

NAIL Structure , Function and Associated D's

NAME OF THE DOCTOR :-
DR. SANKALP AWASTHI

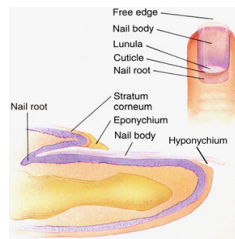
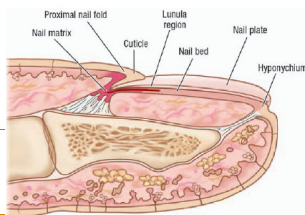
Points to be covered

Embryogenesis
Nail anatomy
Nail physical , chemical properties , function
Nail signs
Associated d's

Biology of nails

Nail apparatus consists of -
• Horny dead product "nail plate"
• Proximal nail fold
• Nail matrix
• Nail bed
• Hyponychium.

Develops during 9th gest.wk from epidermis of dorsal tip of the digit.



Biology of nails

Proximal border of nail fold extends downwards into dermis to form nail-matrix primordium.

By 15th wk, nail matrix(NM)is completely developed and starts to produce nail plate which continue to grow until death.

Nail apparatus lies above the periosteum of distal phalanx(responsible for occurrence of bone alterations in nail disorder).

Nail plate

- Keratinized structure produced throughout life.
- It results from maturation and keratinization of nail matrix epithelium,firmly attached to nail bed.
- Proximally and laterally-surrounded by nail foldsAt the tip of digit, nail plate(smooth,rectangular, translucent and transparent) separates from underlying tissues at hyponychium.
- Its upper surface shows mild longitudinal ridges which increases with age (used for forensic identification).

•Proximal part of finger nail (most visible at thumb)shows whitish,opaque,half moon shaped-area called **lunula** (visible portion of nail matrix).

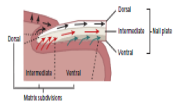
•**Onychocornal band**--Thin distal transverse white band marks the distal most portion of firm attachment of nail plate to nail bed(disruption produces nail plate detachment with onycholysis)

•This band is separated form nail plate by 1-1.5mm pink band-**onychodermal band**.

Onychodermal band (yellow line of pinkus) is structurally important for adherence of nail plate to nail bed and is a major barrier to exogenous substances trying to enter the nail.

Consists of 3 portions

- Dorsal
- Intermediate
- Ventral



Above the lunula, the nail plate is thinner and consists only of the dorsal and intermediate portions.

The nail plate progressively thickens from its emergence to its distal margin, the mean toe nail thickness at the distal margin is 1.65 ± 0.43 mm in men and 1.38 ± 0.20 mm in women.

Fingernails are thinner, their mean thickness is 0.6 mm in men and 0.5 mm in women.

Nail thickness depends on the length of the nail matrix and nail bed. Thinning of the nails is usually a sign of nail matrix disorders, whereas nail thickening is

Proximal Nail Fold

The proximal nail fold is a skin fold that consists of a dorsal and a ventral portion.

The dorsal portion is anatomically similar to the skin of the dorsum of the digit but thinner and devoid of pilosebaceous units.

The ventral portion, cannot be seen from exterior, which proximally is in continuity with the germinative matrix, covers approximately one-fourth of the nail plate.

Eponychium- ant. extension of roof of proximal nail fold on to the nail plate.

The horny layer of the proximal nail fold forms the cuticle, which is firmly attached to the superficial nail plate and prevents the separation of the plate from the nail fold thereby protecting the underlying germinative matrix from environmental insult.

The dermis of this contains numerous capillaries that run parallel to the surface of the skin.

The morphology of proximal nail fold capillaries is typically altered in connective tissue diseases.

Nail Matrix

The nail matrix is epithelial structure that lies above the mid-portion of the distal phalanx.

The matrix appears as a distally convex crescent with its lateral horns extending proximally and laterally.

Nail matrix keratinocytes divide in the basal cell layer.

Keratinization of the nail matrix cells produces the nail plate.

In some fingers, the distal matrix is not completely covered by the proximal nail fold, but is visible through the nail plate as a white half-moon-shaped area, the lunula.

The white color of the lunula results from two main anatomic factors:

- ✓ The keratogenous zone of the distal matrix contains nuclear fragments that cause light diffraction.
- ✓ The nail matrix capillaries are less visible than nail bed capillaries due to the relative thickness of the nail matrix epithelium.

NM Keratinocytes

The nail matrix cells synthesize both "soft" or skin-type and "hard" or hair-type keratins.

The dorsal nail matrix keratinocytes in vivo produce soft keratins, while the ventral nail matrix keratinocytes produce hard keratins.

When cultured in a chemically defined medium, nail matrix cells are larger than epidermal keratinocytes and show a low nucleus/cytoplasm and high euchromatin/heterochromatin ratio.

The growth rate of cultured nail matrix cells is higher than that of epidermal keratinocytes.

NM Melanocytes

Nail matrix melanocytes are usually quiescent.

Two types melanocytes :-

- DOPA-negative, dormant melanocytes localized in the proximal and distal matrix and in the nail bed
- DOPA-positive, activatable melanocytes localized in the distal matrix.

DOPA-positive melanocytes contain key enzymes that are necessary for melanin production.

Nail matrix melanocytes are frequently arranged in small clusters among the suprabasal layers of the nail matrix epithelium.

Langerhans Cells

Langerhans cells are more numerous in the proximal than in the distal nail matrix.

As in normal epidermis, Langerhans cells are predominantly found in the suprabasal layers.

Nail Bed

Nail bed, contains sparse DOPA-negative melanocytes, extends from the distal margin of the lunula to the onychodermal band.

The nail bed epithelium is so adherent to the nail plate that it remains attached to the undersurface of the nail when a nail is avulsed.

Its epithelium is thin and consists of two to five cell layers. Its rete ridges, which are longitudinally oriented, interdigitate with the underlying dermal ridges in a tongue-in-groove-like fashion.

Nail bed keratinization produces a thin horny layer that forms the ventral nail plate, the nail bed contribution to nail plate formation corresponds to about one-fifth of the terminal nail thickness and mass.

HYPONYCHIUM

The hyponychium marks the anatomic area between the nail bed and the distal groove, where the nail plate detaches from the dorsal digit.

It is residuum of distal ridge seen from 10th wk of gestation onwards.

The hyponychium is normally covered by the distal nail plate, but it may become visible in nail biters.

The dermis under the distal matrix consists of a loose network of connective tissue containing numerous blood vessels and glomus bodies.

The longitudinal orientation of the capillary vessels within the nail bed grooves explains the linear pattern of the nail bed hemorrhages (splinter hemorrhages).

Blood Supply of Nail

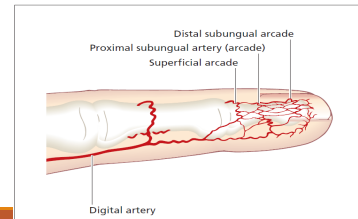
> Lateral digital arteries supply nail through superficial, proximal & distal arcades

> Vasculature of nail bed is unique in that it must supply a vascular structure b/w two hard surfaces ie nail plate & distal phalanx

> Large AV anastomoses with glomus bodies, play key role in peripheral circulation & thermoregulation

> Glomus bodies called as Peripheral heart of masson

ARTERIAL SUPPLY OF DISTAL FINGER



Nerve Supply of Nail

✓ Nail unit is richly innervated by nerves which are branches of median, ulnar & radial nerves

✓ Innervation of nail unit is through two laterally positioned sensory nerves

✓ Digital nerves divides in to three branches just distal to the interphalangeal joint to supply different constituents of the nail unit

Chemical Properties

The nail plate, consists mainly of low-sulfur filamentous proteins (keratins) embedded in matrix composed of (high-sulfur proteins rich in cystine).

Other nail constituents include water, lipids, and trace elements.

Nail keratins consist of:-

Hard 'hair-type' keratins (80-90%)

Soft 'skin-type' keratins. (10-20%)

Chemical Properties

In normal conditions, the water content of nail plate is 7%-12%

Dehydration is faster when the nails are kept long.

The nail contains < 1% Fat content, mainly cholesterol, also contains traces of iron, zinc and calcium.

PHYSICAL PROPERTIES

The nail plate is hard, strong, and flexible.

Hardness and strength are due to the nail plate's high content of hard keratins & cystine-rich, high-sulfur proteins.

While its flexibility depends on its water content and increases with nail plate hydration.

The double curvature of the nail plate along its longitudinal and transverse axes enhances nail plate resistance to mechanical stress.

FUNCTION OF NAILS

Protection of phalanges and fingertips.

Enhancement of fine touch and fine digital movements.

Scratching and grooming.

Esthetic and cosmetic organ.

Fundamentals of Nail Growth

The nail unit is a dynamic structure which remains mitotically active throughout life.

Growth in the normal state occurs in a linear direction from the germinative nail matrix, with a minor contribution from the underlying nail bed.

Kinetic studies of fingernails show an average growth rate of 0.1 mm per day or 3 mm per month.

The growth rate of toenails is slower, or 1 mm per month. On average, it takes approximately 4-6 months for a fingernail to completely grow out and between 12 and 18 months for a toenail.

Growth rate is determined by the proliferative capacity of the metabolically active matrix cells.

Numerous environmental, physiological, and pathological factors are known to influence the speed of nail growth.

More rapid growth has been associated with pregnancy, warmer temperatures, males, minor trauma, and the dominant hand.

A decreased growth rate is seen with acute infections, systemic illness, aging, and malnutrition.

Table 40.2: Physiological Factors Affecting Nail Growth Rate		Table 40.3: Pathological Factors Affecting Nail Growth Rate	
Increase	Decrease	Increase	Decrease
Between second and third year	At birth and after the age of 50 decades	Localized finger trauma	Finger immobilization or paralysis
Pregnancy	Lactation	Raised blood supply (e.g., arteriovenous shunt)	Reduced blood supply (e.g., peripheral vascular disease) or peripheral neuropathy
Right hand/dominant	Left hand/nondominant	Hypertthyroidism	Hypothyroidism
Male (up to 19 years)	Females (up to 40 years)	Psoriasis	Acute infections (e.g., fever, shingles, measles)
Youth	Old age	Psoriasis rubra plaris	Systemic disorders (e.g., chronic renal failure, pneumonia, tuberculosis)
Fingers	Toes	Treatment with oral retinoids, J-dopa, tracinazole	Treatment with antineoplastic
Middle, ring, and index finger nails	Thumb and little finger nails	Malnutrition	Yellow nail syndrome
Warmer temperature	Cooler temperature	Oncychomycosis	

Medications affecting nail growth

Faster growth

Calcium/Vit. D
Levodopa
Biotin
Fluconazole/itraconazole
Terbinafine
OCs

Slower growth

Methotrexate
Azathioprine
Cyclosporine
Gold
Sulfonamides
Lithium
Zidovudine

Due to their slow growth rate, the nails may provide information on pathologic conditions; nail clippings can be used to detect previous exposure to drugs or chemicals.

The nail of the big toe is the best site for investigation because of its size and slow growth rate.

Nail clippings may also be used for genetic analysis and determination of blood groups.

DNA can, in fact, be extracted easily from fingernail clippings and used for enzymatic amplification and genotypic or individual identification.

Reasons : Nails grow always forward & flat

Guiding restraint of proximal nail fold

Influence of underlying phalanx

Adherence of nail plate to nail bed

Containment by Lateral nail folds

Nails in Childhood & Adults

> In Early Child – Nail plate thin & temporary Koilonychia (More Prominent Great Toes)

> Prominence of nail surface markings – Herringbone or Chevron Nails

> Solitary beau's lines – Infancy

Nails in Childhood & Adults

- Onychophagia, Punctate Leuconychia, Pitting, Lamellar Splitting of free edge of nail—normal in children.
- Elderly— Slow rate of growth
- Neapolitan nails : Proximal half – White, No Lunula, Distal Edge is opaque, Central portion – Pink.

NAIL SIGNS , DEFINITION AND ASSOCIATIONS

Abnormilities of shape

•ANONYCHIA:-

- PERMANENT FAILURE OF THE NAIL PLATE DEVELOPMENT, WHICH MAY BE COMPLETE OR PARTIAL
- A MUTATION IN THE R-SPONDIN 4 GEN WHICH PLAYS A PART IN WNT SIGNALLING WITHIN THE CELL IS RESPONSIBLE FOR CONGENITAL ABSENCE OF NAIL
- THEY CAN BE SEEN IN DEAFNESS, ONYCHODYSTROPHY, OSTEOHYSTROPHY AND MENTAL RETARDATION (DOOR) SYNDROME, ECTODERMAL DYSPLASIAS, AND NAIL PATELLA SYNDROME.



MACRONYCHIA AND MICRONYCHIA

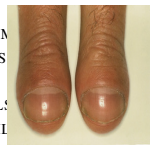
MACRONYCHIA AND MICRONYCHIA ARE CONDITIONS WHERE A NAIL IS CONSIDERED TOO LARGE OR TOO SMALL IN COMPARISON WITH OTHER NAILS

THE ANOMALY MAY AFFECT ONE OR MORE NAILS AND CAN BE EITHER UNILATERAL AND BILATERAL

Genetic Syndromes Associated with Micronychia and Macronychia	
Micronychia	Macronychia
<ul style="list-style-type: none"> • Iso-Kikuchi's syndrome • Ziemer-Laland syndrome • Turner's syndrome 	<ul style="list-style-type: none"> • Von Recklinghausen's disease • Epidermal nevus syndrome • Proteus syndrome • Klippel-Trenaunay-Weber syndrome • Marfan's syndrome

RACKET NAILS

- IS A COMMON DEVELOPMENTAL ANOMALY INHERITED AS AN AD TRAIT
- MORE COMMON IN GIRLS
- ACQUIRED RACKET NAIL BONE RESORPTION AS IN DIFFERENT EXAMPLES OF ACROOSTEOLYSIS AND IN CONGENITAL SYPHILIS



PINCER NAILS

ALSO KNOWN AS TRUMPET OR INVOLUTED NAIL

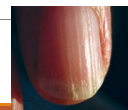
PINCER NAIL DESCRIBES A DYSTROPHY WHERE NAIL GROWTH IS PITCHED TOWARDS THE MIDLINE, COMBINED WITH INCREASED TRANSVERSE CURVATURE

HABIT TIC DEFORMITY HAS THE APPEARANCE OF PARALLEL HORIZONTAL GROOVES IN THE NAIL PLATE, AS THE RESULT OF REPETITIVE MINOR TRAUMA TO THE PROXIMAL NAIL PLATE AND LUNULA



ONYCHOGRYPHOSIS OCCURS WHEN THE NAIL PLATE BECOMES HYPERKERATOTIC AND GROSSLY THICKENED. THE NAIL MAY CURVE AS IT THICKENS

ONYCHORRHEXIS IS DEFINED AS LONGITUDINAL RIDGING OF THE NAIL PLATE AND CAN BE SEEN IN SEVERAL NAIL CONDITIONS SUCH AS LICHEN PLANUS, DARIER'S DISEASE, AND CIRCULATORY DISORDER



CLUBBING --

In clubbing there is increased transverse and longitudinal nail curvature with hypertrophy of the soft-tissue components of the digit pulp. Hyperplasia of the fibrovascular tissue at the base of the nail also occurs.

Pathological associations of clubbing include --- inflammatory bowel disease, carcinoma of the bronchus and cirrhosis.

In forms associated with bronchiectasis or neoplasm, prominent inflammatory joint signs may also be seen, resulting in hypertrophic pulmonary osteoarthropathy



Lovibond's or profile angle (the angle between the proximal nail fold and the nail plate) is obliterated or sometimes reversed. From a normal 160°, it becomes 180° or greater.



The angle between the middle and terminal phalanx is measured at the interphalangeal joint (Curth's angle). In a normal finger, this is 180°, but in severe examples of clubbing, it may be reduced to 160° or even 140°.

SCHAMROTH'S WINDOW IS SEEN WHEN THE DORSAL ASPECTS OF TWO FINGERS FROM OPPOSITE HANDS ARE OPPOSED, REVEALING A WINDOW OF LIGHT, BORDERED LATERALLY BY THE LOVIBOND ANGLES. AS THIS ANGLE IS OBLITERATED IN CLUBBING, THE WINDOW CLOSES.

KOILONYCHIA

GREEK: *KOILOS*, HOLLOW; *ONYX*, NAIL

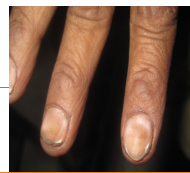
IN KOILONYCHIA THERE IS REVERSE CURVATURE IN THE TRANSVERSE AND LONGITUDINAL AXES GIVING A CONCAVE DORSAL ASPECT TO THE NAIL

MOST PROMINENT IN THE THUMB OR GREAT TOE.

COMMON IN INFANCY IN TOE NAIL

ITS PERSISTENCE MAY BE ASSOCIATED WITH A DEFICIENCY OF CYSTEINE-RICH KERATIN

MOST COMMON SYSTEMIC ASSOCIATION IS WITH IRON DEFICIENCY AND HAEMOCHROMATOSIS



Abnormalities of nail attachment

Nail shedding

Nails may be lost through different mechanisms

1) Complete loss of the nail plate due to proximal nail separation extending distally is called onychomadesis and is a progression of profound Beau's lines

2) Local dermatoses, such as the bullous disorders and paronychia, cause nail loss e.g. toxic epidermal necrolysis, lichen planus etc.

3) Trauma is a common cause of recurrent loss
- It is often associated with subungual haemorrhage

4) Temporary loss has also been described due to drugs such as retinoids, cloxacillin and

5) Onychoptosis defluvium or alopecia unguium describes atraumatic, familial, non-inflammatory nail loss

6) Nail shedding can be part of an inherited structural defect, most obviously in epidermolysis bullosa

7) Nail degloving this refers to partial or total avulsion of the nail and surrounding tissue (perionychium). Typically, it appears as thumb-shaped nail shedding or total loss of the nail organ with soft tissue

Different examples of separation of nail attachment

ONYCHOLYSIS

Onycholysis is the distal or lateral separation of the nail from the nail bed




Areas of separation appear white or yellow due to air beneath the nail and sequestered debris, shed squames and glycoprotein exudate.

Table 40.13: Causes of Onycholysis

Systemic	Dermatological	Others
Thyroid disease	Psoriasis	Drugs
Yellow nail syndrome	Psoriatic arthritis	Drug hypersensitivity
Shell nail syndrome	Reiter's syndrome	Pregnancy
Bronchogenic carcinoma	Hyperhidrosis	Hereditary
Anemia	Pemphigus vulgaris	Use and abuse of nail cosmetics
Multiple myeloma	Pellagra	
SLE	Leprosy	
Lupus erythematosus	Syphilis (secondary, tertiary)	
Porphyria	Occupational trauma	
Peripheral vascular disease	Fungal infections	

PTERYGIUM:-

"DORSAL PTERYGIUM" WHERE PROXIMAL NAIL FOLD FUSES TO MATRIX AND LATER TO NAIL BED OR "VENTRAL PTERYGIUM" WHICH IS A DISTAL EXTENSION OF THE HYPONYCHIIUM ATTACHES TO THE UNDERSURFACE OF THE NAIL PLATE THEREBY OBLITERATING THE DISTAL NAIL GROOVE.



"DORSAL PTERYGIUM IS SEEN IN LICHEN PLANUS, BURNS, CICATRICAL PEMPHIGOID, DYSKERATOSIS CONGENITAL, GVHD AND LUPUS ERYTHEMATOSUS.

"VENTRAL PTERYGIUM IS SEEN IN LEPROSY, NEUROFIBROMATOSIS, LUPUS ERYTHEMATOSUS, AND SYSTEMIC SCLEROSIS.

Subungual hyperkeratosis

hyperkeratosis of the nail bed and hyponychium

Nail plate thickening is common. Dry, white or yellow hyperkeratosis may crumble away from the overhanging nail. Hyperkeratosis may extend onto the digit pulp.

Some ex- wart virus infection (mainly toes) or psoriasis, pityriasis rubra pilaris and eczema (mainly fingers) are found

The nail bed is an epithelium of low proliferative turnover. Any disease process that affects it is likely to result in an excess of squamous debris. The overlying nail prevents simple loss. The initial outcome is compaction of debris into layers of subungual hyperkeratosis.

Focal subungual keratosis seen with Darier's disease, and keratotic debris beneath the nail in Norwegian (crusted)

CHANGES IN NAIL SURFACE


BEAU'S LINES :-

TRANSVERSE GROOVES/DEPRESSION IN NAIL PLATE, MOVE DISTALLY WITH NAIL GROWTH D/T TEMPORARY ARREST IN PROXIMAL NAIL MATRIX PROLIFERATION.

BEAU'S LINES IN MULTIPLE NAILS AT SAME LEVEL S/O SYSTEMIC DISEASE.

CAUSES :-

- TRAUMA- MANICURE, HABIT TIC.
- SKIN D:- ECZEMA, PARONYCHIA, ERYTHRODERMA.
- SYSTEMIC- HIGH FEVER, VIRAL ILLNESS, PERIPHERAL ISCHEMIA.



PITTING :-

PUNCTATE DEPRESSIONS IN THE NAIL PLATE. RESULT FROM A DEFECTIVE KERATINIZATION OF THE PROXIMAL MATRIX WITH PERSISTENCE OF PARAKERATOTIC CELLS IN THE NAIL PLATE SURFACE.

Table 40.7: Causes of Nail Pitting


Psoriasis	Lichen planus
Parakeratosis pustulosa	Lichen nitidus
Reiter's disease	Secondary syphilis
Eczematous dermatitis	Pityriasis rosea
Chronic paronychia	Pemphigus vulgaris
Alopecia areata	Vitiligo
Diabetes mellitus	Rheumatoid arthritis
SLE	Dermatomyositis
Sarcoidosis	Drug-induced erythroderma
Congenital	Normal

Trachyonychia

Trachyonychia presents as a rough surface affecting all of the nail plate and up to 20 nails

The original French term was 'sand-blasted nails', which evokes the main clinical feature of a grey, roughened surface


Can be idiopathic or be associated with alopecia areata, psoriasis and lichen planus, eczema, ichthyosis vulgaris, vitiligo



Onychoschizia

Onychoschizia is also known as lamellar dystrophy and is characterized by transverse splitting into layers at or near the free edge

It is seldom associated with any systemic disorder, although it has been reported with polycythaemia, human immunodeficiency virus (HIV) infection and glucagonoma




Leukonychia

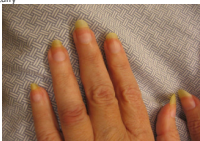
TRUE	APPARENT
Pathology originates in nail matrix and emerges in nail plate.	Pathology originates in nail bed and reflected in nail plate
Eg. Total, subtotal, partial (Mee's lines-transverse)	Eg. Muehrcke's lines, Terry's nails, Lindsay nails.



Mee's line:-
 Single transverse narrow whitish line runs the width of nail plate
 Do not disappear on blanching on multiple nails if due to systemic cause
 in renal failure, CHF, psoriasis, SLE, leprosy, malaria.

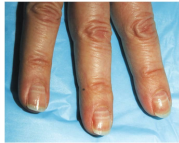


Terry's nails:
 Apparent leukonychia (nail bed changes)
 White proximally, normal distally
 Causes-
 Cirrhosis, CCF, DM, HIV, renal transplant & hemodialysis.

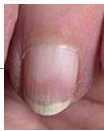


Muehrcke's lines:
 Apparent leukonychia.
 Paired white transverse bands parallel to lunula with pink in between
 Reversible


specific for hypoalbuminemic state (occur in patients albumin <2 g/dL) and disappear when the protein level normalizes
 Other diseases – liver disease, cytotoxic drugs, malnutrition, heart disease



Half and half nail:-
 Lindsay's nail
 Proximal half – normal
 Distal half – red to brownish
 Looses attachment to hyponychium
 Most common finding of nail in hemodialysis recipients
 More common in dialysis recipients than CRF patients



Dystrophic Nails:
 Mis-shapen or partially destroyed nail plates.
 elevation of the nail plate d/t accumulation of soft yellow keratin.
 Causes:-
 Trauma, onychomycosis, psoriasis, systemic diseases



Splinter hemorrhage:-
 Linear, brown-black or red –streaks in basal nail plate (extravasation of blood from longitudinally oriented vessels of nail bed)
 move distally with growth





Table 40.12: Causes of Splinter Hemorrhages

Systemic	Cutaneous	Others
Bacterial endocarditis	Psoriasis	Normal occurrence in some people
Rheumatoid arthritis	Pemphigus	Drug reactions
Internal malignancy	Erythroderma	Dialysis (hemo, peritoneal)
SLE	Oler-Rendu-Weber disease	Use of drugs such as tetracyclines, psoralens, anticoagulants, ganciclovir
Thrombocytopenia	Pityriasis rubra pilaris	
Polyarteritis nodosa		
Tachycardia		
Mitral stenosis		
Hypertension		
Thyrotoxicosis		
Langerhans cell histiocytosis		
Diabetes mellitus		

Melanonychia:-
 A longitudinal or transverse brownish black pigmentation of nail may be part of being racial pigmentation (constitutional).
 Underlying causes are- melanocytic nevus or malignant melanoma, drugs (antimalarials, minocycline, phenytoin, psoralens, sulfonamides, zidovudine, doxorubicin, methotrexate, azathioprine), hemochromatosis, malnutrition, thyroid disease, smoking, HIV infection and Addison's disease.



Infectious causes of nail disorders

Infections of the nail can be caused by bacteria, virus, fungus and yeast. Fungal infections are the most common infectious process in the nail. Nail infections can be primary or secondary

ONYCHOMYCOSIS

Onychomycosis is an infection of the nail caused by dermatophytes, yeasts or moulds. Primary dermatophyte infections occur in four main patterns.

Distal (and lateral) subungual onychomycosis is the most common pattern

Superficial white onychomycosis

Proximal subungual onychomycosis

Total dystrophic onychomycosis

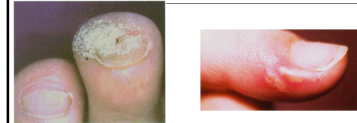


BACTERIAL INFECTIONS

The organism usually gains access through cuts in the nail folds or hyponychium, as in paronychia and onycholysis. The most common bacterial infection is *Staphylococcus*, which causes an acute red and painful infection. Acute paronychia may cause a pus-filled abscess and should be treated by incision and drainage and a culture-specific antibacterial antibiotic.

VIRAL INFECTIONS

The most common viral infection of the nail is verruca vulgaris, caused by the human papillomavirus. Herpetic whitlow can occur around the nails in dentists and others exposed to active herpes simplex virus lesions



NAIL ABNORMALITIES ASSOCIATED WITH SPECIFIC SYNDROMES OR GENODERMATOSES

ISO KIKUCHI SYNDROME

-RARE DEVELOPMENTAL DISORDER THAT HAS BEEN REPORTED MOSTLY FROM JAPAN

-MAY BE U/L OR B/L

-NAILS OF THE INDEX FINGER ARE ABSENT OR SMALL OR THE NAILS MAY BE OF UNEQUAL SIZE

-UNDERLYING BONE ABNORMALITIES ARE COMMON

(TERMINAL BIFURCATION OF DISTAL PHALANX)

NAIL PATELLA SYNDROME (FONG'S SYNDROME , TURNER KEISER SYNDROME)

-INHERITED AS A.D

-UNCOMMON DEVELOPMENTAL SYNDROME IN WHICH NAILS MAY BE PARTIALLY OR TOTALLY ABSENT

-MUTATION IN TRANSCRIPTION FACTOR LMXB1 - DEFECTED GENE IS LOCATED ON 9TH CHROMOSOME

Box 40.9. Tetrad of Nail-Patella Syndrome

- Nail dystrophy
- Hypoplastic or absent patellae
- Elbow dysplasia
- Iliac horns

YELLOW NAIL SYNDROME

- IS CHARACTERIZED BY THE TRIAD OF YELLOW NAILS, LYMPHEDEMA, AND RESPIRATORY DISEASE.
- DENSE FIBROSIS REPLACING THE SUBUNGUAL STROMA IN THE NAIL MATRIX AND NAIL BED IN YNS AND HYPOTHEZIZED THAT THIS SCLEROSIS MIGHT LEAD TO LYMPHATIC OBSTRUCTION.
- AFFECTED NAILS DEMONSTRATE AN THICKNESS INVER TO THE GROWTH R



Fig. 43.14 Yellow nail syndrome

- Darier's disease** – longitudinal streaks, “V” shaped notch, wedge shaped SUH, leukonychia, splinter hemorrhages
- Dyskeratosis congenita** – koilonychia, onychorrhexis, onychoschizia, pitting, ridging, fissuring
- Pachyonychia congenita** – subungual hyperkeratosis.
- Incontinentia pigmenti** – periungual / subungual tumors. Dystrophic nails, koilonychia, pitting
- Reiter's syndrome** – subungual hyperkeratosis, onycholysis, and brownish discoloration, pitting.
- Epidermolysis bullosa** – Hemorrhagic onycholysis, paronychia, nail bed scarring
- Osler-Weber-Rendu syndrome** - Telangiectasia of nail bed, splinter hemorrhage

- **MAL DE MELEDA SYNDROME** – PALE DISTAL HALF
- **TUBEROUS SCLEROSIS** – KOENENS TUMOUR, RIDGING
- **DOWN SYNDROME**- MACRONYCHIA, CLUBBING
- **TURNER SYNDROME** – NARROW, HYPERCONVEX AND DEEP SET NAILS WITH RECALCITRANT CHRONIC PARONYCHIA

NAIL CHANGES IN DERMATOLOGICAL DISORDERS

PSORIASIS

- 10 TO 56 % OF PATIENTS WITH PSORIASIS MAY HAVE NAIL INVOLVEMENT
- PSORIASIS MAY AFFECT ANY OR ALL PARTS OF THE NAIL APPARATUS
- THE CLINICAL SIGNS OF THE DISEASE DEPEND TO A LARGE EXTENT ON THE ANATOMICAL SITE AND THE EXTENT OF INVOLVEMENT
- **PITTING IS M-C NAIL ABNORMALITY**, PITS ARE QUITE SMALL, CAN BE SHALLOW OR DEEP SEATED, > 20 PITS ARE SUGGESTIVE OF PSORIATIC ETIOLOGY

Handwritten notes: *Pitting, ridging, onychia fungus, psoriasis depression*

CHAPTER 40: NAIL AND ITS DISORDERS 1683

Table 40.6: Nail Involvement in Psoriasis

Anatomical site affected	Clinical outcome
Ingestal germative matrix	Pitting, Beau's lines, onycholysis, leukonychia
Distal germative matrix	Focal onycholysis, leukonychia, red lunules, nail plate thinning
Whole matrix	Crumbling of the nail plate
Nail bed	"Oil drop sign", onycholysis, splinter hemorrhages, subungual hyperkeratosis, nail discoloration
Nail folds	Loss of cuticle, paronychia

Notes: With permission from an article published by: Basak P, Scher RK, Dermatological diseases of the nail unit, p. 127. Scher RK, Daniel CR III, editors. Nails: Therapy, diagnosis, surgery. © Elsevier (1995).

PSORIATIC ARTHRITIS

- NAIL LESIONS ARE COMMON
- NAIL LESIONS COMMONLY PRECEDE JOINT INVOLVEMENT
- **ONYCHOLYSIS IS THE M.C FINDING** (BUT ALL TYPES OF NAIL CHANGES CAN BE SEEN.

- PSORIATIC ONYCHOPACHYDERMOPERIOSTITIS**
- VARIANT OF PSORIATIC ARTHROPATHY WITH PAIN AND SOFT TISSUE SWELLING OF THE DISTAL DIGITS ACCOMPANIED BY PSORIATIC NAIL CHANGES WITH UNDERLYING BONE EROSIONS AND PERIOSTEAL REACTION

LICHEN PLANUS

- INCIDENCE OF NAIL CHANGES IN LP RANGES FROM 0% TO 16 %

Table 40.8: Nail Abnormalities in Lichen Planus

Clinical presentation	Pathogenesis	Course
Longitudinal furrows, alternating with periods of normal nail plate and appear as ridges	Reversible focal atrophy of the proximal nail matrix	Reversible if matrix involvement is not extensive
Uniform thinning of the nail plate (may be asymmetric)	Severe diffuse atrophy of the proximal matrix	May be permanent
Onychium	Severe focal destruction of the nail matrix with atrophy	Permanent
Total nail area atrophy	Total destruction of the matrix with nail bed involvement	Permanent
Pit-like sign	Nail bed disease	May be reversible
Volvulus lines in nail plate	Nail bed disease	Reversible
Subungual hyperkeratosis	Nail bed inflammation	Reversible

Notes: Modified from Davis R. The nail in lichen planus. Arch Dermatol. 1970;101:564-71.

PTERYGIUM UNGUIS IS THE HALLMARK OF A SEVERE NAIL D'S , BUT IS NOT AN EXCLUSIVE SIGN OF LP