



MICROBIOLOGY

Lecture : fungi infection

DONE BY :

NAWAR

NIZAR

FUNGAL INFECTION

Agents of Superficial and Subcutaneous Mycoses

FUNGUS	FUNGAL GROWTH		INFECTION SITE	DISEASE
	IN LESION	IN CULTURE (25°C)		
Dermatophytes				
<i>Microsporum canis</i>	Septate hyphae	Mold	Hair, ^a skin	Ringworm
<i>Microsporum audouini</i>	Septate hyphae	Mold	Hair ^a	Ringworm
<i>Microsporum gypseum</i>	Septate hyphae	Mold	Hair, skin	Ringworm
<i>Trichophyton tonsurans</i>	Septate hyphae	Mold	Hair, skin, nails	Ringworm
<i>Trichophyton rubrum</i>	Septate hyphae	Mold	Hair, skin, nails	Ringworm
<i>Trichophyton mentagrophytes</i>	Septate hyphae	Mold	Hair, skin	Ringworm
<i>Trichophyton violaceum</i>	Septate hyphae	Mold	Hair, skin, nails	Ringworm
<i>Epidermophyton floccosum</i>	Septate hyphae	Mold	Skin	Ringworm
Other superficial fungi				
<i>Malassezia furfur</i> ^b	Yeast (mycelia) ^c	Yeast	Skin (pink to brown) ^d	Pityriasis (tinea) versicolor
<i>Hortaea werneckii</i> ^e	Septate hyphae, ellipsoidal cells	Yeast (mold)	Skin (brown–black) ^d	Tinea nigra
<i>Trichosporon cutaneum</i>	Septate hyphae	Mold	Hair (white) ^b	White piedra
<i>Piedraia hortae</i>	Septate hyphae	Mold, ascospores	Hair (black) ^b	Black piedra
Subcutaneous fungi				
<i>Sporothrix schenckii</i>	Cigar-shaped yeast (rare)	Mold	Subcutaneous, lymphatic spread	Sporotrichosis
<i>Fonsecaea pedrosoi</i>	Muriform body ^f	Mold	Wart-like foot lesions	Chromoblastomycosis
<i>Phialophora verrucosa</i>	Muriform body ^f	Mold	Wart-like foot lesions	Chromoblastomycosis
<i>Cladophialophora</i> (<i>Cladosporium</i>) <i>carrionii</i>	Muriform body ^f	Mold	Wart-like foot lesions	Chromoblastomycosis

Dermatophytes

- superficial infections of the skin its rarely invade in deep structure
- *Microsporum*, *Trichophyton*, and *Epidermophyton*.
- Slowly progressive eruptions of the skin (not painful not life threatening)
- The manifestations : erythema, induration, itching, and scaling. These are response for fungal metabolic product producing

ringworm

Describe some of the most prominent features of these infection -well-demarcated patch with inflammatory border



EPIDEMIOLOGY

- ecologic and geographic differences تختلف باختلاف الطقس الرطوبه المكان
- Reservoir may be human, animal, or soil.

Human-to-human transmission usually requires close contact with an infected subject. Transmission requires contact with intact or detached skin or hair such as that in barber shops and locker rooms تنتقل عن طريق اللمس مثلا او عن طريق محلات الحلاقة وغرف تغيير الملابس

DERMATOPHYTOSES:

CLINICAL ASPECTS

- Discomfort and disfiguration. ممكن يكون المريض بدون اعراض وممكن يجيك وهو متذايق من الشكل ومش انه يكون متالم
- Dermatologists often give each infection its own “disease” name, for example, **tinea capitis** (scalp), **tinea pedis** (feet, athlete’s foot), tinea manuum (hands), **tinea cruris** (groin), **tinea barbae** (beard, hair), and **tinea unguium** (nail beds).
Its depend on site of infection, dynamic of skin growth and the inflammatory response



Athlete's foot in a toe web space

scaling and splitting of the skin between the toes, is commonly known as athlete's foot. Moisture and maceration of the skin provide the mode of entry.



- Multiple lesions can fuse to form unusual geometric patterns on the skin. Lesions are common in moist, sweaty skin folds.
- Obesity and the wearing of tight apparel increase susceptibility to infection in the groin and beneath the breasts. هنول مجموعه العوامل الي بتساعد في ظهور هاي الفطريات

- onychomycosis typically presents as a chronic and painless thickening of the nail plate with an accumulation of scaling debris in the nail bed this debris often includes a mixture of human and fungal almonds
- Nail bed infections first cause discoloration of the subungual tissue, then hyperkeratosis and apparent discoloration of the nail plate by the underlying infection follow.
- Hyperkeratosis can dislodge the nail bed.

discoloration



hyperkeratosis



آخر مرحله اللي هي dislodge



Tinea capitis



طبعاً لازم نفرق بينهم اول صورتني فوق هذول tinea capitis so they are fungal infection هان في شعر انا بتلاحظ الشعر زي كانه مكسر بينما تحت بالمره فاش شعر



while these two are not fungal infection they are completely different in treatment هذول بتعالجوا بال ستيرويد بينما اللي فوق ب antifungal drug

DIAGNOSIS

- Infections caused by bacteria, other fungi, and noninfectious disorders (psoriasis, contact dermatitis) may have similar features.
KOH mounts of skin scrapings and infected hairs demonstrate hyphae.
- Some species fluoresce by a U.V. lamp.
- Culture is used when KOH preparations are negative.

حكى راح نوخذة باللاب ومهم جدا نفرق بين الالتهاب اللي من الفطريات من اللي مش فطريات



TREATMENT AND PREVENTION

- resolve spontaneously. معظمه بروح لحاله بدون الحاجه لادويه.
- Topical use of tolnaftate, allylamines, or azoles is usually sufficient .
- Nail bed and more extensive skin infections require systemic therapy which is oral antifungal therapy
- No specific preventive measures such as vaccines exist. مفش الها لقاح او طريقه معينه للحمايه.

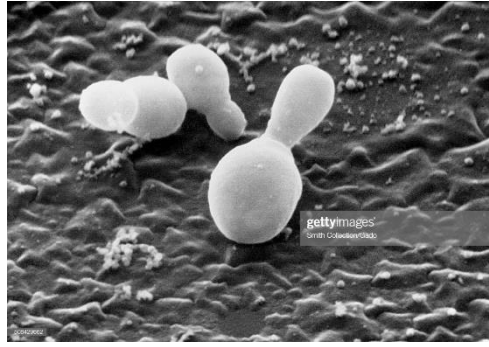
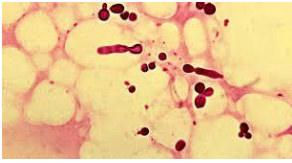
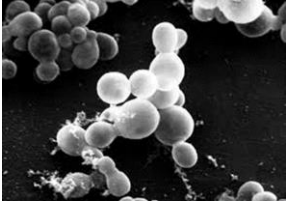
Other Superficial Mycoses

Pityriasis (tinea) versicolor سمي بهذا الاسم لانه عنا تباين بالالوان

discrete areas of hypo- or hyperpigmentation associated with induration and scaling. on trunk and arm

Malassezia furfur is the most common cause مهمه هاي

اذا بنطلع على الصورتين الابيض والاسود بنلاحظ انها
fungal making budding



Tinea nigra

nigra for black color of lesion

- Another tropical infection, characterized by brown to black macular lesions, usually on the palms or soles.
- The cause, *Hortaea werneckii*, is a black-pigmented fungus found in soil and other environmental sites.

مطلوب نعرف المسبب والمكان اللي بتصيبه ومكان تواجده(اللي باللون الاحمر)

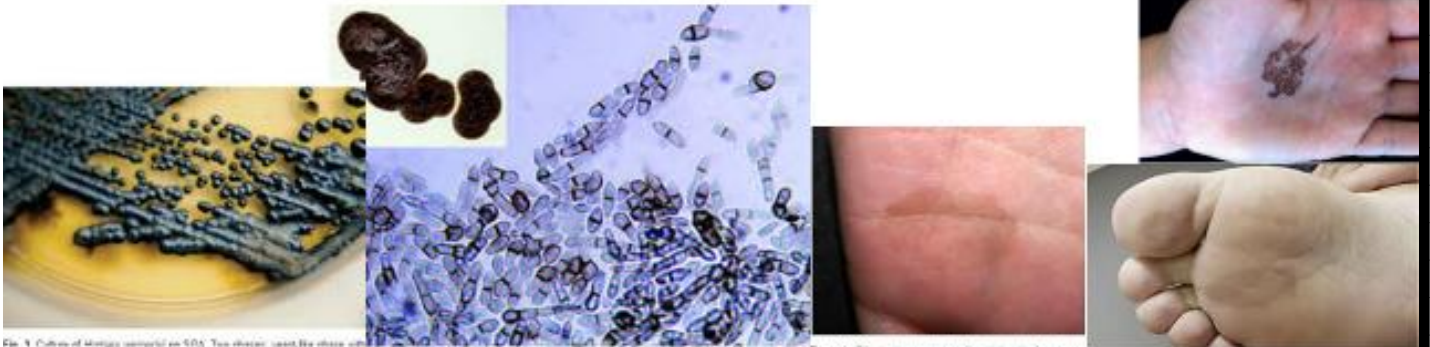


Fig. 8 Culture of *Hortaea werneckii* on 50% Tinsol agar. (left) In vitro culture.

Piedra

- Is an infection of the hair characterized by black or white nodules attached to the hair shaft.

White piedra (caused by *Trichosporon cutaneum*) light, soft and loosely attached

Black piedra (caused by *Piedraia hortae*) dark, hard. ما ضاف الدكتور اشي جديد بس

ركز على الفرق بين البضاء والسوداء



SUBCUTANEOUS FUNGI

- Introduced traumatically through the skin and are typically limited to subcutaneous tissues, lymphatic vessels, and contiguous tissues. عشان تحدث الاصابه لازم نكون تعرضنا لضربه او رضه
They rarely spread to distant organs. لانها نادرا ما يكون في
blood involvement
- The diseases they cause include **sporotrichosis**, **chromoblastomycosis**, and **mycetoma**.
- **Only sporotrichosis has a single specific etiologic agent, *Sporothrix schenckii*.**
هاي النقطة ركز عليها انه هاض المرض ما بسببه الا نوع واحد من الفطريات
- Chromoblastomycosis and mycetoma are clinical syndromes with multiple fungal etiologies.

SPOROTRICHOSIS

EPIDEMIOLOGY

- *S. schenckii* is a ubiquitous saprophyte particularly found in hay, moss, soil, and decaying vegetation, and on the surfaces of various plants.
- Infection is acquired by traumatic inoculation through the skin of material containing the organism.
- Occupational disease of gardeners and farmers. هاي مهمة جداً لانه بعيش التربه وبعيش في النباتات زي ما حكينا فوق

CLINICAL ASPECTS

MANIFESTATIONS

A painless papule that develops a few weeks to a few months after inoculation that eventually ulcerates. ما ضاف شيء جديد.

Lymphatic involvement.

Multiple ulcers due to lymphatic involvement



Chromoblastomycosis

- a tropical disease caused by multiple species of pigmented saprophytic fungi.
Different types of fungi cause this infection
- It appears as **papules that develop into scaly, wart-like structures, usually under the feet.**
- **it is slow and painless**
- and does not involve the lymphatic vessels. هاي مهمه بانها بتفرق عن اللي قبلها فبنلاحظ انها بتظل في مكان محدد
- The organisms are **found in the soil of endemic areas, and most infections occur in individuals who work barefoot.**



Mycetoma

- is a clinical term for an infection **associated with trauma** to the foot **that causes inoculation of any of a dozen fungal species**.
- The typical clinical appearance is of **massive induration with draining sinuses**.
بشكل عام اللي مهم نعرفه انه ما بسببه نوع واحد من الفطريات وانه بنلاحظه ب
massive draining sinuses



حكى الدكتور انها مش معنا وراح نحكي عنها الفصل الجاي *CANDIDA*