10.2 Pseudoleukonychia

Pseudoleukonychia is due to diseases that affect the superficial layers of the nail plate and causes abnormal light transmission. It can be observed in white superficial onychomycosis (classic and deep variant) and in nail fragility due to keratin granulation.

10.3 Apparent Leukonychia

Nail whiteness is due to abnormalities in nail bed and disappear with pressure. Patterns:

- Half and half nails – detected in about 10% of patients with chronic renal disorders, but also in normal subjects. Leukonychia affects the proximal half of the nail.
- Terry's nails – detected in 82% of patients with liver cirrhosis, but also found in normal subjects. Leukonychia affects the whole nail except for a 1–2 mm distal band.
- Muehrcke's lines – white parallel transverse bands that do not move distally with the growth of the nail and disappear after compression. They were originally described in severe serum hypoalbuminemia (nephritic syndrome), but are also common in patients submitted to combination chemotherapy.

A. Tosti et al., *Color Atlas of Nails,*
DOI: 10.1007/978-3-540-79050-1_10, © Springer-Verlag Berlin Heidelberg 2010

Fig. 10.1. The nail is *milky white* as the result of the presence of parakeratotic cells within the nail plate.

Fig. 10.2. True leukonychia in a child, punctate form – very common condition due to trauma.

Fig. 10.3. True leukonychia, punctate form, in a patient with alopecia areata – note the regular arrangement of the *white dots* along the nail plate.

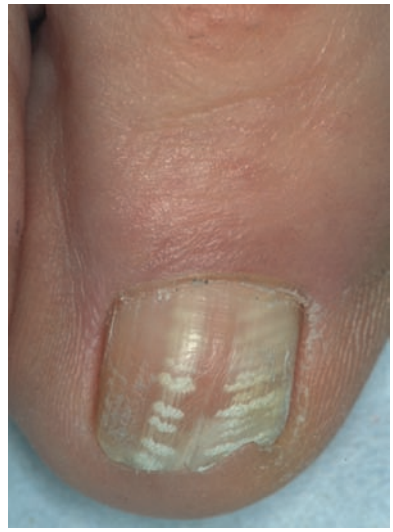


Fig. 10.4. True leukonychia, transverse form, due to high-heeled shoes.

Fig. 10.5. True leukonychia, transverse form, due to overzealous manicuring.

Fig. 10.6. True leukonychia, transverse form, the normality of the cuticles suggests that the trauma is not due to overzealous manicuring.

Fig. 10.7. True leukonychia, transverse form, and onycholysis in a patient with Raynaud's disease – leukonychia is due to reduced peripheral perfusion.

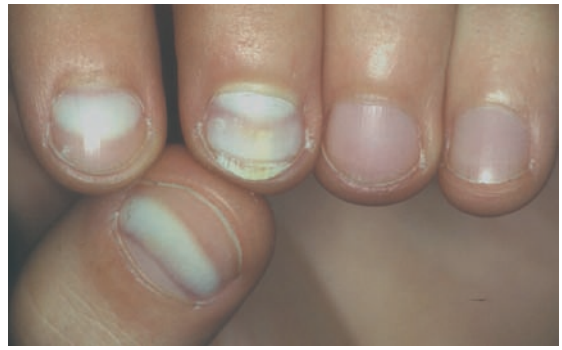


Fig. 10.8. True leukonychia, subtotal form – hereditary condition.

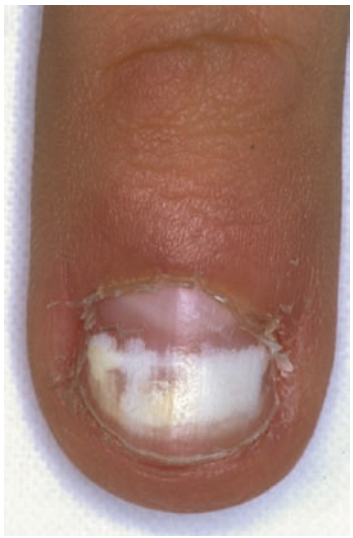


Fig. 10.9. True leukonychia, subtotal form – hereditary condition.

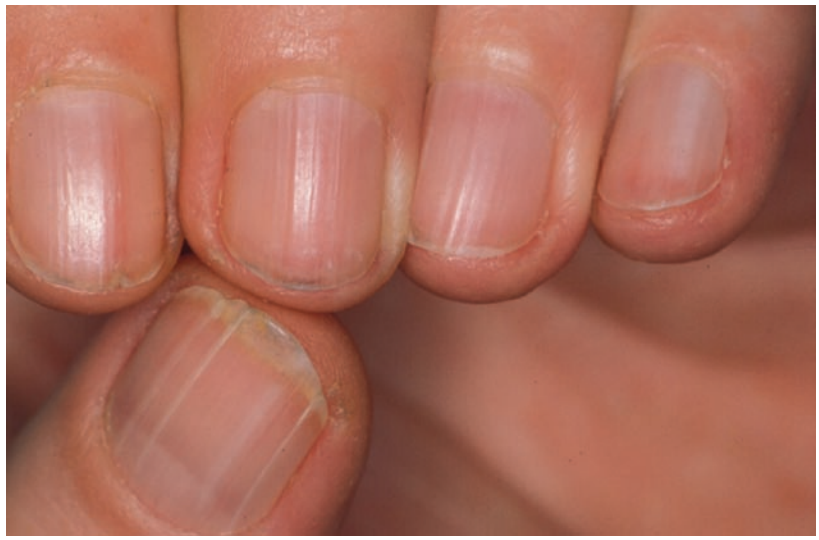


Fig. 10.10. Longitudinal leukonychia in Darier's disease – not also the distal splitting.

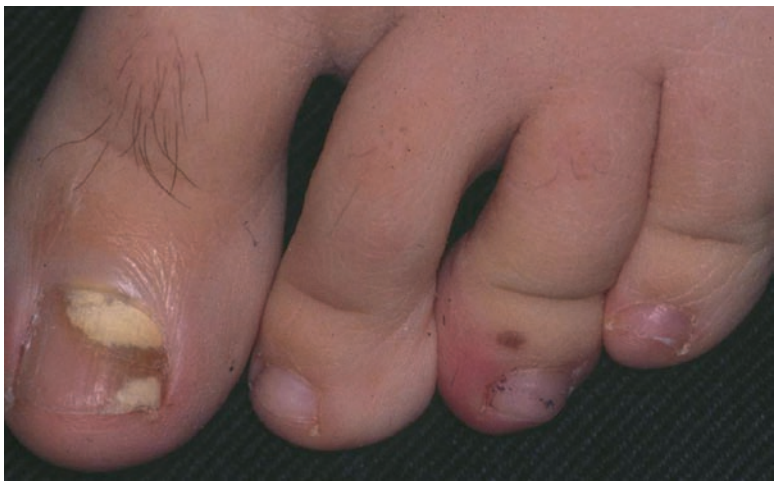


Fig. 10.11. True leukonychia, proximal form, due to proximal subungual onychomycosis.

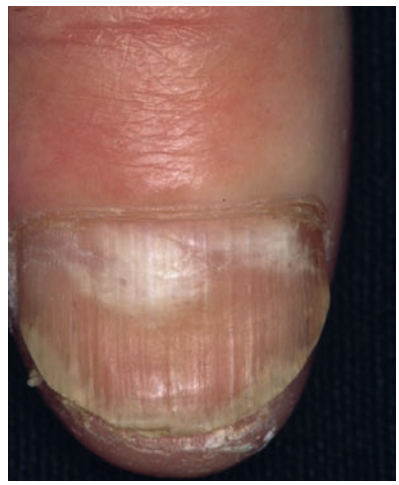


Fig. 10.12. True leukonychia, proximal form, due to proximal subungual onychomycosis.

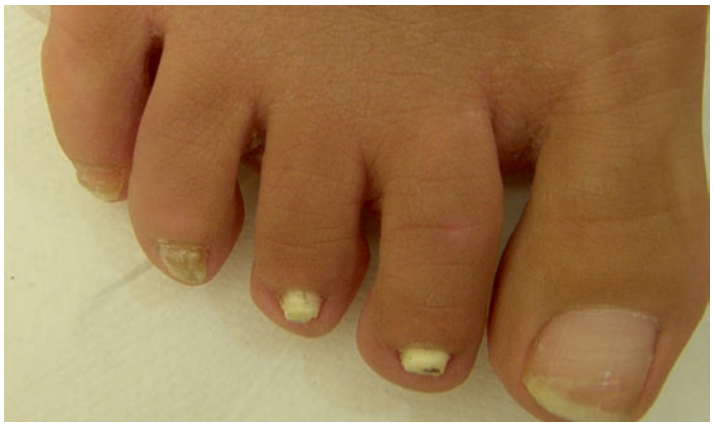


Fig. 10.13. Pseudoleukonychia in *white* superficial onychomycosis, deep variant.

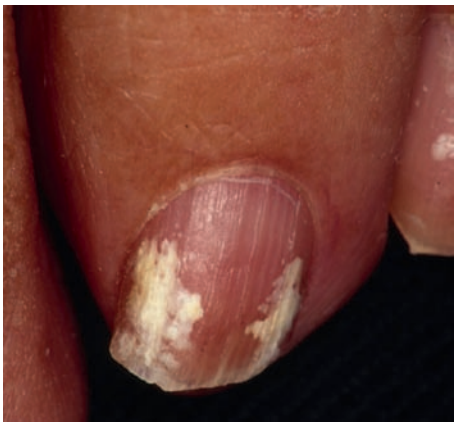


Fig. 10.14. Pseudoleukonychia in *white* superficial onychomycosis, classic variant.

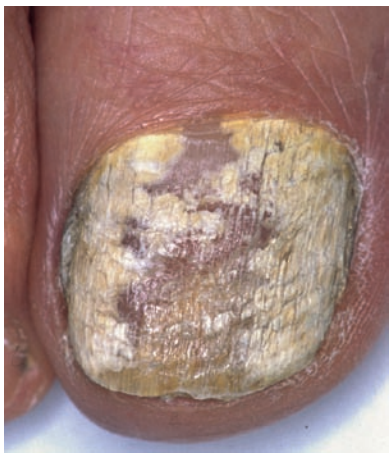


Fig. 10.15. Pseudoleukonychia in *white* superficial onychomycosis, classic variant.

Fig. 10.16. Half and half nails – the *pink* and *white* areas, similar in size, are typically seen in hyperazotaemia and chronic renal disease.

Fig. 10.17. Terry's nails – *white opacity* of almost all the nail plate usually associated with liver cirrhosis.

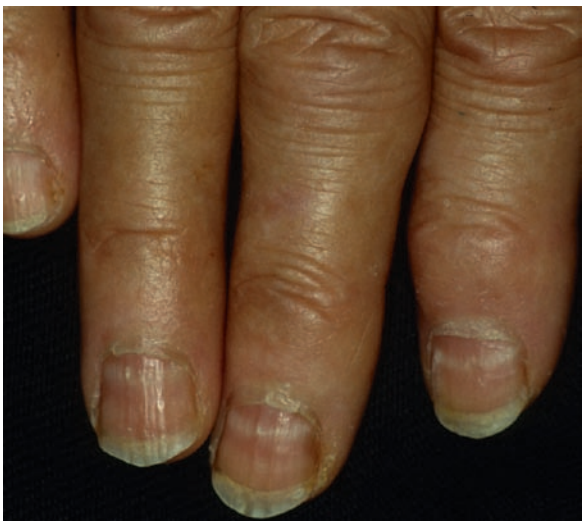


Fig. 10.18. Muercke's lines – *white transverse bands* that do not move distally with the growth of the nail and disappear after compression of the fingertip are associated with severe serum hypoalbuminemia.

10.4 Erythronychia

Erythronychia indicates longitudinal red streaks in the nail. Multiple streaks indicate an inflammatory nail disorder (nail lichen planus or Darier's disease), a single streak is usually due to a benign subungual tumor, particularly onychopapilloma. Malignant tumors, however, have been reported and therefore it is advisable to take a biopsy if the band enlarges. Erythronychia is due to a focal loss of function in the distal matrix. In correspondence with the streaks, the nail plate is thinner and the bed vessels are more visible with frequent hemorrhages. Distal splitting may be present. Fingernails are most commonly affected.

10.5 Red Lunulae

The lunular area may show diffuse or patchy erythematous color. Red lunulae may be a consequence of inflammatory disorders of the nail matrix (lichen planus, alopecia areata) that possibly reflect distal matrix involvement.

Red lunulae have been described also in association with classical rheumatoid arthritis, systemic lupus erythematosus, cardiac failure, hepatic cirrhosis, lymphogranuloma venereum, carbon monoxide poisoning and reticulosarcoma.

Fig. 10.19. Erythronychia of one fingernail – the *red streak* is due to a subungual tumor.

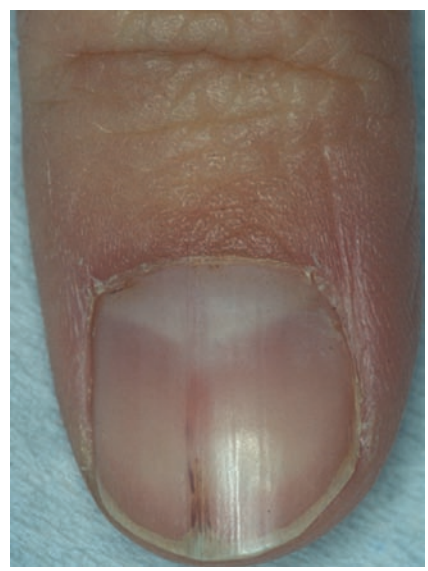


Fig. 10.20. Erythronychia of one fingernail – the *red streak* is due to a subungual tumor.

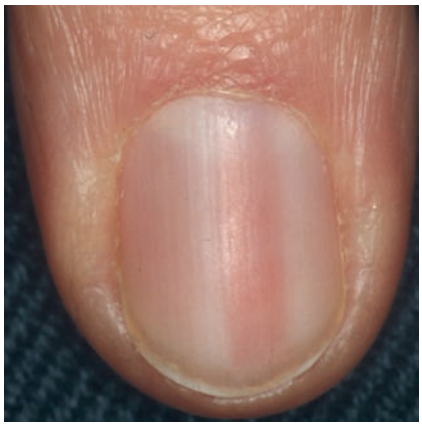


Fig. 10.21. Erythronychia of one fingernail – the *red streak* is due to a subungual tumor.

Fig. 10.22. Erythronychia of several fingernails.

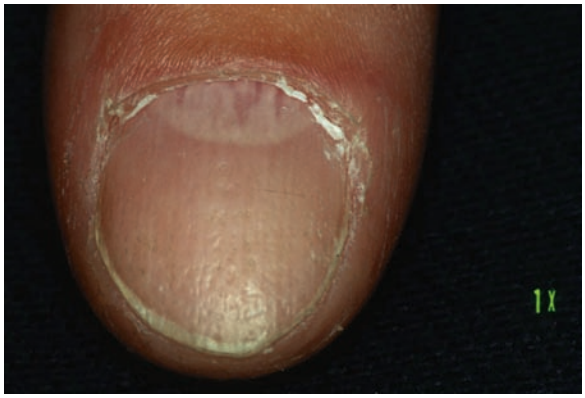


Fig. 10.23. Mottled erythema of the lunulae in alopecia areata.

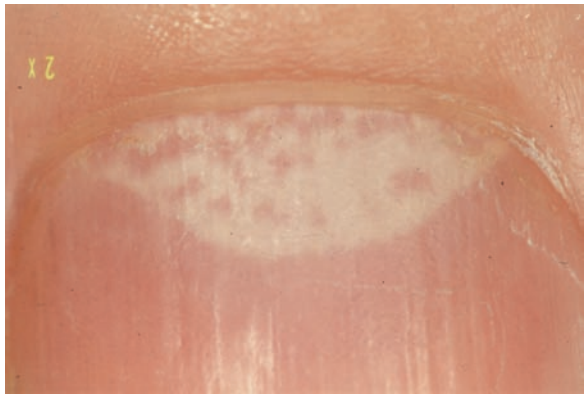


Fig. 10.24. Mottled erythema of the lunulae in alopecia areata.

10.6 Hemorrhages

Splinter hemorrhages result from pinpoint bleeding in the longitudinally arranged nail bed capillaries with successive incorporation of the blood in the ventral nail plate.

They can affect one or several nails. They are generally distal and rarely proximal or involving the whole nail bed.

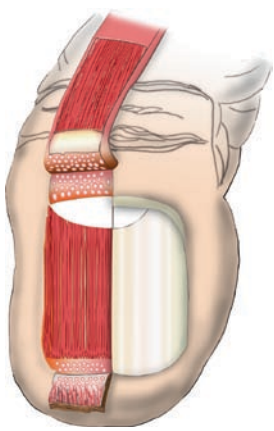


Fig. 10.25. The nail bed capillaries showing a longitudinal arrangement.

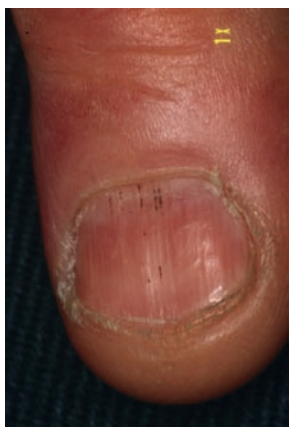


Fig. 10.26. Splinter hemorrhages – note small pinpoint hemorrhages with longitudinal arrangement.

Fig. 10.27. Distal splinter hemorrhages due to psoriasis.

Fig. 10.28. Splinter hemorrhages seen at dermoscopy.

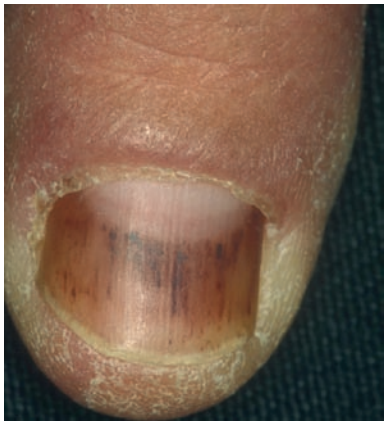


Fig. 10.29. Massive proximal splinter hemorrhages due to vasculitis.

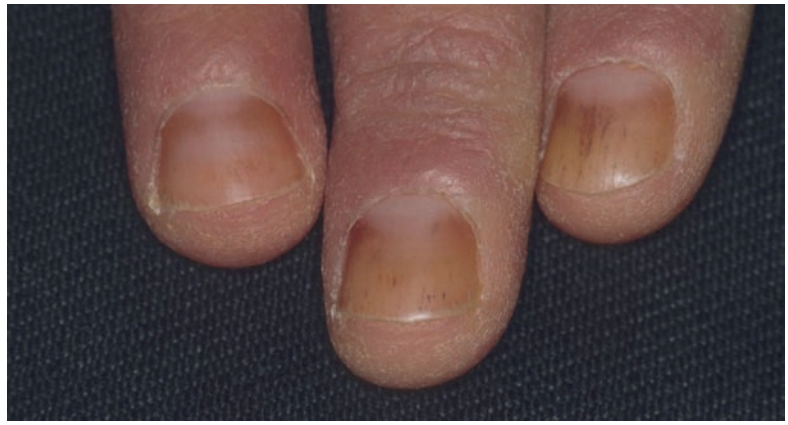


Fig. 10.30. Multiple splinter hemorrhages in a patient taking anticoagulants.

Table 10.1. Common causes of splinter hemorrhages

- Altitude (high)
- Amyloidosis
- Antiphospholipid syndrome
- Bacterial endocarditis
- Darier's disease
- Drugs
- Leukaemias
- Onychomatricoma
- Onychomycosis
- Psoriasis
- Rickettsiosis
- Subungual foreign body
- Trauma
- Trichinosis
- Vasculitis

10.7 Hematomas

Hematomas of the nail apparatus can be subungual or periungual. They are generally due to trauma and are most commonly seen in the toenails.

Non traumatic hematomas are usually due to systemic disorders or drugs, especially anticoagulants.

Nail hematomas moves distally with nail growth as the blood is incorporated in the ventral nail plate.

Color may vary from red to brown – orange to black.

When the hematoma involves the proximal nail bed and matrix it is very important to drain blood to avoid matrix compression with permanent nail dystrophy.

Differential diagnosis with melanic pigmentation may sometimes be difficult.

Dermoscopy can be very useful to distinguish blood extravasations from melanin deposition.

Fig. 10.31. Small hematoma resembling melanic pigmentation.

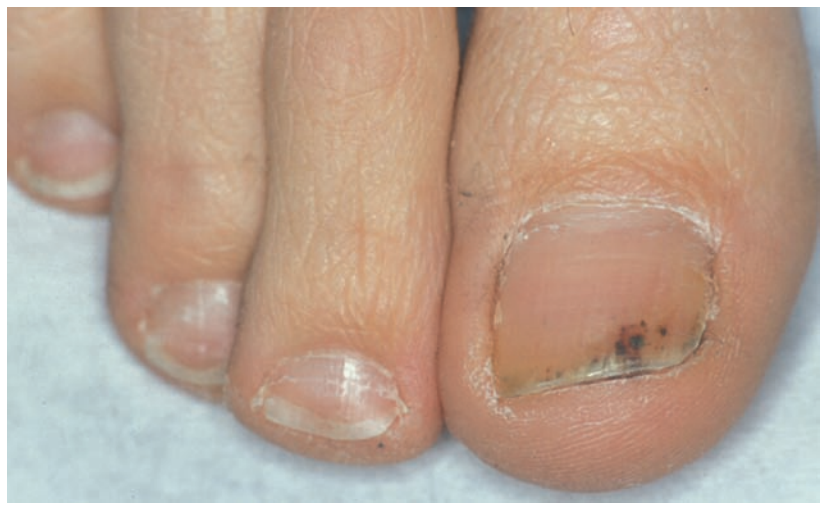


Fig. 10.32. Hematoma due to ill fitting shoes.

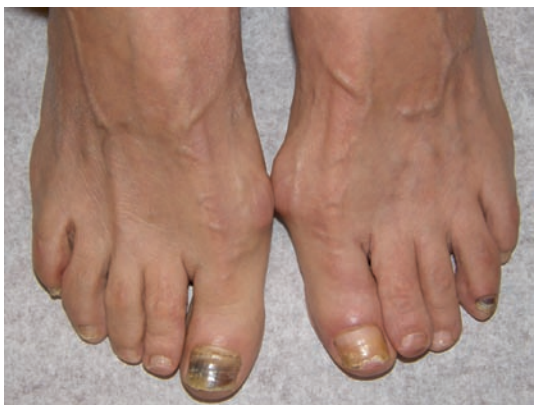


Fig. 10.33. Nail bed hematoma due to trauma.

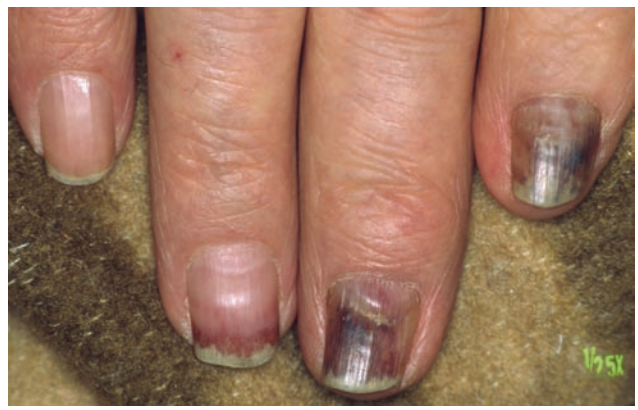


Fig. 10.34. Hematomas in a patient with systemic amyloidosis.

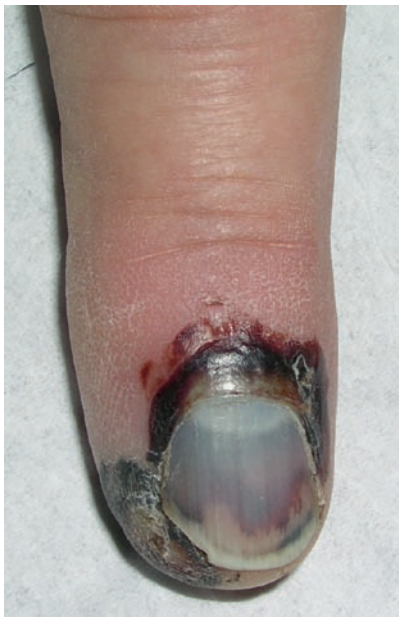


Fig. 10.35. Massive hematoma due to acute trauma – note spreading of the blood in periungual tissues.

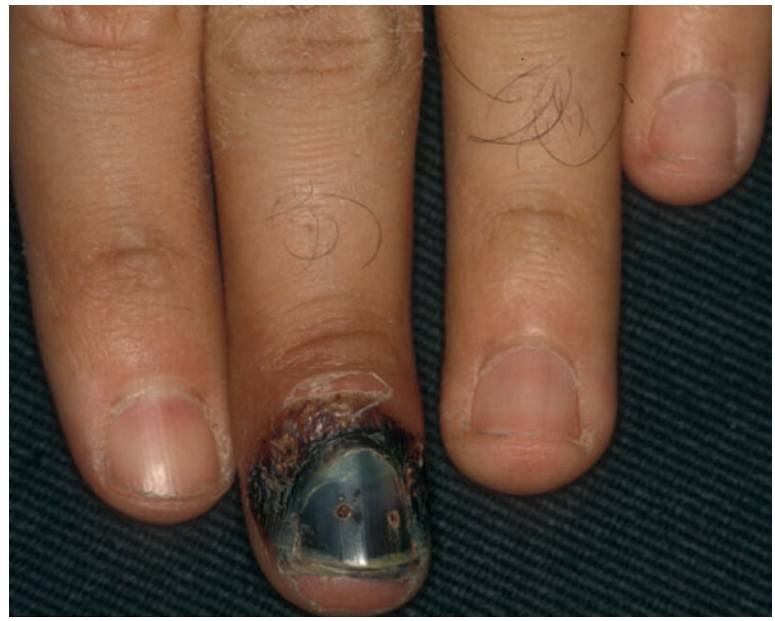


Fig. 10.36. Massive hematoma due to acute trauma – draining of the blood prevents matrix damage.

10.8 Melanonychia

Melanonychia describes the presence of melanin within the nail plate. It appears more often as a longitudinal band starting from the matrix and extending to the tip of the nail plate. Less often the pigmentation can involve the whole nail plate or present as a transverse band.

Nail matrix melanocytes are generally dormant, but in the distal matrix there is an active compartment. This is more frequently responsible for the nail pigmentation, but the dormant pool can be activated too. Histologically, melanonychia can then be due to melanocytic activation, but also to benign melanocytic hyperplasia (as in lentigo), to nevi or melanoma.

Common causes of longitudinal melanonychia due to melanocytic activation include racial melanonychia, inflammatory and traumatic nail disorders, drugs and systemic diseases.

The clinical presentations of melanonychia depend on the number of the bands, color, edges and width. In any patient with longitudinal melanonychia, especially when the condition involves a single nail, the possibility of melanoma should be ruled out. Hutchinson' sign (extension of the pigmentation to the proximal or lateral nail folds) is an important indicator of nail melanoma and can help the clinician in performing the diagnosis even if it is not always present.

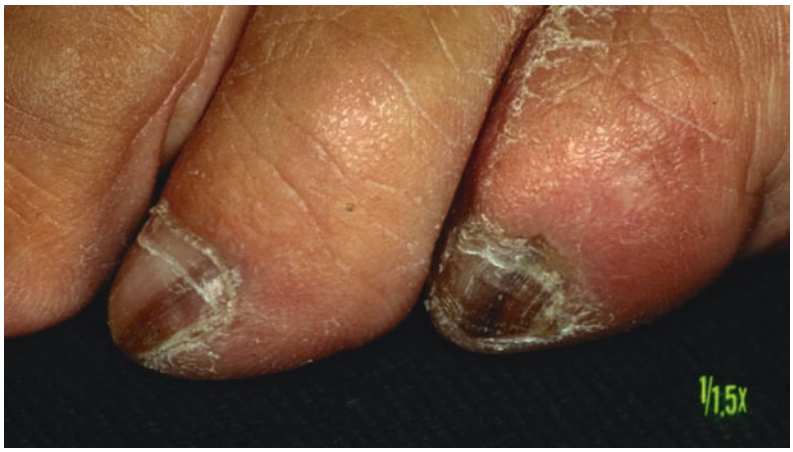


Fig. 10.37. Longitudinal melanonychia (frictional melanonychia) due to podiatric abnormalities and ill fitting shoes.

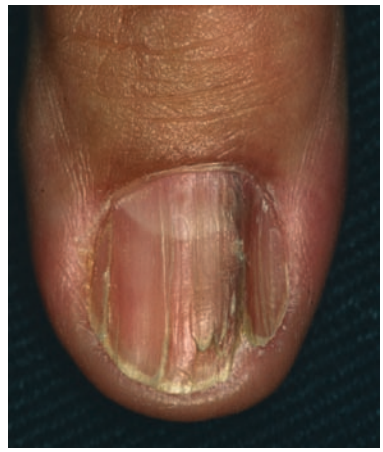


Fig. 10.38. Post inflammatory melanonychia due to lichen planus.

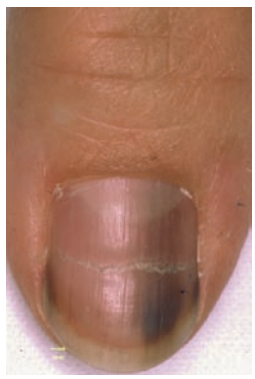


Fig. 10.39. Melanonychia after radiotherapy – note also the onychomadesis.

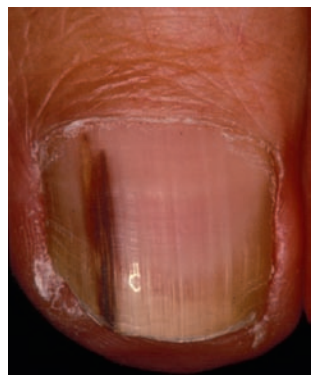


Fig. 10.40. Melanonychia in onychomycosis.

Fig. 10.41. Laugier syndrome – melanonychia is associated with oral pigmentation.

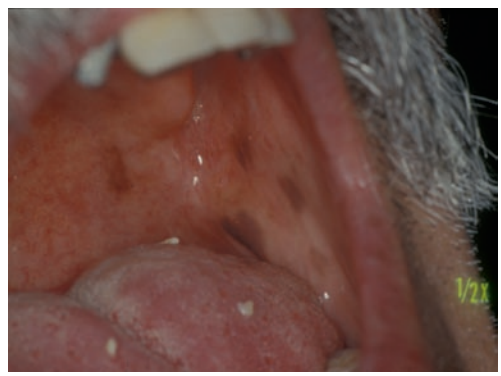


Fig. 10.42. Laugier syndrome – melanonychia is associated with oral pigmentation.

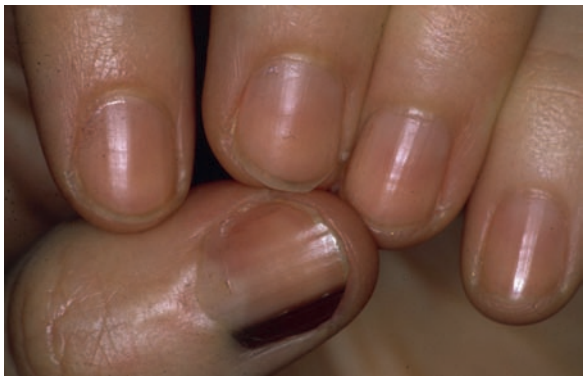


Fig. 10.43. Nail matrix nevus – pigmentation in a single band.

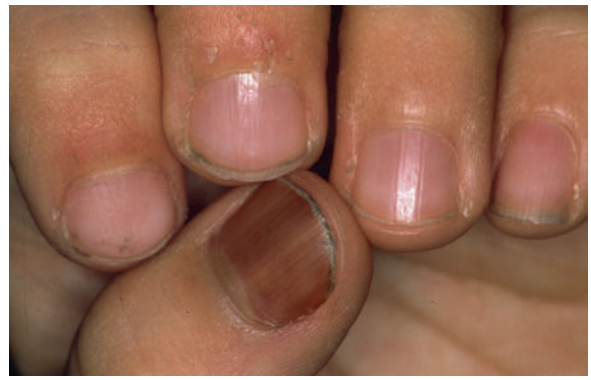


Fig. 10.44. Nail matrix nevus – the pigmentation involves the whole nail plate.

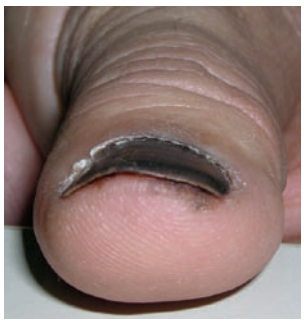


Fig. 10.45. Nail melanoma – note the hyponychial pigmentation suggestive for the disease.

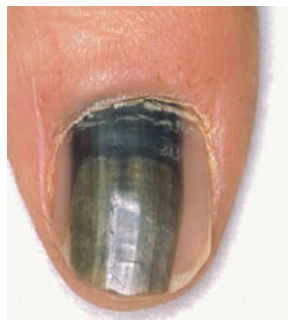


Fig. 10.46. Nail melanoma.

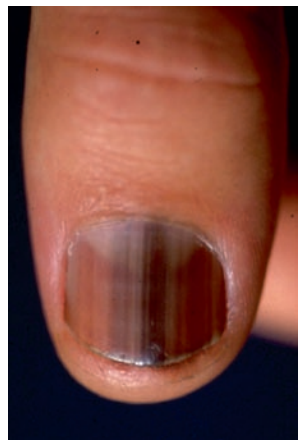


Fig. 10.47. Nail melanoma.

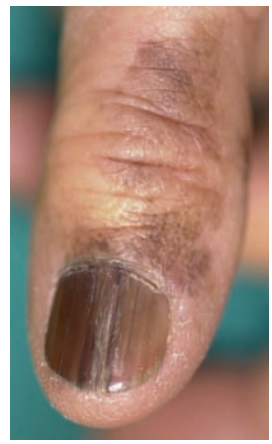


Fig. 10.48. Nail melanoma with Hutchinson' sign.

10.9 Yellow Streaks

They are a typical feature of distal subungual onychomycosis and indicate fungal progression. They appear as longitudinal single or multiple yellow bands. A whitish or orange pigmentation is often present. The presence of yellow streaks is a poor prognostic factor for the response to treatment.

10.10 Yellow Nails

Nail plate color can be yellow due to exogenous discoloration (see table) or due to the yellow nail syndrome (YNS).

The YNS is characterized by an arrest or a reduction in the nail growth resulting in nail thickening, hardening, and yellow discoloration. Fingernails and toenails are excessively curved from side to side and cuticles are absent.

Lymphedema and respiratory disturbances are associated with the nail abnormalities in typical cases. YNS may occasionally be paraneoplastic. The pathogenesis of the YNS is still unknown even though a congenital abnormality of the lymphatic vessels is possibly involved.

Table 10.2. Causes of yellow exogenous discoloration

- Nail lacquers
- Textile dyes
- Potassium bicromate
- Herbicides (paraquat and diquat)
- 4,4′ methylenedianiline
- Hepatic carcinoma

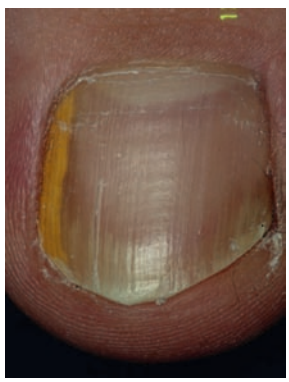


Fig. 10.49. Distolateral subungual onychomycosis – the *yellow streak* along the lateral margin of the nail plate indicates the presence of the fungus.

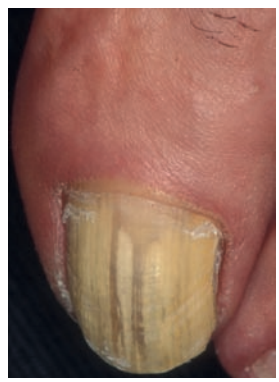


Fig. 10.50. Distal subungual onychomycosis – multiple streaks.

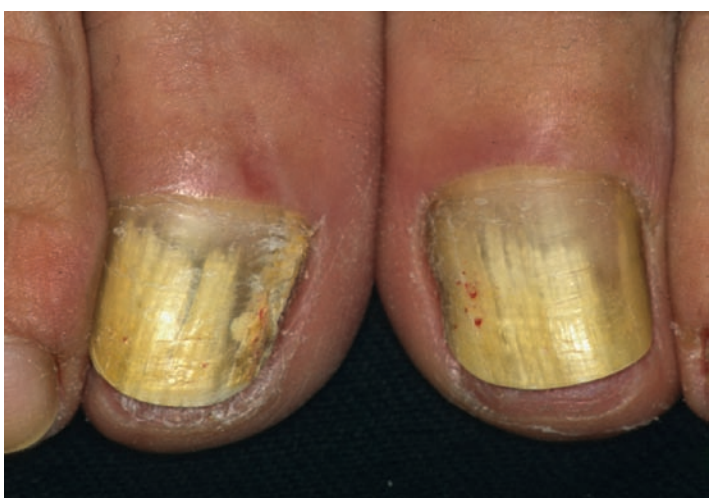


Fig. 10.51. Distal subungual onychomycosis – multiple streaks.

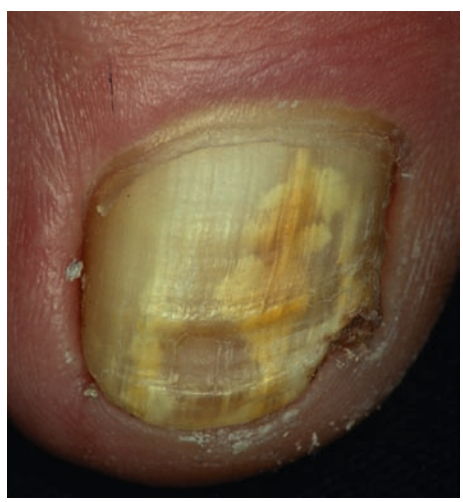


Fig. 10.52. Distal subungual onychomycosis with streaks and a *yellow* onycholytic area in the central portion of the nail plate.

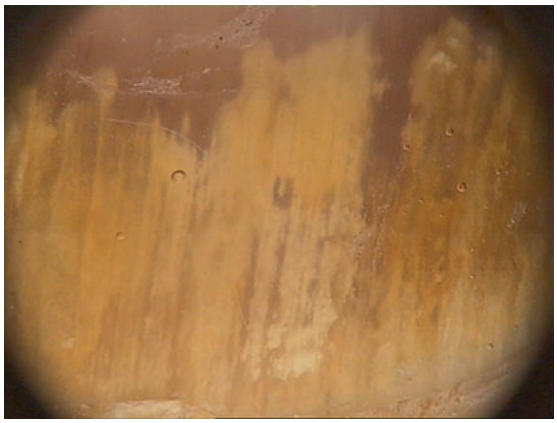


Fig. 10.53. *Yellow streaks* seen at dermoscopy.

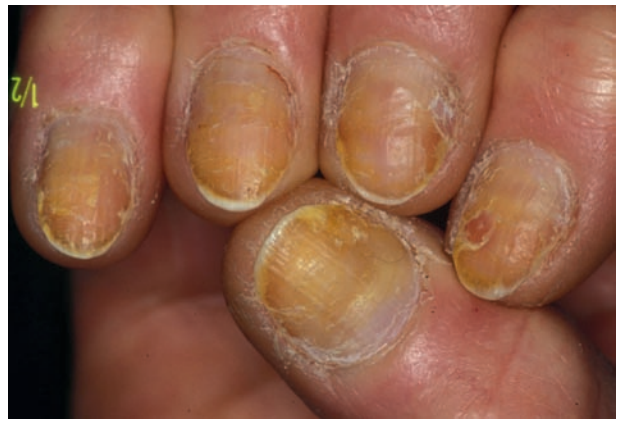


Fig. 10.54. *Yellow* discoloration of the nail plate due to textile hair dyes.

Fig. 10.55. Yellow nail syndrome.

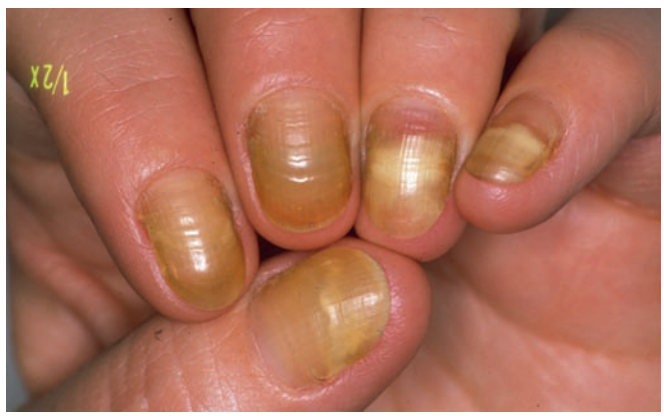


Fig. 10.56. Yellow nail syndrome.

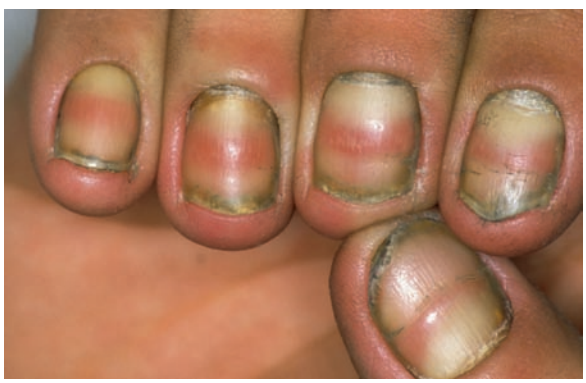


Fig. 10.57. Yellow nail syndrome.

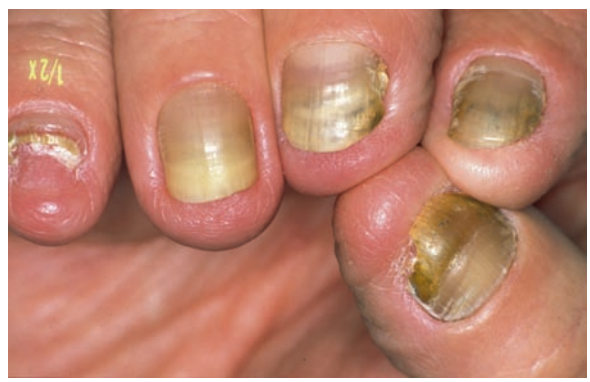


Fig. 10.58. Yellow nail syndrome.

Fig. 10.59. Yellow nail syndrome.

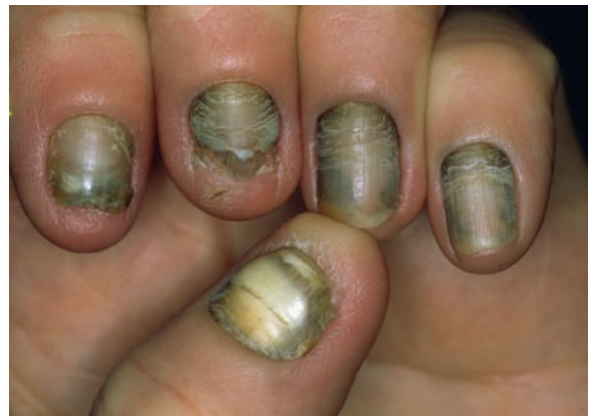


Fig. 10.60. Yellow nail syndrome.

10.11 Green Nails

Green nails are due to the deposition of pyocianin pigment in the subungual or periungual region or on the nail plate.

The color of pigmentation may vary from pale green to very dark green.

They indicate *Pseudomonas* colonization and are common complication of chronic paronychia or onycholysis.

In chronic paronychia the pigmentation often has a longitudinal arrangement along the lateral side of the nail plate and the pigment is within and under the nail plate which usually has an abnormal surface.

This is why in chronic paronychia the pigmentation often persists after eradication of the *Pseudomonas*.

In onycholysis the pigment is under the nail plate and the eradication is simple; removal of the onycholytic nail results in prompt disappearing of the pigmentation.

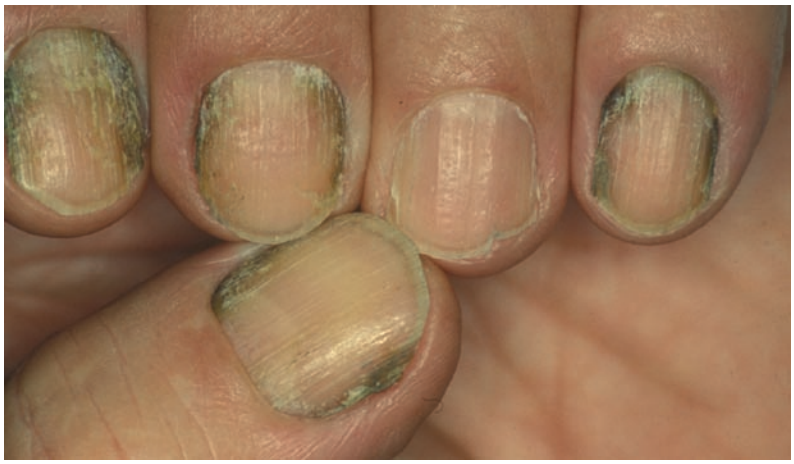


Fig. 10.61. *Green* nails in chronic paronychia.

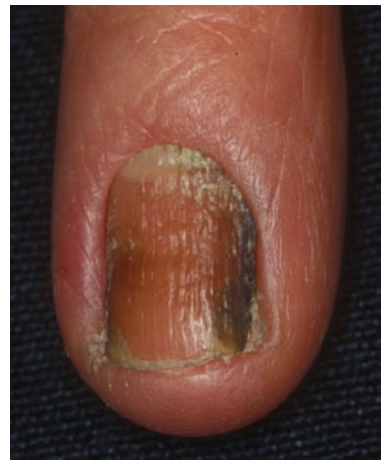


Fig. 10.62. *Green* nails in chronic paronychia.

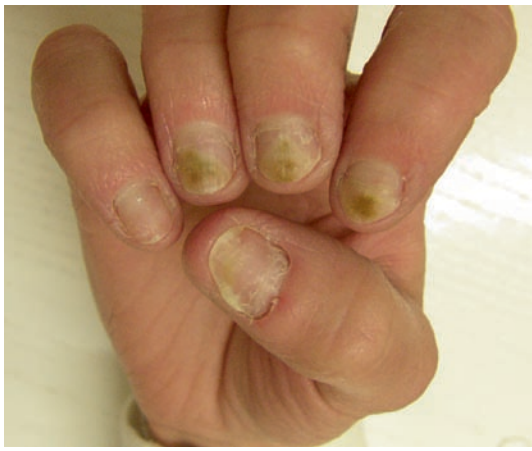


Fig. 10.63. *Green* nails in onycholysis.

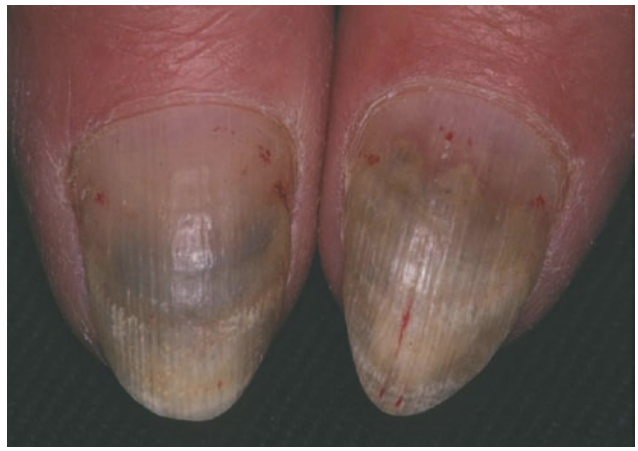


Fig. 10.64. *Green* nails in onycholysis.

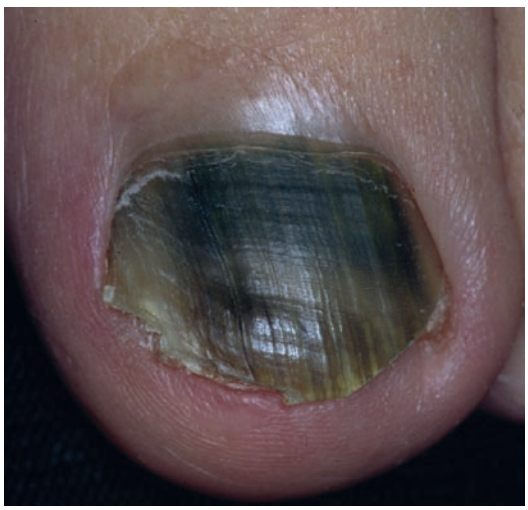


Fig. 10.65. *Green* nails in onycholysis.

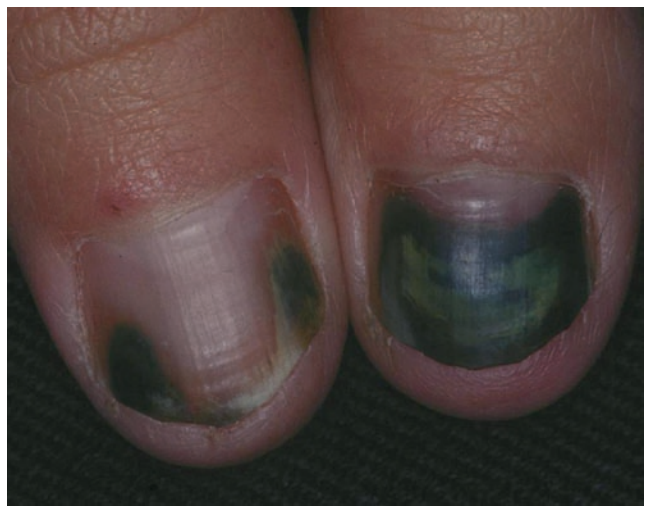


Fig. 10.66. *Green* nails in onycholysis.

10.12 Other Nail Color Changes

Nail color can change due to endogenous or exogenous causes. Nail pigmentation from endogenous causes is rare and typically presents as a discoloration with a proximal border that follows the lunular shape. Staining from exogenous causes typically maintains the shape of the proximal nail fold.

Table 10.3. Causes of endogenous discoloration

- Drugs
  - Psoralens
  - Antimalarials
  - Cancer chemotherapic agents
  - Antirheumatic drugs
  - Other systemic drugs (antimicrobials, e.g., mynocicline)
- Systemic infections
- Dermatological disorders
- Systemic conditions (e.g., argyria)

Table 10.4. Causes of exogenous discoloration

- Purple: Castellani's tintura rubra
- Black:
  - Fresh nuts
  - Tars
  - Ebony
  - Mogany
  - Photographic developers
  - Guns
  - Mineral oils
  - Anthralin
  - Grape
- Brown:
  - Caramelized sugar
  - Coffee
  - Tobacco
- Orange–brown:
  - Picric acid
  - Glutaraldehyde
  - Hydroquinone
- Orange:
  - Nail varnishes
  - Hair dyes

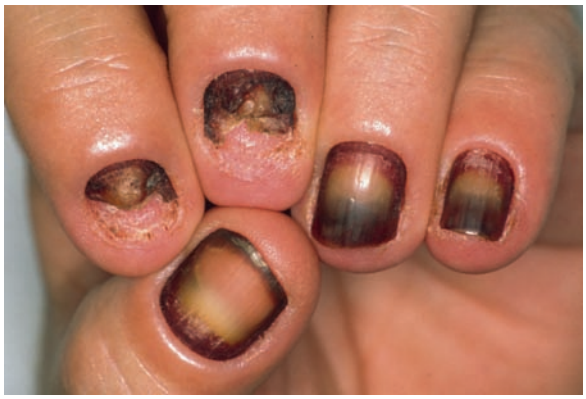


Fig. 10.67. *Purple* pigmentation due to topical application of Castellani's tintura rubra in a patient with yellow nail syndrome.

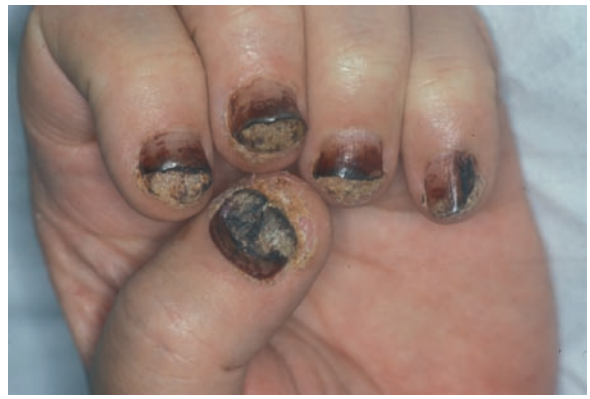


Fig. 10.68. *Black* pigmentation due to topical application of anthralin in a patient with nail psoriasis.

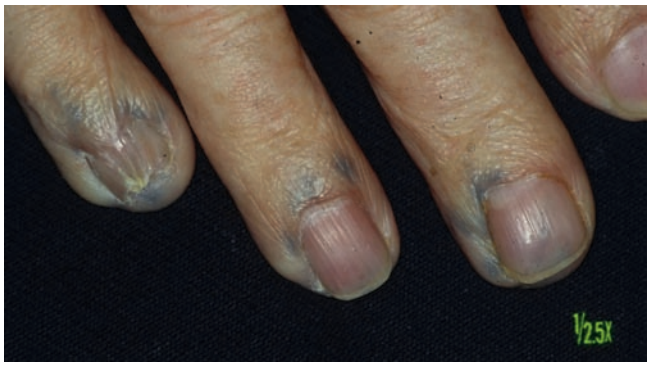


Fig. 10.69. *Black* pigmentation due to a tattoo – the patient had a traumatic fall on the street cold asphalt.

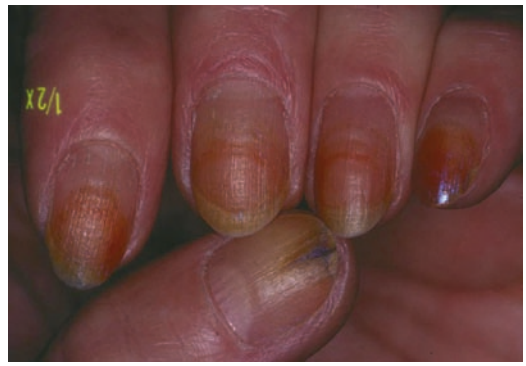


Fig. 10.70. *Orange* discoloration of the nail plate due to nail varnish.

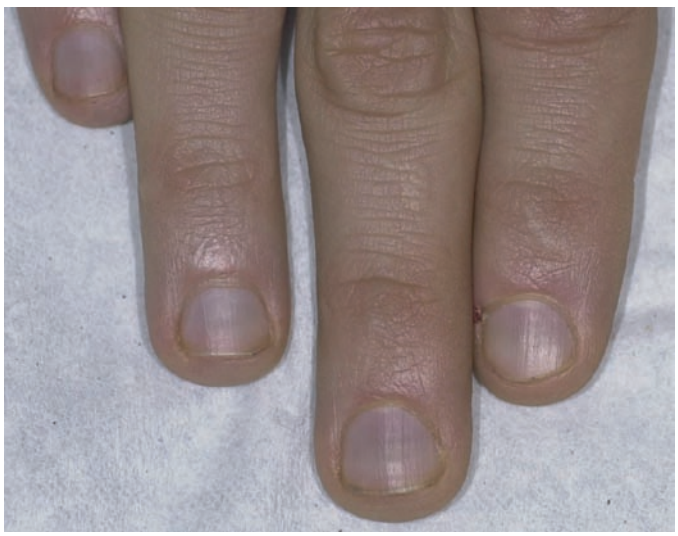


Fig. 10.71. Argyria – *silver* nail plates in a patient who abused of colloidal *silver*.

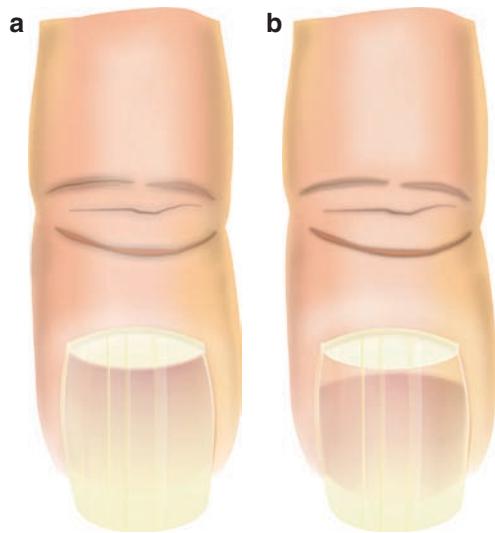


Fig. 10.72. Nail pigmentation from endogenous causes presents as a discoloration with a proximal border that follows the lunular shape (**a**). Staining from exogenous causes typically maintains the shape of the proximal nail fold (**b**).

11 Proximal Nail Fold Abnormalities

11.1 Paronychia

Paronychia is an inflammatory disorder affecting the proximal and lateral nail folds, which normally protect the nail matrix from the environment. It is a very common fingernail affection, three times more common in women than in men and occurring at any age.

Clinical Presentations

- Acute

The affected digit is painful and shows erythema, swelling and pus discharge localized in the proximal and/or lateral nail folds. Sometimes the infection may spread to the nail bed and generate enough pressure to uplift the nail plate with onycholysis or nail plate detachment. In severe cases, the infection may extend to the digital pulp and produce a concomitant felon.

- Chronic

It follows mechanical or chemical traumas that damage the cuticle. The condition is then maintained by penetration of environmental irritants and allergens which cause an inflammatory reaction (mild erythema and swelling) of the proximal nail fold and matrix. Inflammation impairs nail fold keratynization and prevents the formation of a new cuticle. Damage to the nail matrix interferes with the normal nail growth (Beau's lines and onychomadesis). The nail plate may sometimes present a green discoloration of its lateral margins due to *Pseudomonas* colonization.

Secondary colonization with *Candida albicans* and/or bacteria occurs in most cases, causing self-limited episodes of painful acute inflammation.

A. Tosti et al., *Color Atlas of Nails,*
DOI: 10.1007/978-3-540-79050-1_11, © Springer-Verlag Berlin Heidelberg 2010

Table 11.1. Causes of paronychia

• Acute paronychia	• With vescicles/pustules – Bacterial infections – Viral infections (herpetic withlow) – Fungal infections (molds onychomycosis) – Parasitic infections (Leishmaniasis) – Dermatological diseases (allergic contact dermatitis, atopic dermatitis, chronic radiodermitis, pemphigus/pemphigoid, pustular psoriasis) – Systemic diseases (diabetes, digital ischemia, immuno/hematologic disorders) • With pyogenic granuloma – Nail ingrowing – Cast immobilization – Drugs
• Chronic paronychia	• Contact allergy • Food hypersensitivity • *Candida* hypersensitivity • Irritant dermatitis • *Candida* infection (rare) • Foreign body penetration

Fig. 11.1. Normal proximal nail fold.

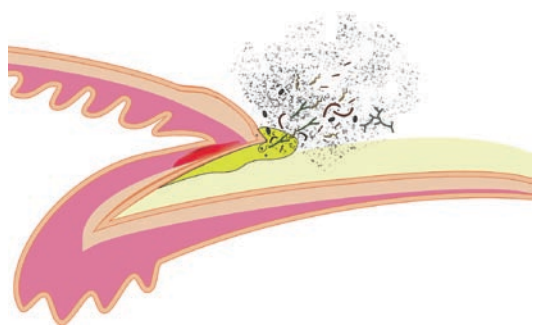


Fig. 11.2. Damaged proximal nail fold which allows the penetration of environmental irritants and allergens which cause an inflammatory reaction.

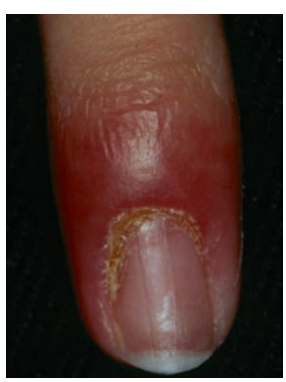


Fig. 11.3. Acute paronychia – note the periungual inflammation with pus discharge.

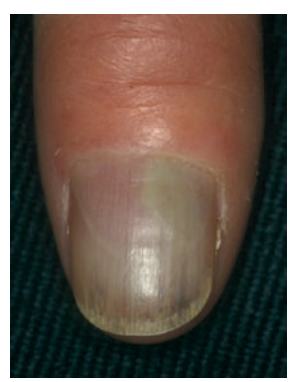


Fig. 11.4. Acute paronychia with mild periungual inflammation and onycholysis due to pus deposition.

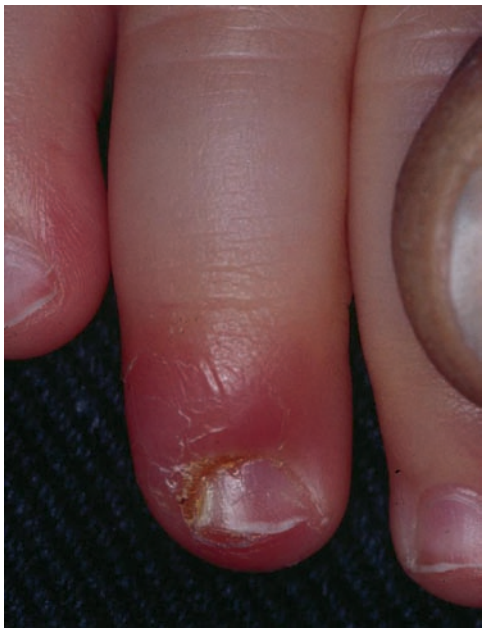


Fig. 11.5. Acute paronychia in a child.

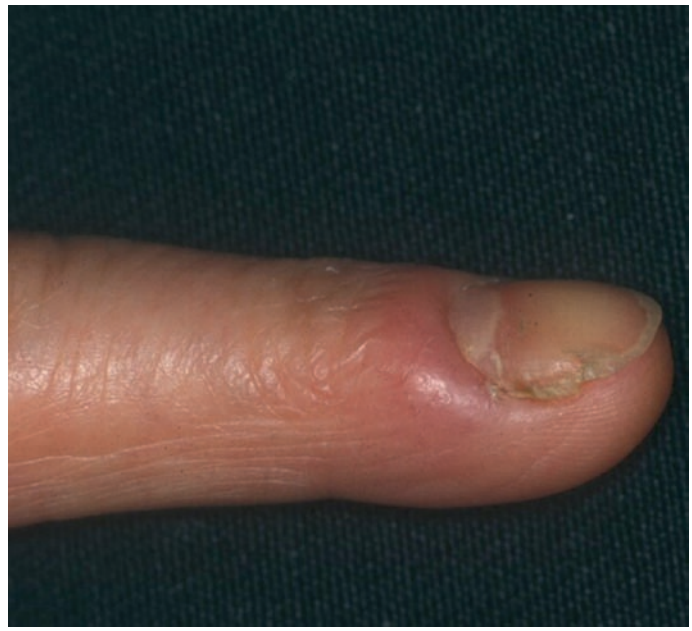


Fig. 11.6. Acute paronychia due to foreign body penetration in a hairdresser.

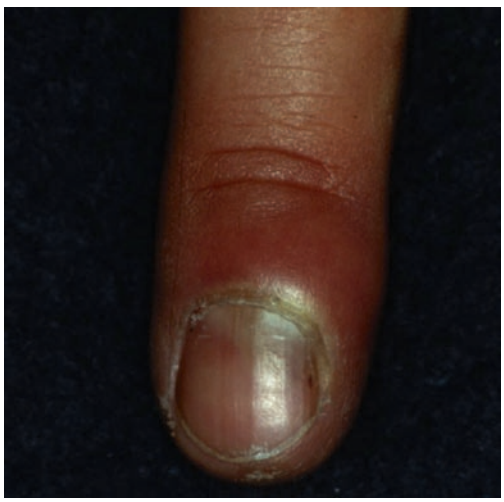


Fig. 11.7. Acute paronychia due to Herpes Simplex Virus – vesicles are not visible as the infection involves the ventral portion of the proximal nail fold.

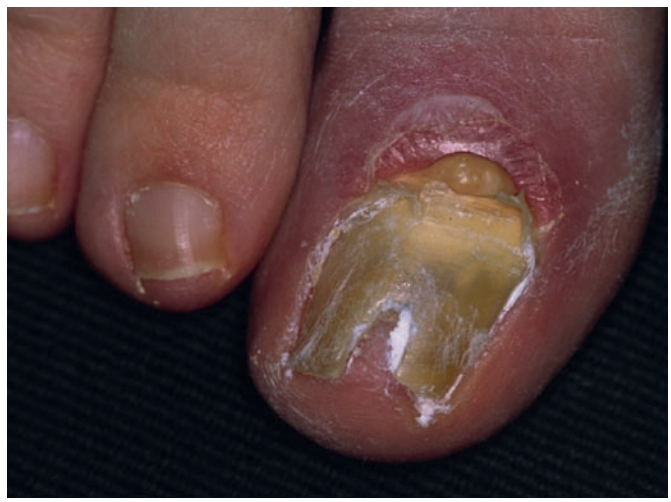


Fig. 11.8. Acute paronychia with periungual inflammation and pus discharge in onychomycosis due to *Fusarium*.

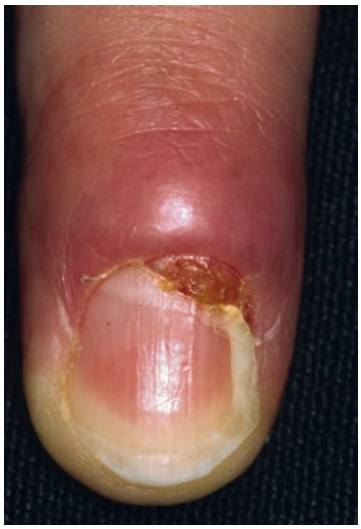


Fig. 11.9. Acute paronychia with pyogenic granuloma due to cast immobilization producing mild nerve injury.

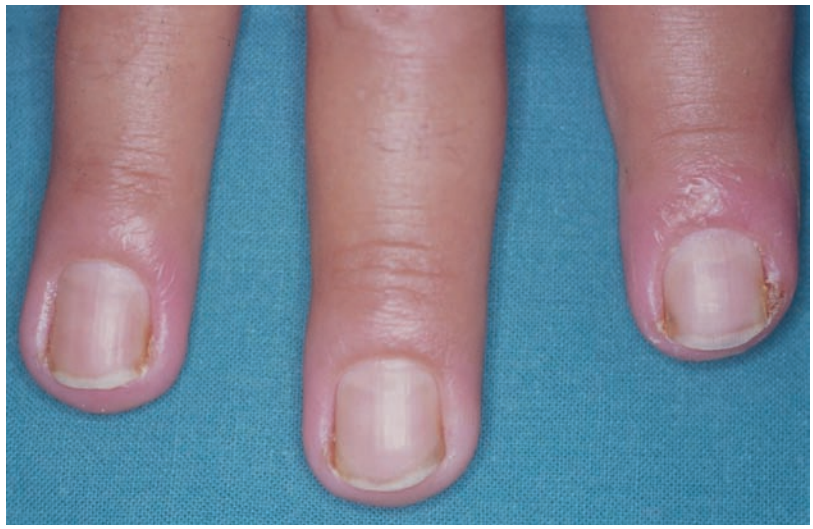


Fig. 11.10. Acute paronychia with pyogenic granulomas in multiple digits.

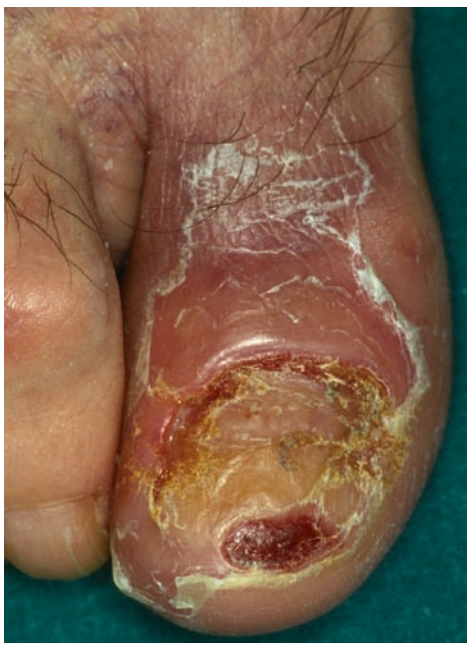


Fig. 11.11. Acute paronychia due to metotrexate treatment.

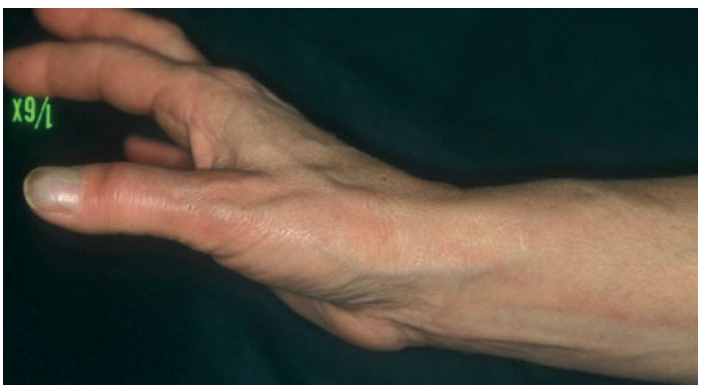


Fig. 11.12. Acute paronychia with lymphangitis.

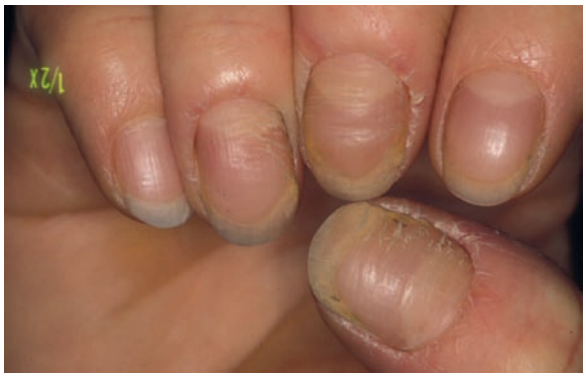


Fig. 11.13. Chronic paronychia – note the absence of the cuticle and Beau's lines.

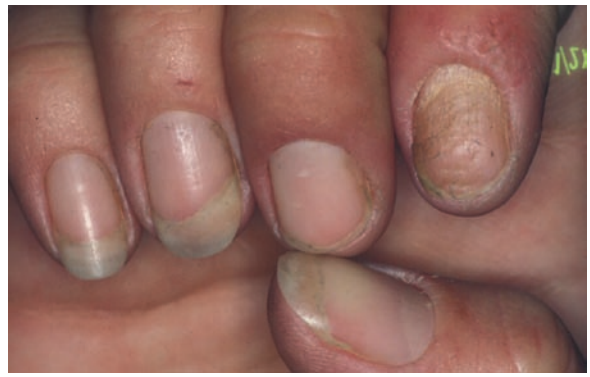


Fig. 11.14. Chronic paronychia due to contact allergy – only one digit may be affected.

Fig. 11.15. Chronic paronychia – note Beau's lines in the second fingernail and onychomadesis in the third one.

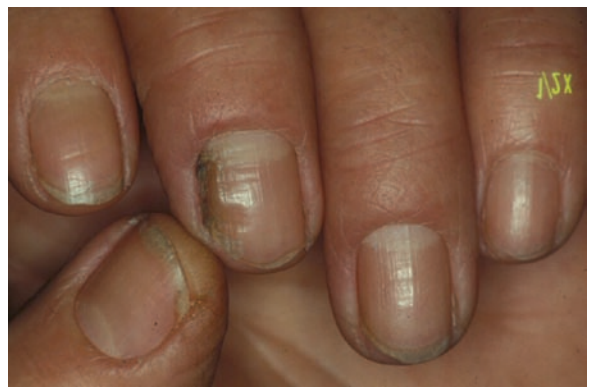


Fig. 11.16. *Pseudomonas* colonization is frequent in patients with chronic paronychia.

Fig. 11.17. *Pseudomonas* colonization is frequent in patients with chronic paronychia.

Fig. 11.18. *Pseudomonas* colonization is frequent in patients with chronic paronychia.

Fig. 11.19. Flare up of acute paronychia in a patient with chronic paronychia.

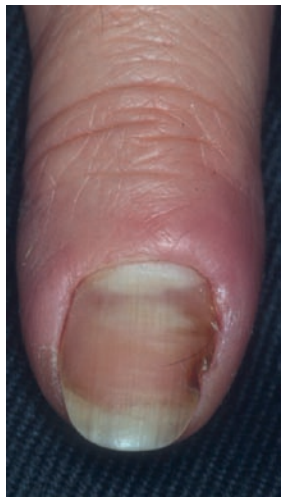
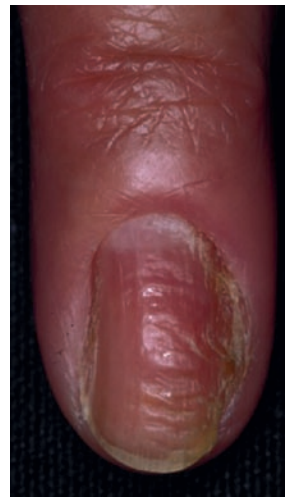


Fig. 11.20. Flare up of acute paronychia in a patient with chronic paronychia.



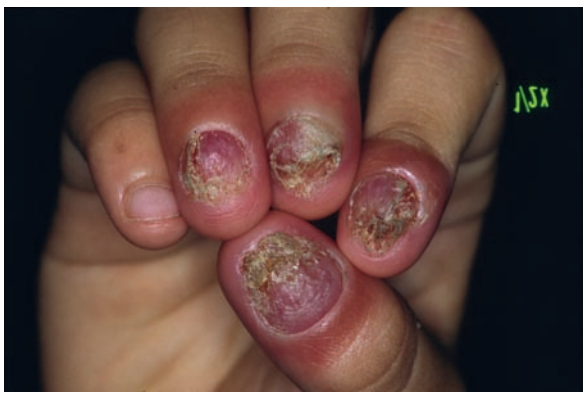


Fig. 11.21. Chronic paronychia in a patient with chronic muco cutaneous candidiasis (CMCC).

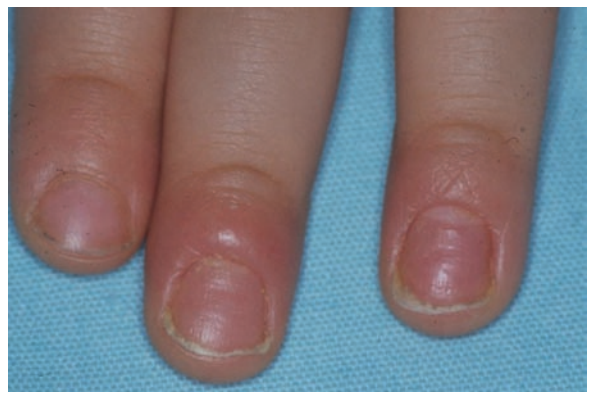


Fig. 11.22. Chronic paronychia in a child due to finger sucking.

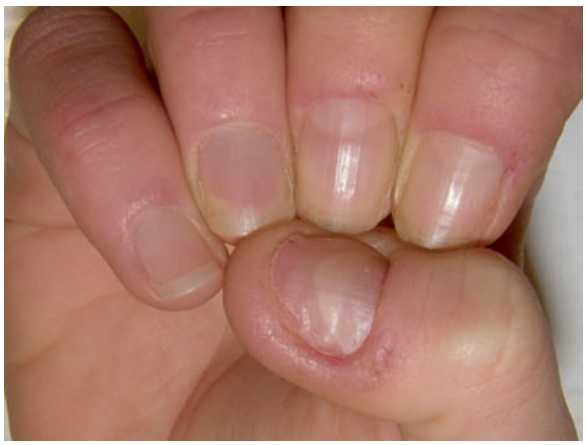


Fig. 11.23. Chronic paronychia in onychotillomania.

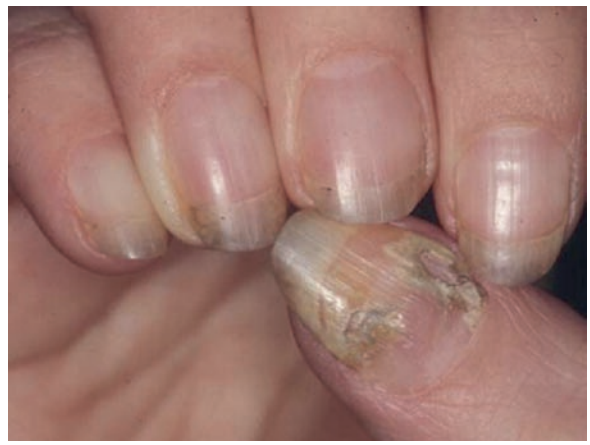


Fig. 11.24. *Candida* paronychia.

11.2 Pyogenic Granuloma

Pyogenic granuloma is a benign vascular tumor that frequently ulcerates and bleeds. Location on the nail apparatus is a common finding where its formation is most commonly due to trauma or ingrown toenail.

Multiple pyogenic granulomas may arise from proximal and lateral nail folds as a typical side effect of treatment with retinoids (isotretinoin >> acitretin), cyclosporin, as well as with the antiretroviral protease-inhibitor indinavir. Paronychia associated with pyogenic granulomas is also a common side effect of treatment with antiepidermal growth factor receptor antibodies (cetuximab/C225) and epidermal growth factor receptor inhibitors with kinase activity (gefatinib, imatinib, sorafenib, and sunitinib) used as chemotherapic agents.

The pathogenesis of pyogenic granuloma is still unknown. It has been supposed that drugs may activate angiogenic factors. Changes in nail appear from 1 to 3 months after starting treatment and fade with interruption of treatment. The reason why some fingers are affected when others are not is unknown.

Cast immobilization and reflex sympathetic dystrophy have also been reported as causing pyogenic granulomas with onychomadesis and a mild peripheral nerve injury might be the causative agent.

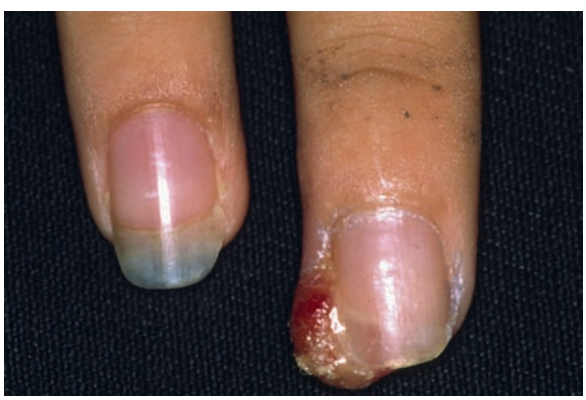


Fig. 11.25. Periungual pyogenic granuloma of the lateral nail fold and nail bed.

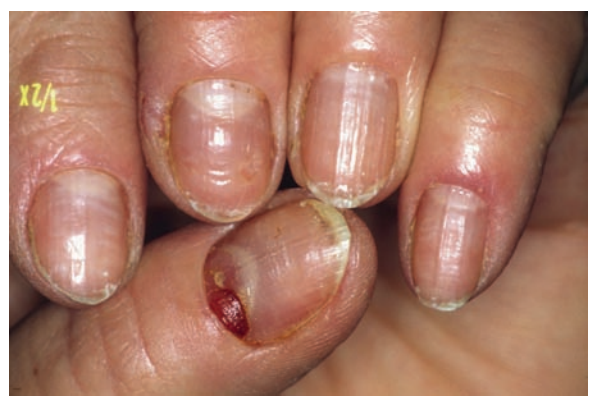


Fig. 11.26. Periungual pyogenic granuloma due to overzealous manicuring.

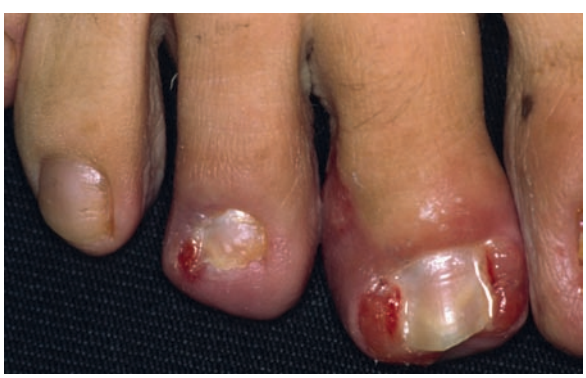


Fig. 11.27. Multiple pyogenic granulomas due to drugs.

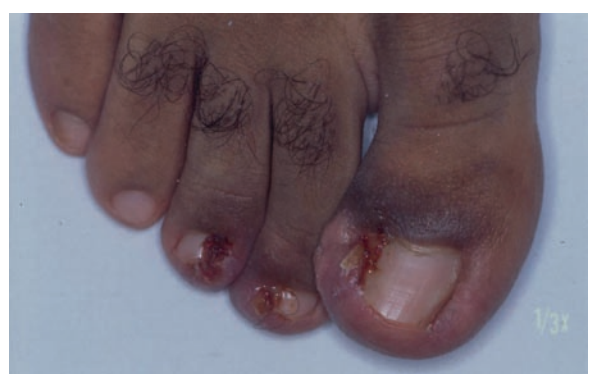


Fig. 11.28. Multiple pyogenic granulomas due to drugs.

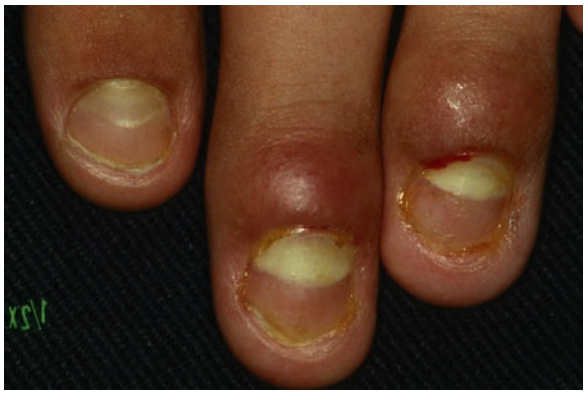


Fig. 11.29. Periungual pyogenic granuloma due to reflex sympathetic dystrophy.

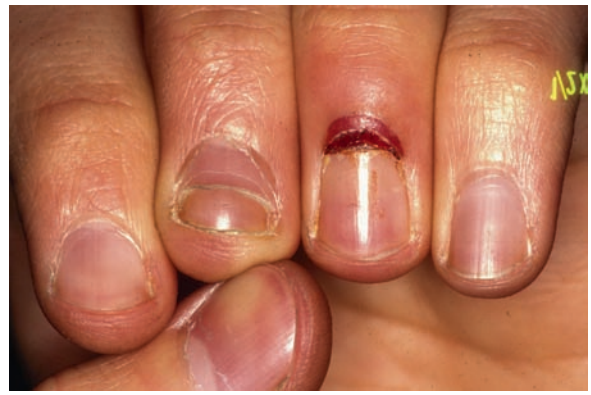


Fig. 11.30. Periungual pyogenic granuloma and onychomadesis after cast immobilization.

11.3 Capillary Alterations

Proximal nail fold capillaries can easily be examined using a portable ophthalmoscope or dermoscope.

Videodermoscopy allows a better visualization at higher magnifications. Examination of the capillaries is a very important tool for diagnosing connective tissue disorders. Normal capillaries appear as longitudinal parallel hairpins regularly distributed. In systemic sclerosis and dermatomyositis proximal nail fold capillaries are rarefied due to the presence of avascular areas. Enlarged capillary loops are present. In systemic lupus erythematosus capillary density is normal, but capillary loops are tortuous.

11.4 Cuticle Abnormalities

The cuticle corresponds to the horny layer on the proximal nail fold and it is firmly attached to the superficial nail plate preventing the separation of the nail plate from the nail folds. The integrity is essential for a normal nail growth. Cuticles can be accidentally removed during mechanical traumas or removed by purpose during manicuring. Cuticle removal is a major factor in the development of chronic paronychia. Absence of the cuticle is a feature in the yellow nail syndrome.

Thickened, hyperkeratotic and ragged cuticles are usually seen in:

- Onichotillomania
- Trachyonychia
- Connective tissue disorders
- Vasculitis

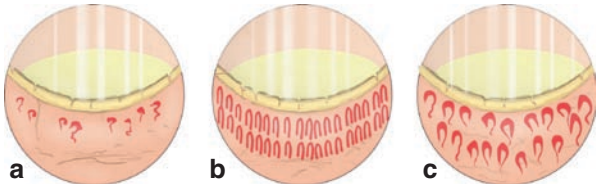


Fig. 11.31. Capillaroscopy aspects (**a**) scleroderma pattern (**b**) normal capillaries (**c**) lupus pattern.

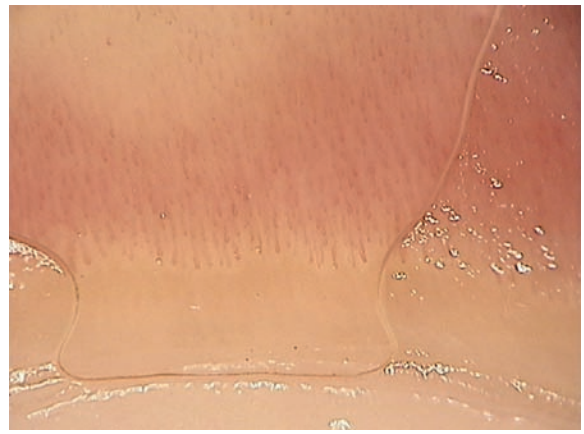


Fig. 11.32. Normal capillaries appearing as longitudinal parallel hairpins regularly distributed.

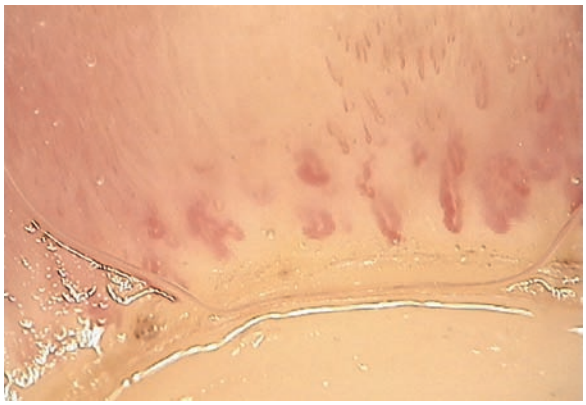


Fig. 11.33. Tortuous and enlarged proximal nail fold capillaries in a patient with dermatomyositis.

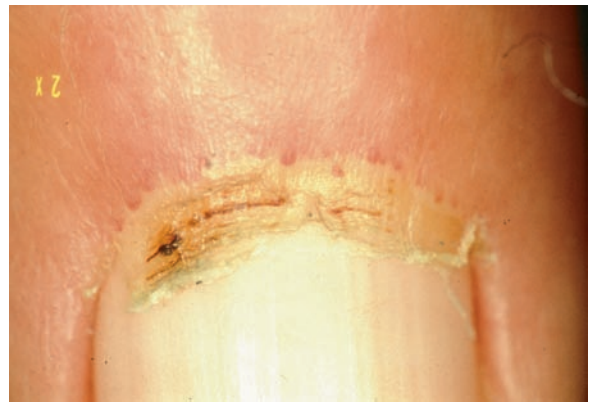


Fig. 11.34. Ragged cuticles and capillary enlargement in a patient with systemic sclerosis – note cuticle hemorrhages.

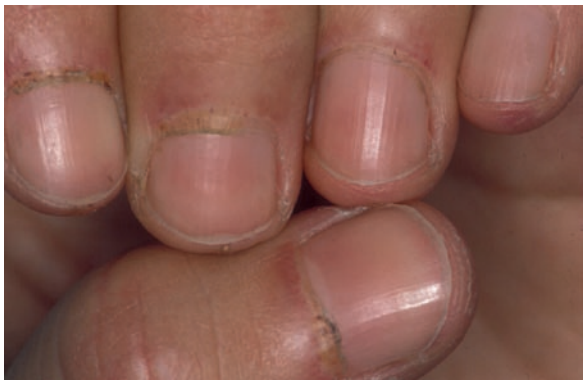


Fig. 11.35. Ragged cuticles in a patient with dermatomyositis.

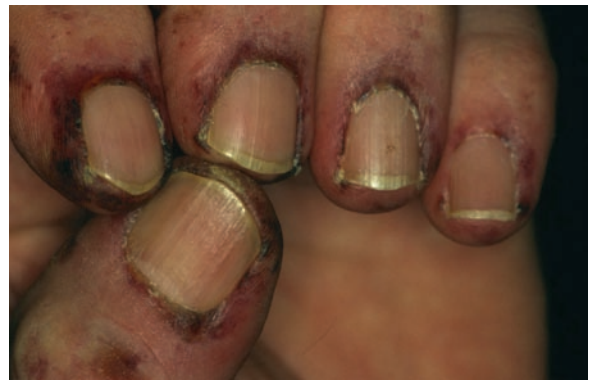


Fig. 11.36. Ragged cuticles and periungual ischemic lesions in a patient with dermatomyositis.

11.5 Retronychia

Retronychia describes a proximal nail ingrowth which leads to inflammation of the proximal nail fold with paronychia. The big toe is most frequently affected. The condition usually follows a trauma that results in nail matrix damage with onychomadesis not followed by detachment of the nail plate lateral edges. The newly formed nail can not grow properly and push backwards the detached nail plate which embeds in the proximal nail fold.

11.6 Dorsal Pterygium

Dorsal pterygium describes a distal extension of the proximal nail fold which adheres to the nail bed. The extension has a V-shaped appearance and often splits the nail plate in two portions. Pterygium occurs where the nail plate is absent due to nail matrix destruction and widens with progressive scarring of the matrix.

It can be seen in lichen planus, digital ischemia, bullous disorders, and trauma.

11.7 Periungual Erythema/Nodules/Papules

Periungual nodules and papules can be a consequence of granuloma due to foreign body or infection.

Periungual erythema may be a consequence of:

- Alterations of the proximal nail fold capillaries
- Inflammatory disorders of the proximal nail fold

In connective tissues disorders (e.g., LES and Dermatomyositis), periungual erythema due to capillaries dilatation is typical. Psoriasis and eczema may affect the periungual tissues causing erythema and swelling of the proximal nail fold in association with nail abnormalities; acute paronychia may occur in patients with nail psoriasis treated with retinoids.

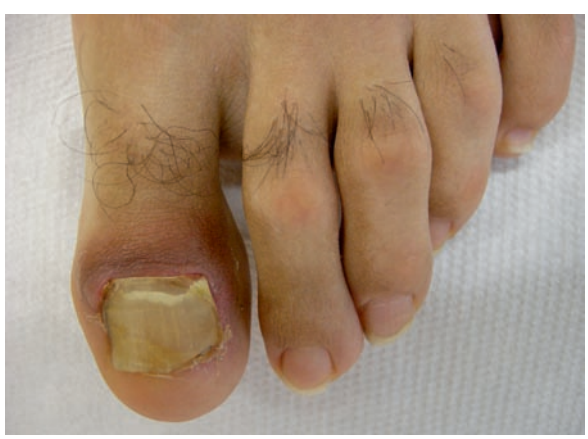


Fig. 11.37. Retronychia (proximal ingrowing) before the nail plate removal.

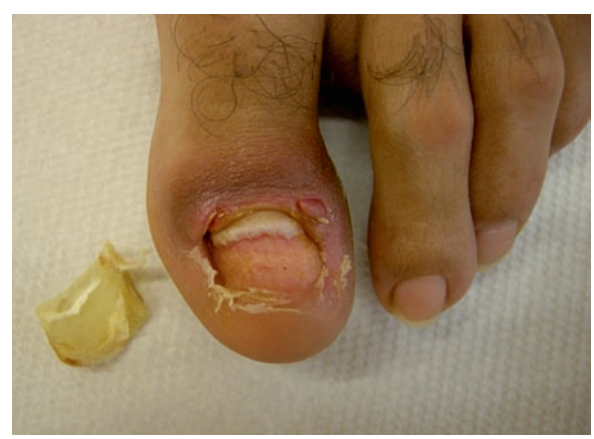


Fig. 11.38. Retronychia (proximal ingrowing) after the nail plate removal.

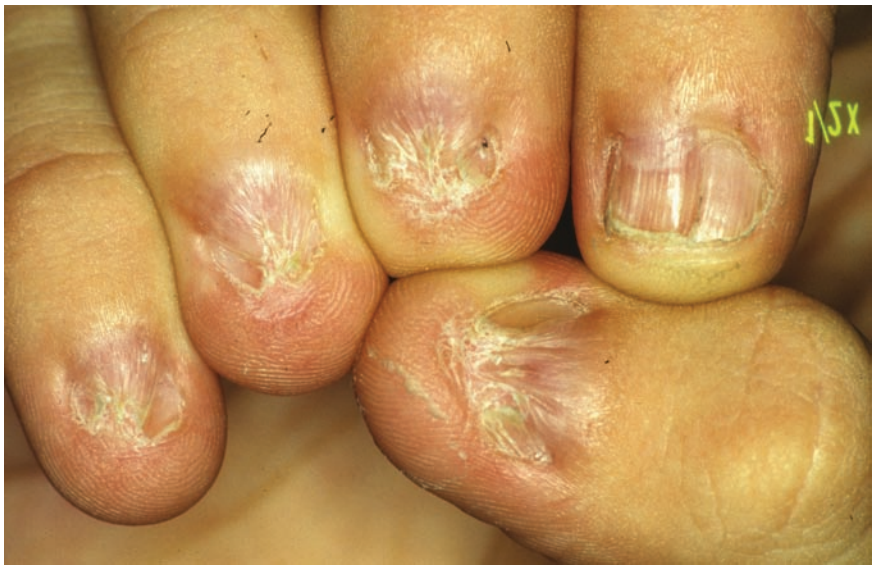


Fig. 11.39. Dorsal pterygium in a patient with nail lichen planus.

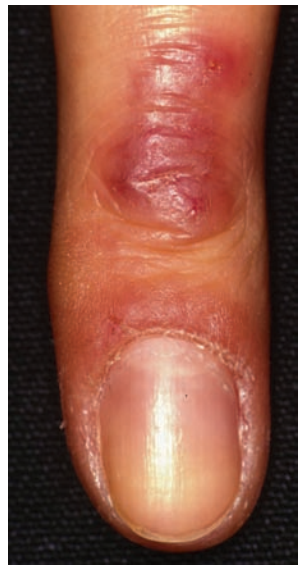


Fig. 11.40. Periungual nodule due to *Mycobacterium marinum.*

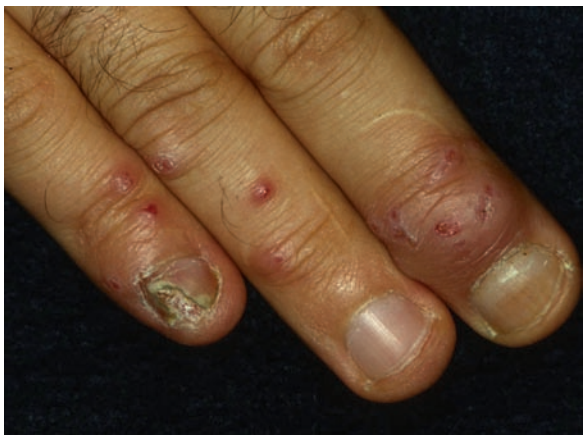


Fig. 11.41. Sea urchin granulomas.

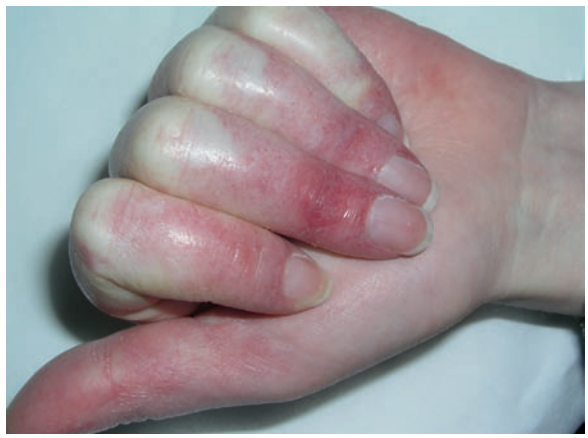


Fig. 11.42. Periungual erythema and desquamation in a patient with lupus erythematosus.

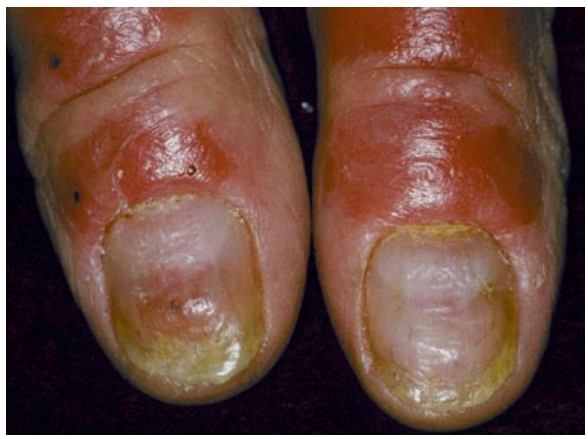


Fig. 11.43. Erythema and swelling of the proximal nail fold in association with nail abnormalities in a patient with psoriasis

12 Hyponychium Abnormalities

12.1 Scaling

Scaling of the hyponychium is commonly observed in inflammatory disorders such as:

- Hallopeau's acrodermatitis
- Contact dermatitis
- Parakeratosis pustolosa

Scaling of the hyponychium is also characteristic of dermatophyte infections and may be a clue for the diagnosis of onychomycosis.

12.2 Pustules

Pustules of the hyponychium may be infective or not. Infections include herpes simplex virus, hand-foot-mouth disease, blistering distal dactylitis, impetigo, and acute bacterial paronychia. Sterile pustules can be seen in thumb sucking, pustular psoriasis and parakeratosis pustolosa.

12.3 Ischemic lesions

Hyponychium atrophy/ulceration may be consequences of impaired peripheral arterial vascularization (vasospasm, occlusion).

12.4 Ventral Pterygium

Pterygium inversus unguis consists of the obliteration of the normal distal separation between the ventral nail plate and the hyponychium. This nail sign is typical of scleroderma.

12.5 Ingrown

Lateral nail ingrown is the final result of several factors:

(a) Lateral deviation of the nail plate in respect to the longitudinal axis of the digit (congenital malalignment of the big toenail – an autosomal dominant condition)
(b) Improper cutting or manual removal of the distal edges of the nail plate
(c) Hyperhydrosis of the feet, which facilitates nail plate softening and breaking
(d) Congenital hypertrophy of the lateral nail folds

Penetration of the lateral edges of the nail plate into the nail folds and the breakage of the nail plate with formation of sharp spicules produce pain and periungual inflammation (stage I); with time, the injured dermis of the nail fold gives rise to a granulation tissue (pyogenic granuloma) (stage II); if the condition lasts longer, the

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granulation tissue induces the growth of a newly formed skin epithelium that partially covers the nail plate (stage III).

Distal nail ingrown can be a consequence of:

(a) Congenital hypertrophy of the anterior nail fold
(b) Overgrowth of distal soft tissue after nail loss

The hypertrophic distal nail fold appears as an asymptomatic lip that partially covers the nail plate. This abnormal growth of soft tissues may deviate the nail laterally and/or may cause nail embedding with acute inflammatory reaction and pain.

The congenital form usually appears at birth or shortly thereafter and is frequently bilateral, regressing spontaneously in a few years.

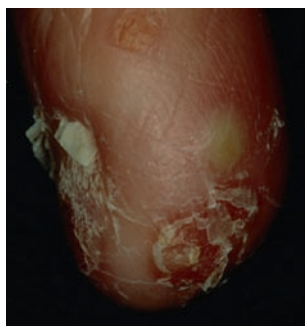

Fig. 12.1. Scaling and pustules in a patient with pustular psoriasis.

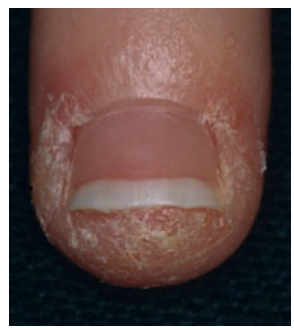

Fig. 12.2. Scaling in a patient with parakeratosis pustolosa.

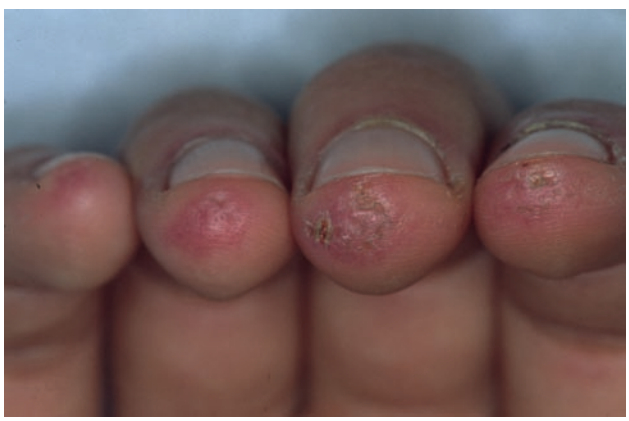

Fig. 12.3. Ischemic lesions in a patient with dermatomyositis.

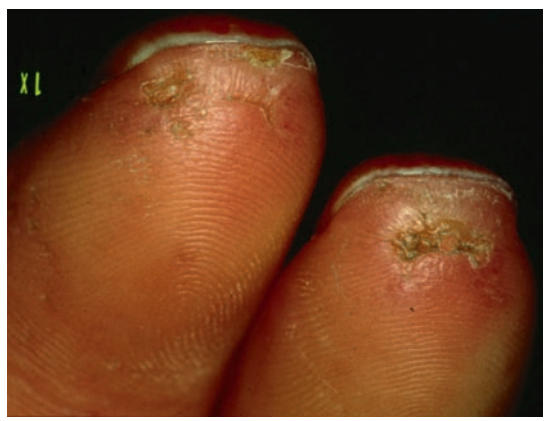

Fig. 12.4. Ventral pterygium in a patient with systemic sclerosis.

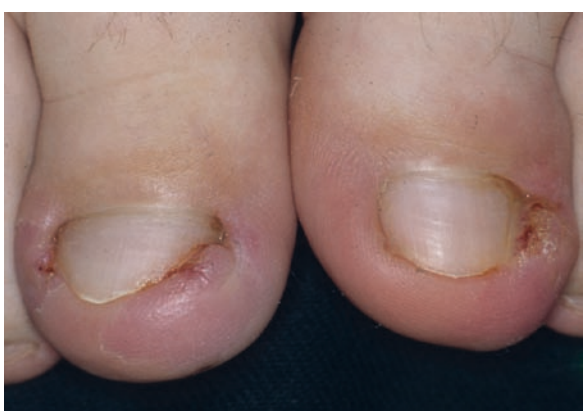

Fig. 12.5. Ingrowing, anterior and lateral.

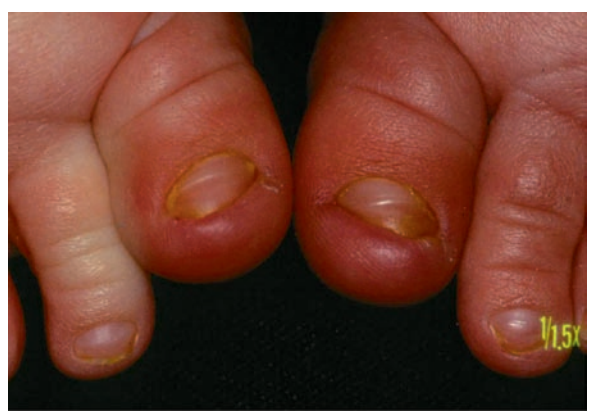

Fig. 12.6. Ingrowing, anterior and lateral.

13 Psoriasis

- Nails involved in up to 50% of patients with psoriasis
- May be the only manifestation of the disease
- Psoriatic arthropathy is often associated
- Chronic course
- Usually several nails affected
- Symptoms differ from patient to patient and from nail to nail

13.1 Clues for Diagnosis

- Irregular pitting
- Salmon patches of the nail bed
- Onycholysis with an erythematous border

Nail psoriasis may also produce non-diagnostic signs that can be also seen in other conditions. These include splinter hemorrhages, subungual hyperkeratosis, nail plate thickening and crumbling, and paronychia.

13.2 Differential Diagnosis

Onychomycosis: subungual hyperkeratosis is usually the only symptom of toenail psoriasis, where differential diagnosis with onychomycosis can be impossible without mycology.

Idiopathic and traumatic onycholysis: in this condition onycholysis is not surrounded by erythema and subungual hyperkeratosis is absent.

Alopecia areata of the nails: pits are small and geometrically distributed.

13.3 Treatment

- There is no cure for psoriasis. The goal is to try to satisfactorily improve the disorder with as few side effects as possible. It may go into remission.
- The Koebner phenomenon and psoriasis are closely related. It is the dermatologists' belief that physical trauma as well as contactants (allergens and irritants) plays a strong role in psoriatic nail diathesis.
- There must be a strict contact irritant/allergen/moisture avoidance regimen.
- Wear light cotton gloves under vinyl gloves for all wet work. (Buy at a paint store or Allerderm© gloves). Wear heavy cotton gloves for all dry work.
- Nail contact with raw fruits (especially citrus) and other raw foods, as well as hydrocarbons, etc. is especially harmful.

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- Use mild soaps like Dove© sensitive skin soap.
- Use no nail cosmetics or artificial nails. Nail polish remover whether acetone or acetate may be especially harmful.
- Use no cuticle scissors. Do not push the cuticles (once reformed) back with another fingernail, metal file, or orange stick. It is best never to push the cuticles back (once formed) in a person prone to psoriasis. If it is going to be done anyway, use only a wet washcloth on the end of the finger at the end of a shower or bath. Don't pick at the nail plate or cuticles.
- For toenail psoriasis: no narrow toed shoes, no higher heels, shoes must fit well with sufficient support.
- Keep nails cut short.

1. *Topical treatment* of psoriasis does not consistently work. When onycholysis is present, cutting the detached nail is mandatory to allow drug penetration into the nail bed. In this case, a topical combination containing calcipotriol and betamethasone may be tried twice a day. Possible alternatives include topical containing vitamin D3 analogs or tazarotene.
2. *Intralesional steroids:* triamcinolone acetonide 3–4 mg/ml strength injected with a 30 gauge needle once a month for several months may be helpful in patients with severe psoriasis involving a few nails. Injections can be done in the proximal nail fold and/or in the nail bed, depending on the nail symptoms.
3. *Systemic treatments*: retinoids, methotrexate, cyclosporin and the biologics are often helpful for nail psoriasis but are only rarely used solely for nails. Acitretin at low dosages 0.3 mg/kg/d for 4–6 months is the best choice due to its good tolerability and safety.

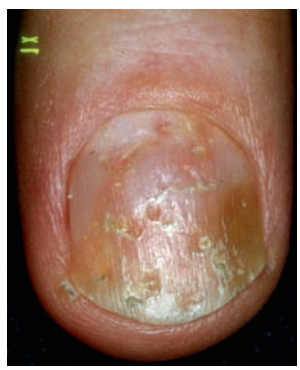

Fig. 13.1. Psoriatic pits – they are large, deep, and irregularly scattered within the nail plate.

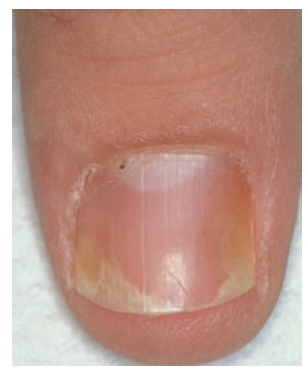

Fig. 13.2. Onycholysis surrounded by erythematous border.

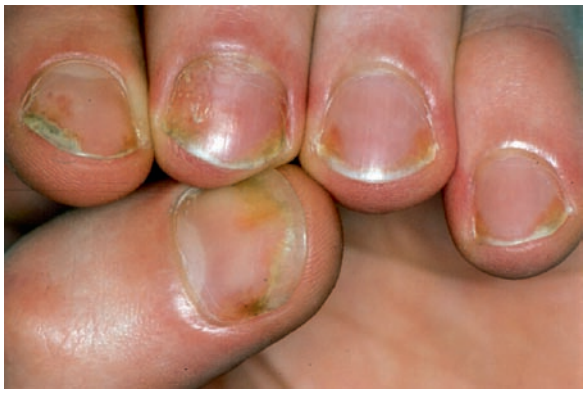

Fig. 13.3. Salmon patches of the nail bed: irregular areas of *yellow–orange* discoloration visible through the nail plate.

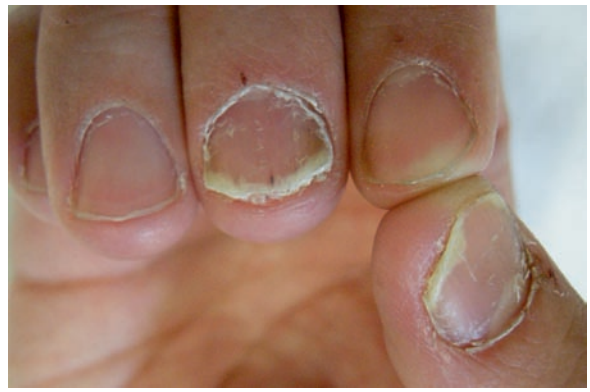

Fig. 13.4. Mild nail psoriasis producing onycholysis, subungual hyperkeratosis, splinter hemorrhages and nail plate surface abnormalities.

Fig. 13.5. Nail psoriasis producing symptoms that may benefit from topical treatment: the detached nail should be cut away before application of topicals.

Fig. 13.6. Nail psoriasis producing symptoms that may benefit from topical treatment: the detached nail should be cut away before application of topicals.

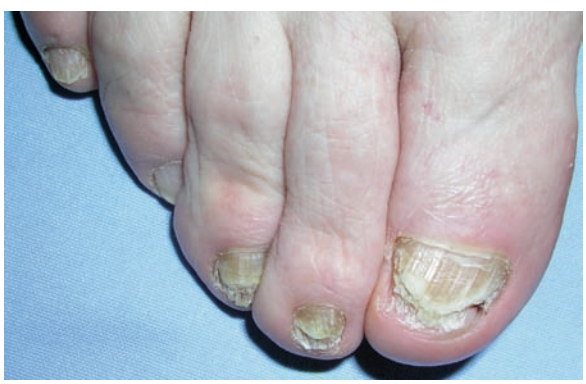

Fig. 13.7. Toenail psoriasis usually produces non specific signs such as onycholysis and subungual hyperkeratosis, mimicking onychomycosis.

Fig. 13.8. Nail plate crumbling – note reddening and swelling of the distal phalanges due to psoriatic arthropathy.

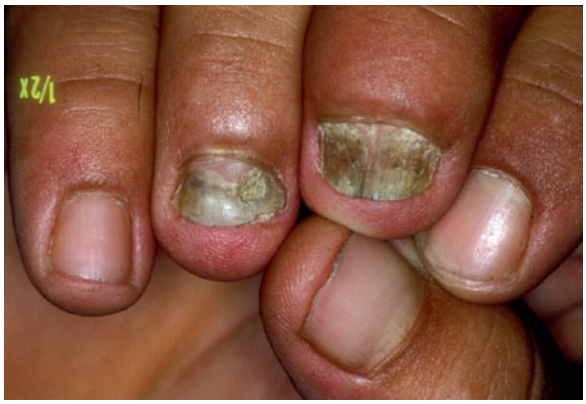

Fig. 13.9. Nail psoriasis producing severe involvement of a few digits: it is an indication for intralesional infiltration of steroids.

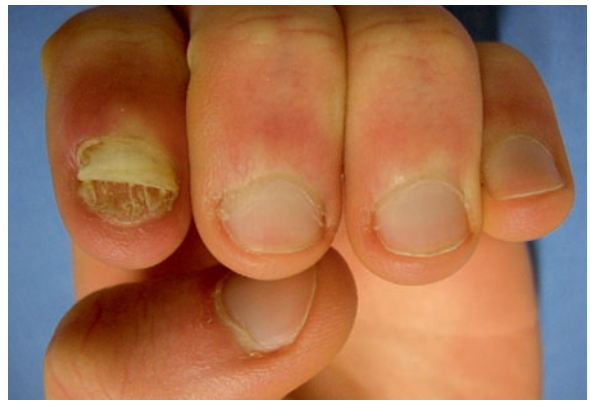

Fig. 13.10. Nail psoriasis producing severe involvement of one digits: it is an indication for intralesional infiltration of steroids.

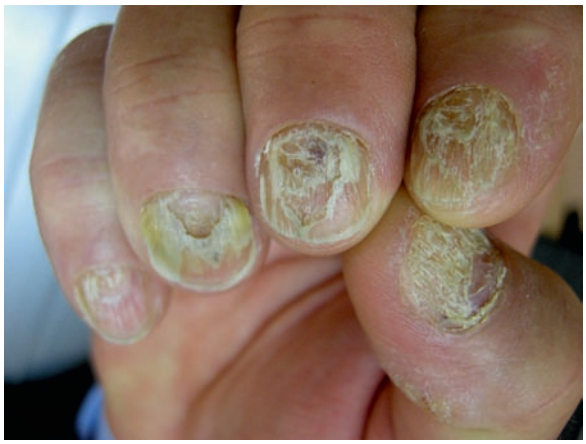

Fig. 13.11. Psoriasis producing diffuse nail plate crumbling of several nails. Systemic acitretin is the treatment of choice.

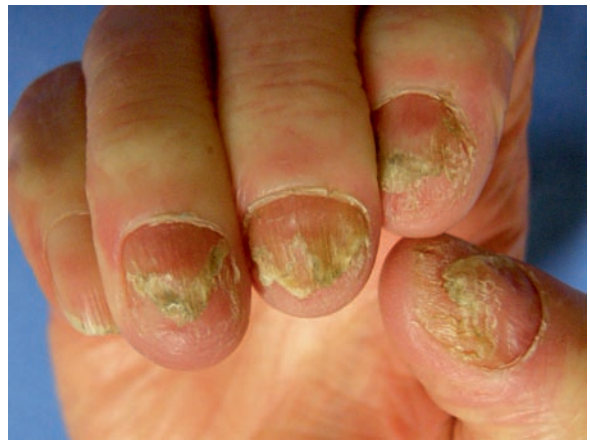

Fig. 13.12. Psoriasis producing diffuse nail plate crumbling of several nails. Systemic acitretin is the treatment of choice.

14 Pustular Psoriasis

- May involve several digits or be limited to 1 (Hallopeau's acrodermatitis)
- Palmo-plantar psoriasis may be present
- Arthropatic psoriasis frequently associated

14.1 Clues for Diagnosis

- Periungual/subungual pustules
- Chronic onycholysis and nail bed hyperkeratosis associated with history of relapsing episodes of acute painful inflammation with pustules around and under the nail plate
- Severe nail plate crumbling with periungual inflammation involving one or several digits

Most commonly, pustular psoriasis of the nails remain confined to the distal part of one digit, producing a chronic dermatitis. The history of acute episodes of inflammation with subungual pustules is diagnostic. Progression of the disease with involvement of several nails is rare.

14.2 Differential Diagnosis

- *Acute contact dermatitis and dyshidrotic eczema*: Lesions are vesicular and not pustular, and involve the palms and soles.
- *Bacterial or viral paronychia*: Bacterial paronychia is not relapsing; differential diagnosis with viral paronychia can require viral cultures.
- *Onychomycosis due to non-dermatophytes*: It may present with acute paronychia and pus discharge from the proximal nail fold, with the clinical features of a PSO or DSLO.

14.3 Treatment

1. *Topical treatment* includes combination of calcipotriol and betamethasone twice a day.
2. *Systemic treatments*: Acitretin at low dosages 0.3 mg/Kg/d for 4–6 months.

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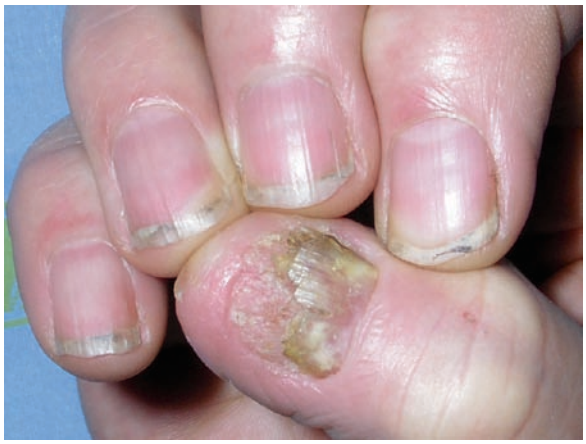

Fig. 14.1. Hallopeau's acrodermatitis – marked swelling of the digit with total onycholysis and pustules of the nail bed and distal pulp.

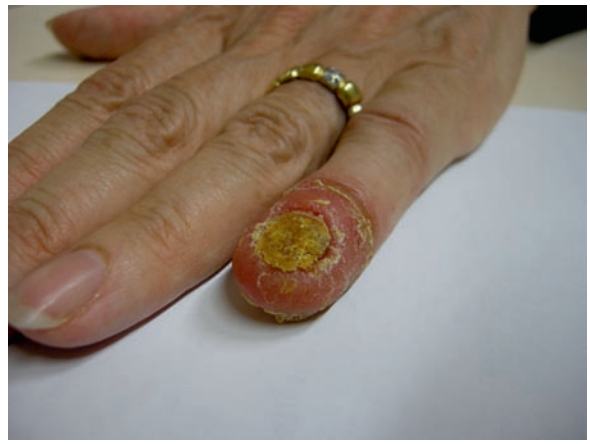

Fig. 14.2. Pustular psoriasis of the distal digit: acute paronychia with pustules and crusts; the nail plate is substituted by a thick crust.

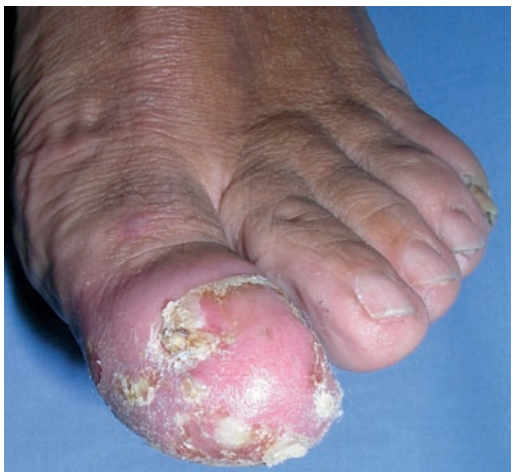

Fig. 14.3. Pustular psoriasis of the big toenail.

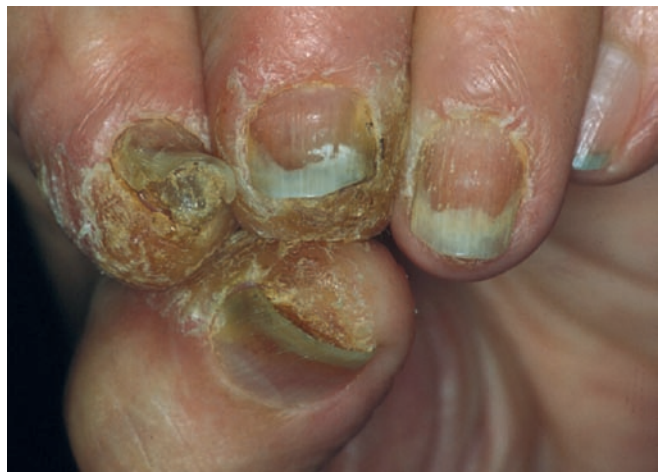

Fig. 14.4. Hallopeau's acrodermatitis: recurrent episodes of subungual pustules lead to chronic onycholysis and nail bed hyperkeratosis.

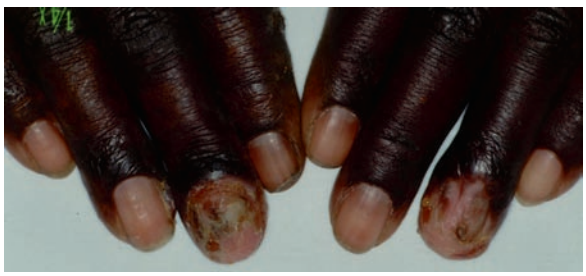

Fig. 14.5. Pustular psoriasis of several nails: inflammation and crusts of the nail bed, hyponychium and periungual tissues, associated with onycholysis.

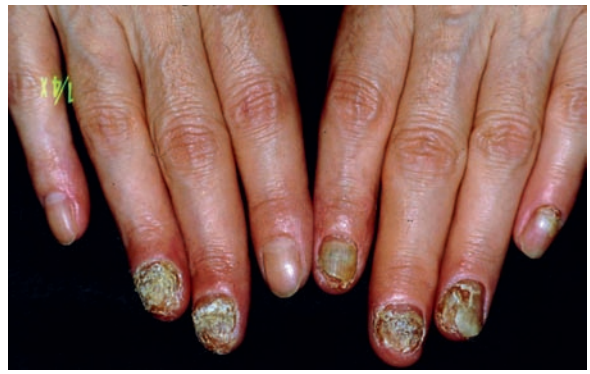

Fig. 14.6. Pustular psoriasis of several nails: inflammation and crusts of the nail bed, hyponychium and periungual tissues, associated with onycholysis.

15 Nail Lichen Planus

- Not rarely develops in absence of skin or mucous membrane involvement
- May lead to nail scarring
- Rare, and usually of mild severity in children
- Different clinical varieties

15.1 Clues for Diagnosis

- Dorsal pterygium
- Nail thinning with longitudinal fissuring and distal splitting

"Typical" features of nail lichen planus are longitudinal ridging and fissuring of the nail plate with thinning and distal splitting. They are a sign of matrix involvement and mainly seen in the fingernails. The lunula may be irregularly red ("mottled lunula") as a sign of inflammation.

Dorsal pterygium is the result of an irreversible damage to the nail matrix with the arrest of nail plate production that allows the proximal nail fold to become attached to the nail bed.

Trachyonichia may be a result of nail matrix lichen planus. The clinical features are identical to those of trachyonychia due to alopecia areata and psoriasis. The course is always benign.

Lichen planus of the nail bed presents with aspecific nail signs, such as onycholysis and subungual hyperkeratosis that in the fingernails are usually associated with typical signs of nail matrix involvement. In the toenails, massive nail thickening is common and may mimic the yellow nail syndrome.

A rare variety of nail lichen planus is idiopathic atrophy of the nails, where a severe and rapid progression of nail matrix disease leads to diffuse nail atrophy and pterygium of several nails. Also rare is erosive nail lichen planus, were one or several digits develop acute painful erosions that heal with scarring.

15.2 Differential Diagnosis

- Typical nail lichen planus producing mild symptoms should be distinguished from nail thinning and ridging due to nail fragility, and from nail ridging associated with ageing.
- Dorsal pterygium may have traumatic causes; in these cases it is not associated with other signs of nail lichen planus.
- Erosive nail lichen planus should be differentiated from bullous diseases that cause nail bed erosions: pathology is the only tool that allows it.

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15.3 Treatment

- Keep the nails short
- Treat any secondary infection
- Strict irritant avoidance regimen
- The Koebner phenomenon is important

Treatment is mandatory in "typical" lichen planus, to avoid matrix destruction with formation of dorsal pterygium. Systemic steroids (intramuscular triamcinolone acetonide 0.5 mg/kg/month) for 6–8 months are the gold standard.

Idiopathic atrophy of the nail does not require any treatment since nail scarring is not reversible.

Trachyonychia due to nail lichen planus is always benign and treatment is not necessary.

Fig. 15.1. Lichen planus of the nails: longitudinal ridging and fissuring with distal nail plate splitting. Severity of symptoms varies in the different patients.

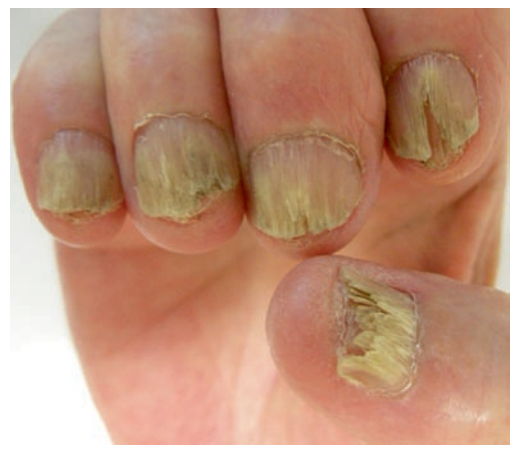

Fig. 15.2. Lichen planus of the nail bed produces subungual hyperkeratosis and onycholysis; longitudinal fissuring due to matrix involvement is associated.

Fig. 15.3. Trachyonychia due to nail lichen planus: the clinical features are indistinguishable from those due to other diseases.

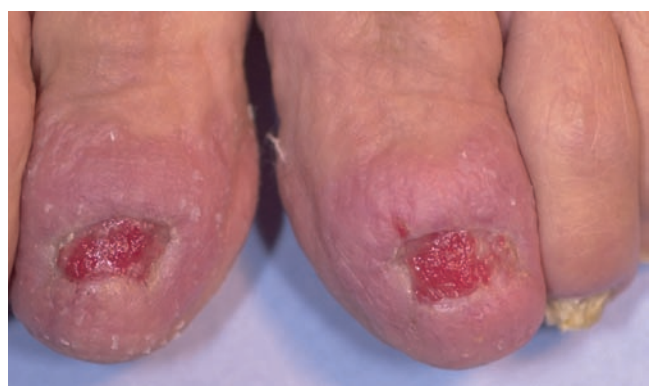

Fig. 15.4. Erosive variant of nail lichen planus: erosions of the nail bed with absence of the nail plate. Nail bed scarring is a common sequela after treatment.

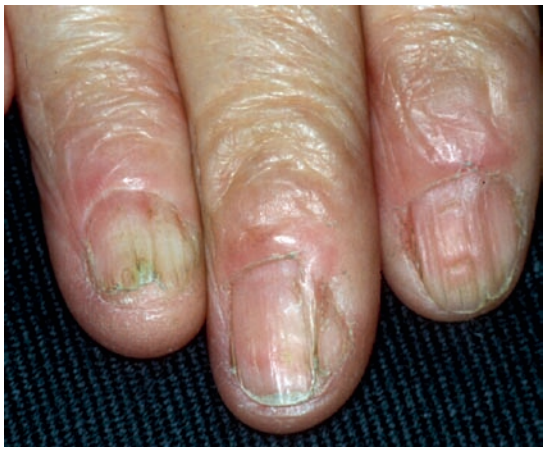

Fig. 15.5. Dorsal pterygium due to nail matrix lichen planus.

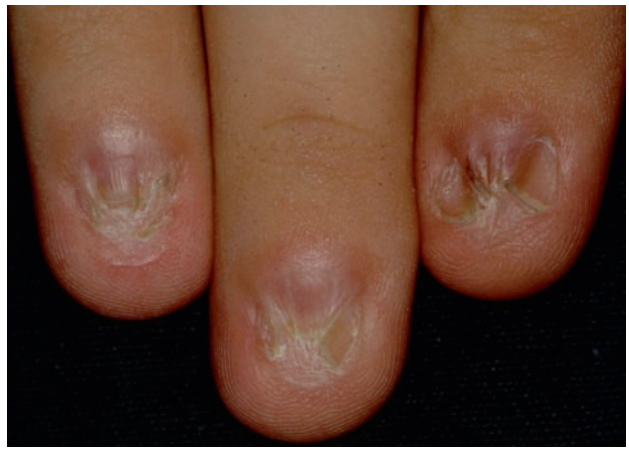

Fig. 15.6. Idiopathic atrophy of the nails: dorsal pterygium of several nails and nail atrophy.

16 Onychomycosis

- Onychomycosis is the most common nail disease
- The prevalence increases with age
- Dermatophytes are responsible for about 85% of cases, non-dermatophyte molds account for 15% of cases and onychomycosis due to yeasts is rare
- Affects more frequently toenails than fingernails
- Predisposing factors include age, diabetes, HIV infection, peripheral vascular impairment and peripheral neuropathies, podiatric abnormalities, sports activities, and traumatic nail disorders
- Clinical diagnosis of onychomycosis always requires laboratory confirmation

Different clinical patterns of infection depend on the way by which fungi colonize the nails.

Type of nail invasion depends on responsible fungus and host susceptibility.

16.1 Distolateral Subungual Onychomycosis (DLSO)

Fungi reach the nail unit through the hyponychium and invade the undersurface of the nail plate spreading proximally. The skin of the palms and soles is frequently involved, being the primary site of infection. This is the most common type of onychomycosis, most frequently due to *T. rubrum*.

Clues for Diagnosis

- Involvement of one/both great toenails
- Distal subungual hyperkeratosis and onycholysis yellow-white in color.
- Presence of yellow streaks along the lateral margin of the nail and/or presence of yellow onycholytic areas in the central portion of the nail (dermathophytoma)
- Tinea pedis plantaris (mocassin-type) usually associated

Differential diagnosis includes traumatic onycholysis (usually symmetrical, subungual hyperkeratosis is absent) and nail psoriasis (several/all toenails involved, diffuse hyperkeratosis): in both cases mycology is always necessary.

16.2 Proximal Subungual Onychomycosis (PSO)

Fungi reach the nail unit through the undersurface of the proximal nail fold and are typically located in the ventral portion of the nail plate. This type of onychomycosis is most frequently caused by molds, where it is typically associated with marked periungual inflammation, but it may also be due to *T. rubrum*, especially in immunocompromized people.

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Clues for Diagnosis

- Involvement of one toenail
- Area of leukonychia in the proximal portion of the nail plate
- Marked periungual inflammation with pus discharge suggests mold onychomycosis

Differential diagnosis includes acute bacterial paronychia, where the nail does not show proximal leukonychia.

16.3 Superficial White Onychomycosis (WSO)

Fungi colonize the dorsal surface of the nail plate. The "classical" form of WSO is usually caused by *T. interdigitale; Fusarium spp.* and other molds produce a "deep" variety of WSO characterized by a larger and deeper nail plate invasion. WSO can affect the toenails where typically involves one or more nails, most commonly the first, second, and third.

Clues for Diagnosis

- Involvement of the toenails
- Presence of one or more small white opaque patches that can be easily scraped off and may coalesce gradually covering the whole nail plate
- Tinea pedis interdigitale is frequently associated

Differential diagnosis includes transverse toenail leukonychia due to trauma (the shape of the pigmentation is different, the dorsal nail plate is normal), and nail plate surface degranulation due to abuse of nail varnishes (the white spots are smaller and more superficial).

16.4 Total Onychomycosis

It results from all types of nail invasion, especially from long-standing DSO. The nail plate is diffusely thickened, friable, and yellow in color.

16.5 Treatment

Treatment depends on the clinical type of the onychomycosis, the number of affected nails, and the severity of nail involvement.

- *Topical treatment:* Nail lacquers (containing Ciclopirox or Amorolfine) are effective as monotherapy in the treatment of WSO and of DLSO limited to the distal nail of a few digits. Treatment should be prolonged for 6–12 months

- *Systemic treatment:* DLSO extending to the proximal nail and PSO due to dermatophytes always require a systemic treatment. Systemic treatment with terbinafine (250 mg daily or as "pulse therapy" at the dosage of 500 mg daily for 1 week a month) or itraconazole (administered in pulse therapy at the dosage of 400 mg daily for 1 week a month) produces mycological cure in more than 90% of fingernail infections and in about 80% of toenail infections. These success rates can be increased by associating a topical treatment with a nail lacquer. Treatment duration is 6 weeks for fingernails and 3–4 months for toenails
- *Chemical or surgical nail avulsion* can be used in association with oral antifungals in order to remove localized fungal masses and in onychomycosis due to non-dermatophytes, where topical treatment combined with periodic nail avulsion is the best choice

Mycological cure should always be evaluated at the end of treatment.

Recurrences and reinfection are not uncommon (up to 20% of cured patients). They may be prevented by the regular application of nail lacquers on the previously affected nails.

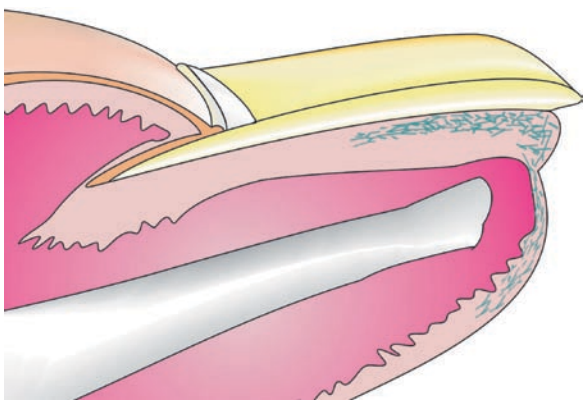

Fig. 16.1. Schematic drawing showing the way by which fungi colonize the nail in DLSO.

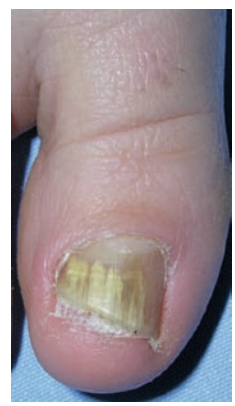

Fig. 16.2. Clinical presentation of DLSO – yellow onycholysis and subungual hyperkeratosis appearing as longitudinal streaks under the nail.

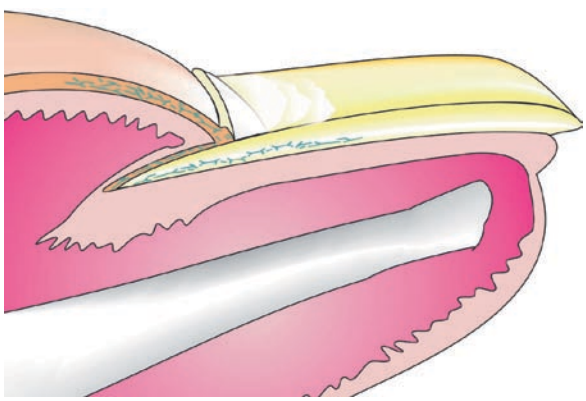

Fig. 16.3. Schematic drawing showing the way by which fungi colonize the nail in PSO.

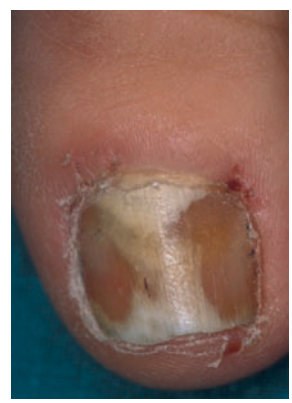

Fig. 16.4. Clinical presentation of PSO – proximal leukonychia associated with periungual inflammation is typical of a non-dermatophyte mold infection.

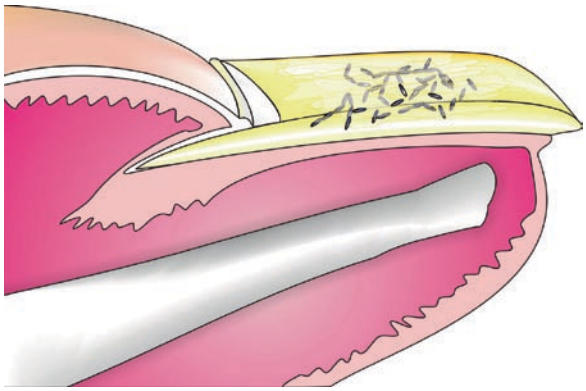

Fig. 16.5. Schematic drawing showing the way by which fungi colonize the nail in WSO.

Fig. 16.6. WSO due to dermatophytes: small white areas of superficial nail invasion.

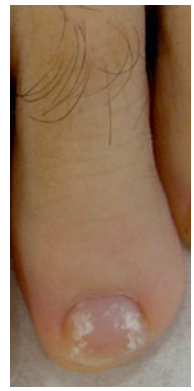

Table 16.1. Fungi responsible for onychomycosis

	Common	Uncommon
Dermatophytes	*Trichophyton rubrum* *Trichophyton interdigitale*	*Epidermophyton floccosum* *Trichophyton mentagrophytes* *Microsporum canis* *Trichophyton schoenleinii* *Trichophyton soudanense* *Trichophyton tonsurans* *Trichophyton violaceum*
Non-dermatophyte molds	*Scopulariopsis brevicaulis* *Fusarium spp*	*Acremonium spp* *Aspergillus spp* *Onichocola canadensis* *Scytalidium spp*
Yeasts	*Candida albicans*	*Candida parapsilosis*

17 Drug-Induced Nail Abnormalities

- Not common
- Several-all nails involved
- Reversible after drug discontinuation
- Cancer chemotherapeutic agents are the most frequent causes

17.1 Beau's Lines/Onychomadesis

Drugs most frequently responsible include cancer chemotherapeutic agents (taxanes), retinoids and radiation therapy. Drug-induced Beau's lines and onychomadesis are usually dose-related and reproducible with repetitive cycles of drug-intake. There is no preventive measure and they require no treatment, because they migrate distally as the nail grows.

17.2 True Transverse Leukonychia

This sign has been reported during treatment with chemotherapeutic agents, especially adriamycin, doxorubicin, cyclophosphamide, and vincristine. Other responsible drugs are cyclosporine A, fluorine, penicillamine, pilocarpine, retinoids, steroids, and sulphonamides. Typically, after acute arsenic and thallium poisoning the nails show multiple bands of transverse leukonychia distributed along the whole width of the nail plate (Mee's lines).

17.3 Onycholysis/Photo-Onycholysis

These nail symptoms result from acute toxicity to the nail bed epithelium with loss of the nail plate/nail bed adhesion. Sometimes an haemorrhagic bulla can be present under the nail plate.

In photo-onycholysis the detachment is caused by a photo-mediated toxic or allergic effect of the drug. Typically the thumbs are spared. Both onycholysis and photo-onycholysis may be preceded or accompanied by pain.

Onycholysis is frequent in patients treated with the taxane – chemotherapic agents, such as docetaxel and paclitaxel where it may be complicated by subungual abscesses. Photo-onycholysis is more rarely observed and it is almost exclusive of patients undergoing PUVA therapy (Psoralens plus UVA radiation). In this case development of photo-onycholysis can be prevented by topical application of coloured nail varnishes. It can occur also with the intake of captopril, chlorpromazine, tetracyclines (doxycycline), thiazide diuretics, oral contraceptives, and fluoroquinolones.

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Onycholysis and photo-onycholysis often regress spontaneously, even without interrupting the drug intake, but in some cases they may persist after the drug withdrawal. Soaking the affected digits in topical antiseptic solutions helps preventing microbial colonization and help reducing pain in taxane-induces onycholysis.

17.4 Acute Paronychia

In drug-induced acute paronychia the proximal nail fold appears erythematous, inflamed and painful and several nails are usually involved soon after the drug intake. Exudative severe paronychia may be observed in patients taking methotrexate. Paronychia due to VEGF and EGF inhibitors, antiretrovirals and retinoids is also common usually improves reducing the dosage of the drug. Topical steroids and mupirocine can be helpful in reducing inflammation and microbial colonization. Paronychia resolves with drug interruption and is frequently followed by onychomadesis. Rechallange is often positive.

17.5 Pyogenic Granulomas

Multiple pyogenic granulomas may arise from proximal and lateral nail folds as a typical side effect of treatment with retinoids, as well as with the antiretroviral protease-inhibitor indinavir.

One or several nails show granulation tissue with formation of painful bleeding nodules.

The pathogenesis is still unknown, but it has been supposed that the drug may activate angiogenic factors. The occurrence of the same side effects with different drugs, i.e., retinoids and indinavir, is probably due to the fact that the HIV-1 protease catalytic site and CRABP (retinoid cellular receptor) have structural analogies. Paronychia associated with pyogenic granulomas has recently reported with cetuximab / C225 (antiepidermal growth factor receptor antibody) and gefitinib (EGFR tyrosine kinase inhibitor) used as chemotherapic agents. Nail changes appear from 1 to 3 months after starting treatment. The nail abnormalities fade with interruption of treatment. Topical mupirocin and steroids may be helpful in improving the nail symptoms. Topical alitretinoin (Panretin or 9-*cis*-retinoic acid), a retinoid receptor panagonist, can also be used to treat pyogenic granuloma. Surgical excision of the granulomas is useless, since relapses are the rule.

17.6 Nail Blood Flow Alterations

1. Ischaemic changes

Drugs which impair the distal digital perfusion may damage the nail unit with ischaemic changes or necrosis. Raynaud's phenomenon is the first typical sign of digital ischaemia; the digit becomes cold and gradually develops gangrene if the

blood flow is not restored. These side effects may occur during systemic administration of β-blockers as well as after systemic or intralesional administration of bleomycin. Non cardioselective β-blockers, especially propanolol, provoke ischaemia because in response to the reduced cardiac output (induced by cardiac β1 blockade) there is no peripheral vasodilation, but vasoconstriction (induced by peripheral β2 blockade).

Bleomycin produces ischaemia in a considerable percentage of patients. The side effect usually develops several months after treatment and is due to collagen and glucosaminoglycan deposition with scleroderma-like manifestations. Drug withdrawal is not always associated with regression of the symptoms.

2. Subungual haemorrhages

Drugs which impair the nail bed blood vessels may damage the nail unit with splinter haemorrhages and/or subungual haematoma.

Splinter haemorrhages appear as multiple longitudinal purple to brown tiny streaks most often evident in the distal nail bed. These are almost exclusively seen in the fingernails. Haemathoma appears as a red to black discoloration of the nail that slowly migrates distally with nail growth.

They are possible side effects of antithrombotics and anticoagulants, including aspirin and warfarin. Cancer chemotherapeutic agents, especially the taxanes, and tetracyclines can also cause subungual haemorrhages and haemathoma due to thrombocytopenia and/or extravasation of blood. Recently we have described a case of splinter haemorrhages due to the nucleotide analogue ganciclovir.

Haemorrhages are dose-related and slowly disappear after drug withdrawal.

17.7 Nail Atrophy

Prolonged application of high potency topical steroids may produce digital atrophy with bone resorption. The affected digit shows a sharpened appearance, thinning, erythema, and scaling of the periungual skin.

17.8 Nail Pigmentation

1. Melanonychia

Several drugs may activate clusters of nail matrix melanocytes to produce melanin, giving rise to the appearance of a band of melanonychia, appearing as multiple light brown–black longitudinal or transverse bands. In drug-induced melanonychia, several nails are generally affected with multiple bands, but in some cases only one digit may be involved. When the band is isolated it is important to distinguish a band of longitudinal melanonychia due to drugs from a band of longitudinal melanonychia due to nail matrix nevi. In doubtful cases a nail matrix biopsy is mandatory.

A diffuse activation of nail matrix melanocytes produces a whole pigmentation of the nail plate.

Drug-induced melanonychia most commonly appears 3–8 weeks after drug-intake. Pigmentation is usually reversible within 6–8 weeks, but may persist for months after drug interruption. Rechallange is usually negative.

The pathogenesis of nail melanocytes activation is unclear and is independent of MSH and ACTH activity and ultraviolet light. Drugs responsible for melanonychia include AZT, cancer chemotherapeutic agents, hydroxyurea, and psoralens. Radiation therapy can also cause melanonychia.

2. Non melanic pigmentation

Nail pigmentation may be a consequence of storage within the nail plate by systemic drugs that are excreted via the nail unit. The pigmentation typically moves distally with nail growth.

Tetracyclines and gold salts often produce a yellow discoloration of the nail plate; clofazimine produces a dark-brown pigmentation. In other cases nail pigmentation may be a consequence of dermal deposition by systemic drugs. Pigmentation of the periungual tissues may be associated. The pigmentation does not move as the nail grows. It takes several months to decrease after interruption of therapy and may not disappear completely. Minocycline is rarely responsible for a blue–grey pigmentation of the nail plate, antimalarials for a blue–brown pigmentation. Several topical drugs, such as tar and anthralin, may deposit within the superficial layers of the nail plate producing an exogenous brown–black pigmentation. Exogenous pigmentation migrates distally with nail growth and has a proximal border parallel to the cuticle.

Fig. 17.1. Mee's lines in a patient treated with combined chemotherapy for breast cancer.

Fig. 17.2. Onycholysis and subungual haematomas in a patient taking metotrexate.

Fig. 17.3. Diffuse fingernail *orange* discoloration due to haemorrhagic soffusion of the nail bed and toenail onycholisis with subungual suppuration of the big toenail in patients treated with paclitaxel.

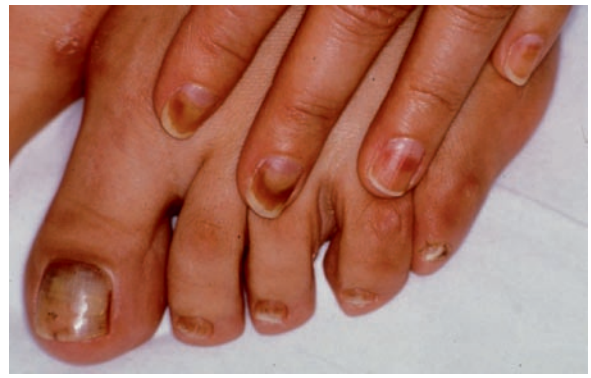

Fig. 17.4. Diffuse fingernail *orange* discoloration due to haemorrhagic soffusion of the nail bed and toenail onycholisis with subungual suppuration of the big toenail in patients treated with paclitaxel.

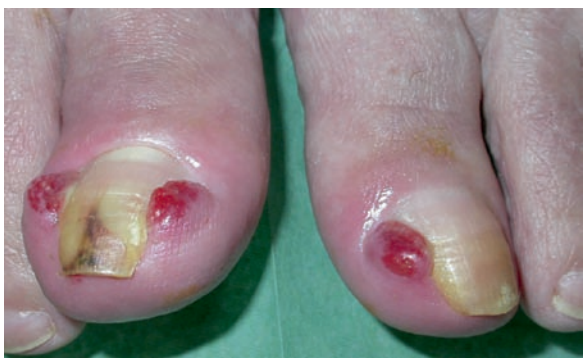

Fig. 17.5. Pyogenic granulomas arising from lateral nail folds in patients taking retinoids.

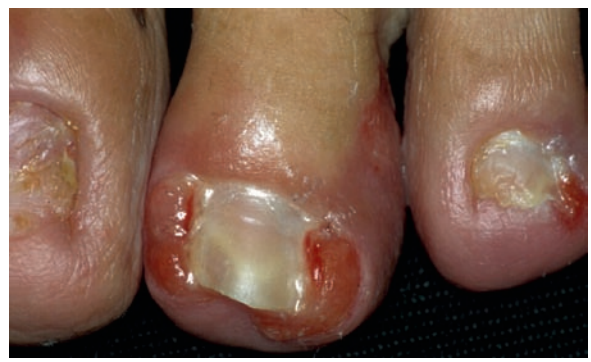

Fig. 17.6. Pyogenic granulomas arising from lateral nail folds in patients taking retinoids.

18 Diagnostic Tools

18.1 Biopsy

This is a very important diagnostic technique. It provides with not only a diagnosis, but also information regarding the etiology and prognosis of a disease. The pathologist should be familiar with nail disorders in order to perform a correct diagnosis. Nail biopsy is especially useful in psoriasis, lichen planus, longitudinal melanonychia and nail tumors. Local anesthesia is always required.

Different types of nail biopsies can be performed, depending on the affected nail area:

- Nail bed punch biopsy (maximum diameter of 3 mm)
- Nail matrix punch biopsy (maximum diameter of 3 mm)
- Longitudinal nail biopsy (the block of tissue will contain the proximal nail fold, matrix, bed, plate, and hyponychium)

18.2 Mycology

It is very important to confirm the clinical diagnosis of onychomycosis.

A negative mycological result does not rule out onychomycosis, since direct microscopy may be negative in up to 10% of cases and culture in up to 30% of cases. For this reason when clinical features strongly suggest onychomycosis, it may be advisable to perform microscopic examination and culture more than once if initial investigations are negative. On the other hand, isolation of fungus from nails does not necessarily indicate onychomycosis, since saprophytic fungi may colonize the nail.

Collection of Samples

Correct collection of samples is important to avoid false negative and to eliminate contaminants.

It is important to collect as much material as possible. Separate samples should be taken from fingernails and toenails. If desquamation of palms and/or soles is present, it should be better to take samples also from these sites.

Disto Lateral Subungual Onychomychosis: Samples (subungual scales) should be obtained from the nail bed and ventral nail plate, from the most proximal portion of the affected area that contains viable fungi. The distal nail plate should be, on the contrary, clipped away since it frequently contains contaminants.

Proximal Subungual Onychomychosis: Samples should be obtained from the intermediate nail plate. Scales are obtained scraping with a curette, after perforating the proximal nail plate with a punch.

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White Superficial Onychomychosis: Samples should be obtained from the superficial nail plate. The white patches can be easily scraped off with a curette.

Microscopic Examination

It is useful to identify the presence of fungal hyphae, but not able to differentiate between species.

After collection, the material is placed on a glass slide with a drop of 40% potassium hydroxide (KOH) solution and covered with a cover slip. The glass slide is then rapidly heated in a Bunsen flame that permits clearing of the keratin. To avoid artifacts it is important to push down gently the cover slip to flatten the scales. Identification of fungi is possible with a microscope with the diaphragm shut down, in order to have a dark background contrasting with the light-refracting hyphae. The glass slide is then screened at low power (10×).

Culture Examination

It is very important to identify the species of fungus as response to treatment may be different.

Inoculation is performed with a sterile needle gently pushing multiple samples into the media. Cultures are incubated at 27–28°C and checked every week. A negative result is considered in the absence of growth after 4–6 weeks.

18.3 Dermoscopy

Dermoscopy is utilized for the differential diagnosis of pigmentary nail lesions but the dermoscopic criteria that have been proposed to distinguish benign from malignant melanocytic nail lesions are not validated by evidence-based studies.

Melanocytic activation	Benign melanocytic hyperplasia	Malignant melanocytic hyperplasia
• Gray background	• Regular pattern • Brown lines with parallelism	• Irregular pattern • Brown to black lines with loss of parallelism

Dermoscopy of the distal edge of the nail plate is useful to determinate the origin of pigmentation, i.e., from the proximal (upper nail edge) or distal nail matrix (lower nail edge).

Dermoscopy of the hyponychium can offer a clue in the diagnosis of nail bed psoriasis evaluating the capillaries of this area that are dilated, tortuous, elongated, and irregularly distributed.

18.4 Capillaroscopy

In the periungual area capillaries are parallel and horizontally distributed with a normal diameter between 8 and 15 μm. They can easily be studied to assess their density, distribution, and morphology in pathological conditions such as Lupus Erythematosus, Systemic Scleroderma, and Dermatomyositis.

18.5 Radiology

X-rays are the gold standard for examination of the distal phalanx bones. An X-ray should always be required when the clinical examination raises the suspicion of a subungual tumor.

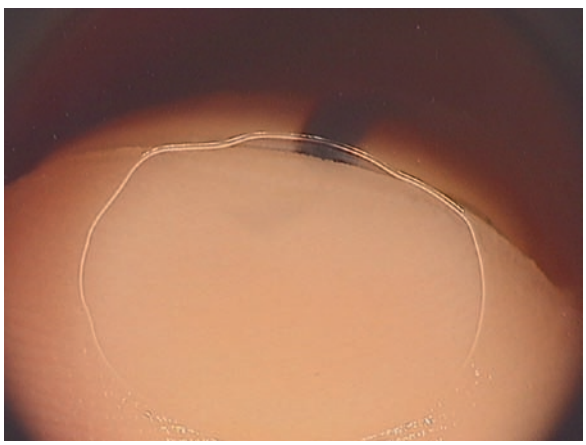

Fig. 18.1. Pigmentation in the lower nail edge comes from the distal nail matrix.

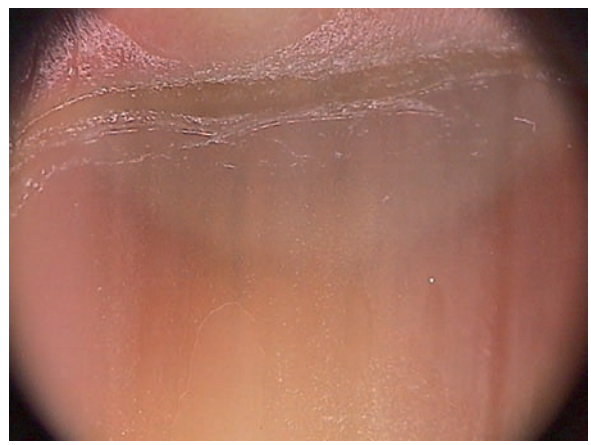

Fig. 18.2. *Gray* background typical of melanocytic activation seen at dermoscopy.

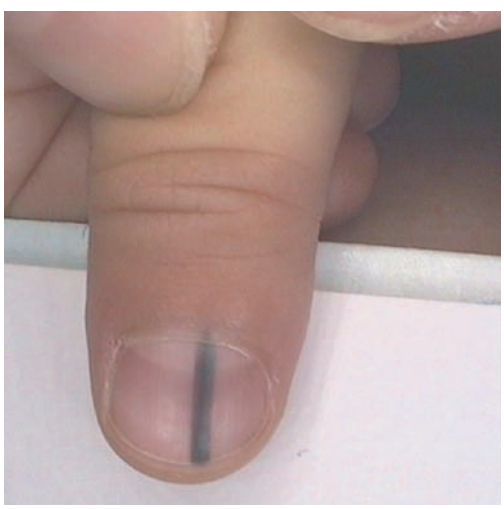

Fig. 18.3. Clinical presentation of a nevus.

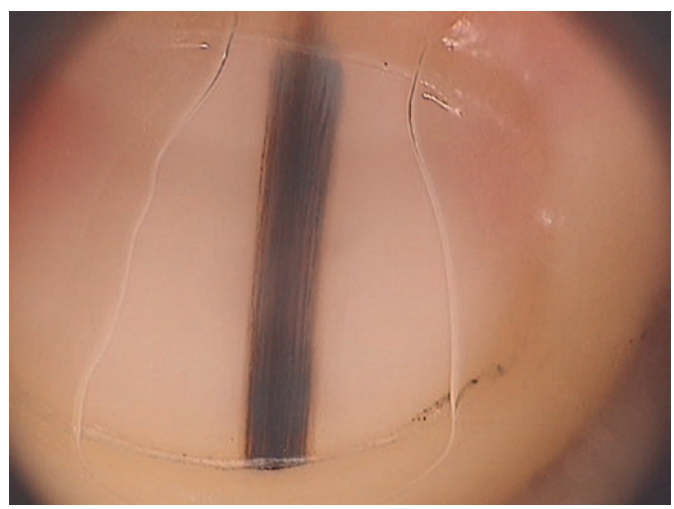

Fig. 18.4. Dermoscopic presentation of a nevus (same patient of Fig.18.3).

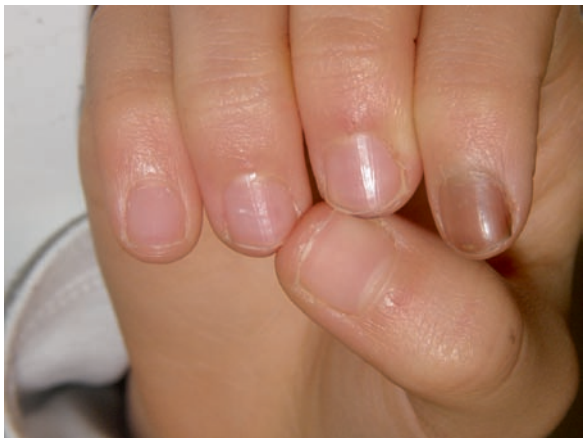

Fig. 18.5. Clinical presentation of nail melanoma.

Fig. 18.6. Dermoscopic presentation of nail melanoma (same patient of Fig.18.5).

Fig. 18.7. Clinical presentation of nail bed psoriasis.

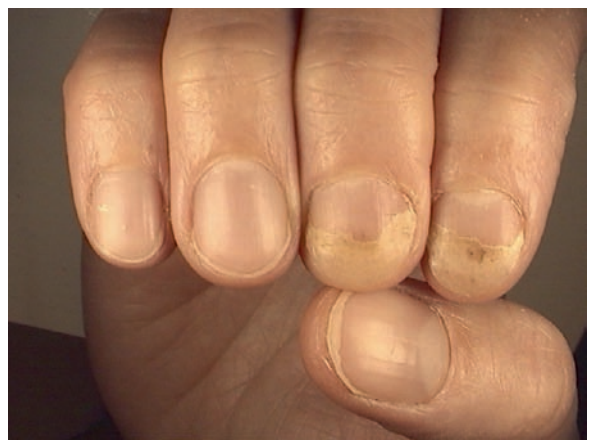

Fig. 18.8. Clinical presentation of nail bed psoriasis.

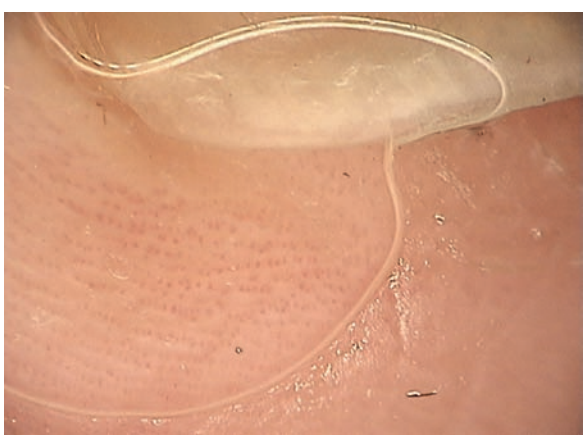

Fig. 18.9. Dermoscopic presentation of nail bed psoriasis – note dilated, tortuous, elongated and irregularly distributed capillaries.

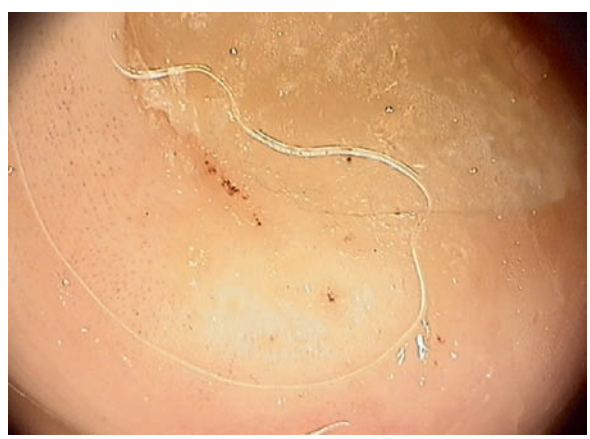

Fig. 18.10. Dermoscopic presentation of nail bed psoriasis – note dilated, tortuous, elongated and irregularly distributed capillaries.

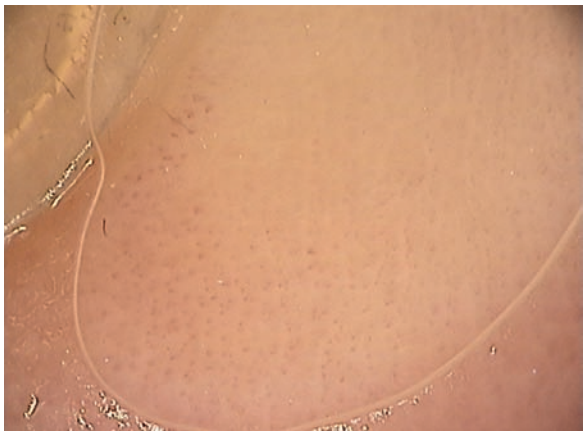

Fig. 18.11. Dermoscopic presentation of nail bed psoriasis – note dilated, tortuous, elongated and irregularly distributed capillaries.

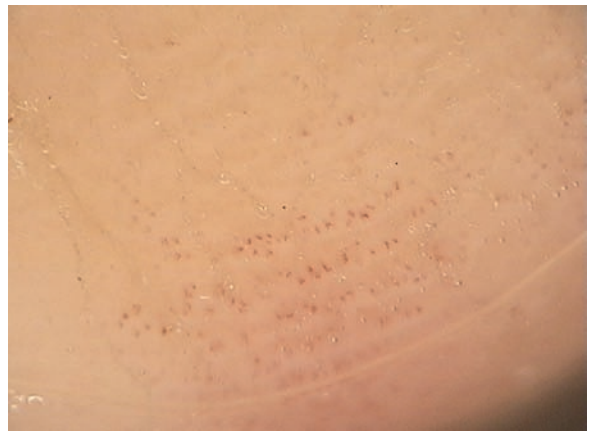

Fig. 18.12. Dermoscopic presentation of nail bed psoriasis – note dilated, tortuous, elongated and irregularly distributed capillaries.

19 Treatment Pearls

19.1 Brittle Nails

1. Hard and brittle nails – add moisture
2. Mildly affected nails – Aquaphor or 10–20% urea twice a day
3. Very dry nails:
   (a) Urea (30–50%) in the morning
   (b) Aquaphor at bedtime – one may also soak the digits at bedtime, apply Aquaphor then light white cotton gloves
4. Soft and brittle nails – too much moisture, use a conditioning cream with 5 to 12% lactic acid, olive oil, SBR Lipocream®, or Impruve® cream twice a day. For hard and brittle or soft and brittle nails:
   (a) One multivitamin a day
   (b) Biotin 2.5–5 mg once a day
   (c) Light cotton gloves under vinyl gloves for wet work (Allerderm®). Heavy cotton gloves for dry work. For medical personnel, disposable, non powder vinyl gloves for work
   (d) Strict contact irritant avoidance regimen
   (e) Mild soap like Dove®
   (f) Avoid
      i. Frequent unnecessary hand washing
      ii. Frequent application and removal of nail cosmetics
      iii. Artificial nails

19.2 Darier's Disease

1. Keep the nails short
2. Treat any secondary infection
3. Strict irritant avoidance regimen
4. The Koebner phenomenon is important
5. Specific treatments are generally anecdotal and unproven
   (a) Steroids
      i. Topical high potency twice a day for 1–2 weeks
      ii. Intralesional triamcinolone acetonide 3–5 mg/ml strength – inject once a month for up to 4 months
      iii. Occasional systemic steroids – begin with 70 mg all in one dose in the morning and taper 5 mg a day
   (b) Retinoids
      i. Topically once a day. Stop if it is too irritating or if it is not better in 1–2 months
      ii. Isotretinoin or acetretin in low dose for up to 6 months

A. Tosti et al., *Color Atlas of Nails,*
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19.3 Dystrophic Fifth Toenail

1. Keep the nail short.
2. Apply 20–30% urea 1–2 times a day to soften if too thick to cut.
3. If you are treating onychomycosis, it is important to tell the patient in advance if there is coincident dystrophic fifth toenail that the fungus treatment might resolve the infection but the dystrophic appearance is likely to remain.
4. Matricectomy may be used for a permanent solution.

19.4 Green Nails

If there is no pain, swelling, or pus, usually no oral therapy is needed.

1. Keep nails short and use a strict irritant/moisture avoidance regimen (see onycholysis)
2. Gentamicin drops can be applied twice a day
3. Drops of vinegar can be applied twice a day

19.5 Ingrown Toenails

1. Remember that the ingrown nail spicule is like a foreign body.
2. For early ingrown nails (non infected):
   (a) Soaks: one teaspoon salt in one pint of cold water for 5 min, then apply 20% urea cream to the nail plate then a mid/high potency topical steroid to the inflamed nail fold. Do this 2–3 times a day for 7–10 d.
   (b) One may gently introduce a wisp of cotton under the most lateral part of the ingrown nail plate.
   (c) One may try to gently lift out the ingrown nail plate with dental floss.
3. For more advanced ingrown nails:
   (a) If culture is infected, then empirically treat with cephalexin 500 mg four times a day until culture returns in 7–10 d. Use one teaspoon salt in one quart of warm water, soak the digit for 10 min, dry off, apply polymixin/bacitracin ointment and then bandage. Do this three times a day 7–10 d.
   (b) If not infected – do same as step 2a above.
   (c) After swelling, granulation tissue, and infection have decreased, the ingrown spicule may be cut out.
   (d) Permanent partial nail matricectomy may be attempted by the proper use of 88% phenol after excision of the offending lateral nail plate.
4. Always cut toenails straight across – don't round at the edges. Wear proper fitting shoes and no higher heels or pointed toe shoes. See an orthopedist or podiatrist for improved foot strike or for anatomical problems.

19.6 Micronychia

1. Usually no treatment is required
2. A prosthesis may be surgically inserted
3. A nail matrix transplant (usually from the great toe) may be done for a single digit
4. Matricectomies may be done for one or several nails

19.7 Onychogryphosis

1. The involved nail must be kept short.
2. The nail may be soaked in warm water for 20–30 min, then one may attempt to cut.
3. If the above does not work, apply 40–50% urea twice a day to soften enough so the nail may be cut.
4. Onychomycosis may be found in the nail but is not causative of the onychogryphosis.
5. For a permanent solution to the problem:
   (a) Permanent matricectomy
   (b) Complicated surgical procedure to realign the matrix and nail bed vertically and not laterally
6. Footwear:
   (a) Wide enough toe box
   (b) No higher heels
   (c) Good support

19.8 Simple Onycholysis

1. The nails must be kept short. The nails must be cut straight across. Don't round the edges. Long nails act as a lever. A nail that is bumped distally transmits a greater force proximally which hinders nail plate reattachment.
2. There must be a strict contact irritant/allergen/moisture avoidance regimen.
   (a) Wear light cotton gloves under vinyl gloves for all wet work. (Buy at a paint store or Allerderm© gloves).
   (b) Wear heavy cotton gloves for all dry work.
   (c) Nail contact with raw fruits (especially citrus) and other raw foods, as well as hydrocarbons, etc. is especially harmful.
   (d) Use mild soaps like Dove© sensitive skin soap.
   (e) Use no nail cosmetics or artificial nails. Nail polish remover whether acetone or acetate may be especially harmful.
3. Don't pick, file, or tear nails.
4. Don't use nails as an instrument or tool.
5. Don't wash the hands unnecessarily.
6. Although controversial, one may consider a topical antifungal as ciclopirox lotion or lacquer, econazole solution, etc. twice a day.
7. For toenail onycholysis:
   (a) No narrow toed shoes
   (b) No higher heels
   (c) Shoes must fit well with sufficient support
8. If there is some inflammation, consider clotrimazole/betamethasone lotion twice a day up to 3 weeks.
9. Inform the patient that the longer the problem has been present, the more difficult that it is to get the nail to reattach especially if the nail bed has cornified ("disappearing nail bed").

19.9 Onychomycosis

1. Tinea unguium – in general, systemic (oral) antifungals are much more effective than topicals.
   (a) Systemic
      - Terbinafine is the most efficacious therapy. For toenails, 250 mg once a day for 3 months. There is no proof that treatment for longer periods works better. Some practitioners use it up to 6 months. Some small studies have utilized pulse therapies – one or two pills per week day for several months. For fingernails, generally 250 mg is given once a day for 6 weeks.
      - Itraconazole is used less frequently. It is used for toenails. Two 100 mg capsules a day for 3 months. In the United States, it is used off label as pulse therapy two 100 mg capsules twice a day with food for one week out of the month for 3 months. It is FDA approved in the USA for two pulses as above for fingernails.
      - Fluconazole – it is used off label in the USA, 150 mg once a week for 12–18 months for toenails and at least 6 months for fingernails.
      - Griseofulvin – this is generally not used in adults for nail dermatophyte infection because of its poor efficacy. In faster growing nails of children, it may work better with a daily dose for 4–6 months.
   (b) Topical
      - Ciclopirox lacquer (Penlac®) is applied once at night. It works less than 10% of the time.
      - Amorolfine (Locetar®) may be applied. Its efficacy can be compared with ciclopirox lacquer.
      - There are others on the market and under investigation. At the time of this writing, we know of none with outstanding efficacy.
      - One of the authors (CRD) uses ciclopirox topically, night after finishing systemic therapy to try to decrease the chance of relapse and reinfection.
      - Systemic plus topical therapy may increase efficacy but the data is not frequently convincing
      - Topical plus curetting may be curative in superficial white onychomycosis
      - Systemic plus debridement or excising, clipping or curetting onycholysis, thick nails, or "dermatophytomas" may be more efficacious

Nail avulsion can be performed in two ways:

- Use 40% urea in petrolatum under occlusion for 1 week being careful to protect the periungual skin to avoid maceration.
- Prescribe commercially available devices containing 40% urea cream and nail shaped tapes to be applied daily for 3 weeks.

1. Non dermatophyte onychomycosis. In general, this is poorly responsive to treatment. Debridement and topical therapy may be tried with inconsistent results.

19.10 Onychorrhexis

1. Usually no treatment is needed with age association. The nails may be filed or buffed but this may thin the nail and increase fragility.
2. Lichen planus – see lichen planus treatment. The problem is usually in the more proximal part of the nail matrix. Intralesional injections of triamcinolone may be used.

19.11 Paronychia

Acute

1. If there is an abscess, gently drain it.
2. Do a bacterial culture and sensitivity at this time.
3. Empirically treat the patient with cephalexin 500 mg orally four times a day until the report returns. The antibiotic may be changed depending on the sensitivity of the cultured organism.
4. One teaspoon salt in one pint of warm water. Soak the digit for 10 min, dry off, apply polymixin/bacitracin ointment and then cover with band aid. Do this three times a day for up to 10 d.
5. Use the same irritant/physical contact avoidance regimen as chronic paronychia.

Chronic

1. Chronic paronychia occurs when the seal between the proximal nail fold (cuticle) is broken by physical and/or contactant trauma.
2. There must be a strict contact irritant/allergen/moisture avoidance regimen.
   (a) Wear light cotton gloves under vinyl gloves for all wet work. (Buy at a paint store or Allerderm© gloves)
   (b) Wear heavy cotton gloves for all dry work
   (c) Nail contact with raw fruits (especially citrus) and other raw foods, as well as hydrocarbons, etc. is especially harmful
   (d) Use mild soaps like Dove© sensitive skin soap.
   (e) Use no nail cosmetics or artificial nails. Nail polish remover whether acetone or acetate may be especially harmful.
   (f) Use no cuticle creams
3. Use no cuticle scissors.
4. Do not push the cuticles (once reformed) back with another fingernail, metal file, or orange stick.
5. It is best never to push the cuticles back (once formed) in a person prone to paronychia. If it is going to be done anyway, use only a wet washcloth on the end of the finger at the end of a shower or bath.
6. Don't pick at the nail plate or cuticles.
7. Don't wash the hands unnecessarily.
8. Use the above as a patient handout
9. Although it is controversial, consider a topical antifungal as ciclopirox lotion or econazole solution twice a day.

10. If not better, promptly stop step 9 and try betamethasone/clotrimazole lotion twice a day for up to 3 weeks
11. For particularly recalcitrant cases, consider intralesional triamcinolone acetonide 3–4 mg/cc strength using a 30 gauge needle not more than once a month for a maximum of 2–3 injections
12. Pulse therapy for about 2 weeks with systemic steroids may be used rarely for particularly recalcitrant cases.

19.12 Pincer Toenails

1. Apply 20–30% urea twice a day to soften the nails. This may decrease any discomfort due to the "splinter-effect" of a rigid nail plate that is impinging on surrounding soft structures.
2. Mild cases can be improved with nail braces (the nail plate is weaker than the brace and conforms to it).
3. A surgical procedure may be used to flatten the nail bed and nail matrix.
4. Permanent matricectomy may solve the problem.
5. Use no narrow toed shoes or higher heels.

19.13 Pincer Fingernails

1. Try to eliminate the cause.
2. Urea 20–30% twice a day.
3. Matricectomies and complicated surgical treatments are more difficult in the fingernails.

19.14 Pitting

Usually no treatment is needed for superficial pitting.

1. Decrease or resolve causative factors
2. Psoriasis
   (a) Decrease Koebner phenomenon (see psoriasis treatment)
   (b) Intralesional triamcinolone (see psoriasis treatment)
   (c) Treat psoriasis elsewhere
   (d) Strict irritant avoidance regimen (see chronic paronychia)
3. Eczema
   (a) Strict irritant avoidance regimen (see chronic paronychia)
   (b) Frequent use of emollients, protective hand creams
   (c) Topical steroid pulse treatment twice a day 1–2 weeks

19.15 Pyogenic Granuloma

1. Cryosurgery may be used
2. Electrodessication and curettage
3. Excision
4. Class one topical steroid pulse therapy twice a day 1–2 weeks
5. Treat any secondary infection
6. Saline soaks 2–3 times a day for 1 week

19.16 Splinter Hemorrhages

1. Nails should be kept short
2. Wear gloves
3. Avoid trauma and contact irritants
4. Treat the causative disorder

19.17 Splitting

1. Trauma may be the cause and a scar is formed. The scar may be excised but excision alone may cause further splitting.
2. A space occupying lesion may be identified and excised.
3. Keep the nails short.
4. Apply nail emollients to decrease drying.
5. A nail wrap, glue, or artificial nail may be used.

19.18 Subungual Masses

1. Clinically a strong pen light may be placed against the pulp of the digit shining up dorsally. Sometimes the location of a mass can be approximated in this manner.
2. X-ray should be used to check for osseous involvement.
3. MRI can be done to evaluate further soft tissue disorders.
4. Then a biopsy is done to confirm the diagnosis.

19.19 Ventral Pterygium

1. The causative condition must be treated or corrected
2. Care should be taken not to clip the scarred tissue when cutting the nails. This would cause bleeding and possible infection.
3. Urea (10–20%) may be applied 1–2 times a day to soften the tissues
4. Polymixin/bacitracin ointment should be applied after clipping the nails each time

19.20 Worn Down Nails

1. Biotin 2.5–5 mg one a day for 6 months
2. Decrease manicuring or buffing
3. Use gloves

Index