Lec. 4B | Fungal Infections

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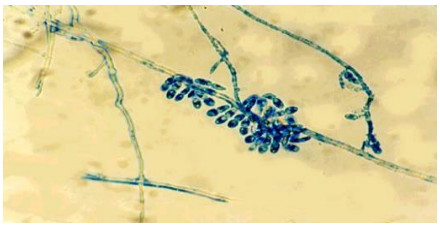
Fungal infections



A. **Superficial fungal infections:** (Skin, hair, nails and/or m.m)
B. **Deep fungal infections:** (Internal organs, occasionally skin)

Dermatophyte infection

Definition: Skin, hair, and nail infections caused by dermatophytes

Pathogen:

- Multicellular organisms that connect together to form long filaments called hyphae which may septate or non-septate. It may be **spore forming**.
- Dermatophytes are fungi that infect keratinized tissue
- It includes 3 genera: Trichophyton (most common), Microsporum, and Epidermophyton genera.
- The most common causative pathogen of tinea is **Trichophyton rubrum.**

Risk factors

- Diabetes mellitus
- Immunocompromised patients (e.g., HIV)
- Poor circulation, peripheral arterial disease
- Maceration of skin (e.g., in athletes)

Diagnosis

1- Clinical Picture

2- Wood's light:

It is a long-wave ultraviolet rays passing through a glass containing **nickel oxide**. Certain fungi fluoresce when examined by Wood's light:

- Microsporum canis ---------- > bright green fluorescence
- Trichophyton schoenleinii -------- > dull green fluorescence

3- Direct microscopic examination: of infected hairs and scales by 10-20% KOH hyphae and spores.

4- Culture: on Sabouraud's agar medium **(confirmative)**

Clinical Types of dermatophyte Infection

According to affected site:

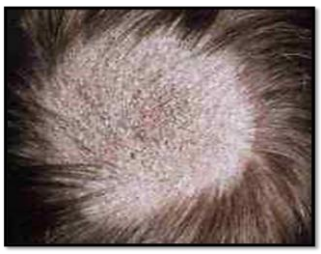
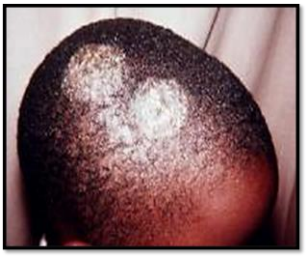
- Tinea capitis: scalp.
- Tinea corporis (circinata): body.
- Tinea barbae: beard
- Tinea cruris: groin.
- Tinea pedis: feet.
- Onychomycosis (T. ungum): Nails

Tinea Capitis

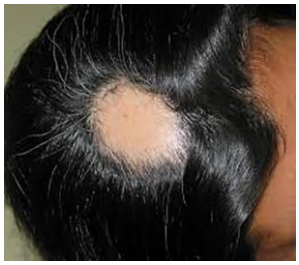
- **Age**: mainly school children
- **Sex**: more frequent in boys than girls
- **Causative fungi** (in Egypt, mainly):
  - Trichophyton violaceum, Trichophyton tonsuran
  - Microsporum canis.
- **Modes of infection**:
  - Direct contact with infected child or animal.
  - Indirect (the use of patient's fomities, brushes, caps).
- **Clinical Types of Tinea Capitis**
  1- Scaly type (scaly ringworm).
  2- Kerion.
  3- Favus.

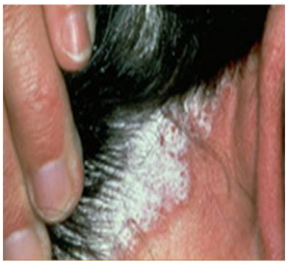
1- Scaly type (scaly ringworm)

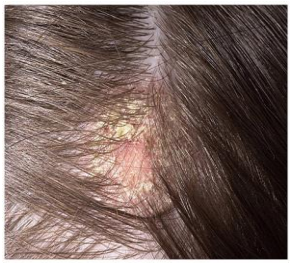
- **Causative organism:** Microsporum canis (M. canis).
- **Lesion:** Single or multiple, round or oval, scaly (grayish white) patches.
- **Hair:** broken off (2-3mm long), dull grey (lusterless) or lost
- **Resolution**: without scar

- **Differential diagnosis:**
  1. **Alopecia areata**: skin is completely normal, hair loss, sudden onset
  2. **Psoriasis**: well-defined erythematous plaque with silvery scales.
  3. **Seborrhoeic dermatitis**: diffuse erythema, yellowish or dull greasy scales

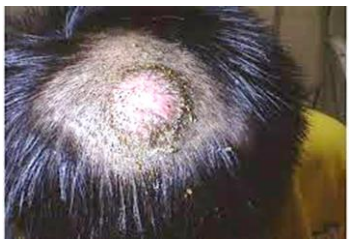
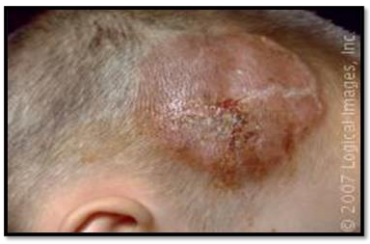

Alopecia areata


Psoriasis

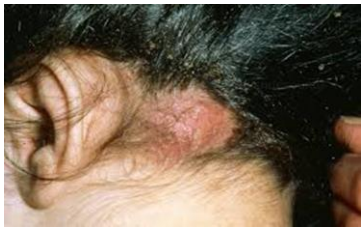

Seborrhoeic dermatitis

2- Kerion

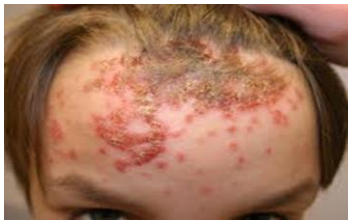
- **Causative organism:** Dermatophytes of animal origin
- **Lesion:** Inflammatory type, Boggy indurated swelling, with crusting.
- **Hairs overlying it:** loose, on removal of hair: seropus.
- **Resolution:** may lead to scar (cicatricial alopecia)
- **In extensive lesions:** Fever, pain & regional lymphadenopathy may be present.

- **Differential diagnosis:**



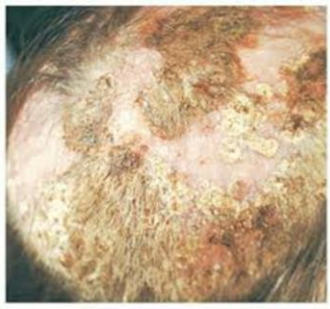
Abscess



Impetigo

3-Favus

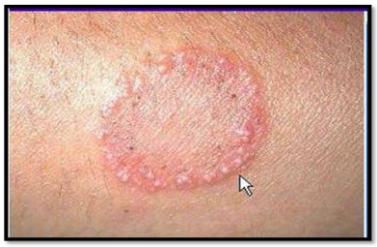
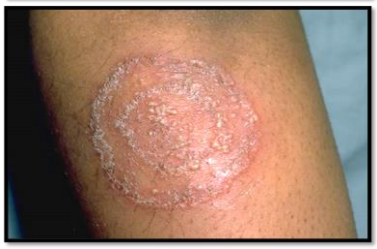
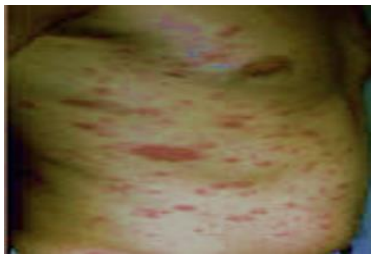
- **Caustive organism:** T. Schoenleinii.
- **Lesion:** **Scutula** (yellow cup shaped crusts that are pierced by hair, with mousy odour). Scutula may be discrete or confluent → extensive (Honey-combed masses).
- **Hair:** pierce the scutulum
- **Resolution:** Scar (Cicatricial alopecia) in neglected cases.
- **Differential Diagnosis:**
  - Psoriasis, seborrhoeic dermatitis (early stage).
  - Atrophic lichen and discoid lupus erythematosus (late stage).



Treatment of tinea capitis	
A- Topical treatment	⅄ Whitfield's ointment. ⅄ Imidazoles, e.g.clotrimazole, econazole, ketoconazole.sertaconaole ⅄ Allylamines e.g. terbinafine
B- Systemic treatment	***Necessary for tinea capitis because topical treatment are unable to penetrate the hair shaft*** ⅄ Griseofulvin (10 mg/kg/d. for 6- 8 weeks.) ⅄ Itraconazole ⅄ Fluconazole ⅄ Terbinafine

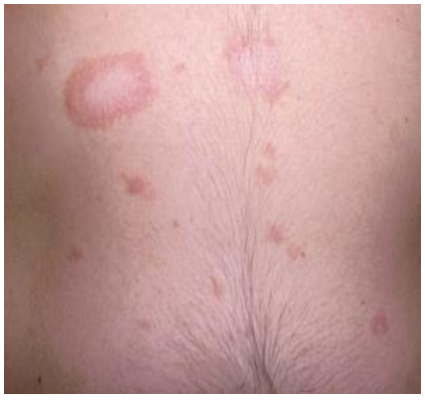
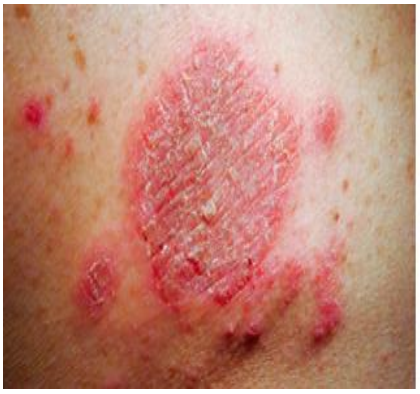
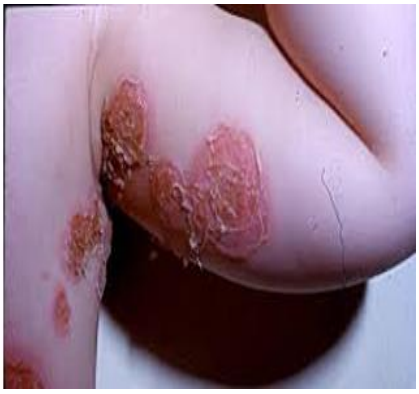
***Other infected members of the household and pets should also receive treatment**.

Tinea Corporis (circinata)

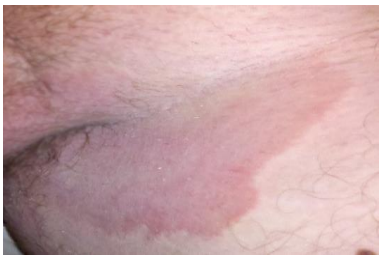
- **Causative organism:** All dermatophytes.
- **Age:** more common in children
- **Lesion:** single or multiple circular lesions, sharply defined, erythematous, raised edge, more inflamed than center "active edge". Sometimes studded with minute vesicles, papules, and pustules.
- **Resolution: central** clearing produces circinate or annular lesions.

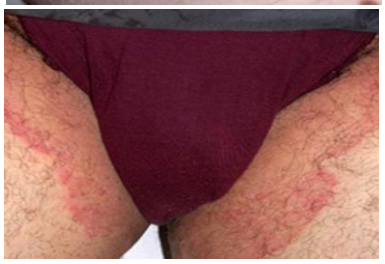
- **Differential diagnosis:**
  - Pityriasis rosea (PR)
  - Circinate impetigo
  - Discoid eczema
- **Treatment:**
  - Mild: Topical antifungal
  - Extensive: Systemic antifungals (terbinafine, itraconazole, fluconazole, griseofulvin)

Tinea Cruris(Jock itch)

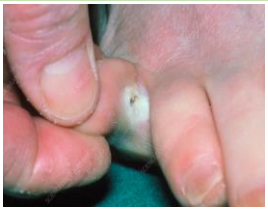
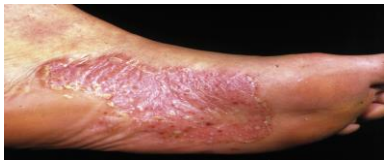
- It is dermatophyte infection of the groin.
- **Commonly by T. rubrum**
- **Lesion:** Starts as small erythematous scaly patch → spreads peripherally without central clearing→ the edge is well-defined with minute vesicles, papules &pustules
- **Symptom:** Itching is common.
- **Sex:** More common in men.
- **Weather:** hot summer.
- **D.D:** Candidal intertrigo, seborrhoeic dermatitis, flexural psoriasis and erythrasma.
- **Treatment:**
  - ✓ The area should be kept dry.
  - ✓ Wearing loose underclothing
  - ✓ Topical antifungal powder
  - ✓ Systemic antifungals (2-4 weeks).





Tinea Pedis (Athlete's foot)

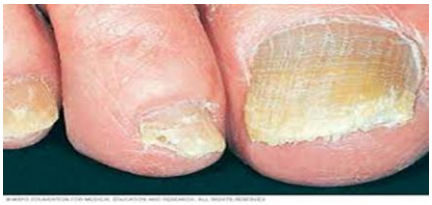
- It is ringworm of the feet. **commonly by T. rubrum, T. interdigitale**
- Most common fungal disease.
- **Predisposing factors:** Wearing sockets & shoes for long duration, hyperhidrosis, communal showers, swimming baths.
- **Age and sex:** common in adult male

Clinical varieties		
A. Interdigital type	▪ Commonest. ▪ Characterized by peeling, maceration& fissuring. ▪ **Site**: lateral toe clefts, may spread to undersurface of the toes.	
B. Squamous hyperkeratotic	▪ Very chronic, resistant to treatment ▪ Characterized by erythema & scaling. ▪ **Site:** whole sole	
C. Acute vesiculobullous	▪ Erythematous itchy vesicular eruption. ▪ **Site:** involve ofenly the medial sides.	

- **Treatment**:
  - Dry the feet thoroughly after bathing. **Open shoes in warm, humid weather**
  - Antifungal powder on the feet for susceptible persons.
  - Topical anti-fungals for mild cases.
  - Systemic anti-fungals for extensive and chronic cases.

Onchomycosis (Tinea unguium)

- **Fungal infection of the nails most commonly T. rubrum**
  The nail plate is thickened, discolored, cracked, with subungual hyperkeratosis, onycholysis and massive destruction of the nail plate.
- **Treatment:** Systemic antifungal
  - The medications with the greatest efficacy are oral terbinafine or itraconazole.
  - These medications are used for at least 6 weeks for fingernails and 12 weeks for toenails.
  - Terbinafine is potentially hepatotoxic, and it is important to periodically check liver function tests.




QUIZ

Cases: viral infection

1. **A male patient 25y.old presented by a group of vesicles on erythematous base on the lumbosacral region. The lesion is unilateral. Patient complains of severe pain. The case is**
   a. Herpes simplex
   b. Warts
   c. Molluscum contagiosum
   d. Herpes zoster
2. **A female patient 20 elevated lesion with hyperkeratotic surface on the dorsum of hand. The lesion is painless. The case is :**
   a. Eczema
   b. Common Wart.
   c. Molluscum contagiosum.
   d. Plane wart.

3. **A child 10 years old presented with multiple smooth white, hemispherical umplicated papules on the trunk. On squeezing the lesion, cheesy material is expressed. The case is:**
   a. Wart
   b. Chicken pox
   c. Molluscum contagiosum
   d. Herpes zoster

Cases: Dermatophytic infections

4. **Female child 10 years old presented by multiple rounded, scaly (grayish white) patches on the scalp, the hair over it is dull-grey and broken off (2-3mm long) since one week. What is your diagnosis?**
   a. Psoriasis
   b. Seborrhoeic dermatitis
   c. Scaly ring worm
   d. Alopecia areata
5. **Male patient 40 yrs old presented by erythematous scaly patch over the upper inner thigh that spreads peripherally with central clearing and the edge is well-defined with minute vesicles, papules &pustules. What is your diagnosis?**
   a. Candidal intertrigo
   b. Flexural psoriasis
   c. Erythrasma
   d. Tinea cruris
6. **Male child 12 years old presented with painless boggy indurated swelling, with crusting over the scalp. The overlying hair is loose, and on removal of hair it exudes seropus.**
   a. Abscess
   b. Favus
   c. Kerion
   d. Impetigo

1	2	3	4	5	6
D	B	C	C	D	C