AN APPROACH TO FUNGAL AND VIRAL INFECTIONS OF SKIN

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LEARNING OUTCOMES

- At the end of lecture, student should be able to
  - Classify cutaneous fungal infections
  - Identify different patterns of superficial fungal infections
  - Make an appropriate diagnosis of superficial fungal infections
  - Treat different types of dermatophytosis
  - Classify common viral infections of skin
  - Recognize clinical features of different viral infections
  - Treat cutaneous viral infections

VERTICAL INTEGRATION

Dermatophytes

- Dermatophytes are a unique group of fungi that are capable of infecting keratinized cutaneous epithelium including stratum corneum, nails, and hair
- The term dermatophytosis thus denotes a condition caused by dermatophytes.

CORE CONCEPT

Characteristic lesion

- circular, sharply marginated with a raised edge
- typically on exposed skin
  - unless the infection represents an extension from a pre-existing infection
- Single or multiple

VERTICAL INTEGRATION

TINEA CAPITIS

- Ringworm of the scalp in which the essential feature is invasion of hair shafts by a dermatophyte fungus
- Predominantly an infection of children

"Grey patch" type

(Noninflammatory)

- well-defined, round hyperkeratotic, scaly areas of alopecia, due to the breaking off of hairs
- Hairs in the affected area turn gray and lusterless
- green fluorescence under Wood's light
- seen most commonly with the anthropophilic ectothrix organisms such as M. audouinii or M. canis

Black Dot

- Caused by the anthropophilic endothrix organisms
  - T. tonsurans
  - T. violaceum
- Relatively non-inflammatory type of patchy baldness
- Formation of black dots as the affected hair breaks at the surface of the scalp is classical

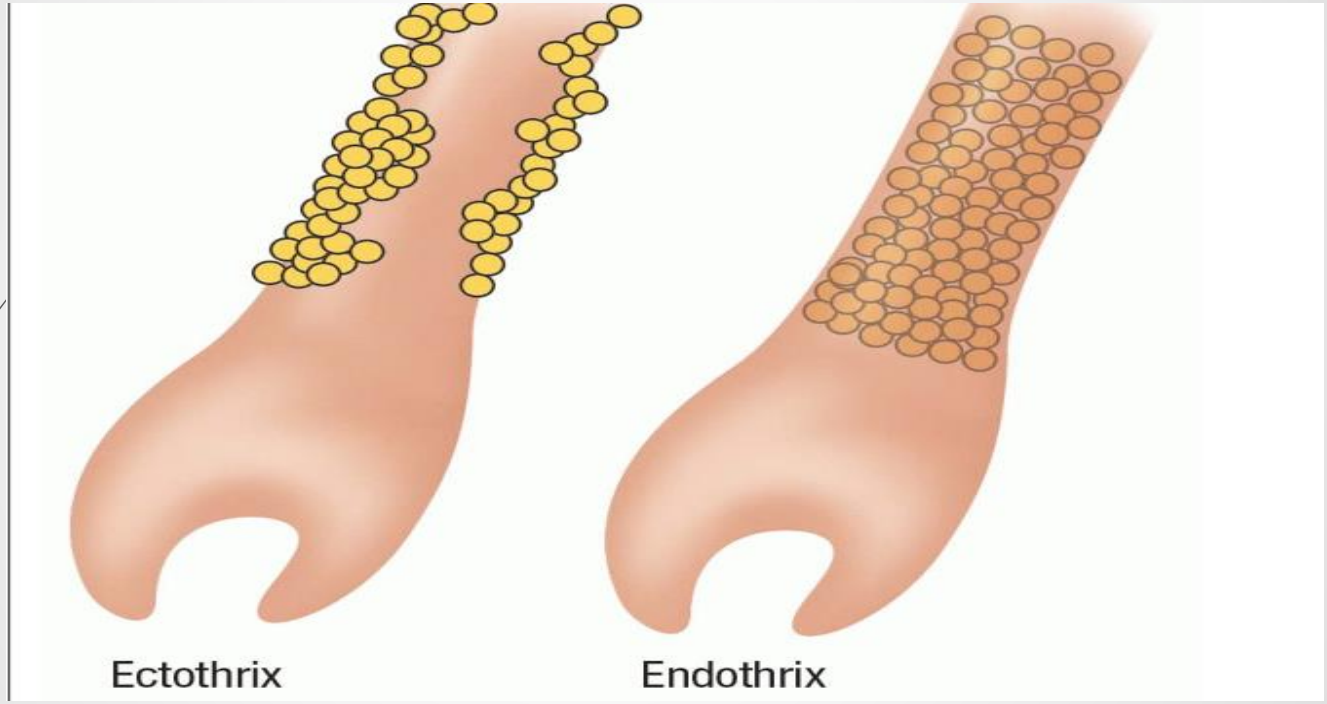
Inflammatory Type

Kerion

- Painful, inflammatory mass in which such hairs as remain are loose
- Usually caused by one of the zoophilic species
  - *T. verrucosum or*
  - *T. mentagrophytes var.mentagrophytes*

Kerion

Low-power microscopy patterns of infection



Small or large arthroconidia forming a sheath around the hair shaft	Anthroconidia within hair shaft

CORE CONCEPT

TINEA BARBAE

- **Ringworm of the beard and moustache areas of the face with invasion of coarse hairs. It is thus a disease of the adult male.**

Tinea of the chin and upper lip in females and children are considered as tinea faciei (ringworm of the glabrous skin of the face).

Circinate tinea barbae has an advancing border of tiny papules, vesicles, and scaling

CORE CONCEPT

TINEA FACIEI

- **Infection of the glabrous skin of the face with a dermatophyte fungus**

(The moustache and beard areas of the adult male are excluded).

Clinical features

- Mostly misdiagnosed
- High proportion of patients do show annular or circinate lesions
- Erythema is usual, but scaling is present in fewer than two-thirds of cases
- Clinical features vary considerably
  - Induration with a raised margin is present in about half
  - Simple papular lesions, and in some cases completely flat patches of erythema, also occur. A few vesicles or pustules may be found, but these are rarely conspicuous.
- Complaints of itching, burning and exacerbation after sun exposure are common

CORE CONCEPT

Tinea Pedis

- Infection of the feet or toes with a dermatophyte fungus.

Clinical features

- **Intertriginous dermatitis**
  - characterized by peeling, maceration and fissuring affecting the lateral toe clefts
  - sometimes spreading to involve the undersurface of the toes
- **Scaling hyperkeratotic variety**
  - affects the soles, heels and sides of the feet
  - The affected areas are pink and covered with fine silvery white scales
- **'Moccasin foot' or dry-type infection**
  - foot is extensively involved,
- **Vesiculobullous**
  - *T. mentagrophytes var. interdigitale- mostly*

CORE CONCEPT

TINEA MANUUM

- Ringworm of palmar skin and with infections beginning under rings
- Hyperkeratosis of the palms and fingers
  - most common variety
  - Affecting the skin diffusely
  - unilateral in about half of cases.
  - accentuation of the flexural creases is characteristic feature
- Crescentic exfoliating scales,
- circumscribed vesicular patches
- discrete red papular and follicular scaly patches

Tinea manuum

TINEA CRURIS

- Infection of the groins by a species of dermatophyte
- **Erythematous plaques**
  - **curved with sharp margins**
  - **extending from the groin down the thighs**
  - **Some central clearance**

CORE CONCEPT

ONYCHOMYCOSIS

- Invasion of the nail plates by species of dermatophytes

Distal and lateral subungual onychomycosis

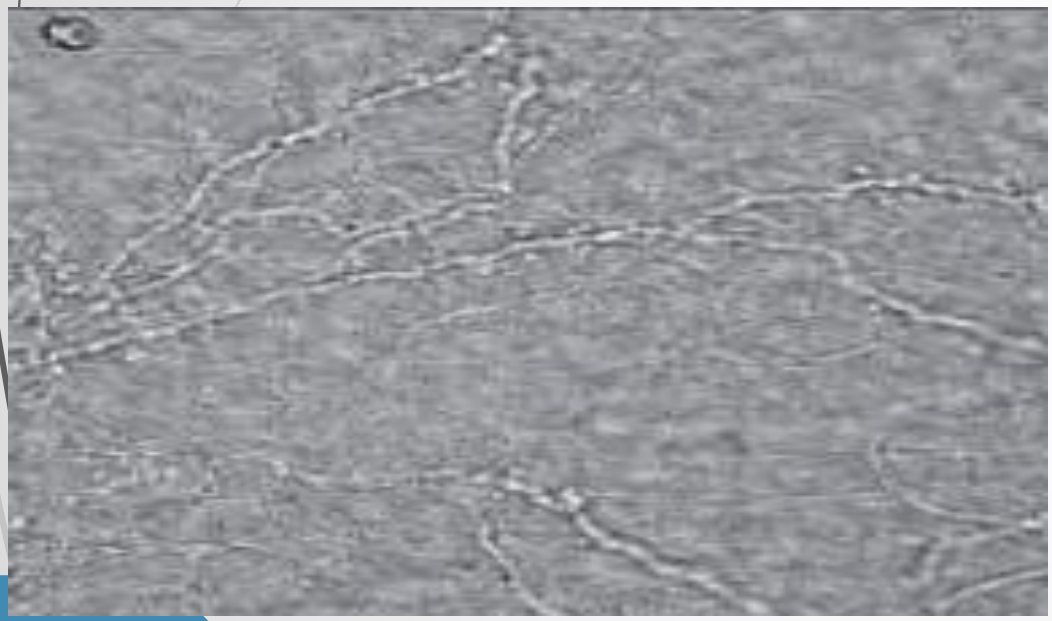
- most common pattern
- white or yellow streak or a patch of discoloration, at the free edge of the nail plate, often near the lateral nail fold

TINEA INCOGNITO

- Ringworm infections modified by corticosteroids
- Systemic or topical
- prescribed for some pre-existing pathology
- or given mistakenly for the treatment of misdiagnosed tinea
- raised margin is diminished.
- Scaling is lost
- inflammation is reduced to a few nondescript nodules

HORIZONTAL INTEGRATION

INVESTIGATIONS



- KOH test for fungal scrapings
- Fungal culture
- Skin biopsy

TREATMENT

- ORAL TREATMENT
  - Terbinafine
  - Fluconazole
  - Itraconazole
  - Ketoconazole

HORIZONTAL INTEGRATION

Topical antifungal

Compound	Available as
Benzoic acid compound (Whitfield's ointment)	Ointment
Undecenoates—various brands available	Ointment, powder
Tolnaftate	Cream, powder, lotion
Imidazoles	
Miconazole, clotrimazole, econazole, sulconazole,* ketoconazole, bifonazole*	Cream, powder, lotion, spray, shampoo (ketoconazole)
Tioconazole nail solution*	Nail treatment
Bifonazole urea*	Nail treatment
Allylamines	
Terbinafine, naftifine*	Cream
Amorolfine*	Cream, nail lacquer
Cyclopyroxolamine*	Cream

SELF DIRECTED LEARNING

Epub 2020 Jan 31.

Recent advances in the diagnosis of dermatophytosis

Jubeda Begum [1], Nasir A Mir [2], Madhu C Lingaraju [3], Bidyarani Buyamayum [4], Kapil Dev [2]

Affiliations + expand

PMID: 32003043 DOI: 10.1002/jobm.201900675

Abstract

Dermatophytosis is a disease of global significance caused by pathogenic keratinolytic fungi called dermatophytes in both animals and humans. The recent taxonomy of dermatophytes classifies them into six pathogenic genera, namely Microsporum, Trichophyton, Epidermophyton, Nannizzia, Lophophyton and Arthroderma. It is because of the delayed diagnostic nature and low accuracy of dermatophyte detection by conventional methods that paved the path for the evolution of molecular diagnostic techniques, which provide the accurate and rapid diagnosis of dermatophytosis for an appropriate, timely antifungal therapy that prevents the nonspecific over-the-counter self-medication. This review focuses on the importance of rapid and accurate diagnosis of dermatophytosis, limitations of conventional methods, selection of targets in diagnosis, and factors affecting sensitivity and specificity of various molecular diagnostic technologies in the diagnosis of dermatophytosis. Generally, all the molecular techniques have a significant edge over the conventional methods of culture and microscopy in the dermatophytosis diagnosis. However, in mycology laboratory, the suitability of any molecular diagnostic technique in the diagnosis of dermatophytosis is driven by the requirement of time, economy, complexity, the range of species spectrum detected and the scale of diagnostic output required. Thus, various choices involved in the pursuit of a diagnosis of dermatophytosis are determined by the available conditions and the facilities in the laboratory.

Keywords: dermatophytes; molecular techniques; sensitivity; specificity; target sequences.

Similar articles

VIRAL INFECTIONS

Herpes viruses

- DNA viruses
- α viruses- HSV 1,HSV 2, VZ
- β viruses- CMV, HHV 6,HHV 7
- γ viruses- EBV,HHV 8

CORE CONCEPT

Primary type 1 HSV infection

- Mainly in infants and young children
- Usually mild and subclinical
- With clinical lesions the severity is more
- Genital primary disease is more severe as compared to oral

HERPETIC GINGIVOSTOMATITIS

- High fever,malaise,restlessness, dribbling
- Painul drinking, eating
- Gums swollen, inflammed,bleed easily
- Vesicles on tonge, pharynx, palate, buccal mucous membrane
- Ulcers with yellowish pseudomembrane
- Regional lymphadenopathy
- Encephalitis- rare

HERPES GENITALIS

- Usually sexually transmitted
- Both types can cause- HSV 2 more common
- Generalized malaise
- Painful and sore ulcers on external genitalia in both sexes
- Perianal region, rectum in homosexual males

RECURRENT INFECTION

- Oral herpes 30-50%
- Genital herpes 95% type 2, 50% type 1
- Triggering factors- minor trauma, febrile illnesses, UV radiation, trigemminal neuralgia, dental surgery, dermabrasion,lasers, premenstrual flare,emotional stress

CORE CONCEPT

CHICKEN POX

- Incubation period 9-23 days
- Fever, malaise (may be absent esp in children)
- Papules which very rapidly become tense, clear, unilocular vesicles.
- Vesicles appear as ‘dew drops on rose petals’
- turbid contents and the red areolae around pustules
- Dry crust forms in 2-4 days

CORE CONCEPT

HERPES ZOSTER

- zoster = a girdle, a reference to its segmental distribution
- Chickenpox can occur in susceptible contacts
- Pain-constant or intermittent
- Rule out myocarditis, pleurisy,duodenal ulcer,cholecystitis, biliary or renal colic etc
- Closely grouped red papules, rapidly becoming vesicular and then pustular
- one, occasionally two and, rarely, more contiguous dermatomes affected

CORE CONCEPT

WARTS

- Warts are small harmless lesions of the skin
- caused by a virus: the human papilloma virus HPV
- Warts are common in children. Most cases occur between ages 12-16 years.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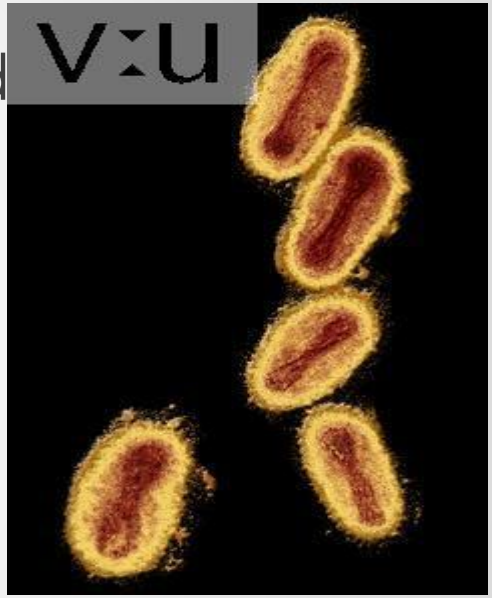
MOLLUSCUM CONTAGIOSUM



It is caused by a DNA poxvirus called *Molluscum contagiosum virus* (MC).

Types of MCV:

There are four types of MCV, MCV-1 to -4;

- MCV-1 is the most prevalent
- MCV-2 is seen usually in adults and often sexually transmitted

SELF DIRECTED LEARNING

Monkeypox: A current emergenc

nlm.nih.gov/36818951/

Review > Turk J Emerg Med. 2023 Jan 2;23(1):5-16. doi: 10.4103/2452-2473.366487. eCollection 2023 Jan-Mar.

Monkeypox: A current emergency global health threat

Mohamud Sheek-Hussein [1], Ahmed R Alsuwaidi [2], Emma A Davies [3], Fikri M Abu-Zidan [4]

Affiliations + expand

PMID: 36818951 PMCID: PMC9930390 DOI: 10.4103/2452-2473.366487

Free PMC article

Abstract

Monkeypox (MPXV) is an emerging zoonotic disease carrying a global health threat. Using a multi-disciplinary approach, we review the current MPXV virus infection outbreak including virology, prevention, clinical presentation, and disaster management. MPXV is caused by a double-stranded deoxyribonucleic acid virus. Despite its clinical similarities with smallpox, it is less severe with low mortality. Human-to-human transmission occurs through prolonged direct or close contact, or through blood, body fluids, or mucosal lesions. Risk groups include frontline health workers who care for MPXV patients, household members of an infected patient, and men who have sex with men. Skin lesions are usually, but not always, at the same stage. They may affect the face followed by the distal extremities with fewer lesions on the trunk (centrifugal distribution). Lesions may involve the mouth, genitalia, conjunctiva, and rectum. The majority of cases are mild. Nevertheless, the disease may have long-term effects on the skin, the neurological system, and the eye. Vaccination against MPXV is available but meanwhile should be limited to those who are at high risk. Those vaccinated against smallpox (usually older than 40 years) might be immune against MPXV. Infectious diseases are without borders. If proper action is not taken, there is considerable risk that MPXV will be entrenched worldwide. Our world has a delicate balance between animals, environment, and humans reflecting the need for a "one globe, one health approach" to address this risk. Following the principles of disaster management and using the lessons we have learned from the COVID-19 pandemic will

STUDY RESOURCES