

2- Cutaneous mycoses

Are infections that extend deeper into the epidermis. It invades hair and nails and causes diseases. The diseases are referred to as ringworm or tinea, also called (dermatophytes) Dermatophytes are keratinophilic - "keratin loving". Digest the keratin which is found in the skin, nails and hair by their keratinase enzyme.

❖ Tinea Pedis

Also known as Athlete's foot is a dermatophyte infection of the skin of the foot. Symptoms include: itching or burning on the skin of the foot, peeling or flaking skin, dry skin, blisters or thick patches of dry red skin. Three species of fungi, *Trichophyton rubrum*, *Trichophyton mentagrophytes*, and *Epidermophyton floccosum* are together responsible for the vast majority of cases of tinea pedis throughout the world.



Figure (1) Tinea pedis caused by *Epidermophyton floccosum*

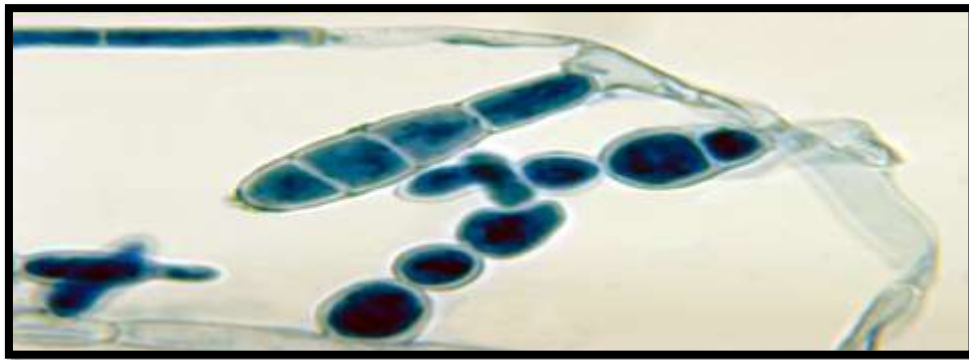


Figure (2) *Epidermophyton floccosum*: Thin-walled macroconidia growing directly from the hyphae and numerous clamidoconidia

❖ Tinea corporis

Dermatophytosis of the body (tinea corporis) affects the glabrous skin and is commonly known as ringworm. Clinically, the lesions present as annular plaques with central clearing, leading scale, and a ring-shape appearance .They occur mainly on the trunk, limbs, and may be single or multiple, of varying sizes, and may coalesce *Microsporum canis* is a frequent cause of human infection,



Figure (3) *Microsporum canis* :Micromorphology: Spindle-shaped, thick-walled macroconidia with more than 6 cells, and few pyriform to claviform microconidia



Figure (4) Tinea corporis: The lesions present as annular plaques and a ring-shape appearance

❖ Tinea cruris

Tinea cruris is infection of the groin with a dermatophyte fungus. It is most often seen in adult men. Tinea cruris is commonly known as jock itch. *Trichophyton rubrum* and *Epidermophyton floccosum* are the most common causes. Symptoms of jock itch are mainly seen in the groin region, inner and upper thighs and on the male genitalia. Some of the symptoms of jock itch infection are: Red or pink ring-shaped rash, Dry and roughened skin, Small blisters (formation).



Figure (5) Tinea of the groin and buttocks caused by *T. rubrum*

❖ Tinea unguium

onychomycosis a fungal infection of the nail, usually caused by a dermatophyte *Trichophyton rubrum* and *T. interdigitale*



Figure (6) Tinea of the toe nails caused by *T. rubrum*

❖ Tinea capitis

is a fungal infection of the scalp, involving both the skin and hair. It is also known as scalp ringworm. Symptoms of tinea capitis include hair loss, dry scaly areas, redness, and itch. Tinea capitis is caused by dermatophytic fungi capable of invading keratinised tissue, such as the hair and nails. *Trichophyton tonsurans* is an anthropophilic dermatophyte that is the most common cause of tinea capitis in the United States. Examples of other anthropophilic fungi that cause tinea capitis include: *T. soudanese*, *T. schoenleinii*, *M. audouinii*.

The infection occurs following invasion of the keratinised stratum corneum of the scalp, the fungus grows downwards into the hair follicle and the hair shaft. It penetrates the hair cuticle and typically invades the hair shaft in one of three ways:

- Ectothrix infection: the dermatophyte grows within the hair follicle and covers the surface of the hair. Fungal spores are evident on the outside of the hair shaft and the cuticle is destroyed. *M. canis* is an ectothrix dermatophyte.



Figure (7) Ectothrix Tinea capitis showing Places hair loss caused by *M. canis*

- Endothrix infection: the dermatophyte invades the hair shaft and grows within it. Fungal spores are retained inside the hair shaft, and the cuticle is not destroyed. *T. tonsurans* is an endothrix dermatophyte.

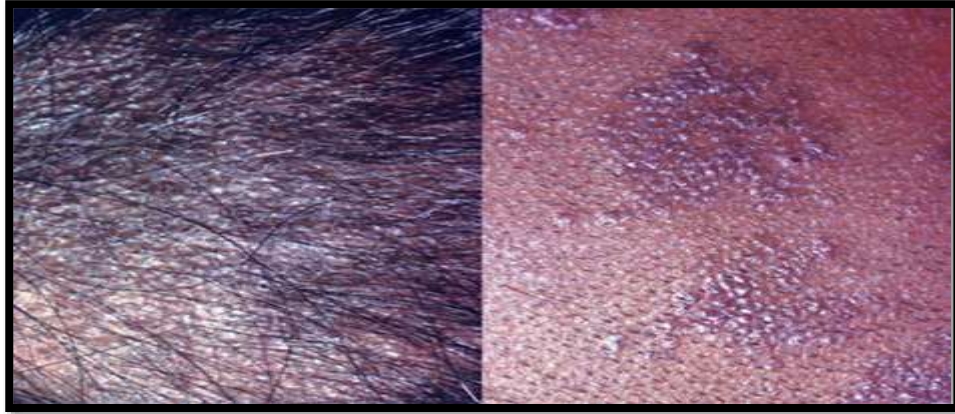


Figure (8) Endothrix tinea capitis caused by *T. tonsurans* and black dot tinea capitis caused by *T. violaceum*

- Favus infection: a chronic dermatophyte infection caused by *T. schoenleinii* and characterised by clusters of hyphae at the base of the hairs, with air spaces in the hair shafts. Clinically there is yellow crusting around the hair shaft.



Figure (9) Favus of the scalp showing extensive hair loss and numerous small scutle caused by *T. schoenleinii*

Laboratory Diagnosis:

Direct Microscopy:

Skin Scrapings, nail scrapings and epilated hairs should be examined using 10% KOH and Parker ink or calcofluor white mounts.

Culture:

Specimens should be inoculated onto primary isolation media, like Sabouraud's dextrose agar containing cycloheximide and incubated at 26-28°C for 4 weeks. The growth of any dermatophyte is significant.

Wood lamp examination

Wood lamp is diagnostic when hair fluorescence is seen, Bright green fluorescence of infected hairs is observed in tinea capitis caused by *Microsporum* species (*M. ferruginium*, *audouinii*, *canis*, and *distorum*). Identifying affected hairs in this way may help with obtaining an appropriate specimen for microscopy and culture. Procedure that uses transillumination (light) to detect bacterial or fungal skin infections.

A Wood lamp examination is a test that uses ultraviolet (UV) light to look at the skin closely. A Wood's lamp is a light that uses long wave ultraviolet light. When an area of scalp that is infected with tinea (a type of ringworm fungus) is viewed under a Wood's light, the fungus may glow.



Figure (10) Wood lamp fluorescence device



Figure (11) Tinea capitis: Wood lamp fluorescence